



# Cisco Nexus 9000 Series FPGA/EPLD Upgrade Release Notes, Release 9.3(13)

This document lists the current and past versions of EPLD images and describes how to update them for use with the Cisco Nexus 9000 Series switches.

This document also covers later releases. If a newer Cisco Nexus 9000 Series FPGA/EPLD Upgrade Release Notes document isn't available, then these are the latest numbers available for upgrade.

The following table lists the changes to this document.

| Date              | Description                       |
|-------------------|-----------------------------------|
| December 18, 2023 | Release 9.3(13) became available. |

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## Introduction

The Cisco Nexus 9000 Series NX-OS mode 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 a line card 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. These EPLD image updates are not mandatory unless otherwise specified. The EPLD image upgrades are independent from the Cisco In Service Software Upgrade (ISSU) process, which upgrades the system image with no impact on the network environment.

## When to Upgrade EPLDs

When Cisco makes an EPLD image upgrade available, these release notes announce their availability, and you can download the EPLD images from <https://software.cisco.com/download/navigator.html>.

## 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, then consider postponing the upgrade until a better time.

**NOTE:** The EPLD upgrade operation is a disruptive operation. Execute this operation only at a programmed maintenance time. The system ISSU upgrade is a nondisruptive upgrade.

**NOTE:** Do not perform an EPLD upgrade during an ISSU system upgrade.

**NOTE:** EPLD version is backward compatible.

## Switch Requirements

The Cisco Nexus 9000 Series switch must be running the Cisco NX-OS operating system

You must be able to access the switch through a console, SSH, or Telnet (required for setting up a switch running in NX-OS mode).

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

## EPLD Upgrades Available for NX-OS Mode Releases 9.3(13)

Each EPLD image that you can download from [Software Download page](#), is a bundle of EPLD upgrades. To see the recent updated EPLD versions for the Cisco Nexus 9200, 9300, 9300-EX, 9300-FX, and 9500 platforms, see the following tables.

**NOTE:** All updates to an image are shown in boldface. If more than one release is shown for a column, the boldface applies to the first release listed for the column.

**NOTE:** The 9.3(13) release of EPLD, addresses the Secure Boot Hardware Tampering vulnerability for the Nexus 3K and Nexus 9000 Series switches. Please refer to [Security Advisory](#).

Please review the advisory for affected HW-PIDs (see below table) for more details on how to apply the patch. The 9.3(13) release epld requires a specific sequence of upgrade.

Vulnerable Products addressed in Security Advisory (cisco-sa-20190513-secureboot)

## Nexus 9000 Series Switches

| PID             | Fixed IO FPGA Version |
|-----------------|-----------------------|
| N9K-C93180YC-EX | 0x15                  |
| N9K-C93108TC-EX | 0x15                  |
| N9K-C93180LC-EX | 0x20                  |
| N9K-C93180YC-FX | 0x20                  |
| N9K-C93108TC-FX | 0x20                  |

|                  |      |
|------------------|------|
| N9K-C9348GC-FXP  | 0x10 |
| N9K-C92300YC     | 0x20 |
| N9K-C93240YC-FX2 | 0x10 |
| N9K-C9336C-FX2   | 0x10 |
| N9K-C9364C       | 0x6  |
| N9K-C9332C       | 0x10 |
| N9K-C92160YC-X   | 0x19 |
| N9K-C9272Q       | 0x17 |
| N9K-C92304QC     | 0x12 |
| N9K-C9236C       | 0x17 |
| N9K-C9232C       | 0x8  |
| N9K-SUP-A+       | 0x14 |
| N9K-SUP-B+       | 0x14 |
| N9K-C93120TX     | 0x13 |
| N9K-SUP-B        | 0x30 |
| N9K-SUP-A        | 0x30 |

#### Nexus 3000 Series Switches

|                 |      |
|-----------------|------|
| N3K-C36180YC-R  | 0x8  |
| N3K-C3636C-R    | 0x8  |
| N3K-3232C       | 0x12 |
| N3K-C3264Q-S    | 0x12 |
| N3K-C31108PC-V  | 0x6  |
| N3K-C3164Q-40GE | 0x13 |
| N3K-C31108TC-V  | 0x6  |
| N3K-C3132C-Z    | 0x20 |
| N3K-C3264C-E    | 0x6  |

NOTE: N3K-C36180YC-R and N3K-C3636C-R, CPU FPGA will have the fix, so look for CPU FPGA instead of IO.

## Cisco Secure Boot Hardware Tampering Vulnerability - Remediation Steps

The following section details updating your EPLD version for affected switches listed in:

<https://tools.cisco.com/security/center/content/CiscoSecurityAdvisory/cisco-sa-20190513-secureboot>

### Nexus 9000 Modular chassis with dual supervisor:

#### IMPORTANT NOTE:

It is required to update both Golden and Primary regions of FPGA to address this particular vulnerability. It is by design,

Cisco Secure Boot Hardware Tampering Vulnerability - Remediation Steps

that we don't allow updating both primary and golden at the same time (to avoid programming errors, that may cause switch to not boot, hence only one region is allowed to be programmed per reload).

Please do not attempt to upgrade Golden region of FPGA once it is on a fixed version.

1. Copy the EPLD image to bootflash (e.g. used n9000-epld.9.3.13.img).
2. If you have dual supervisor, determine which is the standby Supervisor by doing 'show module' and start upgrading it first. On the N9K, Only supervisors need upgrade for this vulnerability. LC/FM/SC cards are not affected.
3. Assuming standby supervisor is slot 28. Update the Primary FPGA region of standby supervisor.

```
install epld bootflash:n9000-epld.9.3.13.img module 28
```

Expected result: Switch will update primary EPLD of standby supervisor and will reload the standby supervisor module automatically. Please don't interrupt, power cycle or reload when EPLD update is happening. Once standby is booted, it will again come up as standby supervisor. A 'show version module 28 epld' will continue to show old version.

```
switch# show mod | grep SUP
27 0 Supervisor Module          N9K-SUP-A      active *
28 0 Supervisor Module          N9K-SUP-A      ha-standby
27 9.3(0.416)      1.0 SUP1
28 9.3(0.416)      0.3011 SUP2
```

```
switch# show version module 28 epld
EPLD Device      Version
-----
IO FPGA          0x27
```

This is expected, as the switch would have booted from Golden FPGA which is still not updated. You can verify this from syslog which would say:

```
%CARDCLIENT-5-MOD_BOOT_GOLDEN: Module 28 IOFPGA booted from Golden
```

4. Update the Golden (also called backup) FPGA region of the standby supervisor.

```
install epld bootflash:n9000-epld.9.3.13.img module 28 golden
```

```
Module 28 : IO FPGA [Programming   ] : 100.00% ( 64 of 64 total sectors)
Module 28 EPLD upgrade is successful.
Module      Type Upgrade-Result
-----
28      SUP      Success
```

Expected result: Switch will update the golden EPLD of standby supervisor and will reload the standby supervisor module automatically. Please don't interrupt, power cycle or reload when EPLD update is happening. Once standby is booted, it will again come up as ha-standby supervisor.

Once this is done, when you check 'show version module 28 epld' you will see FPGA version that is >= to the fixed version for the standby supervisor. Your switch has the fixed version for standby supervisor.

```
switch# show version module 28 epld

EPLD Device      Version
-----
IO FPGA          0x30
```

Repeat Step 3 and 4, for the active supervisor. At the end of Step 3, supervisor in slot 27 will reload and hence now will become standby supervisor. The active supervisor will be Supervisor in slot 28.

(considering SUP 27 is active to begin with, for the above activity, such as steps 3 and 4, commands would have 27 in place of 28.)

Log below shows what happens when epld upgrade happens for active supervisor.

Module 27 : IO FPGA [Programming] : 100.00% ( 64 of 64 sectors)

Module 27 EPLD upgrade is successful.

Module Type Upgrade-Result

```
-----
 27    SUP    Success
```

EPLDs upgraded. Performing switchover.

Once the supervisor in Slot 27 becomes ha-standby complete step 4 for Slot 27, and it will again boot and become ha-standby. Both the supervisors now have the vulnerability fixed version of FPGA.

At the end of the upgrades, switch should boot with primary for both SUPs, logs below

```
switch# show logging log | grep -i fpga | grep -i 27
2019 Jul 10 07:55:04 switch %CARDCLIENT-5-MOD_BOOT_PRIMARY: Module 27 IOFPGA booted from Primary
switch# show logging log | grep -i fpga | grep -i 28
2019 Jul 10 07:58:01 switch %CARDCLIENT-5-MOD_BOOT_PRIMARY: Module 28 IOFPGA booted from Primary
```

## Nexus 9000 Modular chassis with single supervisor:

### IMPORTANT NOTE:

It is required to update both Golden and Primary regions of FPGA to address this particular vulnerability. It is by design, that we don't allow updating both primary and golden at the same time (to avoid programming errors, that may cause switch to not boot, hence only one region is allowed to be programmed per reload).

Please do not attempt to upgrade Golden region of FPGA once it is on a fixed version.

1.Copy the EPLD image to bootflash (e.g. used n9000-epld.9.3.13.img).

2.Assuming the supervisor is in Slot27. Update the Primary FPGA region.

install epld bootflash:n9000-epld.9.3.13.img module 27

Expected result: Switch will update primary EPLD of the supervisor and will reload the switch automatically. Please don't interrupt, power cycle or reload when EPLD update is happening. Once the supervisor is booted, the 'show version module 27 epld' will continue to show old version

Switch#show version module 27 epld

```
-----
Name           InstanceNum    Version    Date
-----
```

Cisco Secure Boot Hardware Tampering Vulnerability - Remediation Steps

```
IO FPGA          0          0x27   20160111
BIOS version     v08.35(08/31/2018)
Alternate BIOS version v08.32(10/18/2016)
```

This is expected, as the switch would have booted from Golden FPGA which is still not updated. You can verify this from sys-log which would say:

```
%CARDCLIENT-5-MOD_BOOT_GOLDEN: Module 27 IOFPGA booted from Golden
```

3. Since in this case there is only one supervisor, update the Golden (also called backup) FPGA region.

```
install epld bootflash:n9000-epld.9.3.13.img module 27 golden
```

```
Module 27 : IO FPGA [Programming   ] : 100.00% ( 64 of 64 total sectors)
Module 27 EPLD upgrade is successful.
```

```
Module   Type Upgrade-Result
-----
 27     SUP      Success
```

Expected result: Switch will update the golden EPLD of the supervisor and will reload the switch automatically. Please don't interrupt, power cycle or reload when EPLD update is happening.

**Once this is done, when you check 'show version module 27 epld' you will see FPGA version that is >= to the fixed version for the supervisor. Your supervisor has the vulnerability fixed version of FPGA.**

```
SWITCH# show version module 27 epld
```

```
-----
Name           InstanceNum   Version   Date
-----
IO FPGA        0            0x30     20190625
BIOS version   v08.35(08/31/2018)
Alternate BIOS version v08.32(10/18/2016)
```

At the end of the upgrades, switch should boot with primary for the SUP, log below

```
switch# show logging log | grep -i fpga | grep -i 27
2019 Jul 10 07:55:04 switch %CARDCLIENT-5-MOD_BOOT_PRIMARY: Module 27 IOFPGA booted from Primary
```

**IMPORTANT NOTE:**

If you attempt to upgrade the Golden region of the FPGA once it is on the fixed version, the system will not automatically allow you to upgrade the Golden region of SUP, and will provide the following prompt:

```
switch# install epld bootflash:n9000-epld.9.2.5.img module all golden
```

Digital signature verification is successful

Compatibility check:

```
Module   Type   Upgradable   Impact Reason
-----
 22      FM     Yes          disruptive Module Upgradable
 24      FM     Yes          disruptive Module Upgradable
 27      SUP    No           none     Golden Not Upgradable
 28      SUP    No           none     Golden Not Upgradable
 29      SC     Yes          disruptive Module Upgradable
 30      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 |
|--------|------|---------|-----------------|-------------|--------------|
| 22     | FM   | IO FPGA | 0x19            | 0x19        | Yes          |
| 24     | FM   | IO FPGA | 0x19            | 0x19        | Yes          |
| 29     | SC   | IO FPGA | 0x17            | 0x20        | Yes          |
| 30     | SC   | IO FPGA | 0x17            | 0x20        | Yes          |

Module 27 (EPLD ver 0x29) Golden upgrade not supported

Module 28 (EPLD ver 0x30) Golden upgrade not supported

The above modules require upgrade.

Since both System Controller modules need an upgrade,a chassis reload will happen at the end of the upgrade.

Do you want to continue (y/n) ? [n] y

## Nexus 9000 and Nexus 3000 TOR:

### IMPORTANT NOTE:

It is required to update both Golden and Primary regions of FPGA to address this particular vulnerability. It is by design, that we don't allow updating both primary and golden at the same time (to avoid programming errors, that may cause switch to not boot, hence only one region is allowed to be programmed per reload).

Please do not attempt to upgrade Golden region of FPGA once it is on a fixed version.

1. Copy the EPLD image to bootflash (e.g. used n9000-epld.9.3.13.img).
2. Update the Primary FPGA region.

```
install epld bootflash:n9000-epld.9.3.13.img module 1
```

Expected result: Switch will update EPLD and will reload automatically. Please don't interrupt, power cycle or reload when EPLD update is happening. **Switch would boot up with golden FPGA, 'show version module 1 epld' would show the old Fpga version for IO, due to this. This is expected.**

```
show version module 1 epld
```

| Name                   | InstanceNum        | Version | Date     |
|------------------------|--------------------|---------|----------|
| IO FPGA                | 0                  | 0x06    | 20180920 |
| MI FPGA                | 0                  | 0x01    | 20170609 |
| BIOS version           | v01.14(06/15/2019) |         |          |
| Alternate BIOS version | v01.12(07/25/2018) |         |          |

You can verify this from syslog which would say:

```
%CARDCLIENT-5-MOD_BOOT_GOLDEN: Module 1 IOFPGA booted from Golden
%CARDCLIENT-2-FPGA_BOOT_GOLDEN: IOFPGA booted from Golden
```

3. Update the Golden (also called backup) FPGA region.



install epld bootflash:n9000-epld.9.3.13.img module 1 golden

Expected result: Switch will update EPLD and will reload automatically. Please don't interrupt, power cycle or reload when EPLD update is happening.

Once this is done, when you check 'show version module 1 epld' you will see FPGA version that is >= to the fixed version.

show version module 1 epld

```

-----
Name           InstanceNum      Version      Date
-----
IO FPGA        0                0x07        20180920
MI FPGA        0                0x01        20170609
BIOS version   v01.14(06/15/2019)
Alternate BIOS version v01.12(07/25/2018)
    
```

After upgrade is complete, switch should boot up with primary, shown logs below

show logging log | grep -i fpga

```

2019 Jul 9 19:46:11 Deervalley4 %CARDCLIENT-2-FPGA_BOOT_PRIMARY: IOFPGA booted from Primary
2019 Jul 9 19:46:11 Deervalley4 %CARDCLIENT-2-FPGA_BOOT_PRIMARY: MIFPGA booted from Primary
2019 Jul 9 19:46:11 Deervalley4 %CARDCLIENT-5-MOD_BOOT_PRIMARY: Module 1 IOFPGA booted from Primary
2019 Jul 9 19:46:11 Deervalley4 %CARDCLIENT-5-MOD_BOOT_PRIMARY: Module 1 MIFPGA booted from Primary
    
```

NOTE: For N3K-C36180YC-R and N3K-C3636C-R, CPU FPGA will have the fix, so look for CPU FPGA instead of IO.

Available EPLD Images for the Cisco Nexus 9200, 9300, 9300-EX, and 9300-FX Platform Switches

| Switch or Uplink Module                   | EPLD Device | Release 9.3(6) | Release 9.3(7) | Release 9.3(8-10) | Release 9.3(11-12) | Release 9.3(13) |
|---|-------------|----------------|----------------|-------------------|--------------------|-----------------|
| Cisco Nexus 92160YC-X<br>(N9K-C92160YC-X) | IOFPGA      | 0x19 (0.025)   | 0x19 (0.025)   | 0x19 (0.025)      | 0x19 (0.025)       | 0x19 (0.025)    |
|   | MIFPGA      | 0x5 (0.005)    | 0x5 (0.005)    | 0x5 (0.005)       | 0x5 (0.005)        | 0x5 (0.005)     |
| Cisco Nexus 92300YC<br>(N9K-C92300YC)     | IOFPGA      | 0x22 (0.034)   | 0x22 (0.034)   | 0x22 (0.034)      | 0x22 (0.034)       | 0x22 (0.034)    |
|   | MIFPGA0     | 0x7 (0.007)    | 0x7 (0.007)    | 0x7 (0.007)       | 0x7 (0.007)        | 0x7 (0.007)     |
|   | MIFPGA1     | 0x2 (0.002)    | 0x2 (0.002)    | 0x2 (0.002)       | 0x2 (0.002)        | 0x2 (0.002)     |
| Cisco Nexus 92304QC<br>(N9K-C92304QC)     | IOFPGA      | 0x12 (0.018)   | 0x12 (0.018)   | 0x12 (0.018)      | 0x12 (0.018)       | 0x12 (0.018)    |
|   | MIFPGA0     | 0x1 (0.001)    | 0x1 (0.001)    | 0x1 (0.001)       | 0x1 (0.001)        | 0x1 (0.001)     |
|   | MIFPGA1     | 0x1 (0.001)    | 0x1 (0.001)    | 0x1 (0.001)       | 0x1 (0.001)        | 0x1 (0.001)     |
| Cisco Nexus 9232C                         | IOFPGA      | 0x8 (0.008)    | 0x8 (0.008)    | 0x8 (0.008)       | 0x8 (0.008)        | 0x8 (0.008)     |

| Switch or Uplink Module                         | EPLD Device | Release 9.3(6) | Release 9.3(7) | Release 9.3(8-10) | Release 9.3(11-12) | Release 9.3(13) |
|---|-------------|----------------|----------------|-------------------|--------------------|-----------------|
| (N9K-C9232C)                                    | MIFPGA      | 0x2 (0.002)    | 0x2 (0.002)    | 0x2 (0.002)       | 0x2 (0.002)        | 0x2 (0.002)     |
| Cisco Nexus 92348GC-X<br>(N9K-C92348GC-X)       | IOFPGA      | 0x14 (0.020)   | 0x14 (0.020)   | 0x14 (0.020)      | 0x15 (0.021)       | 0x15 (0.021)    |
| Cisco Nexus 9236C<br>(N9K-C9236C)               | IOFPGA      | 0x17 (0.023)   | 0x17 (0.023)   | 0x17 (0.023)      | 0x17 (0.023)       | 0x17 (0.023)    |
|   | MIFPGA      | 0x9 (0.009)    | 0x9 (0.009)    | 0x9 (0.009)       | 0x9 (0.009)        | 0x9 (0.009)     |
| Cisco Nexus 9272Q<br>(N9K-C9272Q)               | IOFPGA      | 0x17 (0.023)   | 0x17 (0.023)   | 0x17 (0.023)      | 0x17 (0.023)       | 0x17 (0.023)    |
|   | MIFPGA0     | 0x4 (0.004)    | 0x4 (0.004)    | 0x4 (0.004)       | 0x4 (0.004)        | 0x4 (0.004)     |
|   | MIFPGA1     | 0x7 (0.007)    | 0x7 (0.007)    | 0x7 (0.007)       | 0x7 (0.007)        | 0x7 (0.007)     |
| Cisco Nexus 93108TC-EX<br>(N9K-C93108TC-EX)     | IOFPGA      | 0x15 (0.021)   | 0x15 (0.021)   | 0x15 (0.021)      | 0x15 (0.021)       | 0x15 (0.021)    |
|   | MIFPGA      | 0x2 (0.002)    | 0x2 (0.002)    | 0x2 (0.002)       | 0x2 (0.002)        | 0x2 (0.002)     |
| Cisco Nexus 93108TC-FX<br>(N9K-C93108TC-FX)     | IOFPGA      | 0x22 (0.034)   | 0x22 (0.034)   | 0x22 (0.034)      | 0x23 (0.035)       | 0x23 (0.035)    |
|   | MIFPGA      | 0x3 (0.003)    | 0x3 (0.003)    | 0x3 (0.003)       | 0x3 (0.003)        | 0x3 (0.003)     |
| Cisco Nexus 93108TC-FX3P<br>(N9K-C93108TC-FX3P) | IOFPGA      | 0x8 (0.008)    | 0x8 (0.008)    | 0x8 (0.008)       | 0x8 (0.008)        | 0x8 (0.008)     |
|   | MIFPGA      | 0x9 (0.009)    | 0x9 (0.009)    | 0x9 (0.009)       | 0x10 (0.016)       | 0x11 (0.017)    |
| Cisco Nexus 93120TX<br>(N9K-C93120TX)           | IOFPGA      | 0x13 (0.019)   | 0x13 (0.019)   | 0x13 (0.019)      | 0x13 (0.019)       | 0x13 (0.019)    |
|   | MIFPGA1     | 0x10 (0.016)   | 0x10 (0.016)   | 0x10 (0.016)      | 0x10 (0.016)       | 0x10 (0.016)    |
|   | MIFPGA2     | 0x9 (0.009)    | 0x9 (0.009)    | 0x9 (0.009)       | 0x9 (0.009)        | 0x9 (0.009)     |
| Cisco Nexus 93128TX<br>(N9K-C93128TX)           | IOFPGA      | 0x11 (0.017)   | 0x11 (0.017)   | 0x11 (0.017)      | 0x11 (0.017)       | 0x11 (0.017)    |
|   | MIFPGA      | 0x9 (0.009)    | 0x9 (0.009)    | 0x9 (0.009)       | 0x9 (0.009)        | 0x9 (0.009)     |
| Cisco Nexus 9316D-GX<br>(N9K-C9316D-GX)         | IOFPGA      | 0x15 (0.021)   | 0x15 (0.021)   | 0x15 (0.021)      | 0x18 (0.024)       | 0x18 (0.024)    |
|   | MIFPGA      | 0x6 (0.006)    | 0x6 (0.006)    | 0x6 (0.006)       | 0x6 (0.006)        | 0x6 (0.006)     |
| Cisco Nexus 93180LC-                            | IOFPGA      | 0x22           | 0x22           | 0x22              | 0x22               | 0x22 (0.034)    |

| Switch or Uplink Module                         | EPLD Device | Release 9.3(6)  | Release 9.3(7)  | Release 9.3(8-10) | Release 9.3(11-12) | Release 9.3(13) |
|---|-------------|-----------------|-----------------|-------------------|--------------------|-----------------|
| EX<br>(N9K-C93180LC-EX)                         |             | (0.034)         | (0.034)         | (0.034)           | (0.034)            |                 |
|   | MIFPGA      | 0x15<br>(0.021) | 0x15<br>(0.021) | 0x15<br>(0.021)   | 0x15<br>(0.021)    | 0x15 (0.021)    |
| Cisco Nexus 93180YC-FX3S<br>(N9K-C93180YC-FX3S) | IOFPGA      | 0x12<br>(0.018) | 0x12<br>(0.018) | 0x12<br>(0.018)   | 0x12<br>(0.018)    | 0x12 (0.018)    |
|   | MIFPGA      | 0x15<br>(0.021) | 0x15<br>(0.021) | 0x15<br>(0.021)   | 0x15<br>(0.021)    | 0x15 (0.021)    |
| Cisco Nexus 93180YC-FX3<br>(N9K-C93180YC-FX3)   | IOFPGA      | N/A             | N/A             | 0x12<br>(0.018)   | 0x12<br>(0.018)    | 0x12 (0.018)    |
|   | MIFPGA      | N/A             | N/A             | 0x16<br>(0.022)   | 0x16<br>(0.022)    | 0x16 (0.022)    |
| Cisco Nexus 93180YC-EX<br>(N9K-C93180YC-EX)     | IOFPGA      | 0x15<br>(0.021) | 0x15<br>(0.021) | 0x15<br>(0.021)   | 0x15<br>(0.021)    | 0x15 (0.021)    |
|   | MIFPGA      | 0x4 (0.004)     | 0x4 (0.004)     | 0x4 (0.004)       | 0x4 (0.004)        | 0x4 (0.004)     |
| Cisco Nexus 93180YC-FX<br>(N9K-C93180YC-FX)     | IOFPGA      | 0x22<br>(0.034) | 0x22<br>(0.034) | 0x22<br>(0.034)   | 0x23<br>(0.035)    | 0x23 (0.035)    |
|   | MIFPGA      | 0x10<br>(0.016) | 0x10<br>(0.016) | 0x10<br>(0.016)   | 0x10<br>(0.016)    | 0x10 (0.016)    |
| Cisco Nexus 93180YC2-FX<br>(N9K-C93180YC2-FX)   | IOFPGA      | 0x22<br>(0.034) | 0x22<br>(0.034) | 0x22<br>(0.034)   | 0x23<br>(0.035)    | 0x23 (0.035)    |
|   | MIFPGA      | 0x3 (0.003)     | 0x3 (0.003)     | 0x3 (0.003)       | 0x3 (0.003)        | 0x3 (0.003)     |
| Cisco Nexus 93216TC-FX2<br>(N9K-C93216TC-FX2)   | IOFPGA      | 0x16<br>(0.022) | 0x16<br>(0.022) | 0x16<br>(0.022)   | 0x16<br>(0.022)    | 0x16 (0.022)    |
|   | MIFPGA0     | 0x5 (0.005)     | 0x5 (0.005)     | 0x5 (0.005)       | 0x5 (0.005)        | 0x5 (0.005)     |
|   | MIFPGA1     | 0x5 (0.005)     | 0x5 (0.005)     | 0x5 (0.005)       | 0x5 (0.005)        | 0x5 (0.005)     |
| Cisco Nexus 93240YC-FX2<br>(N9K-C93240YC-FX2)   | IOFPGA      | 0x12<br>(0.018) | 0x13<br>(0.019) | 0x13<br>(0.019)   | 0x17<br>(0.023)    | 0x17 (0.023)    |
|   | MIFPGA1     | 0x12<br>(0.018) | 0x12<br>(0.018) | 0x12<br>(0.018)   | 0x12<br>(0.018)    | 0x12 (0.018)    |
|   | MIFPGA2     | 0x8 (0.008)     | 0x8 (0.008)     | 0x8 (0.008)       | 0x8 (0.008)        | 0x8 (0.008)     |
| Cisco Nexus 9332C<br>(N9K-C9332C)               | IOFPGA      | 0x12<br>(0.018) | 0x13<br>(0.019) | 0x13<br>(0.019)   | 0x17<br>(0.023)    | 0x17 (0.023)    |
|   | MIFPGA      | 0x3 (0.003)     | 0x3 (0.003)     | 0x3 (0.003)       | 0x3 (0.003)        | 0x3 (0.003)     |

| Switch or Uplink Module                    | EPLD Device | Release 9.3(6) | Release 9.3(7) | Release 9.3(8-10) | Release 9.3(11-12) | Release 9.3(13) |
|--|-------------|----------------|----------------|-------------------|--------------------|-----------------|
| Cisco Nexus 9332PQ (N9K-C9332PQ)           | IOFPGA      | 0x12 (0.018)   | 0x12 (0.018)   | 0x12 (0.018)      | 0x12 (0.018)       | 0x12 (0.018)    |
|  | MIFPGA      | 0x17 (0.023)   | 0x17 (0.023)   | 0x17 (0.023)      | 0x17 (0.023)       | 0x17 (0.023)    |
| Cisco Nexus 9336C-FX2 (N9K-C9336C-FX2)     | IOFPGA      | 0x12 (0.018)   | 0x13 (0.019)   | 0x13 (0.019)      | 0x17 (0.023)       | 0x17 (0.023)    |
|  | MIFPGA      | 0x5 (0.005)    | 0x5 (0.005)    | 0x5 (0.005)       | 0x5 (0.005)        | 0x5 (0.005)     |
| Cisco Nexus 93360YC-FX2 (N9K-C93360YC-FX2) | IOFPGA      | 0x16 (0.022)   | 0x16 (0.022)   | 0x16 (0.022)      | 0x16 (0.022)       | 0x16 (0.022)    |
|  | MIFPGA0     | 0x4 (0.004)    | 0x4 (0.004)    | 0x4 (0.004)       | 0x4 (0.004)        | 0x4 (0.004)     |
|  | MIFPGA1     | 0x3 (0.003)    | 0x3 (0.003)    | 0x3 (0.003)       | 0x3 (0.003)        | 0x3 (0.003)     |
| Cisco Nexus 9348GC-FXP (N9K-C9348GC-FXP)   | IOFPGA      | 0x10 (0.016)   | 0x10 (0.016)   | 0x10 (0.016)      | 0x13 (0.019)       | 0x13 (0.019)    |
|  | MIFPGA      | 0x10 (0.016)   | 0x10 (0.016)   | 0x10 (0.016)      | 0x10 (0.016)       | 0x10 (0.016)    |
| Cisco Nexus 9348GC-FXP (N9K-C9348GC2-FXP)  | IOFPGA      | 0x10 (0.016)   | 0x10 (0.016)   | 0x10 (0.016)      | 0x13 (0.019)       | 0x13 (0.019)    |
|  | MIFPGA      | 0x3 (0.003)    | 0x3 (0.003)    | 0x3 (0.003)       | 0x3 (0.003)        | 0x3 (0.003)     |
| Cisco Nexus 93600CD-GX (N9K-C93600CD-GX)   | IOFPGA      | 0x15 (0.021)   | 0x15 (0.021)   | 0x15 (0.021)      | 0x18 (0.024)       | 0x18 (0.024)    |
|  | MIFPGA      | 0x9 (0.009)    | 0x9 (0.009)    | 0x9 (0.009)       | 0x9 (0.009)        | 0x9 (0.009)     |
| Cisco Nexus 9364C (N9K-C9364C)             | IOFPGA      | 0x7 (0.007)    | 0x7 (0.007)    | 0x7 (0.007)       | 0x7 (0.007)        | 0x7 (0.007)     |
|  | MIFPGA0     | 0x11 (0.017)   | 0x11 (0.017)   | 0x11 (0.017)      | 0x11 (0.017)       | 0x11 (0.017)    |
|  | MIFPGA1     | 0x4 (0.004)    | 0x4 (0.004)    | 0x4 (0.004)       | 0x4 (0.004)        | 0x4 (0.004)     |
| Cisco Nexus 9364C-GX (N9K-C9364C-GX)       | IOFPGA      | 0x6 (0.006)    | 0x6 (0.006)    | 0x6 (0.006)       | 0x6 (0.006)        | 0x6 (0.006)     |
|  | MIFPGA0     | 0x5 (0.005)    | 0x5 (0.005)    | 0x5 (0.005)       | 0x5 (0.005)        | 0x5 (0.005)     |
|  | MIFPGA1     | 0x4 (0.004)    | 0x4 (0.004)    | 0x4 (0.004)       | 0x4 (0.004)        | 0x4 (0.004)     |
| Cisco Nexus 9372PX (N9K-C9372PX)           | IOFPGA      | 0x8 (0.008)    | 0x8 (0.008)    | 0x8 (0.008)       | 0x8 (0.008)        | 0x8 (0.008)     |
|  | MIFPGA      | 0x15 (0.021)   | 0x15 (0.021)   | 0x15 (0.021)      | 0x15 (0.021)       | 0x15 (0.021)    |

| Switch or Uplink Module  | EPLD Device | Release 9.3(6) | Release 9.3(7) | Release 9.3(8-10) | Release 9.3(11-12) | Release 9.3(13) |
|--|-------------|----------------|----------------|-------------------|--------------------|-----------------|
| Cisco Nexus 9372PX-E (N9K-C9372PX-E)                             | IOFPGA      | 0x8 (0.008)    | 0x8 (0.008)    | 0x8 (0.008)       | 0x8 (0.008)        | 0x8 (0.008)     |
|  | MIFPGA      | 0x15 (0.021)   | 0x15 (0.021)   | 0x15 (0.021)      | 0x15 (0.021)       | 0x15 (0.021)    |
| Cisco Nexus 9372TX (N9K-C9372TX)                                 | IOFPGA      | 0x6 (0.006)    | 0x6 (0.006)    | 0x6 (0.006)       | 0x6 (0.006)        | 0x6 (0.006)     |
|  | MIFPGA      | 0x15 (0.021)   | 0x15 (0.021)   | 0x15 (0.021)      | 0x15 (0.021)       | 0x15 (0.021)    |
| Cisco Nexus 9372TX-E (N9K-C9372TX-E)                             | IOFPGA      | 0x6 (0.006)    | 0x6 (0.006)    | 0x6 (0.006)       | 0x6 (0.006)        | 0x6 (0.006)     |
|  | MIFPGA      | 0x3 (0.003)    | 0x3 (0.003)    | 0x3 (0.003)       | 0x3 (0.003)        | 0x3 (0.003)     |
| Cisco Nexus 9396PX (N9K-C9396PX)                                 | IOFPGA      | 0x16 (0.022)   | 0x16 (0.022)   | 0x16 (0.022)      | 0x16 (0.022)       | 0x16 (0.022)    |
|  | MIFPGA      | 0x15 (0.021)   | 0x15 (0.021)   | 0x15 (0.021)      | 0x15 (0.021)       | 0x15 (0.021)    |
| Cisco Nexus 9396TX (N9K-C9396TX)                                 | IOFPGA      | 0x9 (0.009)    | 0x9 (0.009)    | 0x9 (0.009)       | 0x9 (0.009)        | 0x9 (0.009)     |
| 4-port 100-Gigabit optical uplink module (N9K-M4PC-CFP2)         | MIFPGA      | 0x11 (0.017)   | 0x11 (0.017)   | 0x11 (0.017)      | 0x11 (0.017)       | 0x11 (0.017)    |
| 6-port 40-Gigabit optical uplink module (N9K-M6PQ or N9K-M6PQ-E) | MIFPGA      | 0x10 (0.016)   | 0x10 (0.016)   | 0x10 (0.016)      | 0x10 (0.016)       | 0x10 (0.016)    |
| 12-port optical uplink module (N9K-M12PQ)                        | MIFPGA      | 0x20 (0.032)   | 0x20 (0.032)   | 0x20 (0.032)      | 0x20 (0.032)       | 0x20 (0.032)    |

<sup>1</sup> Not available in this release.

## Available EPLD Images for the Cisco Nexus 9500 Platform Switches

| Component   | EPLD Device | Release 9.3(6)  | Release 9.3(7)  | Release 9.3(8-10) | Release 9.3(11-12) | Release 9.3(13) |
|---|-------------|-----------------|-----------------|-------------------|--------------------|-----------------|
| Supervisor A (N9K-SUP-A)  | IOFPGA      | 0x31<br>(0.049) | 0x31<br>(0.049) | 0x31<br>(0.049)   | 0x31<br>(0.049)    | 0x31<br>(0.049) |
| Supervisor A+ (N9K-SUP-A+)  | IOFPGA      | 0x15<br>(0.021) | 0x15<br>(0.021) | 0x15<br>(0.021)   | 0x18<br>(0.024)    | 0x18<br>(0.024) |
| Supervisor B (N9K-SUP-B)  | IOFPGA      | 0x30<br>(0.049) | 0x30<br>(0.049) | 0x30<br>(0.049)   | 0x30<br>(0.049)    | 0x30<br>(0.049) |
| Supervisor B+ (N9K-SUP-B+)  | IOFPGA      | 0x15<br>(0.021) | 0x15<br>(0.021) | 0x15<br>(0.021)   | 0x18<br>(0.024)    | 0x18<br>(0.024) |
| System Controller (N9K-SC-A)  | IOFPGA      | 0x20<br>(0.032) | 0x20<br>(0.032) | 0x20<br>(0.032)   | 0x23<br>(0.035)    | 0x23<br>(0.035) |
| 8-port 100-Gigabit CFP2 line card (N9K-X9408)                                 | IOFPGA      | 0x5 (0.005)     | 0x5 (0.005)     | 0x5<br>(0.005)    | 0x5 (0.005)        | 0x5<br>(0.005)  |
|   | MIFPGA      | 0x9 (0.009)     | 0x9 (0.009)     | 0x9<br>(0.009)    | 0x9 (0.009)        | 0x9<br>(0.009)  |
| 32-port 100-Gigabit QSFP28 line card (N9K-X9432C-S)                           | IOFPGA      | 0x14<br>(0.020) | 0x14<br>(0.020) | 0x14<br>(0.020)   | 0x14<br>(0.020)    | 0x14<br>(0.020) |
|   | MIFPGA      | 0x4 (0.004)     | 0x4 (0.004)     | 0x4<br>(0.004)    | 0x4 (0.004)        | 0x4<br>(0.004)  |
| 32-port 40-Gigabit QSFP+ line card (N9K-X9432PQ)                              | IOFPGA      | 0x16<br>(0.022) | 0x16<br>(0.022) | 0x16<br>(0.022)   | 0x16<br>(0.022)    | 0x16<br>(0.022) |
|   | MIFPGA      | 0x13<br>(0.019) | 0x13<br>(0.019) | 0x13<br>(0.019)   | 0x13<br>(0.019)    | 0x13<br>(0.019) |
| 32-port 100-Gigabit QSFP28 line card (N9K-X9732C-EX) (for -E fabric modules)  | IOFPGA      | 0x13<br>(0.019) | 0x13<br>(0.019) | 0x13<br>(0.019)   | 0x13<br>(0.019)    | 0x13<br>(0.019) |
|   | MIFPGA      | 0x9 (0.009)     | 0x9 (0.009)     | 0x9<br>(0.009)    | 0x9 (0.009)        | 0x9<br>(0.009)  |
| 32-port 100-Gigabit QSFP28 line card (N9K-X9732C-EXM) (for -E fabric modules) | IOFPGA      | 0x11<br>(0.017) | 0x11<br>(0.017) | 0x11<br>(0.017)   | 0x11<br>(0.017)    | 0x11<br>(0.017) |
|   | MIFPGA      | 0x5 (0.005)     | 0x5 (0.005)     | 0x5<br>(0.005)    | 0x5 (0.005)        | 0x5<br>(0.005)  |
| 36-port 100-Gigabit QSFP28 line card (N9K-X9732C-FX)                          | IOFPGA      | 0x7 (0.007)     | 0x7 (0.007)     | 0x7<br>(0.007)    | 0x7 (0.007)        | 0x7<br>(0.007)  |
|   | MIFPGA      | 0x2 (0.002)     | 0x2 (0.002)     | 0x2<br>(0.002)    | 0x2 (0.002)        | 0x2<br>(0.002)  |
| 36-port 40-Gigabit QSFP+ line   | IOFPGA      | 0x19            | 0x19            | 0x19              | 0x19               | 0x19            |

| Component  | EPLD Device | Release 9.3(6) | Release 9.3(7) | Release 9.3(8-10) | Release 9.3(11-12) | Release 9.3(13) |
|--|-------------|----------------|----------------|-------------------|--------------------|-----------------|
| card (N9K-X9636PQ)   |             | (0.025)        | (0.025)        | (0.025)           | (0.025)            | (0.025)         |
|  | MIFPGA      | 0x13 (0.019)   | 0x13 (0.019)   | 0x13 (0.019)      | 0x13 (0.019)       | 0x13 (0.019)    |
| 36-port 40-Gigabit QSFP+ line card (N9K-X9536PQ)                               | IOFPGA      | 0x11 (0.017)   | 0x11 (0.017)   | 0x11 (0.017)      | 0x11 (0.017)       | 0x11 (0.017)    |
|  | MIFPGA      | 0x7 (0.007)    | 0x7 (0.007)    | 0x7 (0.007)       | 0x7 (0.007)        | 0x7 (0.007)     |
| 36-port 100-Gigabit QSFP28 line card (N9K-X9736C-EX)                           | IOFPGA      | 0x13 (0.019)   | 0x13 (0.019)   | 0x13 (0.019)      | 0x14 (0.020)       | 0x14 (0.020)    |
|  | MIFPGA      | 0x9 (0.009)    | 0x9 (0.009)    | 0x9 (0.009)       | 0x9 (0.009)        | 0x9 (0.009)     |
| 36-port 100-Gigabit QSFP28 line card (N9K-X9736C-FX)                           | IOFPGA      | 0x7 (0.007)    | 0x7 (0.007)    | 0x7 (0.007)       | 0x12 (0.018)       | 0x12 (0.018)    |
|  | MIFPGA      | 0x7 (0.007)    | 0x7 (0.007)    | 0x7 (0.007)       | 0x7 (0.007)        | 0x7 (0.007)     |
| 48-port 1-/10-Gigabit SFP+ and 4-port 40-Gigabit QSFP+ line card (N9K-X9464PX) | IOFPGA      | 0x11 (0.017)   | 0x11 (0.017)   | 0x11 (0.017)      | 0x11 (0.017)       | 0x11 (0.017)    |
|  | MIFPGA      | 0x10 (0.016)   | 0x10 (0.016)   | 0x10 (0.016)      | 0x10 (0.016)       | 0x10 (0.016)    |
| 48-port 1/10GBASE-T and 4-port 40-Gigabit QSFP+ line card (N9K-X9464TX)        | IOFPGA      | 0x9 (0.009)    | 0x9 (0.009)    | 0x9 (0.009)       | 0x9 (0.009)        | 0x9 (0.009)     |
|  | MIFPGA      | 0x8 (0.008)    | 0x8 (0.008)    | 0x8 (0.008)       | 0x8 (0.008)        | 0x8 (0.008)     |
| 48-port 1/10GBASE-T and 4-port 40-Gigabit QSFP+ line card (N9K-X9464TX2)       | IOFPGA      | 0x9 (0.009)    | 0x9 (0.009)    | 0x9 (0.009)       | 0x9 (0.009)        | 0x9 (0.009)     |
|  | MIFPGA      | 0x3 (0.003)    | 0x3 (0.003)    | 0x3 (0.003)       | 0x3 (0.003)        | 0x3 (0.003)     |
| 48-port 1/10GBASE-T and 4-port 40-Gigabit QSFP+ line card (N9K-X9564TX)        | IOFPGA      | 0x10 (0.016)   | 0x10 (0.016)   | 0x10 (0.016)      | 0x10 (0.016)       | 0x10 (0.016)    |
|  | MIFPGA      | 0x8 (0.008)    | 0x8 (0.008)    | 0x8 (0.008)       | 0x8 (0.008)        | 0x8 (0.008)     |
| 48-port 1-/10-Gigabit SFP+ and 4-port 40-Gigabit QSFP+ line card (N9K-X9564PX) | IOFPGA      | 0x14 (0.020)   | 0x14 (0.020)   | 0x14 (0.020)      | 0x14 (0.020)       | 0x14 (0.020)    |
|  | MIFPGA      | 0x10 (0.016)   | 0x10 (0.016)   | 0x10 (0.016)      | 0x10 (0.016)       | 0x10 (0.016)    |
| 48-port 1-/10-/25-Gigabit  | IOFPGA      | 0x12           | 0x12           | 0x12              | 0x15               | 0x15            |

| Component   | EPLD Device | Release 9.3(6) | Release 9.3(7) | Release 9.3(8-10) | Release 9.3(11-12) | Release 9.3(13) |
|---|-------------|----------------|----------------|-------------------|--------------------|-----------------|
| SFP28 and 4-port 40-/100-Gigabit QSFP28 line card (N9K-X97160YC-EX)               |             | (0.018)        | (0.018)        | (0.018)           | (0.021)            | (0.021)         |
|   | MIFPGA      | 0x5 (0.005)    | 0x5 (0.005)    | 0x5 (0.005)       | 0x5 (0.005)        | 0x5 (0.005)     |
| 48-port 10-Gigabit SFP+ and 4-port 100-Gigabit QSFP28 line card (N9K-X9788TC-FX)  | IOFPGA      | 0x4 (0.004)    | 0x4 (0.004)    | 0x4 (0.004)       | 0x7 (0.007)        | 0x7 (0.007)     |
|   | MIFPGA      | 0x6 (0.006)    | 0x6 (0.006)    | 0x6 (0.006)       | 0x6 (0.006)        | 0x6 (0.006)     |
| 48-port 10-Gigabit SFP+ and 4-port 100-Gigabit QSFP28 line card (N9K-X9788TC2-FX) | IOFPGA      | 0x6 (0.006)    | 0x6 (0.006)    | 0x6 (0.006)       | 0x6 (0.006)        | 0x6 (0.006)     |
|   | MIFPGA      | 0x3 (0.003)    | 0x3 (0.003)    | 0x3 (0.003)       | 0x3 (0.003)        | 0x3 (0.003)     |
| Fabric module for Cisco Nexus 9504 40-Gigabit line cards (N9K-C9504-FM)           | IOFPGA      | 0x19 (0.025)   | 0x19 (0.025)   | 0x19 (0.025)      | 0x19 (0.025)       | 0x19 (0.025)    |
| Fabric module for Cisco Nexus 9504 100-Gigabit -EX line (N9K-C9504-FM-E)          | IOFPGA      | 0x15 (0.021)   | 0x15 (0.021)   | 0x15 (0.021)      | 0x18 (0.024)       | 0x18 (0.024)    |
| Fabric module for Cisco Nexus 9504 100-Gigabit -S line cards (N9K-C9504-FM-S)     | IOFPGA      | 0x11 (0.017)   | 0x11 (0.017)   | 0x11 (0.017)      | 0x11 (0.017)       | 0x11 (0.017)    |
| Fabric module for Cisco Nexus 9508 40-Gigabit line cards (N9K-C9508-FM)           | IOFPGA      | 0x19 (0.025)   | 0x19 (0.025)   | 0x19 (0.025)      | 0x19 (0.025)       | 0x19 (0.025)    |
| Fabric module for Cisco Nexus 9508 100-Gigabit -EX line cards (N9K-C9508-FM-E)    | IOFPGA      | 0x14 (0.020)   | 0x14 (0.020)   | 0x14 (0.020)      | 0x14 (0.020)       | 0x14 (0.020)    |
| Fabric module for Cisco Nexus 9508 100-Gigabit -EX line (N9K-C9508-FM-E2)         | IOFPGA      | 0x9 (0.009)    | 0x9 (0.009)    | 0x9 (0.009)       | 0x12 (0.018)       | 0x12 (0.018)    |
| Fabric module for Cisco Nexus 9508 100-Gigabit -S line (N9K-C9508-FM-S)           | IOFPGA      | 0x11 (0.017)   | 0x11 (0.017)   | 0x11 (0.017)      | 0x11 (0.017)       | 0x11 (0.017)    |



| Component  | EPLD Device | Release 9.3(6) | Release 9.3(7) | Release 9.3(8-10) | Release 9.3(11-12) | Release 9.3(13) |
|--|-------------|----------------|----------------|-------------------|--------------------|-----------------|
| Fabric module for Cisco Nexus 9516<br>40-Gigabit line cards (N9K-C9516-FM)                 | IOFPGA      | 0x13 (0.019)   | 0x13 (0.019)   | 0x13 (0.019)      | 0x13 (0.019)       | 0x13 (0.019)    |
| Fabric module for Cisco Nexus 9516<br>100-Gigabit -EX line cards (N9K-C9516-FM-E)          | IOFPGA      | 0x8 (0.008)    | 0x8 (0.008)    | 0x8 (0.008)       | 0x8 (0.008)        | 0x8 (0.008)     |
|  | MIFPGA      | 0x8 (0.008)    | 0x8 (0.008)    | 0x8 (0.008)       | 0x8 (0.008)        | 0x8 (0.008)     |
| Fabric module for Cisco Nexus 9516<br>100-Gigabit -EX and -FX line cards (N9K-C9516-FM-E2) | MIFPGA      | 0x11 (0.011)   | 0x11 (0.011)   | 0x11 (0.011)      | 0x11 (0.011)       | 0x11 (0.011)    |
|  | IOFPGA      | 0x8 (0.008)    | 0x8 (0.008)    | 0x8 (0.008)       | 0x8 (0.008)        | 0x8 (0.008)     |

<sup>2</sup> Not available in this release.

#### Available EPLD Images for the Cisco Nexus 9500 Platform Switches with R Line Cards

| Component  | EPLD Device | Release 9.3(6) | Release 9.3(7) | Release 9.3(8-10) | Release 9.3(11-12) | Release 9.3(13) |
|--|-------------|----------------|----------------|-------------------|--------------------|-----------------|
| 36-port 100-Gigabit QSFP28 line card (N9K-X9636C-RX)                             | IOFPGA      | 0x18 (0.024)   | 0x18 (0.024)   | 0x18 (0.024)      | 0x18 (0.024)       | 0x18 (0.024)    |
|  | MIFPGA      | 0x3 (0.003)    | 0x3 (0.003)    | 0x3 (0.003)       | 0x3 (0.003)        | 0x3 (0.003)     |
| 36-port 100-Gigabit QSFP28 line card (N9K-X9636C-R)                              | IOFPGA      | 0x12 (0.018)   | 0x12 (0.018)   | 0x12 (0.018)      | 0x12 (0.018)       | 0x12 (0.018)    |
|  | MIFPGA      | 0x9 (0.009)    | 0x9 (0.009)    | 0x9 (0.009)       | 0x9 (0.009)        | 0x9 (0.009)     |
| 36-port 40-Gigabit OSF+ line card (N9K-X9636Q-R)                                 | IOFPGA      | 0x19 (0.025)   | 0x19 (0.025)   | 0x19 (0.025)      | 0x19 (0.025)       | 0x19 (0.025)    |
|  | MIFPGA      | 0x3 (0.003)    | 0x3 (0.003)    | 0x3 (0.003)       | 0x3 (0.003)        | 0x3 (0.003)     |
| 52-port 100-Gigabit -R line cards (N9K-X96136YC-R)                               | IOFPGA      | 0xD            | 0xD            | 0xD               | 0xD                | 0xD             |
|  | MIFPGA      | 0xF            | 0xF            | 0xF               | 0xF                | 0xF             |
|  | DBFPGA      | 0xE            | 0xE            | 0xE               | 0xE                | 0xE             |
| Fabric module for Cisco Nexus 9504<br>100-Gigabit -R line cards (N9K-C9504-FM-R) | IOFPGA      | 0x7 (0.007)    | 0x7 (0.007)    | 0x7 (0.007)       | 0x7 (0.007)        | 0x7 (0.007)     |
| Fabric module for Cisco Nexus  | IOFPGA      | 0x10           | 0x10           | 0x10              | 0x10               | 0x10            |

Determining Whether to Upgrade EPLD Images

| Component  | EPLD Device | Release 9.3(6) | Release 9.3(7) | Release 9.3(8-10) | Release 9.3(11-12) | Release 9.3(13) |
|--|-------------|----------------|----------------|-------------------|--------------------|-----------------|
| 9508<br>100-Gigabit -R line cards (N9K-C9508-FM-R) |             | (0.016)        | (0.016)        | (0.016)           | (0.016)            | (0.016)         |

<sup>5</sup> Not available in this release.

## Determining Whether to Upgrade EPLD Images

EPLD image number, you can skip the upgrade.

- To determine the EPLD upgrades needed for a Cisco Nexus 9000 Series switch, use the `show install impact epld bootflash: command` on that switch and indicate the `n9000-epld.9.3.13.img` image. In the following example, the MIFPGA, and IOFPGA EPLD images do not need to be upgraded.

```
switch# show install all impact epld n9000-epld.9.3.13.img
Retrieving EPLD versions.... Please wait.
Images will be upgraded according to following table:
Module  Type  EPLD          Running-Version  New-Version  Upg-Required
-----  ---  -----
      1   LC  MI FPGA          0x0f           0x0f           No
      1   LC  IO FPGA          0x0d           0x0d           No
      1   LC  DB FPGA          0x0e           0x0e           No
     21   FM  IO FPGA          0x07           0x07           No
     27   SUP IO FPGA          0x15           0x15           No
     28   SUP IO FPGA          0x15           0x15           No
     29   SC  IO FPGA          0x20           0x20           No
     30   SC  IO FPGA          0x20           0x20           No
Compatibility check:
Module  Type      Upgradable  Impact  Reason
-----  ---
      1      LC          Yes      disruptive  Module Upgradable
     21      SUP        Yes      disruptive  Module Upgradable
     27      SUP        Yes      disruptive  Module Upgradable
     28      SUP        Yes      disruptive  Module Upgradable
     29      SC         Yes      disruptive  Module Upgradable
     30      SC         Yes      disruptive  Module Upgradable
```

## Downloading the EPLD Images

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

- From a browser, go to <https://software.cisco.com/download/navigator.html>.  
The browser displays the Cisco website.
- Choose Switches.  
A list of switch types displays on the right.

## Installation Guidelines

- 3           Select Data Center Switches.  
  
              The right side lists the Data Center Switch product series.
- 4           Select Cisco Nexus 9000.  
  
              The right side lists the switches in the series that you selected.
- 5           Select the switch that you are updating EPLD images for.  
  
              The Downloads page opens and lists what you can download for the switch that you selected.
- 6           Select NX-OS EPLD Updates.  
  
              The Download Software page lists the available EPLD images for the switch.
- 7           If you see a new EPLD image for the NX-OS software installed on the switch, click the Download button.  
  
              CAUTION: When you are trying to upgrade EPLD, it is recommended to use the same version of EPLD as that of installed software. However, if the installed version of EPLD is already later than the software you are installing, NX-OS software does not allow for the downgrading of the EPLD. Newer EPLD is compatible with older NX-OS software.
- 8           Click the link for the file.  
  
              The Downloads page displays a Download button and lists information for the file.
- 9           Click Download.  
  
              The Supporting Documents page opens to display the rules for downloading the software.
- 10          Read the rules and click Agree.  
  
              A File Download dialog box opens to ask if you want to open or save the images file.
- 11          Click Save.  
  
              The Save As dialog box appears.
- 12          Indicate where to save the file and click Save.  
  
              The file saves to the location that you specified.

## Installation Guidelines

To upgrade the EPLD images using CLI commands, follow these guidelines:

- 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. Also be sure that you have an EPLD image file.

CAUTION: When you are trying to upgrade EPLD, it is recommended to use the same version of EPLD as that of installed software. However, if the installed version of EPLD is already later than the software you are installing, it is not required to downgrade the EPLD.

- You can execute an upgrade from the active supervisor module only. This upgrade is for one or all of the modules as follows:

## Upgrading the EPLD Images

- You can upgrade a module individually.
  - You can upgrade all modules sequentially.
  - You can update the images for online modules only.
- On a Cisco Nexus 9500 platform 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 9500 platform 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 reapply the upgrade to the module that was being upgraded during the interruption.
  - The upgrade process disrupts traffic on the targeted module.
  - Do not insert or remove any modules while an EPLD upgrade is in progress.

- 1 Copy the EPLD image file to bootflash.
- 2 To determine if you need to upgrade the BIOS for the image, use the `show install all impact` command and see the Upgrade Required (Upg-Required) field for the BIOS row in the command output.
- 3 If you do not need to upgrade the BIOS, set the boot variable using the `boot nxos bootflash:n9000-dk9.9.3.13.bin` command.
- 4 Enter the `copy running-config startup-config` command to set the startup boot variables to the NX-OS image.
- 5 If you need to upgrade the BIOS, enter the `install all nxos bootflash:n9000-dk9.9.3.13.bin` command.
- 6 Enter the `install epld bootflash:n9000-epld.9.3.13.img module all` command.  
The switch automatically reboots.

## Upgrading the EPLD Images

CAUTION: When you are trying to upgrade EPLD, it is recommended to use the same version of EPLD as that of installed software. However, if the installed version of EPLD is already later than the software you are installing, it is not required to downgrade the EPLD.

## Verifying the EPLD Upgrades

To verify the EPLD upgrades for a switch or its modules, use the `show version module slot-number epld` command as follows:

- To verify updates for a module on a modular switch (Cisco Nexus 9500 platform switches), indicate the chassis slot number for *slot-number*.  
`switch# show version module 22 epld`

## Displaying the Status of EPLD Upgrades

- To verify updates for a top-of-rack switch (Cisco Nexus 9200, 9300, and 9300-EX platforms), use 1 for *slot-number*.

```
switch# show version module 1 epld
```

## Displaying the Status of EPLD Upgrades

To display the status of EPLD upgrades on the switch, use the `show install epld status` command.

## 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 that are installed in the switch (Cisco Nexus 9504, 9508, and 9516 switches only), you can either upgrade only the standby 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)

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)

- If there is only one supervisor that are installed in the switch, your upgrading or downgrading of EPLD images is disruptive.

## Related Documentation

The entire [Cisco NX-OS 9000 Series documentation](#) set.

## Release Notes

The entire [Cisco NX-OS 9000 Series release notes](#) set.

## Documentation Feedback

To provide technical feedback on this document, or to report an error or omission, please send your comments to [nexus9k-docfeedback@cisco.com](mailto:nexus9k-docfeedback@cisco.com). We appreciate your feedback.

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