



Upgrading and Downgrading ROM Monitor Firmware

This chapter describes how to upgrade or downgrade the ROM Monitor Firmware.

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Information About ROM Monitor Firmware

The ROM Monitor, which is also known as ROMMON, is a bootstrap program that initializes the hardware and boots the Cisco IOS XR firmware when you power on or restart a Cisco ASR 9000 Series Router. ROM Monitor upgrades can be required to resolve firmware defects or support new features. Typically, ROM Monitor upgrades are infrequent and not required for every Cisco IOS XR software upgrade.

The ROM Monitor firmware on all Route Processors (RP)s must be compatible with the current Cisco IOS XR software release running on the router before it is upgraded to the latest Cisco IOS XR Software Release.

If the router is brought up with an incompatible version of the ROM Monitor software, then the standby RP may fail to boot.

This table lists the minimum ROMMON version required for Cisco ASR 9001 Routers:

Table 1: Minimum ROMMON Version Required for Cisco ASR 9001 Routers

Cisco IOS XR Release	Minimum ROMMON Version
Release 5.1.1	2.03
Release 5.2.0	2.04



Note ROMMON versions are backward compatible. You need not downgrade the ROMMON versions if the current version is higher than the listed compatible version.

ROMMON A and ROMMON B

Each node in a Cisco ASR 9000 Series Router includes two copies of ROM Monitor: ROMMON A and ROMMON B. During power on, ROMMON A loads first. If ROMMON A detects the presence of ROMMON B, it checks the compatibility and integrity of the ROMMON B code. If ROMMON B passes these tests, ROMMON A passes control of the router to ROMMON B.

Normally, you only upgrade ROMMON B. ROMMON A is a backup for ROMMON B. When you upgrade the ROMMON B, the router uses the unmodified ROMMON A if the ROM Monitor upgrade is interrupted or fails for any reason.

Failures are most likely to occur during ROMMON upgrades or downgrades and unlikely to fail during normal usage. A failure in ROMMON A results in an inactive card that must be returned to the authorized merchandiser.

**Note**

We recommend that you upgrade ROMMON on all the boards to the latest version provided in FPD pie for any particular release.

Upgrading or Downgrading a Single Node or All Nodes

The upgrade and downgrade procedures for ROMMON firmware are the same. Install a higher version to upgrade the firmware, or a lower version to downgrade the firmware.

ROM Monitor operates on every node within the router. During an upgrade or downgrade, the ROMMON firmware is copied into hardware EEPROMs in the router.

For most upgrades, we recommend upgrading or downgrading the ROMMON firmware on all nodes. You can also upgrade or downgrade a single node, which is useful when moving a card between two routers or adding a card that is not running the correct ROM Monitor version. When you upgrade a single node that uses ROM Monitor in both the CPU0 and SP modules, such as a line card node, we recommend that you upgrade both modules to the same ROM Monitor version.

Reloading Nodes After a ROMMON Firmware Change

The new ROMMON firmware is not active on a node until the card is reloaded. For example, if you upgrade a single node, you must reload that node only after the upgrade. If you upgrade or downgrade all nodes, you must also reload all nodes to activate the new ROMMON version.

To gracefully reload all nodes, reload the standby RSP, perform a redundancy switchover, reload the second RSP, and then reload all other nodes in the system.

If the router does not contain a redundant standby RSP, or if you wish to perform a cold restart, you can also reload all nodes at the same time, including the primary RSP. Remember that a cold restart results in router downtime while the cards reboot.

Upgrading or Downgrading ROM Monitor Using the FPD PIE

The field-programmable devices (FPDs) are hardware devices implemented on router cards that support separate software upgrades. A field-programmable gate array (FPGA) is a type of programmable memory device that exists on most hardware components of a router. The term *FPD* describes any type of programmable

hardware device on Serial Interface Processors (SIPs) and shared port adapters (SPAs), including FPGAs. Cisco IOS XR software provides the Cisco FPD upgrade feature to manage the upgrade of FPD images on SIPs and SPAs. For more information on upgrading FPDs, see Upgrading FPD on Cisco IOS XR Software module in the Cisco ASR 9000 Series Aggregation Services Router System Management Configuration Guide.

The following procedure upgrades or downgrades the ROM Monitor firmware using the ROM Monitor image contained in the FPD software package installation envelope (PIE). This section also includes instructions to reload a node, gracefully reload all nodes in the system, or perform a cold restart for all nodes in the system.

**Note**

- We recommend upgrading one card at a time. After each upgrade, you should see a message indicating that the upgrade was performed successfully. Reload the card only after the upgrade finishes successfully.
- Do not perform hardware reload or OIR during FPD upgrade because it can result in corrupt FPDs of hardware.

If you are not sure if a card requires a ROM monitor upgrade, you can install the card and use the **show hw-module fpd location** <node-id> command to determine if the ROM monitor image on the card is compatible with the currently running Cisco IOS XR software release.

Prerequisites

Before upgrading or downgrading ROM Monitor firmware, verify that the FPD PIE is installed on your router. For more information on installing software PIEs, see the *Upgrading and Managing Cisco IOS XR Software* module in *Cisco ASR 9000 Series Aggregation Services Router System Management Configuration Guide*.

SUMMARY STEPS

1. **show hw-module fpd location all**
2. **admin**
3. **show fpd package**
4. **upgrade hw-module fpd rommon location [all | node-id]**
5. **exit**
6. If you are upgrading a single node on a router, including a standby RSP, go to Step 9.
7. If you are upgrading a router with redundant RSPs, and want to perform a graceful reload, go to Step 10.
8. If you are upgrading a router with a single RSP, or want to perform a cold restart on all nodes, go to Step 11.
9. Reload a single node.
10. Gracefully reload all nodes on a system that includes redundant RSPs.
11. Reload all nodes in the system (cold restart).
12. **show platform**

DETAILED STEPS

	Command or Action	Purpose
Step 1	show hw-module fpd location all Example: RP/0/RSP0/CPU0:router# show hw-module fpd location all	Displays the current FPD image versions for all cards installed in the router. Use this command to determine if you must upgrade the ROM monitor image on your cards.
Step 2	admin Example: RP/0/RSP0/CPU0:router# admin	Enters administration EXEC mode from EXEC mode.
Step 3	show fpd package Example: RP/0/RSP0/CPU0:router(admin)# show fpd package	(Optional) Displays which cards are supported with your current Cisco IOS XR software release, which FPD or ROM monitor image you need for each card, and what the minimum hardware requirements are for the cards. If there are multiple FPD images for your card, use this command to determine which FPD image to use if you want to upgrade only a specific FPD type.
Step 4	upgrade hw-module fpd rommon location [all node-id] Example: RP/0/RSP0/CPU0:router(admin)# upgrade hw-module fpd rommon location 0/RSP1/CPU0	Upgrades the ROMMON B images on the specified card (<i>node-id</i>) or all cards (all). Note <ul style="list-style-type: none"> • Before you continue to reload the card, you should see a message indicating that the upgrade was completed successfully. • The use of force option when doing an fpd upgrade is not recommended except under explicit direction from Cisco Engineering or TAC.
Step 5	exit Example: RP/0/RSP0/CPU0:router(admin)# exit	Exits administration EXEC mode and returns to EXEC mode.
Step 6	If you are upgrading a single node on a router, including a standby RSP, go to Step 9.	Continues to reload the node.
Step 7	If you are upgrading a router with redundant RSPs, and want to perform a graceful reload, go to Step 10.	Continues to gracefully reload all nodes.
Step 8	If you are upgrading a router with a single RSP, or want to perform a cold restart on all nodes, go to Step 11.	Continues to perform a cold restart of all nodes.
Step 9	Reload a single node. Example: RP/0/RSP0/CPU0:router# hw-module location 0/RSP1/CPU0 reload	Reloads a single node within a router, such as a standby RSP. The new ROM Monitor firmware is not active on a node until the card is reloaded.

	Command or Action	Purpose
		<p>Replace <i>node-id</i> with the node ID you specified when upgrading ROM Monitor.</p> <p>Go to Step 12 to verify that the correct ROMMON firmware is active on each node.</p>
<p>Step 10</p>	<p>Gracefully reload all nodes on a system that includes redundant RSPs.</p> <p>Example:</p> <pre>RP/0/RSP0/CPU0:router# cfs check RP/0/RSP0/CPU0:router# hw-module location 0/RSP1/CPU0 reload RP/0/RSP0/CPU0:router# show redundancy RP/0/RSP0/CPU0:router# redundancy switchover RP/0/RSP0/CPU0:router# show redundancy RP/0/RSP0/CPU0:router# admin RP/0/RSP0/CPU0:router(admin)# show platform RP/0/RSP0/CPU0:router(admin)# hw-module location 0/1/CPU0 reload RP/0/RSP0/CPU0:router(admin)# hw-module location 0/2/CPU0 reload RP/0/RSP0/CPU0:router(admin)# hw-module location 0/SM0/SP reload RP/0/RSP0/CPU0:router(admin)# hw-module location 0/SM1/SP reload RP/0/RSP0/CPU0:router(admin)# hw-module location 0/SM2/SP reload RP/0/RSP0/CPU0:router(admin)# hw-module location 0/SM3/SP reload RP/0/RSP0/CPU0:router(admin)# show platform</pre>	<p>Gracefully reloads all nodes on a system that includes redundant RSPs. The new ROM Monitor firmware is not active on a node until the card is reloaded.</p> <p>(Optional) Use cfs check command to ensure the sanity of the configuration file system for the default-SDR.</p> <p>Reload the standby RSP to activate the new ROM Monitor firmware. Specify the <i>node-id</i> of the standby RSP.</p> <p>Wait till the standby RSP fully boots.</p> <p>Use the show redundancy command to verify the redundancy status of the RSPs. Wait for the standby RSP to return to “Ready” state.</p> <p>Use the redundancy switchover command to cause the primary (active) RSP to fail over to the redundant standby RSP. The control switches over to the standby RSP.</p> <p>Note</p> <ul style="list-style-type: none"> • The standby RSP must be ready to take over. <p>Use the show redundancy command to verify the status of the RSPs. Wait for the standby RSP to return to ready state.</p> <p>Use the admin command to enter administration EXEC mode.</p> <p>Use the show platform command to view all the nodes in the system. Enter this command in administration EXEC mode to display information for all nodes in the system, including admin plane resources.</p> <p>Use the hw-module location <i>node-id</i> reload command to reload each additional card where the ROM Monitor firmware was changed. Each node must be reloaded to activate the new ROM Monitor firmware.</p> <p>Replace <i>node-id</i> with the node ID you specified when upgrading ROM Monitor.</p> <p>Use the hw-module location <i>node-id</i> reload command to reload all upgraded nodes in the system.</p> <p>Use the show platform command to view all the nodes in the system. Verify that all the reloaded nodes are in the “IOS XR RUN” state.</p>

	Command or Action	Purpose
Step 11	Reload all nodes in the system (cold restart). Example: <pre>RP/0/RSP0/CPU0:router# cfs check RP/0/RSP0/CPU0:router# admin RP/0/RSP0/CPU0:router(admin)# reload location all</pre>	Reloads all nodes, including the RSP. Use these commands if you are upgrading a router with a single RSP, or wish to perform a cold restart of all nodes. The new ROM Monitor firmware is not active on a node until the card is reloaded. Reloading the primary RSP interrupts all service. (Optional) Use the cfs check command to ensure the sanity of the configuration file system for the default-SDR. Enters administration EXEC mode. Use the reload location all command in administration EXEC mode to reload all nodes in the system.
Step 12	show platform Example: <pre>RP/0/RSP0/CPU0:router# show platform</pre>	Verifies that the ROM monitor image on the card has been successfully upgraded by displaying the status of all cards in the system.

Troubleshooting Tips

This section provides the troubleshooting tips for the upgrade procedure:

- If any node cannot be upgraded successfully, if you do not receive a message indicating a successful upgrade, or if you see error messages similar to the following message, try reformatting the bootflash (**format bootflash: [location all | node-id]**) and then repeat this upgrade procedure:

```
LC/0/3/CPU0:rommon_burner[65635]: %ROMMON_BURNER-3-FILE_OP_ERR : Opening ROMMON flash
partition failed: No such file or directory in function main at line 952
```

- If you are upgrading ROMMON B and the version does not change to the expected version after the upgrade, the upgrade might have failed. When the router cannot load ROMMON B, it loads ROMMON A.

If ROMMON A is used for any card in the router, following SYSLOG message is displayed during system boot up:

```
LC/0/5/CPU0:Nov 5 12:29:12.311 : rommon_fpd_agent[202]: rommon instance 0 has image A
programmed. Upgrade the possibly corrupt image B using "upgrade hw-module fpd" CLI in
admin mode.
```

- If both ROMMAN B and ROMMON A are damaged due to an unexpected node reset or a power interruption during the upgrade, the affected route processors must be returned to Cisco for repair.
- If a lower version of the ROM Monitor is detected based on the version check performed during system boot, following error message is displayed:

```
RP/0/RSP1/CPU0:Nov 19 07:19:02.628 : rommon_fpd_agent[308]:
%PLATFORM-UPGRADE_FPD-4-DOWN_REV : lc rommon instance 0 is down-rev (V0.63), upgrade
to (V0.64). Use the "upgrade hw-module fpd" CLI in admin mode.
```

ROM Monitor Upgrades: Examples

This section provides the following configuration examples:

ROM Monitor Upgrade: Example

The following example shows how to display ROM monitor image information for all cards in the router:

```
RP/0/RSP1/CPU0:router(admin)# show hw-module fpd location all
```

```
Sun Jun 6 04:34:58.956 DST
```

```
=====
Existing Field Programmable Devices
=====
Location      Card Type      HW      Current SW Upg/
Version Type Subtype Inst Version Dng?
=====
0/RSP0/CPU0   A9K-RSP-4G     4.8    lc    fpga3    0      1.18    No
                lc    fpga1    0      1.05    No
                lc    fpga2    0      1.15    No
                lc    cbc      0      1.02    No
                lc    fpga4    0      3.08    No
                lc    hsbi     0      4.00    No
                lc    rommon   0      1.04    No
-----
0/RSP0/CPU0   ASR-9010-FAN   1.0    lc    cbc      1      4.00    No
-----
0/RSP0/CPU0   ASR-9010-FAN   1.0    lc    cbc      2      4.00    No
-----
0/1/CPU0      A9K-40GE-B     1.0    lc    fpga1    0      0.42    No
                lc    fpga2    0      0.09    No
                lc    cbc      0      2.02    No
                lc    cp1d1    0      0.19    No
                lc    rommon   0      1.03    No
-----
0/1/CPU0      A9K-40GE-B     1.0    lc    fpga1    1      0.42    No
-----
0/4/CPU0      A9K-8T/4-B     1.0    lc    fpga1    0      0.42    No
                lc    fpga2    0      0.10    No
                lc    cbc      0      2.02    No
                lc    cp1d2    0      0.08    No
                lc    cp1d1    0      0.19    No
                lc    cp1d3    0      0.03    No
                lc    rommon   0      1.03    No
                lc    fpga3    0      14.42   No
-----
0/4/CPU0      A9K-8T/4-B     1.0    lc    fpga1    1      0.42    No
-----
0/6/CPU0      A9K-4T-B       1.0    lc    fpga1    0      0.42    No
                lc    fpga2    0      0.10    No
                lc    cbc      0      2.02    No
                lc    cp1d2    0      0.08    No
                lc    cp1d1    0      0.19    No
                lc    cp1d3    0      0.03    No
                lc    rommon   0      1.03    No
                lc    fpga3    0      14.42   No
=====
```

```
0/6/CPU0      A9K-4T-B                1.0  lc  fpga1  1      0.42  No
-----
```

The following example shows how to upgrade the ROM Monitor image when a lower version of ROM Monitor firmware is detected. In the example, the ROM Monitor image for the 0/RSP1/CPU0 node ID is updated:

```
RP/0/RSP0/CPU0:router (admin) # upgrade hw-module fpd rommon location 0/RSP1/CPU0
```

```
% RELOAD REMINDER:
```

- The upgrade operation of the target module will not interrupt its normal operation. However, for the changes to take effect, the target module will need to be manually reloaded after the upgrade operation. This can be accomplished with the use of "hw-module <target> reload" command.
- If automatic reload operation is desired after the upgrade, please use the "reload" option at the end of the upgrade command.
- The output of "show hw-module fpd location" command will not display correct version information after the upgrade if the target module is not reloaded.

```
Continue? [confirm]
```

```
Starting the upgrade/download of following FPD:
```

```
=====
Location      Type Subtype Upg/Dng   Current   Upg/Dng
              Type Subtype Upg/Dng   Version   Version
=====
0/RSP1/CPU0  lc   rommon  upg       0.63      0.64
=====
```

```
RP/0/RSP1/CPU0:Nov 19 07:24:11.553 : lc_fpd_upgrade[243]: %PLATFORM-UPGRADE_FPD-6-START :
Starting to upgrade rommon subtype image from 0.63 to 0.64 for this card on location
0/RSP1/CPU0
```

```
RP/0/RSP1/CPU0:Nov 19 07:24:11.561 : rommon_fpd_agent[308]: Start Upgrade...
```

```
RP/0/RSP1/CPU0:Nov 19 07:24:11.561 : rommon_fpd_agent[308]: Programming fpd instance 0...with
file
```

```
/net/node0_RSP0_CPU0/dev/shmem/asr9k-fpd-3.7.2.10I/fpd/ucode/rommon-viking-8641d-rsp2-B.bin
```

```
RP/0/RSP1/CPU0:Nov 19 07:24:21.098 : lc_fpd_upgrade[243]: %PLATFORM-UPGRADE_FPD-6-PASSED :
Successfully upgrade rommon subtype image for this card on location 0/RSP1/CPU0
```

```
% Successfully upgraded 1 FPD for A9K-RSP-4G-HDD on location 0/RSP1/CPU0
```

The following example shows reload of the 0/RSP1/CPU0 node:

```
RP/0/RSP0/CPU0:router (admin) # hw-module location 0/RSP1/CPU0 reload
```

```
WARNING: This will take the requested node out of service.
```

```
Do you wish to continue?[confirm(y/n)] y
```

```
RP/0/RSP0/CPU0:Nov 19 07:26:45.060 : shelfmgr[323]: %PLATFORM-SHELFMGR-6-USER_RESET : Node
0/RSP1/CPU0 is reset due to user reload request
```

```
RP/0/RSP0/CPU0:Nov 19 07:26:51.866 : shelfmgr[323]: %PLATFORM-SHELFMGR-6-NODE_STATE_CHANGE
: 0/RSP1/CPU0 card type:1049346 nstate:ROMMON
```

```
RP/0/RSP0/CPU0:Nov 19 07:27:11.153 : shelfmgr[323]: %PLATFORM-SHELFMGR_HAL-6-BOOT_REQ_RECEIVED
: Boot Request from 0/RSP1/CPU0, Rommon Version: 0.64
```

```
RP/0/RSP0/CPU0:Nov 19 07:27:11.155 : shelfmgr[323]: %PLATFORM-SHELFMGR-6-NODE_STATE_CHANGE
: 0/RSP1/CPU0 card type:1049346 nstate:MBI-BOOTING
```

```
RP/0/RSP0/CPU0:Nov 19 07:29:26.661 : shelfmgr[323]: %PLATFORM-SHELFMGR-6-NODE_STATE_CHANGE
: 0/RSP1/CPU0 card type:1049346 nstate:IOS XR RUN
```

```
RP/0/RSP0/CPU0:Nov 19 07:29:52.066 : redcon[303]: %HA-REDCON-1-STANDBY_READY : standby card
is ready
```

Verify the upgrade using the **show hw-module fpd location all** command, as shown in the following command:

```
RP/0/RSP0/CPU0:router(admin)# show hw-module fpd location all
```

```
===== Existing Field Programmable Devices =====
Location      Card Type      HW      Current SW Upg/
Version Type Subtype Inst Version Dng?
=====
0/RSP0/CPU0   A9K-RSP-4G     4.8    lc   fpga3   0    1.18   No
              A9K-RSP-4G     4.8    lc   fpga1   0    1.05   No
              A9K-RSP-4G     4.8    lc   fpga2   0    1.15   No
              A9K-RSP-4G     4.8    lc   cbc     0    1.02   No
              A9K-RSP-4G     4.8    lc   fpga4   0    3.08   No
              A9K-RSP-4G     4.8    lc   hsbi    0    4.00   No
              A9K-RSP-4G     4.8    lc   rommon  0    1.04   No
-----
0/RSP0/CPU0   ASR-9010-FAN   1.0    lc   cbc     1    4.00   No
-----
0/RSP0/CPU0   ASR-9010-FAN   1.0    lc   cbc     2    4.00   No
-----
0/RSP0/CPU0   A9K-BPID2-10-SLOT 1.0    lc   cbc     3    7.00   No
-----
0/RSP1/CPU0   A9K-RSP-4G     4.8    lc   fpga3   0    1.18   No
              A9K-RSP-4G     4.8    lc   fpga1   0    1.05   No
              A9K-RSP-4G     4.8    lc   fpga2   0    1.15   No
              A9K-RSP-4G     4.8    lc   cbc     0    1.02   No
              A9K-RSP-4G     4.8    lc   fpga4   0    3.08   No
              A9K-RSP-4G     4.8    lc   hsbi    0    4.00   No
              A9K-RSP-4G     4.8    lc   rommon  0    1.04   No
-----
0/1/CPU0      A9K-4T-L       1.0    lc   fpga1   0    0.42   No
              A9K-4T-L       1.0    lc   fpga2   0    0.10   No
              A9K-4T-L       1.0    lc   cbc     0    2.02   No
              A9K-4T-L       1.0    lc   cpld2   0    0.08   No
              A9K-4T-L       1.0    lc   cpld1   0    0.19   No
              A9K-4T-L       1.0    lc   cpld3   0    0.03   No
              A9K-4T-L       1.0    lc   rommon  0    1.03   No
              A9K-4T-L       1.0    lc   fpga3   0    14.42  No
-----
0/1/CPU0      A9K-4T-L       1.0    lc   fpga1   1    0.42   No
-----
0/2/CPU0      A9K-2T20GE-B  1.0    lc   fpga1   0    0.42   No
              A9K-2T20GE-B  1.0    lc   fpga2   0    0.16   No
              A9K-2T20GE-B  1.0    lc   cbc     0    2.02   No
              A9K-2T20GE-B  1.0    lc   cpld2   0    0.11   No
              A9K-2T20GE-B  1.0    lc   cpld1   0    0.19   No
              A9K-2T20GE-B  1.0    lc   cpld3   0    0.09   No
              A9K-2T20GE-B  1.0    lc   rommon  0    1.03   No
-----
0/2/CPU0      A9K-2T20GE-B  1.0    lc   fpga1   1    0.42   No
-----
0/3/CPU0      A9K-SIP-700    0.31   lc   fpga1   0    0.22   No
              A9K-SIP-700    0.31   lc   cbc     0    3.03   Yes
              A9K-SIP-700    0.31   lc   rommon  0    1.02   Yes
              A9K-SIP-700    0.31   lc   fpga2   0    5.14   No
              A9K-SIP-700    0.31   lc   cpld1   0    0.15   No
-----
0/3/1         SPA-2XCHOC12/DS0 1.0    spa  rommon  1    2.02   No
              SPA-2XCHOC12/DS0 1.0    spa  fpga1   1    1.36   No
              SPA-2XCHOC12/DS0 1.0    spa  fpga2   1    1.00   No
-----
0/4/CPU0      A9K-8T/4-L     1.0    lc   fpga1   0    0.42   No
              A9K-8T/4-L     1.0    lc   fpga2   0    0.10   No
```

			lc	cbc	0	2.02	No
			lc	cp1d2	0	0.08	No
			lc	cp1d1	0	0.19	No
			lc	cp1d3	0	0.03	No
			lc	rommon	0	1.03	No
			lc	fpga3	0	14.42	No

0/4/CPU0	A9K-8T/4-L	1.0	lc	fpga1	1	0.42	No

0/6/CPU0	A9K-40GE-L	1.0	lc	fpga1	0	0.42	No
			lc	fpga2	0	0.09	No
			lc	cbc	0	2.02	No
			lc	cp1d1	0	0.19	No
			lc	rommon	0	1.03	No

0/6/CPU0	A9K-40GE-L	1.0	lc	fpga1	1	0.42	No

NOTES:

- One or more FPD needs an upgrade or a downgrade. This can be accomplished using the "admin upgrade hw-module fpd" CLI.

The following example shows how to upgrade ROMMON B:



Note The use of **force** option when doing an fpd upgrade is not recommended except under explicit direction from Cisco Engineering or TAC.

```
RP/0/RSP0/CPU0:router(admin)# upgrade hw-module fpd rommon location 0/RSP1/CPU0
```

```
% RELOAD REMINDER:
```

- The upgrade operation of the target module will not interrupt its normal operation. However, for the changes to take effect, the target module will need to be manually reloaded after the upgrade operation. This can be accomplished with the use of "hw-module <target> reload" command.
- If automatic reload operation is desired after the upgrade, please use the "reload" option at the end of the upgrade command.
- The output of "show hw-module fpd location" command will not display correct version information after the upgrade if the target module is not reloaded.

```
Continue? [confirm]
```

```
Starting the upgrade/download of following FPD:
```

```
=====
Location      Type Subtype Upg/Dng   Current   Upg/Dng
              Version  Version
=====
0/RSP1/CPU0 lc  rommon upg      0.64      1.0
=====
```

```
RP/0/RSP1/CPU0:Dec 11 16:18:01.982 : lc_fpd_upgrade[240]: %PLATFORM-UPGRADE_FPD-6-START :
Starting to upgrade rommon subtype image from 0.64 to 1.0 for this card on location
0/RSP1/CPU0
```

```
RP/0/RSP1/CPU0:Dec 11 16:18:01.989 : rommon_fpd_agent[303]: Start Upgrade...
```

```
RP/0/RSP1/CPU0:Dec 11 16:18:01.990 : rommon_fpd_agent[303]: Programming fpd instance 0...with
file
```

```
/net/node0_RSP0_CPU0/dev/shmem/asr9k-fpd-3.7.1.23I/fpd/ucode/rommon-viking-8641d-rsp2-B.bin
RP/0/RSP1/CPU0:Dec 11 16:18:11.604 : lc_fpd_upgrade[240]: %PLATFORM-UPGRADE_FPD-6-PASSED :
Successfully upgrade rommon subtype image for this card on location 0/RSP1/CPU0
```

```
% Successfully upgraded 1 FPD for A9K-RSP-4G-HDD on location 0/RSP1/CPU0
```

```
RP/0/RSP0/CPU0:ios(admin)# hw-module location 0/RSP1/CPU0 reload
```

Graceful Reload of a Cisco ASR 9000 Series Router: Example

In the following example, a Cisco ASR 9000 Series Router is gracefully reloaded following a ROM Monitor firmware upgrade or downgrade:

```
RP/0/RSP0/CPU0:router# cfs check
```

```
Creating any missing directories in Configuration File system...OK
Initializing Configuration Version Manager...OK
Syncing commit database with running configuration...OK
```

```
RP/0/RSP0/CPU0:router#hw-module location 0/RSP1/CPU0 reload
```

```
WARNING: This will take the requested node out of service.
```

```
Do you wish to continue?[confirm(y/n)]y
```

```
RP/0/RSP0/CPU0:router# show redundancy
```

```
Redundancy information for node 0/RSP0/CPU0:
```

```
=====
```

```
Node 0/RSP0/CPU0 is in ACTIVE role
Partner node (0/RSP1/CPU0) is in STANDBY role
Standby node in 0/RSP1/CPU0 is ready
Standby node in 0/RSP1/CPU0 is NSR-ready
```

```
Reload and boot info
```

```
-----
```

```
A9K-RSP-4G-HDD reloaded Thu Dec 11 14:50:47 2008: 2 hours, 27 minutes ago
Active node booted Thu Dec 11 14:50:47 2008: 2 hours, 27 minutes ago
Standby node boot Thu Dec 11 17:15:16 2008: 2 minutes ago
Standby node last went not ready Thu Dec 11 17:16:27 2008: 1 minute ago
Standby node last went ready Thu Dec 11 17:17:27 2008: 39 seconds ago
There have been 0 switch-overs since reload
```

```
RP/0/RSP0/CPU0:router# redundancy switchover
```

```
Proceed with switchover 0/RSP0/CPU0 -> 0/RSP1/CPU0? [confirm]
```

```
Initiating switch-over.
```

```
<Move to node 0/RSP1/CPU0>
```

```
RP/0/RSP1/CPU0:router# show redundancy
```

```
Redundancy information for node 0/RSP1/CPU0:
```

```
=====
```

```
Node 0/RSP1/CPU0 is in ACTIVE role
Partner node (0/RSP0/CPU0) is in STANDBY role
Standby node in 0/RSP0/CPU0 is ready
Standby node in 0/RSP0/CPU0 is NSR-ready
```

```
Reload and boot info
```

```
-----
```

```
A9K-RSP-4G-HDD reloaded Thu Dec 11 14:50:47 2008: 2 hours, 35 minutes ago
Active node booted Thu Dec 11 17:15:15 2008: 11 minutes ago
Last switch-over Thu Dec 11 17:19:29 2008: 7 minutes ago
Standby node boot Thu Dec 11 17:22:57 2008: 3 minutes ago
Standby node last went not ready Thu Dec 11 17:24:06 2008: 2 minutes ago
Standby node last went ready Thu Dec 11 17:25:06 2008: 1 minute ago
There has been 1 switch-over since reload
```

```
RP/0/RSP1/CPU0:router# hw-module location 0/RSP0/CPU0 reload
```

```
WARNING: This will take the requested node out of service.
Do you wish to continue?[confirm(y/n)] y
```

```
RP/0/RSP1/CPU0:router# show redundancy
Redundancy information for node 0/RSP1/CPU0:
=====
Node 0/RSP1/CPU0 is in ACTIVE role
Partner node (0/RSP0/CPU0) is in STANDBY role
Standby node in 0/RSP0/CPU0 is ready
Standby node in 0/RSP0/CPU0 is NSR-ready
```

```
Reload and boot info
-----
```

```
A9K-RSP-4G-HDD reloaded Thu Dec 11 14:50:47 2008: 2 hours, 41 minutes ago
Active node booted Thu Dec 11 17:15:15 2008: 16 minutes ago
Last switch-over Thu Dec 11 17:19:29 2008: 12 minutes ago
Standby node boot Thu Dec 11 17:28:56 2008: 3 minutes ago
Standby node last went not ready Thu Dec 11 17:30:02 2008: 2 minutes ago
Standby node last went ready Thu Dec 11 17:31:02 2008: 1 minute ago
There has been 1 switch-over since reload
```

```
RP/0/RSP1/CPU0:router# admin
```

```
RP/0/RSP1/CPU0:router(admin)# show platform
```

Node	Type	State	Config State
0/RSP0/CPU0	A9K-RSP-4G-HDD (Standby)	IOS XR RUN	PWR,NSHUT,MON
0/RSP1/CPU0	A9K-RSP-4G-HDD (Active)	IOS XR RUN	PWR,NSHUT,MON
0/FT0/SP	FAN TRAY	READY	
0/0/CPU0	A9K-4T-B	IOS XR RUN	PWR,NSHUT,MON
0/2/CPU0	A9K-40GE-E	IOS XR RUN	PWR,NSHUT,MON
0/6/CPU0	A9K-8T/4-E	IOS XR RUN	PWR,NSHUT,MON

```
RP/0/RSP1/CPU0:router(admin)# hw-module location 0/0/CPU0 reload
```

```
WARNING: This will take the requested node out of service.
Do you wish to continue?[confirm(y/n)] y
```

```
RP/0/RSP1/CPU0:router(admin)# hw-module location 0/2/CPU0 reload
```

```
WARNING: This will take the requested node out of service.
Do you wish to continue?[confirm(y/n)] y
```

```
RP/0/RSP1/CPU0:router(admin)# hw-module location 0/6/CPU0 reload
```

```
WARNING: This will take the requested node out of service.
Do you wish to continue?[confirm(y/n)] y
```

```
RP/0/RSP1/CPU0:router(admin)# show platform
```

Node	Type	State	Config State
0/RSP0/CPU0	A9K-RSP-4G-HDD (Standby)	IOS XR RUN	PWR,NSHUT,MON
0/RSP1/CPU0	A9K-RSP-4G-HDD (Active)	IOS XR RUN	PWR,NSHUT,MON
0/FT0/SP	FAN TRAY	READY	
0/0/CPU0	A9K-4T-B	IOS XR RUN	PWR,NSHUT,MON
0/2/CPU0	A9K-40GE-E	IOS XR RUN	PWR,NSHUT,MON
0/6/CPU0	A9K-8T/4-E	IOS XR RUN	PWR,NSHUT,MON

```
RP/0/RSP1/CPU0:router(admin)# show hw-module fpd location all
```

```
===== Existing Field Programmable Devices =====
HW Current SW Upg/
Version Type Subtype Inst Version Dng?
Location Card Type
```

0/RSP0/CPU0	A9K-RSP-4G	4.8	lc	fpga3	0	1.18	No
			lc	fpga1	0	1.05	No
			lc	fpga2	0	1.15	No
			lc	cbc	0	1.02	No
			lc	fpga4	0	3.08	No
			lc	hsbi	0	4.00	No
			lc	rommon	0	1.04	No
0/RSP0/CPU0	ASR-9010-FAN	1.0	lc	cbc	1	4.00	No
0/RSP0/CPU0	ASR-9010-FAN	1.0	lc	cbc	2	4.00	No
0/RSP0/CPU0	A9K-BPID2-10-SLOT	1.0	lc	cbc	3	7.00	No
0/RSP1/CPU0	A9K-RSP-4G	4.8	lc	fpga3	0	1.18	No
			lc	fpga1	0	1.05	No
			lc	fpga2	0	1.15	No
			lc	cbc	0	1.02	No
			lc	fpga4	0	3.08	No
			lc	hsbi	0	4.00	No
			lc	rommon	0	1.04	No
0/1/CPU0	A9K-4T-L	1.0	lc	fpga1	0	0.42	No
			lc	fpga2	0	0.10	No
			lc	cbc	0	2.02	No
			lc	cp1d2	0	0.08	No
			lc	cp1d1	0	0.19	No
			lc	cp1d3	0	0.03	No
			lc	rommon	0	1.03	No
			lc	fpga3	0	14.42	No
0/1/CPU0	A9K-4T-L	1.0	lc	fpga1	1	0.42	No
0/2/CPU0	A9K-2T20GE-B	1.0	lc	fpga1	0	0.42	No
			lc	fpga2	0	0.16	No
			lc	cbc	0	2.02	No
			lc	cp1d2	0	0.11	No
			lc	cp1d1	0	0.19	No
			lc	cp1d3	0	0.09	No
			lc	rommon	0	1.03	No
0/2/CPU0	A9K-2T20GE-B	1.0	lc	fpga1	1	0.42	No
0/3/CPU0	A9K-SIP-700	0.31	lc	fpga1	0	0.22	No
			lc	cbc	0	3.03	Yes
			lc	rommon	0	1.02	Yes
			lc	fpga2	0	5.14	No
			lc	cp1d1	0	0.15	No
0/3/1	SPA-2XCHOC12/DS0	1.0	spa	rommon	1	2.02	No
			spa	fpga1	1	1.36	No
			spa	fpga2	1	1.00	No
0/4/CPU0	A9K-8T/4-L	1.0	lc	fpga1	0	0.42	No
			lc	fpga2	0	0.10	No
			lc	cbc	0	2.02	No
			lc	cp1d2	0	0.08	No
			lc	cp1d1	0	0.19	No
			lc	cp1d3	0	0.03	No
			lc	rommon	0	1.03	No
			lc	fpga3	0	14.42	No
0/4/CPU0	A9K-8T/4-L	1.0	lc	fpga1	1	0.42	No

0/6/CPU0	A9K-40GE-L	1.0	lc	fpga1	0	0.42	No
			lc	fpga2	0	0.09	No
			lc	cbc	0	2.02	No
			lc	cpld1	0	0.19	No
			lc	rommon	0	1.03	No
0/6/CPU0	A9K-40GE-L	1.0	lc	fpga1	1	0.42	No

NOTES:

- One or more FPD needs an upgrade or a downgrade. This can be accomplished using the "admin upgrade hw-module fpd" CLI.

Additional References

Related Documents

Related Topic	Document Title
Hardware component commands	<i>Interface and Hardware Component Command Reference for Cisco ASR 9000 Series Routers</i>
System management commands	<i>System Management Command Reference for Cisco ASR 9000 Series Routers</i>

Technical Assistance

Description	Link
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