



Field-Programmable Device Upgrades

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Field-programmable devices (FPDs) are hardware devices implemented on router cards that support separate software upgrades. An FPD image package is used to upgrade FPD images.

Finding Feature Information in This Module

Your Cisco IOS software release may not support all of the features documented in this module. To reach links to specific feature documentation in this module and to see a list of the releases in which each feature is supported, use the [“Feature Information for Field-Programmable Device Upgrades”](#) section on page 55.

Finding Support Information for Platforms and Cisco IOS and Catalyst OS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS and Catalyst OS software image support. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.

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Prerequisites for Field-Programmable Device Upgrades

The FPD image package must be compatible with the Cisco IOS software that is running on the router. If an incompatibility exists between an FPD image package and the Cisco IOS software release running the router, the device with the FPD will not operate properly until the incompatibility is resolved.

Restrictions for Field-Programmable Device Upgrades

The following restrictions apply to this feature:

- This feature guide does not describe FPD upgrades on SPA interface processors (SIPs) and shared port adapters (SPAs). For SPA and SIP information, see [Related Documents, page 20](#).
- Download the FPD image package file *before* booting the router using a new Cisco IOS release if the following are true:
 - You are upgrading the Cisco IOS image.
 - You are running hardware that supports automatic FPD upgrades for its FPGA device.

If the system requires an FPD upgrade and the Cisco IOS image is unable to locate an FPD image package, the system messages will indicate that the FPD image is incompatible. You will need to go to the Cisco Software Center on Cisco.com to download the FPD image package for your Cisco IOS software release.

- The FPD image package file on your system must be compatible with your Cisco IOS release; do not change the name of the FPD image package file.

The FPD automatic upgrade feature searches only for the FPD image package file that is the same version number as the Cisco IOS release being used by the system. For example, if the Cisco IOS release being used is Cisco IOS Release 12.4(5)T1, the system searches for the FPD image package file that supports the specific Cisco IOS release (c7200-fpd-pkg.124-5.T1.pkg).

Information About Field-Programmable Device Upgrades

To perform field-programmable device upgrades, you should understand the following concepts:

- [Field-Programmable Devices and Field-Programmable Gate Arrays, page 2](#)
- [FPD Image Packages, page 3](#)

Field-Programmable Devices and Field-Programmable Gate Arrays

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 some cards in Cisco routers. The term “FPD” in general describes any type of programmable hardware device, including FPGAs.

FPD Image Packages

An FPD image package is used to upgrade FPD images. Whenever a Cisco IOS image is released that supports the FPD feature, a companion FPD image package is also released for that Cisco IOS release. The FPD image package is available from Cisco.com and is accessible from the Cisco Software Center page, where you also go to download your Cisco IOS image.

How to Upgrade Field-Programmable Devices

This feature guide describes how to upgrade FPD images in the Cisco 7200 VXR router and Cisco 7301 router, port adapters, and service adapters that support FPD. This feature guide also provides the information that you need to determine whether an FPD upgrade is necessary and to verify the FPD upgrade process.

This section contains the following procedures:

- [Field-Programmable Device Quick Upgrade \(Automatic FPD Upgrade Only\)](#), page 3
- [Manually Upgrading Field-Programmable Devices](#), page 6
- [Modifying the Default Path for the FPD Image Package Location](#), page 8
- [Upgrading Field-Programmable Devices from an FTP or TFTP Server](#), page 8
- [Verifying and Troubleshooting Field-Programmable Device Upgrades](#), page 11

Field-Programmable Device Quick Upgrade (Automatic FPD Upgrade Only)

This section provides information for upgrading FPD as quickly as possible, either before or after upgrading the Cisco IOS release. The procedures in this section require that the hardware support automatic FPD upgrades. For information on manually upgrading FPD, see the “[Manually Upgrading Field-Programmable Devices](#)” section on page 6.

This section describes how to perform an FPD quick upgrade in the following subsections:

- [Field-Programmable Device Quick Upgrade Before Upgrading the Cisco IOS Release \(Recommended\)](#), page 3
- [Field-Programmable Device Quick Upgrade After Upgrading the Cisco IOS Release](#), page 4

Field-Programmable Device Quick Upgrade Before Upgrading the Cisco IOS Release (Recommended)

The quickest way to upgrade FPD is to do so before upgrading the Cisco IOS release, as described in the following procedure.

Prerequisites

You must be familiar with the procedures and locations for loading and maintaining Cisco IOS images. This information is described in the [Cisco IOS Configuration Fundamentals Configuration Guide, Release 12.4](#).

Restrictions

This procedure applies only to hardware that supports automatic FPD upgrades for its FPGA device.

SUMMARY STEPS

1. **show running-config**
2. Select the Cisco IOS release you want and download it.
3. Select the FPD image package and download it to the disk2: Flash Disk.
4. Reboot the router using the new Cisco IOS release.

DETAILED STEPS

-
- | | |
|---------------|---|
| Step 1 | Verify that the FPD automatic upgrade feature is enabled by examining the output of the show running-config command.

Look for the upgrade fpd auto line in the output. If there are no upgrade commands in the output, the upgrade fpd auto is enabled because it is the default setting. If automatic upgrades are disabled, use the upgrade fpd auto command to enable automatic FPD upgrades. |
| Step 2 | Select the Cisco IOS release you want and download it.

Log in at www.cisco.com and navigate to the download site for the specific Cisco IOS release and image that you want to download. |
| Step 3 | Select the FPD image package and download it to the disk2: Flash Disk.

If there is an FPD image package available with the Cisco IOS release, it is displayed next to the Cisco IOS release as FIELD PROGRAMMABLE DEVICE IMAGE PACKAGE in the Software Feature Set options list. Download the FPD image package for the new version of Cisco IOS to the disk2: Flash Disk. |
| Step 4 | Reboot the router using the new Cisco IOS release.

Reboot the router using the new version of Cisco IOS. When the new Cisco IOS release boots, it searches for the FPD image package in the disk2: Flash Disk. The router updates the FPD images automatically as part of the Cisco IOS boot process. |
-

Field-Programmable Device Quick Upgrade After Upgrading the Cisco IOS Release

If you have already upgraded the Cisco IOS release, use the following procedure to upgrade your FPD.

Prerequisites

You must be familiar with the procedures and locations for loading and maintaining Cisco IOS images. This information is described in the [Cisco IOS Configuration Fundamentals Configuration Guide, Release 12.4](#).

Restrictions

This procedure applies only to hardware that supports automatic FPD upgrades for its FPGA device.

SUMMARY STEPS

1. **show running-config**
2. **show hw-module all fpd**
3. Select the FPD image package and download it to the disk2: Flash Disk.
4. Reboot the router.

DETAILED STEPS

- Step 1** Verify that the FPD automatic upgrade feature is enabled by examining the output of the **show running-config** command.

Look for the **upgrade fpd auto** line in the output. If there are no upgrade commands in the output, the **upgrade fpd auto** is enabled because it is the default setting. If automatic upgrades are disabled, use the **upgrade fpd auto** command to enable automatic FPD upgrades.

- Step 2** Determine if an FPD upgrade is required using the **show hw-module all fpd** command.

An FPD upgrade is not always necessary after Cisco IOS is upgraded. Use the **show hw-module all fpd** command to see if all system FPDs are compatible with the Cisco IOS release. If all FPDs have the minimum required version, no further action is necessary. If at least one FPD needs an upgrade and it supports automatic upgrade, proceed to the next step. The following sample output indicates that an FPD upgrade is not required:

Router# **show hw-module all fpd**

```

=====
Slot Card Type           H/W   Field Programmable   Current   Min. Required
Ver.   Device: "ID-Name"   Version   Version
=====
npe NPE-G2               1.7    1-NPEG2 I/O FPGA     0.19      0.1
-----
0   VSA                  0.1    1-VSA                0.10      0.10
=====

```

- Step 3** Select the FPD image package and download it to the disk2: Flash Disk.

Log in at www.cisco.com and navigate to the download site for the specific Cisco IOS release and image that you are currently running. If there is an FPD image package available with the Cisco IOS release, it is displayed next to the Cisco IOS release as FIELD PROGRAMMABLE DEVICE IMAGE PACKAGE in the Software Feature Set options list.



Note Do not change any FPD-related settings on your system. If the default settings for the **upgrade fpd path** command have been changed, change the settings back to their default settings using the **no** form of this command.

- Step 4** Reboot the router.

When the Cisco IOS release boots, it searches for the FPD image package in the disk2: Flash Disk. The router updates the FPD images automatically as part of the Cisco IOS boot process.

Manually Upgrading Field-Programmable Devices

Use the following procedure to manually upgrade FPD image packages on the NPE-G2, port adapters, and service adapters that support FPD in the Cisco 7200 VXR router.

Prerequisites

You must be familiar with the procedures and locations for loading and maintaining Cisco IOS images. This information is described in the [Cisco IOS Configuration Fundamentals Configuration Guide, Release 12.4](#).

SUMMARY STEPS

1. **show hw-module all fpd**
2. Select the FPD image package and download it to a Flash Disk or to an FTP or TFTP server.
3. **show upgrade fpd file *file-url***
4. **upgrade hw-module slot {*slot-number* | npe} fpd file *file-url***
5. **show upgrade fpd progress**
6. Make the router use the updated FPD.
7. **show hw-module all fpd**

DETAILED STEPS

- Step 1** Determine if an FPD upgrade is required using the **show hw-module all fpd** command.

If all FPDs have the minimum required version, no further action is necessary. If an FPD image package needs an upgrade, proceed to the next step.

The following sample output indicates that the NPE-G2 does not meet the minimum version requirements. The output also contains a “NOTES” section that provides the name of the FPD image package needed to upgrade the FPD image on the NPE-G2.

Router# **show hw-module all fpd**

```
==== =====
Slot Card Type          H/W   Field Programmable   Current   Min. Required
Ver.   Device: "ID-Name"   Version   Version
==== =====
npe NPE-G2              1.5    1-NPEG2 I/O FPGA     0.18      0.20 *
-----
  0 VSA                  0.0    1-VSA                0.10      0.10
==== =====
```

NOTES:

- FPD images that are required to be upgraded are indicated with a '*' character in the "Minimal Required Version" field.
- The following FPD image package file is required for the upgrade:
"c7200-fpd-pkg.124-4.XD.pkg"

- Step 2** Select the FPD image package and download it to a Flash Disk or to an FTP or TFTP server.

Log in at www.cisco.com and navigate to the download site for the specific Cisco IOS release and image that you are currently running. If there is an FPD image package available with the Cisco IOS release, it is displayed next to the Cisco IOS release as **FIELD PROGRAMMABLE DEVICE IMAGE PACKAGE** in the Software Feature Set options list. It should be the same FPD image package as the one indicated by the **show hw-module all fpd** command.

Download the FPD image package for the new version of Cisco IOS to a Flash Disk on the router or to an accessible FTP or TFTP server.

- Step 3** Verify the contents of the FPD image package using the **show upgrade fpd file file-url** command.

The *file-url* argument of the **show upgrade fpd file file-url** command is the FPD location and name of the FPD image package file. If you are able to generate output related to the FPD image package using this command, the upgrade should work properly. In the following example, the router is able to generate FPD image package information for the FPD image package on the TFTP server:

```
Router# show upgrade fpd file
tftp://mytftpserver/myname/myfpdpkg/c7200-fpd-pkg.124-4.XD.pkg
Loading /auto/tftpboot-users/abcdef/c7200-fpd-pkg.124-4.XD.pkg from 223.255.254.254 (via
GigabitEthernet0/1):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!
[OK - 1419264 bytes]

Cisco Field Programmable Device Image Package for IOS
C7200 FPD Image Package (c7200-fpd-pkg.124-4.XD.pkg), Version 12.4(20060105:195420)
Copyright (c) 2005-2006 by cisco Systems, Inc.
Built Thu 05-Jan-2006 11:54 by abcdef
```

Bundled FPD Image Version Matrix				
Supported Card Types	ID	Image Name	Version	Min. Req. H/W Ver.
NPEG2 IOFPGA	1	NPEG2 IOFPGA	0.18	0.20
VSA	1	VSA	0.10	0.10

- Step 4** Manually upgrade the FPD using the **upgrade hw-module slot {slot-number | npe} fpd file file-url** command.

The **npe** keyword of the **upgrade hw-module slot {slot-number | npe} fpd file file-url** command indicates the chassis slot location of the NPE-G2. The *slot-number* argument indicates the chassis slot location of a port adapter or service adapter. The *file-url* argument is the FPD location and name of the FPD image package file. In the following example, the card is the NPE-G2 and the FPD image package file is on a TFTP server:

```
Router# upgrade hw-module slot npe fpd file
tftp://mytftpserver/myname/myfpdpkg/c7200-fpd-pkg.124-4.XD.pkg
```



Note Because the VSA uses the I/O controller slot, the slot number for it is always 0 (zero).

Step 5 Verify that the FPD upgrade is complete using the **show upgrade fpd progress** command.

The following example shows that the FPD upgrade is complete, because the upgrade is no longer in progress:

```
Router# show upgrade fpd progress

% There is no FPD image upgrade in progress.
```

Step 6 Make the router use the updated FPD:

- a. If you have updated the FPD for the NPE-G2, power cycle the router.

The router will *not* use the new version of the FPD if you reboot the router without a power cycle.

- b. If you have updated the FPD for a port adapter or service adapter, reboot the router. When the router boots, the port adapter or service adapter is automatically power cycled.

Step 7 Verify that the FPD upgrade was successful using the **show hw-module all fpd** command.

After the router has rebooted and the Cisco IOS has reloaded, use the **show hw-module all fpd** command to verify that all FPDs now have the minimum required version.

Modifying the Default Path for the FPD Image Package Location

When automatic FPD upgrade is supported and enabled, the Cisco IOS software looks for the FPD image package file on the disk2: Flash Disk. (If supported, automatic FPD upgrade is enabled by default.)

If there is not enough space on the disk2: Flash Disk, you can store an FPD image package in another file system. However, because the system expects to find the FPD image package on the disk2: Flash Disk in an automatic FPD upgrade, you need to change the FPD image package location so that the system is directed to search the alternate location (such as another file system on the router or an FTP or TFTP server.)

To change the location of the FPD image package file, use the **upgrade fpd path *fpd-pkg-dir-url*** command. The *fpd-pkg-dir-url* argument is the alternate location.



Note

If the system cannot locate an FPD image package file when an upgrade is required for a port adapter or service adapter, the port adapter or service adapter is disabled (offline). Because it does not come online until FPD is compatible, the port adapter or service adapter is also disabled if it requires an FPD upgrade and the automatic upgrade feature is disabled.

Upgrading Field-Programmable Devices from an FTP or TFTP Server

If the card supports automatic FPD upgrade, the recommended location for downloading the FPD image package is to the disk2: Flash Disk. If automatic upgrade is supported, the router searches for the FPD image package in the disk2: Flash Disk whenever it detects an incompatibility between the FPD and the Cisco IOS release.

You can change the default of the router loading an FPD image from the disk2: Flash Disk using the **upgrade fpd path *fpd-pkg-dir-url*** command. This command allows you to set the path to search for the FPD image package file to a location other than the disk2: Flash Disk.

For large deployments where all the systems are being upgraded to a specific Cisco IOS software release, it is recommended that the FPD image package file be downloaded to an FTP or TFTP server that is accessible to all the affected systems. Use the **upgrade fpd path** *fpd-pkg-dir-url* command to configure the routers to look for the FPD image package file on an FTP or TFTP server.

You will also need to change the path that the router uses to locate the FPD image package if the disk 2: Flash Disk is full.

Prerequisites

You must be familiar with the procedures and locations for loading and maintaining Cisco IOS images. This information is described in the [Cisco IOS Configuration Fundamentals Configuration Guide, Release 12.4](#).

Restrictions

This procedure applies only to hardware that supports automatic FPD upgrades for its FPGA device.

SUMMARY STEPS

1. Select the FPD image and download it to an FTP or TFTP server.
2. Access the router from a connection other than an interface on a port adapter or service adapter for which you are upgrading the FPD.
3. **upgrade fpd path** *fpd-pkg-dir-url*
4. **show running-config**
5. **show upgrade fpd file** *file-url*
6. Save the configuration and reload the router with the new Cisco IOS release.

DETAILED STEPS

-
- | | |
|---------------|---|
| Step 1 | <p>Select the FPD image and download it to an FTP or TFTP server.</p> <p>Log in at www.cisco.com and navigate to the download site for the specific Cisco IOS release and image that you are currently running. If there is an FPD image package available with the Cisco IOS release, it is displayed next to the Cisco IOS release as FIELD PROGRAMMABLE DEVICE IMAGE PACKAGE in the Software Feature Set options list.</p> <p>Download the FPD image package for the new version of Cisco IOS to an accessible FTP or TFTP server.</p> |
| Step 2 | <p>Access the router from a connection other than an interface on a port adapter or service adapter for which you are upgrading the FPD.</p> <p>It is recommended to connect to the router from a port adapter or service adapter interface other than an interface on the port adapter or service adapter for which you are upgrading FPD. This is because an FPD incompatibility disables all interfaces on the port adapter or service adapter, making even a manual FPD upgrade impossible on that port adapter or service adapter.</p> <p>If access through one of the port adapter or service adapter interfaces (for which you are upgrading FPD) is the only access to the router you have, do not use the FTP or TFTP upgrade method. Instead, copy the FPD image package to the disk2: Flash Disk before upgrading your Cisco IOS release. This allows the router to find the FPD image package during the first Cisco IOS bootup and the FPD upgrades automatically.</p> |

- Step 3** Use the **upgrade fpd path** *fpd-pkg-dir-url* command to instruct the router to find the FPD image package file on the FTP or TFTP server.

In the following examples, *my_tftpserver* or *my_ftpserver* is the path to the server, *fpd_pkg_dir* is the directory on the server where the FPD image package is located, and *login:password* is your FTP login name and password:

```
Router(config)# upgrade fpd path tftp://my_tftpserver/fpd_pkg_dir/
```

```
Router(config)# upgrade fpd path ftp://login:password@my_ftpserver/fpd_pkg_dir/
```

- Step 4** Verify that the FPD automatic upgrade feature is enabled by examining the output of the **show running-config** command.

Look for the **upgrade fpd auto** line in the output. If there are no upgrade commands in the output, the **upgrade fpd auto** is enabled because it is the default setting. If automatic upgrades are disabled, use the **upgrade fpd auto** command to enable automatic FPD upgrades.

- Step 5** Verify that the router is connecting to the default FPD image package using the **show upgrade fpd file file-url** command.

If you are able to generate output related to the FPD image package using this command, the upgrade should work properly. In the following example, the router is able to generate FPD image package information for the FPD image package on the TFTP server:

```
Router# show upgrade fpd file
tftp://mytftpserver/myname/myfpdpgk/c7200-fpd-pkg.124-4.XD.pkg
Loading /auto/tftpboot-users/abcdef/c7200-fpd-pkg.124-4.XD.pkg from 223.255.254.254 (via
GigabitEthernet0/1):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 1419264 bytes]
```

```
Cisco Field Programmable Device Image Package for IOS
C7200 FPD Image Package (c7200-fpd-pkg.124-4.XD.pkg), Version 12.4(20060105:195420)
Copyright (c) 2005-2006 by cisco Systems, Inc.
Built Thu 05-Jan-2006 11:54 by abcdef
```

Bundled FPD Image Version Matrix				
Supported Card Types		ID	Image Name	Min. Req. H/W Ver.
NPEG2 IOFPGA		1	NPEG2 IOFPGA	0.7 0.0
VSA		1	VSA	0.8 0.0

- Step 6** Save the configuration and reload the router with the new Cisco IOS release.

During the system startup after the reload, the router checks the FPD image versions for all the cards and any upgrade operation occurs automatically if an upgrade is required. In each upgrade operation, the system extracts the necessary FPD images to the card from the FPD image package file located on the FTP or TFTP server.

Verifying and Troubleshooting Field-Programmable Device Upgrades

This section describes how to get information about FPD image packages, such as current and minimum FPD image package versions, the default FPD image package, and FPD upgrade progress.

This section provides information you can use to verify and troubleshoot FPD upgrades in the following subsections:

- [Verifying the FPD Upgrade Progress, page 11](#)
- [Displaying Current and Minimum Required FPD Image Versions, page 11](#)
- [Displaying Information About the Default FPD Image Package, page 13](#)
- [Recovering from a Loss of Power During an FPD Upgrade, page 13](#)

Verifying the FPD Upgrade Progress

Use the **show upgrade fpd progress** command to view a “snapshot” of the upgrade progress while an FPD image package upgrade is taking place. The following example shows that the FPD image is being updated, the approximate amount of time needed to perform the update, and the amount of time the FPD update has taken so far:

```
Router# show upgrade fpd progress
```

FPD Image Upgrade Progress Table:

```
==== =====
Slot Card Type          Field Programmable      Approx.
                        Device : "ID-Name"    Time      Elapsed
                        :                               Needed   Time      State
==== =====
npe NPE-G2 IOFPGA       1-NPEG2 I/O FPGA       00:01:00   00:00:23   Updating...
==== =====
```

Displaying Current and Minimum Required FPD Image Versions

To display the current version of FPD images on the cards installed on your router, use the **show hw-module all fpd** command or the **show hw-module slot fpd** command. These commands can be used to identify information about FPD images on any FPD-capable cards.

The following example shows that all FPDs have the minimum required version:

```
Router# show hw-module all fpd
```

```
====
Slot Card Type      H/W   Field Programmable   Current   Min. Required
Ver.   Device: "ID-Name" Version   Version
====
npe NPE-G2          1.3   1-NPEG2 I/O FPGA     0.19      0.10
-----
0 VSA               0.0   1-VSA                0.10      0.10
=====
```

The following example shows that all FPDs for the port adapter have the minimum required version. For the NPE-400, the “###” characters in the ID-Name, Current Version, and Min, Required Version fields indicate that FPD does not apply to the NPE-400.

```
Router# show hw-module all fpd
```

```
====
Slot Card Type      H/W   Field Programmable   Current   Min. Required
Ver.   Device: 'ID-Name' Version   Version
====
npe NPE-400          1.1   #####              #.#       #.#
-----
1 PA-MC-1T3-EC      1.0   1-ToySurprise FPGA   1.2       1.1
                        2-Subrate FPGA       1.4       1.4
                        3-Rommon/IPL         2.0       2.0
=====
```

The following example shows that the NPE-G2 does not meet the minimum version requirements. The output also contains a “NOTES” section that provides the name of the FPD image package needed to upgrade the FPD image on the NPE-G2.

```
Router# show hw-module all fpd
```

```
====
Slot Card Type      H/W   Field Programmable   Current   Min. Required
Ver.   Device: "ID-Name" Version   Version
====
npe NPE-G2          1.5   1-NPEG2 I/O FPGA     0.18      0.20 *
-----
0 VSA               0.0   1-VSA                0.10      0.10
=====
```

NOTES:

- FPD images that are required to be upgraded are indicated with a '*' character in the "Minimal Required Version" field.
- The following FPD image package file is required for the upgrade:
"c7200-fpd-pkg.124-4.XD.pkg"

The following example shows FPD information for the VPN Services Adapter (VSA) in slot 0:

```
Router# show hw-module slot 0 fpd
```

```
====
Slot Card Type      H/W   Field Programmable   Current   Min. Required
Ver.   Device: "ID-Name" Version   Version
====
0 VSA               0.0   1-VSA                0.9       0.8
=====
```

Displaying Information About the Default FPD Image Package

Use the **show upgrade fpd package default** command to find out which cards are supported with your current Cisco IOS release and which FPD image package you need.

```
Router# show upgrade fpd package default
```

```
*****
This IOS release requires the following default FPD Image Package for
the automatic upgrade of FPD images:
*****
```

```
Version: 12.4(4)XD
```

```
Package Filename: c7200-fpd-pkg.124-4.XD.pkg
```

```
List of card type supported in this package:
```

No.	Card Type	Minimal HW Ver.
1)	VSA	0.0
2)	NPE-G2	0.0

```
*****
```

Recovering from a Loss of Power During an FPD Upgrade

If the router loses power while you are performing an FPD upgrade, the recovery procedure varies depending on whether you were upgrading FPD for a port adapter or service adapter, or for the NPE-G2.

Port Adapters and Service Adapters

When the router reboots after a power loss, the automatic FPD upgrade restarts provided that:

- The FPD image package on the disk2: Flash Disk or in an alternate location you have specified using the **upgrade fpd path** *fpd-pkg-dir-url* command is compatible with the Cisco IOS image.
- Automatic FPD upgrade is enabled (this is the default setting).

If the system cannot locate an FPD image package file when an upgrade is required for a port adapter or service adapter, the port adapter or service adapter is disabled (offline). Because it does not come online until FPD is compatible, the port adapter or service adapter is also disabled if it requires an FPD upgrade and the automatic upgrade feature is disabled.

If the port adapter or service adapter is disabled, perform the following procedure to upgrade the FPD:

-
- Step 1** Select the FPD image package and download it to the disk2: Flash Disk.
 - Step 2** Make sure automatic FPD upgrade is enabled by using the **upgrade fpd auto** command.
 - Step 3** Reboot the router.

When the Cisco IOS has reloaded, the automatic upgrade process begins. When the automatic FPD upgrade completes, the port adapter or service adapter comes back online.

NPE-G2

Perform the following procedure to fall back to another copy of the FPD and to complete the FPD upgrade that was interrupted:

-
- Step 1** Power down the router and remove NPE-G2.
For information on removing and installing the NPE-G2, see the [Network Processing Engine and Network Services Engine Installation and Configuration](#) document
- Step 2** Remove the pre-installed jumper JP3 from the NPE-G2 board.
- Step 3** Insert the NPE-G2 into the router and power up the router.
- Step 4** Reload the Cisco IOS image.
- Step 5** Manually upgrade the FPD using the **upgrade hw-module slot npe fpd file** *file-url* command.
- Step 6** Verify that the FPD upgrade is complete using the **show upgrade fpd progress** command.
- Step 7** When the upgrade is complete, power down the router and remove the NPE-G2.
- Step 8** Re-install jumper JP3 on the NPE-G2 board.
- Step 9** Insert the NPE-G2 into the router, and power up the router.
- Step 10** Reload the Cisco IOS and verify that the upgrade was successful using the **show hw-module slot npe fpd** command.
-

Configuration Examples for Field-Programmable Device Upgrades

This section provides the following configuration example:

- [Manual FPD Upgrade: Example, page 14](#)
- [Automatic FPD Upgrade: Example, page 15](#)
- [Downloading the FPD Image Package from a TFTP Server and Automatic FPD Image Upgrade from Flash: Example, page 16](#)
- [System Cannot Locate FPD Image Package File for an Automatic FPD Image Upgrade: Example, page 19](#)
- [Incompatible FPD Image Version Detection and Disabled Automatic FPD Image Upgrade: Example, page 19](#)

Manual FPD Upgrade: Example

The following example shows the output that is displayed when the FPD image package for the NPE-G2 is upgraded using the **upgrade hw-module slot npe fpd file** command:

```
Router# upgrade hw-module slot npe fpd file
tftp://mytftpserver/myname/myfpdpgk/c7200-fpd-pkg.124-4.XD.pkg
% The following FPD(s) will be updated for NPE-G2 (H/W ver = 0.0) in NPE slot:
```

```

=====
Field Programmable   Current   Upgrade   Estimated
Device: "ID-Name"    Version   Version   Upgrade Time
=====
1-NPEG2 I/O FPGA     0.7       0.8       00:01:00
=====

% NOTES:
- Use 'show upgrade fpd progress' command to view the progress of the FPD
  upgrade.
- You must power-cycle the router after the upgrade. The FPD upgrade is
  not finalized until the router is power-cycled.
- The output of 'show hw-module <target> fpd' will not reflect the
  upgraded FPD version until the router is power-cycled to finalize the
  upgrade.

% Are you sure that you want to perform this operation? [no]: yes
% Initiating the upgrade operation on the target card ...

Router#
*Jan 1 00:33:41.611: %FPD_MGMT-6-UPGRADE_TIME: Estimated total FPD image upgrade time for
NPE-G2 card in NPE slot = 00:01:00.
*Jan 1 00:33:41.615: %FPD_MGMT-6-UPGRADE_START: NPEG2 I/O FPGA (FPD ID=1) image upgrade
in progress for NPE-G2 card in NPE slot. Updating to version 0.8. PLEASE DO NOT INTERRUPT
DURING THE UPGRADE PROCESS (estimated upgrade completion time = 00:01:00) ...

*Jan 1 00:34:14.279: %FPD_MGMT-6-UPGRADE_PASSED: NPEG2 I/O FPGA (FPD ID=1) image in the
NPE-G2 card in NPE slot has been successfully updated from version 0.7 to version 0.8.
Upgrading time = 00:00:32.664
*Jan 1 00:34:14.279: %FPD_MGMT-6-OVERALL_UPGRADE: All the attempts to upgrade the
required FPD images have been completed for NPE-G2 card in NPE slot. Number of
successful/failure upgrade(s): 1/0.

```

Automatic FPD Upgrade: Example

The following example shows the output that is displayed when a VSA in slot 0 requires an FPD image upgrade and the **upgrade fpd auto** command is enabled (this is the default). The required FPD image is automatically upgraded.

```

*Apr 10 00:37:42.859: %FPD_MGMT-3-INCOMP_IMG_VER: Incompatible VSA (FPD ID=1) image
version detected for VSA card in slot 0. Detected version = 0.9, minimum required version
= 0.10. Current HW version = 0.0.
*Apr 10 00:37:42.859: %FPD_MGMT-5-UPGRADE_ATTEMPT: Attempting to automatically upgrade the
FPD image(s) for VSA card in slot 0. Use 'show upgrade fpd progress' command to view the
upgrade progress ...
*Apr 10 00:37:43.023: %FPD_MGMT-6-BUNDLE_DOWNLOAD: Downloading FPD image bundle for VSA
card in slot 0 ...
*Apr 10 00:37:44.543: %FPD_MGMT-6-UPGRADE_TIME: Estimated total FPD image upgrade time for
VSA card in slot 0 = 00:03:00.
*Apr 10 00:37:44.639: %FPD_MGMT-6-UPGRADE_START: VSA (FPD ID=1) image upgrade in progress
for VSA card in slot 0. Updating to version 0.10. PLEASE DO NOT INTERRUPT DURING THE
UPGRADE PROCESS (estimated upgrade completion time = 00:03:00) ...*****
*Apr 10 00:38:57.483: %FPD_MGMT-6-UPGRADE_PASSED: VSA (FPD ID=1) image in the VSA card in
slot 0 has been successfully updated from version 0.9 to version 0.10. Upgrading time =
00:01:12.844
*Apr 10 00:38:57.483: %FPD_MGMT-6-OVERALL_UPGRADE: All the attempts to upgrade the
required FPD images have been completed for VSA card in slot 0. Number of
successful/failure upgrade(s): 1/0.
*Apr 10 00:38:57.483: %FPD_MGMT-5-CARD_POWER_CYCLE: VSA card in slot 0 is being power
cycled for the FPD image upgrade to take effect.

```

Downloading the FPD Image Package from a TFTP Server and Automatic FPD Image Upgrade from Flash: Example

In the following example, a Cisco IOS image and the FPD image package file that supports that particular Cisco IOS image (c7200-fpd-pkg.124.pkg) are copied to the disk2: Flash Disk from a TFTP server. The router is then configured to boot using the new Cisco IOS image and reloaded.

When the router reboots using the new Cisco IOS image, the FPD version check that occurs at bootup detects an FPD incompatibility and then initiates the FPD image upgrade process. The FPD image is upgraded automatically. After the system messages indicate that the FPD upgrade was successful, the **show hw-module slot 0 fpd** command and the **show hw-module all fpd** command are entered to verify the upgrade procedure. FPD messages are italicized for emphasis.

```
Router# copy tftp://hostname/path/c7200-fpd-pkg.124.pkg disk2:
```

```
Destination filename [c7200-fpd-pkg.124.pkg]?
```

```
Accessing tftp://hostname/path/c7200-fpd-pkg.124.pkg...
```

```
Loading path/c7200-fpd-pkg.124.pkg from 223.255.254.254 (via
FastEthernet0):!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
```

```
[OK - 22870596 bytes]
```

```
22870596 bytes copied in 133.476 secs (171346 bytes/sec)
```

```
Router# dir disk2:
```

```
Directory of disk2:/
```

```

 2  -rw-      1415168  Apr 10 2000 00:36:26 +00:00  c7200-fpd-pkg.124-test.pkg
 4  -rw-      24850300  Apr 9 2000 21:42:02 +00:00  c7200p-ik9s-mz
```

```
Router# reload
```

```
Proceed with reload? [confirm]
```

```
*Apr 10 00:36:39.331: %SYS-5-RELOAD: Reload requested by console. Reload Reason: Reload
Command.
```

```
System Bootstrap, Version 12.4(4r)XD, RELEASE SOFTWARE (fc1)
```

```
Technical Support: http://www.cisco.com/techsupport
```

```
Copyright (c) 2005 by cisco Systems, Inc.
```

```
Socket jumper: not present Failsafe jumper: present = normal
```

```
FPGA revision 0x00000013
```

```
C7200 platform with 1046528 Kbytes of main memory
```

```
Readonly ROMMON initialized
```

```
rommon 1 > boot disk2:c7200p-ik9s-mz
```

```
Self decompressing the image :
```

```
#####
#####
#####
#####
##### [OK]
```

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cisco Systems, Inc.
170 West Tasman Drive
San Jose, California 95134-1706

Cisco IOS Software, 7200 Software (C7200-IK9S-M), Experimental Version
12.4(20060105:195420) [jsmith-pc0105 101]
Copyright (c) 1986-2006 by Cisco Systems, Inc.
Compiled Thu 12-Jan-06 21:13 by jsmith
Image text-base: 0x0000A320, data-base: 0x02854000

This product contains cryptographic features and is subject to United States and local country laws governing import, export, transfer and use. Delivery of Cisco cryptographic products does not imply third-party authority to import, export, distribute or use encryption. Importers, exporters, distributors and users are responsible for compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
<http://www.cisco.com/wwl/export/crypto/tool/stqrg.html>

If you require further assistance please contact us by sending email to export@cisco.com.

Cisco 7206VXR (NPE-G2) processor (revision A) with 917504K/65536K bytes of memory.
Processor board ID 26786794
MPC7447A CPU at 1411Mhz, Implementation 0, Rev 1.1
6 slot VXR midplane, Version 2.6

Last reset from power-on

PCI bus mb1 (Slots 1, 3 and 5) has a capacity of 600 bandwidth points.
Current configuration on bus mb1 has a total of 200 bandwidth points.
This configuration is within the PCI bus capacity and is supported.

PCI bus mb2 (Slots 2, 4 and 6) has a capacity of 600 bandwidth points.
Current configuration on bus mb2 has a total of 0 bandwidth points.
This configuration is within the PCI bus capacity and is supported.

Please refer to the following document "Cisco 7200 Series Port Adaptor Hardware Configuration Guidelines" on Cisco.com <<http://www.cisco.com>> for c7200 bandwidth points oversubscription and usage guidelines.

2 FastEthernet interfaces
3 Gigabit Ethernet interfaces
1 Virtual Private Network (VPN) Module
2045K bytes of NVRAM.

250368K bytes of ATA PCMCIA card at slot 2 (Sector size 512 bytes).
65536K bytes of Flash internal SIMM (Sector size 512K).

Press RETURN to get started!

```
*Apr 10 00:37:40.015: %LINK-3-UPDOWN: Interface GigabitEthernet0/1, changed state to up
*Apr 10 00:37:40.015: %LINK-3-UPDOWN: Interface GigabitEthernet0/2, changed state to up
*Apr 10 00:37:40.015: %LINK-3-UPDOWN: Interface GigabitEthernet0/3, changed state to up
*Apr 10 00:37:40.015: %LINK-3-UPDOWN: Interface FastEthernet0/2, changed state to down
*Apr 10 00:37:40.803: %LINK-3-UPDOWN: Interface FastEthernet5/0, changed state to down
*Apr 10 00:37:41.039: %LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1,
changed state to down
*Apr 10 00:37:41.039: %LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2,
changed state to down
*Apr 10 00:37:41.039: %LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/3,
changed state to down
*Apr 10 00:37:41.039: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2,
changed state to down
*Apr 10 00:37:42.375: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet5/0,
changed state to down
*Apr 10 00:37:42.843: %SYS-5-CONFIG_I: Configured from memory by console
*Apr 10 00:37:42.859: %FPD_MGMT-3-INCOMP_IMG_VER: Incompatible VSA (FPD ID=1) image
version detected for VSA card in slot 0. Detected version = 0.9, minimum required version
= 0.10. Current HW version = 0.0.
*Apr 10 00:37:42.859: %FPD_MGMT-5-UPGRADE_ATTEMPT: Attempting to automatically upgrade the
FPD image(s) for VSA card in slot 0. Use 'show upgrade fpd progress' command to view the
upgrade progress ...
*Apr 10 00:37:43.023: %FPD_MGMT-6-BUNDLE_DOWNLOAD: Downloading FPD image bundle for VSA
card in slot 0 ...
*Apr 10 00:37:44.543: %FPD_MGMT-6-UPGRADE_TIME: Estimated total FPD image upgrade time for
VSA card in slot 0 = 00:03:00.
*Apr 10 00:37:44.639: %FPD_MGMT-6-UPGRADE_START: VSA (FPD ID=1) image upgrade in progress
for VSA card in slot 0. Updating to version 0.10. PLEASE DO NOT INTERRUPT DURING THE
UPGRADE PROCESS (estimated upgrade completion time = 00:03:00) ...*****
*Apr 10 00:37:45.191: %LINK-3-UPDOWN: Interface FastEthernet0/2, changed state to down
*Apr 10 00:37:45.191: %LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to
administratively down
*Apr 10 00:37:45.191: %LINK-5-CHANGED: Interface GigabitEthernet0/3, changed state to
administratively down
*Apr 10 00:37:45.191: %LINK-5-CHANGED: Interface FastEthernet5/0, changed state to
administratively down
*Apr 10 00:37:49.279: %SYS-5-RESTART: System restarted --
Cisco IOS Software, 7200 Software (C7200-IK9S-M), Experimental Version
12.4(20060105:195420) [jsmith-pc0105 101]
Copyright (c) 1986-2006 by Cisco Systems, Inc.
Compiled Thu 12-Jan-06 21:13 by jsmith
*Apr 10 00:37:50.643: %LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1,
changed state to up
*Apr 10 00:37:53.663: %SNMP-5-COLDSTART: SNMP agent on host G2PPC is undergoing a cold
start
*Apr 10 00:37:53.759: %SYS-6-BOOTTIME: Time taken to reboot after reload = 79 seconds
*Apr 10 00:38:57.483: %FPD_MGMT-6-UPGRADE_PASSED: VSA (FPD ID=1) image in the VSA card in
slot 0 has been successfully updated from version 0.9 to version 0.10. Upgrading time =
00:01:12.844
*Apr 10 00:38:57.483: %FPD_MGMT-6-OVERALL_UPGRADE: All the attempts to upgrade the
required FPD images have been completed for VSA card in slot 0. Number of
successful/failure upgrade(s): 1/0.
*Apr 10 00:38:57.483: %FPD_MGMT-5-CARD_POWER_CYCLE: VSA card in slot 0 is being power
cycled for the FPD image upgrade to take effect.
```

```
Router# show hw-module slot 0 fpd
```

```
=====
Slot Card Type          H/W   Field Programmable   Current   Min. Required
                        Ver.   Device: "ID-Name"    Version   Version
=====
  0 VSA                  0.0   1-VSA                0.10      0.10
=====
```

```
Router# show hw-module all fpd
```

```
=====
Slot Card Type          H/W   Field Programmable   Current   Min. Required
                        Ver.   Device: "ID-Name"    Version   Version
=====
npe NPE-G2              1.3   1-NPEG2 I/O FPGA     0.19      0.1
-----
  0 VSA                  0.0   1-VSA                0.10      0.10
=====
```

System Cannot Locate FPD Image Package File for an Automatic FPD Image Upgrade: Example

The following example shows the output that is displayed when a VSA in slot 0 requires an FPD upgrade and the **upgrade fpd auto** command is enabled, but the system cannot find the FPD image package file:

```
*Apr  9 21:59:58.859: %FPD_MGMT-3-INCOMP_IMG_VER: Incompatible VSA (FPD ID=1) image
version detected for VSA card in slot 0. Detected version = 0.9, minimum required version
= 0.10. Current HW version = 0.0.
*Apr  9 21:59:58.859: %FPD_MGMT-5-UPGRADE_ATTEMPT: Attempting to automatically upgrade the
FPD image(s) for VSA card in slot 0. Use 'show upgrade fpd progress' command to view the
upgrade progress ...
*Apr  9 21:59:58.947: %FPD_MGMT-3-PKG_FILE_SEARCH_FAILED: FPD image package
(c7200-fpd-pkg.124-test.pkg) cannot be found in system's flash card or disk to do FPD
upgrade.
*Apr  9 21:59:58.947: %FPD_MGMT-5-CARD_DISABLED: VSA card in slot 0 is being disabled
because of an incompatible FPD image version. Note that the c7200-fpd-pkg.124-test.pkg
package will be required if you want to perform the upgrade operation.
```

Incompatible FPD Image Version Detection and Disabled Automatic FPD Image Upgrade: Example

The following example shows the output that is displayed when a port adapter or service adapter requires an FPD upgrade, but the **upgrade fpd auto** command is disabled. The port adapter or service adapter is disabled after the system boot and remains disabled until the FPD incompatibility upgrade is addressed.

```
*Apr 10 00:20:10.859: %FPD_MGMT-3-INCOMP_IMG_VER: Incompatible VSA (FPD ID=1) image
version detected for VSA card in slot 0. Detected version = 0.9, minimum required version
= 0.10. Current HW version = 0.0.
*Apr 10 00:20:10.859: %FPD_MGMT-4-BYPASS_AUTO_UPGRADE: The automatic FPD image upgrade
feature is not enabled, bypassing the image upgrade for VSA card in slot 0.
*Apr 10 00:20:10.859: %FPD_MGMT-5-CARD_DISABLED: VSA card in slot 0 is being disabled
because of an incompatible FPD image version. Note that the c7200-fpd-pkg.124-test.pkg
package will be required if you want to perform the upgrade operation.
```

Additional References

The following sections provide references related to Field-Programmable Device Upgrades

Related Documents

Related Topic	Document Title
Cisco 7200 VXR router hardware description (chassis slot numbering)	Cisco 7200 VXR Installation and Configuration Guide
FPD upgrades on SPA interface processors (SIPs) and shared port adapters (SPAs)	Cisco 7304 Router Modular Services Card and Shared Port Adapter Software Configuration Guide Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide Cisco 12000 Series Router SIP and SPA Software Configuration Guide (Cisco IOS)
NPE-G2 description	Network Processing Engine and Network Services Engine Installation and Configuration
PA-MC-T3-EC description	PA-MC-T3-EC Port Adapter Installation and Configuration
PA-T3/E3-EC description	PA-T3/E3-EC Port Adapter Installation and Configuration
VPN Service Adapter description	VPN Service Adapter Installation and Configuration

Standards

Standard	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	—

MIBs

MIB	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	—

Technical Assistance

Description	Link
<p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p>	http://www.cisco.com/techsupport

Command Reference

This section documents new, modified, and replaced commands.

- [show hw-module all fpd, page 22](#)
- [show hw-module slot fpd, page 25](#)
- [show upgrade fpd file, page 28](#)
- [show upgrade fpd package default, page 33](#)
- [show upgrade fpd progress, page 36](#)
- [upgrade fpd auto, page 38](#)
- [upgrade fpd path, page 41](#)
- [upgrade hw-module slot, page 46](#)
- [upgrade hw-module slot fpd file, page 51](#)

show hw-module all fpd

To display the current versions of all field-programmable devices (FPDs) for all of the supported card types on a router, enter the **show hw-module all fpd** command in privileged EXEC mode.

show hw-module all fpd

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes Privileged EXEC (#)

Command History	Release	Modification
	12.2(18)SXE	This command was introduced.
	12.0(31)S	This command was integrated into Cisco IOS Release 12.0(31)S.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.4(4)XD	This command was integrated into Cisco IOS Release 12.4(4)XD.
	12.4(11)T	This command was integrated into Cisco IOS Release 12.4(11)T.
	12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
	12.4(15)T	Added an example for the PA-MC-T3-EC port adapter.

Usage Guidelines Other than the FPD version information, the output for this command can also contain useful FPD-related notes.

For more information about FPD upgrades on SPA interface processors (SIPs) and shared port adapters (SPAs), see the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*.

Examples

Cisco 7200 VXR

The following example shows an FPD image file version that requires an upgrade (indicated by the asterisk) for the NPE-G2 network processing engine in the Cisco 7200 VXR router:

Router# **show hw-module all fpd**

```

=====
Slot Card Type          H/W   Field Programmable   Current   Min. Required
Ver.   Device: "ID-Name"   Version   Version
=====
npe NPE-G2              1.5    1-NPEG2 I/O FPGA     0.18      0.20 *
-----
0 VSA                   0.0    1-VSA                 0.10      0.10
=====

```

NOTES:

- FPD images that are required to be upgraded are indicated with a '*' character in the "Minimal Required Version" field.
- The following FPD image package file is required for the upgrade:
"c7200-fpd-pkg.124-4.XD.pkg"

The following example shows that all FPDs for the port adapter have the minimum required version. For the NPE-400, the "###" characters in the ID-Name, Current Version, and Min. Required Version fields indicate that FPD does not apply to the NPE-400.

Router# **show hw-module all fpd**

```
=====
Slot Card Type           H/W   Field Programmable   Current   Min. Required
Ver.   Device: 'ID-Name' Version   Version
=====
npe NPE-400              1.1   #####              #.#       #.#
-----
  1 PA-MC-1T3-EC         1.0   1-ToySurprise FPGA   1.2       1.1
                                2-Subrate FPGA       1.4       1.4
                                3-Rommon/IPL         2.0       2.0
=====
```

Cisco 7600 Series

The following example shows FPD image file versions for all SIPs and SPAs in the Cisco 7600 series router:

Router# **show hw-module all fpd**

```
=====
Slot Card Type           H/W   Field Programmable   Current   Min. Required
Ver.   Device: "ID-Name" Version   Version
=====
  4 7600-SIP-200          0.132 1-I/O FPGA           0.19      0.18
                                2-EOS FPGA           0.22      0.22
                                3-PEGASUS TX FPGA    0.121     0.121
                                4-PEGASUS RX FPGA    0.13      0.13
                                5-ROMMON             1.1       1.1
-----
 4/0 SPA-4XOC3-ATM        1.0   1-I/O FPGA           0.121     0.121
-----
 4/1 SPA-8XCHT1/E1        0.117 1-ROMMON             2.12      2.12
                                2-I/O FPGA           0.22      0.22
-----
 4/3 SPA-4XCT3/DS0        0.253 1-ROMMON             2.12      2.12
                                2-I/O FPGA           0.21      0.21
                                3-T3 SUBRATE FPGA    0.15      0.15
=====
```

The following example shows FPD image file versions that require an upgrade (indicated by the asterisk) for two SIPs in the Cisco 7600 series router. The SIPs are disabled due to the version mismatch.

Router# **show hw-module all fpd**

```
=====
Slot Card Type           H/W   Field Programmable   Current   Min. Required
Ver.   Device: "ID-Name" Version   Version
=====
  1 7600-SIP... <DISABLED> 0.550 1-I/O FPGA           1.1       1.1
                                2-EOS FPGA           1.211     1.211
                                3-PEGASUS TX FPGA    1.129     1.129
                                4-PEGASUS RX FPGA    1.3       1.3
                                5-ROMMON             1.1       1.2      *
```

```
show hw-module all fpd
```

```
-----
 4 7600-SIP... <DISABLED> 0.550 1-I/O FPGA          1.1          1.1
                                2-EOS FPGA          1.211        1.211
                                3-PEGASUS TX FPGA      1.129        1.129
                                4-PEGASUS RX FPGA      1.3          1.3
                                5-ROMMON             1.1          1.2          *
```

NOTES:

- FPD images that are required to be upgraded are indicated with a '*' character in the "Minimal Required Version" field.
- The following FPD image package file is required for the upgrade:
"c7600-fpd-pkg.122-18.SXE.pkg"

Related Commands

Command	Description
show hw-module slot fpd	Displays the current versions of all FPDs for a SIP in the specified slot location and for all of the SPAs installed in that SIP or any FPD-capable cards.
show hw-module subslot fpd	Displays the current versions of all FPDs for a particular SPA or all of the active SPAs on a router.

show hw-module slot fpd

To display the current versions of all field-programmable devices (FPDs) for a SIP in the specified slot location and for all of the SPAs installed in that SIP, or to display the current versions of any FPD-capable cards, enter the **show hw-module slot fpd** command in privileged EXEC mode.

Cisco 7200 VXR

show hw-module slot {*slot* | **npe**} **fpd**

Cisco 7304, Cisco 7600 Series, Cisco 12000 Series

show hw-module slot *slot* **fpd**

Syntax Description	<i>slot</i>	Chassis slot number. Refer to the appropriate hardware manual for slot information. For SIPs, refer to the platform-specific SPA hardware installation guide or the corresponding “Identifying Slots and Subslots for SIPs and SPAs” topic in the platform-specific SPA software configuration guide. For slot numbering in the Cisco 7200 VXR router, refer to the <i>Cisco 7200 VXR Installation and Configuration Guide</i> .
	npe	NPE-G2 network processing engine in the Cisco 7200 VXR router.

Defaults	No default behavior or values
----------	-------------------------------

Command Modes	Privileged EXEC (#)
---------------	---------------------

Command History	Release	Modification
	12.2(18)SXE	This command was introduced.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.4(4)XD	This command was integrated into Cisco IOS Release 12.4(4)XD, and the npe keyword was added.
	12.4(11)T	This command was integrated into Cisco IOS Release 12.4(11)T.
	12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.

Usage Guidelines	Use the show hw-module slot fpd command to show the FPD image version information for a particular SIP and all of its installed SPAs, or to display the current versions of FPD-capable cards in the Cisco 7200 VXR router. To display FPD information for all of the supported card types on a router, use the show hw-module all fpd command.
------------------	---

Other than the FPD version information, the output for this command can also contain useful FPD-related notes.

For more information about FPD upgrades on SPA interface processors (SIPs) and shared port adapters (SPAs), see the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*.

Examples

Cisco 7200 VXR

The following example shows that the FPD version on the NPE-G2 meets the minimum FPD version requirements:

```
Router# show hw-module slot npe fpd
```

```
====
Slot Card Type          H/W   Field Programmable   Current   Min. Required
Ver.   Device: "ID-Name"   Version   Version
====
npe NPE-G2              1.3   1-NPEG2 I/O FPGA    0.19     0.1
====
```

The following example shows FPD information for the VPN Services Adapter (VSA) in slot 0:

```
Router# show hw-module slot 0 fpd
```

```
====
Slot Card Type          H/W   Field Programmable   Current   Min. Required
Ver.   Device: "ID-Name"   Version   Version
====
0 VSA              0.0   1-VSA                0.9      0.8
====
```

Cisco 7600 Series

The following example shows that the FPD versions on the SIP installed in chassis slot 4, and each of its installed SPAs, meet the minimum FPD version requirements:

```
Router# show hw-module slot 4 fpd
```

```
====
Slot Card Type          H/W   Field Programmable   Current   Min. Required
Ver.   Device: "ID-Name"   Version   Version
====
4 7600-SIP-200          0.550 1-I/O FPGA           1.1      1.1
                                2-EOS FPGA           1.211    1.211
                                3-PEGASUS TX FPGA    1.129    1.129
                                4-PEGASUS RX FPGA    1.3      1.3
                                5-ROMMON             1.2      1.2
-----
4/0 SPA-2XT3/E3         1.0   1-ROMMON             2.12     2.12
                                2-I/O FPGA           0.24     0.24
                                3-E3 FPGA            0.6      0.6
                                4-T3 FPGA            0.14     0.14
-----
4/1 SPA-4XOC3-POS       0.209 1-I/O FPGA           3.4      3.4
-----
4/2 SPA-8XCHT1/E1       0.117 1-ROMMON             2.12     2.12
                                2-I/O FPGA           1.2      1.2
====
```

Related Commands

Command	Description
show hw-module all fpd	Displays the current versions of all FPDs for all of the supported card types on a router.
show hw-module subslot fpd	Displays the current versions of all FPDs for a particular SPA or all of the active SPAs on a router.

show upgrade fpd file

To display the contents of an FPD image package file, enter the **show upgrade fpd file** command in privileged EXEC mode.

show upgrade fpd file *file-url* [**detail**]

Syntax Description

<i>file-url</i>	Specifies the location of the FPD image package file, beginning with the location or type of storage device (examples include disk0 , slot0 , tftp , or ftp) and followed by the path to the FPD image package file.
detail	(Optional) Displays detailed information about the contents of the FPD image package file. This option is intended for use by Cisco customer support personnel only.

Defaults

No default behavior or values

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(20)S6	This command was introduced and replaced the show upgrade file command on the Cisco 7304 router.
12.2(25)S3	The output of the show upgrade fpd file file-url command was changed to display only brief versioning information. The output generated from this command in previous Cisco IOS releases can still be generated in this release by entering the show upgrade fpd file-url detail command. The detail option is also new in this release.
12.2(18)SXE	This command was integrated into Cisco IOS Release 12.2(18)SXE.
12.0(31)S	This command was integrated into Cisco IOS Release 12.0(31)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.4(4)XD	This command was integrated into Cisco IOS Release 12.4(4)XD.
12.4(11)T	This command was integrated into Cisco IOS Release 12.4(11)T.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.

Usage Guidelines

This command provides information related to the FPD image package file. Most of the information in this command output is useful for Cisco customer support purposes only.

In Cisco IOS Releases 12.2(20)S2 through 12.2(20)S5, the output generated by entering this command can be generated by entering the **show upgrade file** command.

For more information about FPD upgrades on SPA interface processors (SIPs) and shared port adapters (SPAs), see the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*.

Examples**Cisco 7200 VXR**

The following example shows that the router is able to generate FPD image package information for the FPD image package on the TFTP server:

```
Router# show upgrade fpd file
tftp://mytftpserver/myname/myfpdpgk/c7200-fpd-pkg.124-4.XD.pkg
Loading /auto/tftpboot-users/jsmith/c7200-fpd-pkg.124-4.XD.pkg from 223.255.254.254 (via
GigabitEthernet0/1):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!
[OK - 1419264 bytes]

Cisco Field Programmable Device Image Package for IOS
C7200 FPD Image Package (c7200-fpd-pkg.124-4.XD.pkg), Version 12.4(20060105:195420)
Copyright (c) 2005-2006 by cisco Systems, Inc.
Built Thu 05-Jan-2006 11:54 by abcdef
```

```
=====
                                Bundled FPD Image Version Matrix
=====
                                Min. Req.
Supported Card Types      ID  Image Name      Version  H/W Ver.
=====
NPEG2 IOFPGA              1  NPEG2 IOFPGA      0.7      0.0
-----
VSA                        1  VSA                0.8      0.0
=====
```

Cisco 7304

The output in the following example displays information about the FPD image package file stored in the disk0: Flash card memory:

```
Router# show upgrade fpd file disk0:spa-fpd.122-20.S6.pkg

% Extracting compressed bundle spa_4fe2ge-fpd.bndl.zip ...

Content for the "spa_4fe2ge-fpd.bndl" bundle file:

          Bundle Name:4xFE/2xGE SPA FPD Bundle
          Bundle Version:0.5
    Number of Supported Cards:2
      Supported Card Type(s):SPA-4FE-7304 (0x435)
                           SPA-2GE-7304 (0x436)
    Bundle Header Format Version:4
      Bundle Header Length:128 bytes
      Bundle Data Length:4951592 bytes
      Bundle Magic Number:0xC5C0FBC0
      Bundle 32-Bit CRC:0x3B53C5C0
      Bundle Build Date:10/12/2004 (MM/DD/YYYY)
    Number of Images Bundled:1
      Bundle Name Prefix:spa_4fe2ge

Image #1:
  Name      :Data & I/O FPGA
  ID        :1
  Version   :4.17
  Minimal H/W Version :0.0
  Order in Bundle :1
  Header Length :128 bytes
```

show upgrade fpd file

```

Data Length           :4951464 bytes
Total Length          :4951464 bytes (Data + Padding)
Magic Number          :0xC5C0FDC0
32-Bit CRC            :0x14613280
Build Date            :10/12/2004 (MM/DD/YYYY)
Image Format           :XSVF
Upgrade Path          :By Host
Upgrade Path Info     :0
Control Flag Value    :0x1
Estimated Upgrade Time:420 seconds

```

The output in the following example displays information about the FPD image package file stored at a TFTP server location:

```

Router# show upgrade fpd file tftp://mytftpserver/myfpdpgkd/spa-fpd.122-20.S6.pkg
Loading myfpdpgkd/spa-fpd.122-20.S6.pkg from 223.255.254.254 (via FastEthernet0):!

```

```

% Extracting compressed bundle spa_4fe2ge-fpd.bndl.zip
.....
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!

```

Content for the "spa_4fe2ge-fpd.bndl" bundle file:

```

          Bundle Name:4xFE/2xGE SPA FPD Bundle
          Bundle Version:0.5
Number of Supported Cards:2
          Supported Card Type(s):SPA-4FE-7304 (0x435)
                                SPA-2GE-7304 (0x436)
Bundle Header Format Version:4
          Bundle Header Length:128 bytes
          Bundle Data Length:4951592 bytes
          Bundle Magic Number:0xC5C0FBC0
          Bundle 32-Bit CRC:0x3B53C5C0
          Bundle Build Date:10/12/2004 (MM/DD/YYYY)
Number of Images Bundled:1
          Bundle Name Prefix:spa_4fe2ge

```

Image #1:

```

Name                :Data & I/O FPGA
ID                  :1
Version             :4.17
Minimal H/W Version :0.0
Order in Bundle     :1
Header Length       :128 bytes
Data Length         :4951464 bytes
Total Length        :4951464 bytes (Data + Padding)
Magic Number        :0xC5C0FDC0
32-Bit CRC          :0x14613280
Build Date          :10/12/2004 (MM/DD/YYYY)
Image Format         :XSVF
Upgrade Path        :By Host
Upgrade Path Info   :0
Control Flag Value  :0x1
Estimated Upgrade Time:420 seconds

```

[OK - 703488 bytes]

Cisco 7600 Series, Catalyst 6500 Series

The output in the following example shows the **show upgrade fpd file** command on a Cisco 7600 series router and Catalyst 6500 series switch:

```
Router# show upgrade fpd file
tftp://myftpserver/myname/myfpdpgk/c7600-fpd-pkg.122-18.SXE.pkg
Loading myname/myfpdpgk/c7600-fpd-pkg.122-18.SXE.pkg from 124.0.0.0 (via FastEthernet0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK]
Cisco Field Programmable Device Image Package for IOS
C7600 Family FPD Image Package (c7600-fpd-pkg.122-18.SXE.pkg), Version 12.2(SXE)
Copyright (c) 2004-2005 by cisco Systems, Inc.
Built Fri 25-Mar-2005 09:12 by abcdef
```

Bundled FPD Image Version Matrix				
Supported Card Types	ID	Image Name	Version	Min. Req. H/W Ver.
2-port T3/E3 Serial SPA	1	T3E3 SPA ROMMON	2.12	0.0
	2	T3E3 SPA I/O FPGA	0.24	0.0
	3	T3E3 SPA E3 FPGA	0.6	0.0
	4	T3E3 SPA T3 FPGA	0.14	0.0
4-port T3/E3 Serial SPA	1	T3E3 SPA ROMMON	2.12	0.0
	2	T3E3 SPA I/O FPGA	0.24	0.0
	3	T3E3 SPA E3 FPGA	0.6	0.0
	4	T3E3 SPA T3 FPGA	0.14	0.0
8-port Channelized T1/E1 SPA	1	CTE1 SPA ROMMON	2.12	0.140
	1	CTE1 SPA ROMMON NP	2.12	0.0
	2	CTE1 SPA I/O FPGA	1.2	0.0
2-port Channelized T3 SPA	1	CT3 SPA ROMMON	2.12	0.100
	2	CT3 SPA I/O FPGA	1.1	0.100
	3	CT3 SPA T3 FPGA R1	0.11	0.100
	3	CT3 SPA T3 FPGA R2	0.15	0.200
4-port Channelized T3 SPA	1	CT3 SPA ROMMON	2.12	0.100
	2	CT3 SPA I/O FPGA	1.1	0.100
	3	CT3 SPA T3 FPGA R1	0.11	0.100
	3	CT3 SPA T3 FPGA R2	0.15	0.200
2-port OC3 POS SPA	1	POS SPA IOFPGA P1	3.4	0.0
	1	POS SPA IOFPGA P2	3.4	0.200
4-port OC3 POS SPA	1	POS SPA IOFPGA P1	3.4	0.0
	1	POS SPA IOFPGA P2	3.4	0.200
1-port OC12 POS SPA	1	POS SPA IOFPGA P1	3.4	0.0
	1	POS SPA IOFPGA P2	3.4	0.200
2-port OC3 ATM SPA	1	KATM SPA IOFPGA	1.24	0.0
4-port OC3 ATM SPA	1	KATM SPA IOFPGA	1.24	0.0
1-port OC12 ATM SPA	1	KATM SPA IOFPGA	1.24	0.0

■ show upgrade fpd file

```

SIP-200
1 SIP-200 I/O FPGA P1      1.1      0.100
1 SIP-200 I/O FPGA P4      1.1      0.400
1 SIP-200 I/O FPGA P6      1.1      0.600
2 SIP-200 EOS FPGA P1      0.27     0.100
2 SIP-200 EOS FPGA P450    1.211    0.450
2 SIP-200 EOS FPGA P5      0.27     0.500
2 SIP-200 EOS FPGA P550    1.211    0.550
2 SIP-200 EOS FPGA P6      1.211    0.600
3 SIP-200 PEG TX FPGA P1   1.129    0.100
3 SIP-200 PEG TX FPGA P6   1.129    0.600
4 SIP-200 PEG RX FPGA P1   1.3      0.100
4 SIP-200 PEG RX FPGA P4   1.3      0.400
4 SIP-200 PEG RX FPGA P6   1.3      0.600
5 SIP-200 ROMMON           1.2      0.100
-----
SIP-400
1 SIP-400 ROMMON           1.1      0.1
2 SIP-400 I/O FPGA         0.82     0.1
3 SIP-400 SWITCH FPGA      0.25     0.1
-----
CWPA2
1 CWPA2 I/O FPGA P1        0.37     0.1
2 CWPA2 EOS FPGA P1        0.28     0.1
3 CWPA2 ROMMON             1.1      0.1
=====

```

Related Commands

Command	Description
show hw-module all fpd	Displays the current versions of all FPDs for all of the supported card types on a router.
show hw-module slot fpd	Displays the current versions of all FPDs for a SIP in the specified slot location and for all of the SPAs installed in that SIP or any FPD-capable cards.
show hw-module subslot fpd	Displays the current versions of all FPDs for a particular SPA or all of the active SPAs on a router.
show upgrade fpd package default	Displays which FPD image package is needed for the router to properly support the SPAs or other FPD-capable cards.
show upgrade fpd progress	Displays the progress of the FPD upgrade while an FPD upgrade is taking place.
show upgrade fpd table	Displays various information used by the Cisco IOS software to manage the FPD image package file.
upgrade fpd auto	Configures the router to automatically upgrade the FPD image when an FPD version incompatibility is detected.
upgrade fpd path	Specifies the location from where the FPD image package should be loaded when an automatic FPD upgrade is initiated by the router.
upgrade hw-module slot	Manually upgrades the current FPD image package on a SIP or any FPD-capable cards.
upgrade hw-module subslot	Manually upgrades the current FPD image on the specified SPA.

show upgrade fpd package default

To display which FPD image package is needed for the router to properly support the SPAs or other FPD-capable cards for the running Cisco IOS release, enter the **show upgrade fpd package default** command in privileged EXEC mode.

show upgrade fpd package default

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes Privileged EXEC (#)

Command History	Release	Modification
	12.2(20)S6	This command was introduced and replaced the show upgrade package default command on the Cisco 7304 router.
	12.2(18)SXE	This command was integrated into Cisco IOS Release 12.2(18)SXE.
	12.0(31)S	This command was integrated into Cisco IOS Release 12.0(31)S.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.4(4)XD	This command was integrated into Cisco IOS Release 12.4(4)XD.
	12.4(11)T	This command was integrated into Cisco IOS Release 12.4(11)T.
	12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.

Usage Guidelines It is important to note that the output from this command is generated from the Cisco IOS image and provides information regarding the default FPD image package file that is needed for your particular Cisco IOS release. This command output also lists the SPAs or other cards supported by the default FPD image package file for the running Cisco IOS image.

In Cisco IOS Releases 12.2(20)S2 through 12.2(20)S5, the output generated by entering this command can be generated by entering the **show upgrade package default** command.

For more information about FPD upgrades on SPA interface processors (SIPs) and shared port adapters (SPAs), see the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*.

Examples

Cisco 7200 VXR

The following example shows which cards are supported with your current Cisco IOS release and which FPD image package you need:

```
Router# show upgrade fpd package default
```

```
*****
This IOS release requires the following default FPD Image Package for
the automatic upgrade of FPD images:
*****
```

```
Version: 12.4(4)XD
```

```
Package Filename: c7200-fpd-pkg.124-4.XD.pkg
```

```
List of card type supported in this package:
```

No.	Card Type	Minimal HW Ver.
1)	VSA	0.0
2)	NPE-G2	0.0

```
*****
```

Cisco 7304

In the following example, the **show upgrade fpd package default** command output shows that the spa_fpd.122-20-S6.pkg FPD image package file is required if you install the SPA-4FE-7304 or the SPA-2GE-7304 on this particular router with this particular Cisco IOS software release:

```
Router# show upgrade fpd package default
```

```
*****
This IOS release supports the following default FPD Image Package(s) for
automatic upgrade:
*****
```

```
SPA FPD Image Package:spa_fpd.122-20.S6.pkg
```

```
List of SPAs supported in this package:
```

No.	SPA Name	Minimal HW Ver.
1)	SPA-4FE-7304	0.0
2)	SPA-2GE-7304	0.0

Related Commands

Command	Description
show hw-module all fpd	Displays the current versions of all FPDs for all of the supported card types on a router.
show hw-module slot fpd	Displays the current versions of all FPDs for a SIP in the specified slot location and for all of the SPAs installed in that SIP or any FPD-capable cards.
show hw-module subslot fpd	Displays the current versions of all FPDs for a particular SPA or all of the active SPAs on a router.
show upgrade fpd file	Displays the contents of an FPD image package file.

Command	Description
show upgrade fpd progress	Displays the progress of the FPD upgrade while an FPD upgrade is taking place.
show upgrade fpd table	Displays various information used by the Cisco IOS software to manage the FPD image package file.
upgrade fpd auto	Configures the router to automatically upgrade the FPD image when an FPD version incompatibility is detected.
upgrade fpd path	Specifies the location from where the FPD image package should be loaded when an automatic FPD upgrade is initiated by the router.
upgrade hw-module slot	Manually upgrades the current FPD image package on a SIP or any FPD-capable cards.
upgrade hw-module subslot	Manually upgrades the current FPD image on the specified SPA.

show upgrade fpd progress

To view the progress of an FPD upgrade while an FPD upgrade is taking place, enter the **show upgrade fpd progress** command in privileged EXEC mode.

show upgrade fpd progress

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes Privileged EXEC (#)

Command History	Release	Modification
	12.2(20)S6	This command was introduced and replaced the show upgrade progress command on the Cisco 7304 router.
	12.2(18)SXE	This command was integrated into Cisco IOS Release 12.2(18)SXE.
	12.0(31)S	This command was integrated into Cisco IOS Release 12.0(31)S.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.4(4)XD	This command was integrated into Cisco IOS Release 12.4(4)XD.
	12.4(11)T	This command was integrated into Cisco IOS Release 12.4(11)T.
	12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.

Usage Guidelines In Cisco IOS Releases 12.2(20)S2 through 12.2(20)S5, the output generated by entering this command can be generated by entering the **show upgrade progress** command.

For more information about FPD upgrades on SPA interface processors (SIPs) and shared port adapters (SPAs), refer to the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*.

Examples

Cisco 7200 VXR

The following example shows that the FPD image is being updated, the approximate amount of time needed to perform the update, and the amount of time the FPD update has taken so far:

Router# **show upgrade fpd progress**

FPD Image Upgrade Progress Table:

```

=====
Slot Card Type          Field Programmable      Approx.
                        Device : "ID-Name"    Time      Elapsed
                        :                               Needed   Time      State
=====
npe NPE-G2 IOFPGA       1-NPEG2 I/O FPGA       00:01:00   00:00:23   Updating...
=====

```

Cisco 7304

The following example shows the status of FPD updates on the SPAs located in subslots 0 and 1:

Router# **show upgrade fpd progress**

FPD Image Upgrade Progress Table:

```

=====
Slot Card Description      Field Programmable   Time
                        Device : "ID-Name"   Needed   Time Left   State
=====
  2/0 SPA-2GE-7304         1-4FE/2GE FPGA      00:06:00  00:05:17  Updating...
-----
  2/1 SPA-4FE-7304         1-4FE/2GE FPGA      --:--:--  --:--:--  Waiting...
=====

```

Related Commands

Command	Description
show hw-module all fpd	Displays the current versions of all FPDs for all of the supported card types on a router.
show hw-module slot fpd	Displays the current versions of all FPDs for a SIP in the specified slot location and for all of the SPAs installed in that SIP or any FPD-capable cards.
show hw-module subslot fpd	Displays the current versions of all FPDs for a particular SPA or all of the active SPAs on a router.
show upgrade fpd file	Displays the contents of an FPD image package file.
show upgrade fpd package default	Displays which FPD image package is needed for the router to properly support the SPAs or other FPD-capable cards.
show upgrade fpd table	Displays various information used by the Cisco IOS software to manage the FPD image package file.
upgrade fpd auto	Configures the router to automatically upgrade the FPD image when an FPD version incompatibility is detected.
upgrade fpd path	Specifies the location from where the FPD image package should be loaded when an automatic FPD upgrade is initiated by the router.
upgrade hw-module slot	Manually upgrades the current FPD image package on a SIP or any FPD-capable cards.
upgrade hw-module subslot	Manually upgrades the current FPD image on the specified SPA.

upgrade fpd auto

To configure the router to automatically upgrade the current FPD images on a SPA or any FPD-capable cards when an FPD version incompatibly is detected, enter the **upgrade fpd auto** global configuration command. To disable automatic FPD image upgrades, use the **no** form of this command.

upgrade fpd auto

no upgrade fpd auto

Syntax Description

This command has no arguments or keywords.

Defaults

This command is enabled by default if your router has any installed SPAs or FPD-capable cards. The router checks the FPD image during bootup or after an insertion of a SPA or FPD-capable card. If the router detects an incompatibility between an FPD image and a SPA or FPD-capable card, an automatic FPD upgrade attempt occurs unless the user has disabled automatic FPD upgrades by entering the **no upgrade fpd auto** command. The **upgrade fpd path** command can be used to direct the router to search for the FPD image package at another location (such as an FTP or TFTP server) when an FPD incompatibility is detected.

Cisco 7200 VXR

The router searches the disk2: Flash Disk for the FPD image package file when an FPD incompatibility is detected and **upgrade fpd auto** is enabled.

Cisco 7304

The router searches the primary Flash file system (disk0:) for the FPD image package file when an FPD incompatibility is detected and **upgrade fpd auto** is enabled.

Cisco 7600 Series, Cisco 12000 Series

The router searches all of its Flash file systems for the FPD image package when an FPD incompatibility is detected and **upgrade fpd auto** is enabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(20)S2	This command was introduced.
12.2(18)SXE	This command was integrated into Cisco IOS Release 12.2(18)SXE.
12.0(31)S	This command was integrated into Cisco IOS Release 12.0(31)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.4(4)XD3	This command was integrated into Cisco IOS Release 12.4(4)XD3.
12.4(11)T	This command was integrated into Cisco IOS Release 12.4(11)T.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.

Usage Guidelines

This command is enabled by default. In most cases, this default configuration should be retained.

If this command is disabled but an FPD upgrade is required for a SPA, the **upgrade hw-module subslot** command can be used to upgrade the SPA FPD image manually after the SPA is disabled because of the existing FPD incompatibility.

If this command is disabled but an FPD upgrade is required for an FPD-capable card on the Cisco 7200 VXR router, you cannot upgrade the card manually. Select the FPD image package and download it to the disk2: Flash Disk, enable the automatic FPD upgrade by using the **upgrade fpd auto** command, and reboot the router.

Upgrading the FPD image on a SPA or FPD-capable card places the SPA or card offline while the upgrade is taking place. The time required to complete an FPD image upgrade can be lengthy. The **show upgrade fpd progress** command can be used to gather more information about estimated FPD download times for a particular SPA.

For more information about FPD upgrades on SPA interface processors (SIPs) and shared port adapters (SPAs), refer to the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*.

Examples

Cisco 7200 VXR

The following example shows the output that is displayed when a VSA in slot 0 requires an FPD image upgrade and the **upgrade fpd auto** command is enabled. The required FPD image is automatically upgraded.

```
*Apr 10 00:37:42.859: %FPD_MGMT-3-INCOMP_IMG_VER: Incompatible VSA (FPD ID=1) image
version detected for VSA card in slot 0. Detected version = 0.9, minimum required version
= 0.10. Current HW version = 0.0.
*Apr 10 00:37:42.859: %FPD_MGMT-5-UPGRADE_ATTEMPT: Attempting to automatically upgrade the
FPD image(s) for VSA card in slot 0. Use 'show upgrade fpd progress' command to view the
upgrade progress ...
*Apr 10 00:37:43.023: %FPD_MGMT-6-BUNDLE_DOWNLOAD: Downloading FPD image bundle for VSA
card in slot 0 ...
*Apr 10 00:37:44.543: %FPD_MGMT-6-UPGRADE_TIME: Estimated total FPD image upgrade time for
VSA card in slot 0 = 00:03:00.
*Apr 10 00:37:44.639: %FPD_MGMT-6-UPGRADE_START: VSA (FPD ID=1) image upgrade in progress
for VSA card in slot 0. Updating to version 0.10. PLEASE DO NOT INTERRUPT DURING THE
UPGRADE PROCESS (estimated upgrade completion time = 00:03:00) ...*****
*Apr 10 00:38:57.483: %FPD_MGMT-6-UPGRADE_PASSED: VSA (FPD ID=1) image in the VSA card in
slot 0 has been successfully updated from version 0.9 to version 0.10. Upgrading time =
00:01:12.844
*Apr 10 00:38:57.483: %FPD_MGMT-6-OVERALL_UPGRADE: All the attempts to upgrade the
required FPD images have been completed for VSA card in slot 0. Number of
successful/failure upgrade(s): 1/0.
*Apr 10 00:38:57.483: %FPD_MGMT-5-CARD_POWER_CYCLE: VSA card in slot 0 is being power
cycled for the FPD image upgrade to take effect.
```

Cisco 7304

The following example shows the output displayed when a SPA requires an FPD image upgrade and the **upgrade fpd auto** command is enabled. The incompatible FPD image is automatically upgraded.

```
% Uncompressing the bundle ... [OK]
*Jan 13 22:38:47:%FPD_MGMT-3-INCOMP_FPD_VER:Incompatible 4FE/2GE FPGA (FPD ID=1) image
version detected for SPA-4FE-7304 card in subslot 2/0. Detected version = 4.12, minimal
required version = 4.13. Current HW version = 0.32.
*Jan 13 22:38:47:%FPD_MGMT-5-FPD_UPGRADE_ATTEMPT:Attempting to automatically upgrade the
FPD image(s) for SPA-4FE-7304 card in subslot 2/0 ...

*Jan 13 22:38:47:%FPD_MGMT-6-BUNDLE_DOWNLOAD:Downloading FPD image bundle for SPA-4FE-7304
card in subslot 2/0 ...
```

```

*Jan 13 22:38:49:%FPD_MGMT-6-FPD_UPGRADE_TIME:Estimated total FPD image upgrade time for
SPA-4FE-7304 card in subslot 2/0 = 00:06:00.
*Jan 13 22:38:49:%FPD_MGMT-6-FPD_UPGRADE_START:4FE/2GE FPGA (FPD ID=1) image upgrade in
progress for SPA-4FE-7304 card in subslot 2/0. Updating to version 4.13. PLEASE DO NOT
INTERRUPT DURING THE UPGRADE PROCESS (estimated upgrade completion time = 00:06:00)
...[.....]
(part of the output has been removed for brevity)
.....
.....]
SUCCESS - Completed XSVF execution.

*Jan 13 22:44:33:%FPD_MGMT-6-FPD_UPGRADE_PASSED:4FE/2GE FPGA (FPD ID=1) image upgrade for
SPA-4FE-7304 card in subslot 2/0 has PASSED. Upgrading time = 00:05:44.108
*Jan 13 22:44:33:%FPD_MGMT-6-OVERALL_FPD_UPGRADE:All the attempts to upgrade the required
FPD images have been completed for SPA-4FE-7304 card in subslot 2/0. Number of
successful/failure upgrade(s):1/0.
*Jan 13 22:44:33:%FPD_MGMT-5-CARD_POWER_CYCLE:SPA-4FE-7304 card in subslot 2/0 is being
power cycled for the FPD image upgrade to take effect.

```

Related Commands

Command	Description
show hw-module all fpd	Displays the current versions of all FPDs for all of the supported card types on a router.
show hw-module slot fpd	Displays the current versions of all FPDs for a SIP in the specified slot location and for all of the SPAs installed in that SIP or any FPD-capable cards.
show hw-module subslot fpd	Displays the current versions of all FPDs for a particular SPA or all of the active SPAs on a router.
show upgrade fpd file	Displays the contents of an FPD image package file.
show upgrade fpd package default	Displays which FPD image package is needed for the router to properly support the SPAs or other FPD-capable cards.
show upgrade fpd progress	Displays the progress of the FPD upgrade while an FPD upgrade is taking place.
show upgrade fpd table	Displays various information used by the Cisco IOS software to manage the FPD image package file.
upgrade fpd path	Specifies the location from where the FPD image package should be loaded when an automatic FPD upgrade is initiated by the router.
upgrade hw-module slot	Manually upgrades the current FPD image package on a SIP or any FPD-capable cards.
upgrade hw-module subslot	Manually upgrades the current FPD image on the specified SPA.

upgrade fpd path

To configure the router to search for an FPD image package file in a location other than the default router Flash file system during an automatic FPD upgrade, enter the **upgrade fpd path** command in global configuration mode. To return to the default setting of the router searching for the FPD image package file in the router Flash file systems when an automatic FPD upgrade is triggered, use the **no** form of this command.

upgrade fpd path *fpd-pkg-dir-url*

no upgrade fpd path *fpd-pkg-dir-url*

Syntax Description

<i>fpd-pkg-dir-url</i>	Specifies the location of the FPD image package file, beginning with the location or type of storage device (examples include disk0 , slot0 , tftp , or ftp) and followed by the path to the FPD image package file. It is important to note that the name of the FPD image package file should not be specified as part of <i>fpd-pkg-dir-url</i> ; Cisco IOS will automatically download the correct FPD image package file once directed to the proper location. It is important to note that the last character of the <i>fpd-pkg-dir-url</i> is always a “/”.
------------------------	--

Defaults

The **upgrade fpd path** command is used to specify a new location for a router to locate the FPD image package file, if you want to store the FPD image package file in a location other than the default router Flash file system for automatic FPD upgrades. The default locations the router searches are as follows:

Cisco 7200 VXR

The router searches the disk2: Flash Disk for the FPD image package file when an FPD incompatibility is detected and **upgrade fpd auto** is enabled.

Cisco 7304

The router searches the primary Flash file system (disk0:) for the FPD image package file when an FPD incompatibility is detected and **upgrade fpd auto** is enabled.

Cisco 7600 Series, Cisco 12000 Series

The router searches all of its Flash file systems for the FPD image package when an FPD incompatibility is detected and **upgrade fpd auto** is enabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(20)S2	This command was introduced.
12.2(18)SXE	This command was integrated into Cisco IOS Release 12.2(18)SXE.
12.0(31)S	This command was integrated into Cisco IOS Release 12.0(31)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Release	Modification
12.4(4)XD3	This command was integrated into Cisco IOS Release 12.4(4)XD3.
12.4(11)T	This command was integrated into Cisco IOS Release 12.4(11)T.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.

Usage Guidelines

It is important to note that the last character of the *fpd-pkg-dir-url* is always a “/”. This path points users to the directory that stores the file, but not the file itself.

When specifying the path to the location of the new FPD image package file, do not include the file name in the path. The Cisco IOS will automatically download the correct FPD image package file once directed to the proper location, even if multiple FPD image package files of different versions are stored in the same location.

If the **upgrade fpd path** command is not entered, the router searches the default router Flash file system for the FPD image.

For more information about FPD upgrades on SPA interface processors (SIPs) and shared port adapters (SPAs), refer to the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*.

Examples

In the following example, the FPD image package file that is stored on the TFTP server using the path *johnstftpserver/fpdfiles* is scanned for the latest FPD image package file when an automatic FPD upgrade occurs:

```
upgrade fpd path tftp://johnstftpserver/fpdfiles/
```

In the following example, the FPD package file that is stored on the FTP server using the path *johnsftpserver/fpdfiles* is scanned for the latest FPD image package when an automatic FPD upgrade occurs. In this example, *john* is the username and *XXXXXXXX* is the FTP password:

```
upgrade fpd path ftp://john:XXXXXXXX@johnsftpserver/fpdfiles/
```

Related Commands

Command	Description
show hw-module all fpd	Displays the current versions of all FPDs for all of the supported card types on a router.
show hw-module slot fpd	Displays the current versions of all FPDs for a SIP in the specified slot location and for all of the SPAs installed in that SIP or any FPD-capable cards.
show hw-module subslot fpd	Displays the current versions of all FPDs for a particular SPA or all of the active SPAs on a router.
show upgrade fpd file	Displays the contents of an FPD image package file.
show upgrade fpd package default	Displays which FPD image package is needed for the router to properly support the SPAs or other FPD-capable cards.
show upgrade fpd progress	Displays the progress of the FPD upgrade while an FPD upgrade is taking place.
show upgrade fpd table	Displays various information used by the Cisco IOS software to manage the FPD image package file.
upgrade fpd auto	Configures the router to automatically upgrade the FPD image when an FPD version incompatibility is detected.

Command	Description
upgrade hw-module slot	Manually upgrades the current FPD image package on a SIP or any FPD-capable cards.
upgrade hw-module subslot	Manually upgrades the current FPD image on the specified SPA.

upgrade hw-module slot



Note

The **upgrade hw-module slot** command is not available in Cisco IOS Release 12.2(33)SRB and later Cisco IOS 12.2SR releases. It is replaced by the **upgrade hw-module slot fpd file** command.



Note

The **upgrade hw-module slot** command is not available in Cisco IOS Release 12.4(15)T and later Cisco IOS 12.4T releases. It is replaced by the **upgrade hw-module slot fpd file** command.

To manually upgrade the current FPD image package on a SIP or any FPD-capable cards, enter the **upgrade hw-module slot** command in privileged EXEC mode.

Cisco 7200 VXR

```
upgrade hw-module slot {slot | npe} file file-url
```

Cisco 7304

```
upgrade hw-module slot slot file file-url [reload]
```

Cisco 7600 Series, Cisco 12000 Series

```
upgrade hw-module slot slot file file-url [force]
```

Syntax Description

<i>slot</i>	Chassis slot number. Refer to the appropriate hardware manual for slot information. For SIPs, refer to the platform-specific SPA hardware installation guide or the corresponding “Identifying Slots and Subslots for SIPs and SPAs” topic in the platform-specific SPA software configuration guide. For slot numbering in the Cisco 7200 VXR router, refer to the <i>Cisco 7200 VXR Installation and Configuration Guide</i> .
npe	NPE-G2 network processing engine in the Cisco 7200 VXR router.
file	Specifies that a file will be downloaded.
<i>file-url</i>	Specifies the location of the FPD image package file, beginning with the location or type of storage device (examples include disk0 , slot0 , tftp , or ftp) and followed by the path to the FPD image package file.
reload	(Optional) Reloads the SPA to complete the FPD upgrade.
force	(Optional) Forces the update of all compatible FPD images in the indicated FPD image package file on the SPA that meet the minimal version requirements. Without this option, the manual upgrade will only upgrade incompatible FPD images.

Defaults

Cisco 7200 VXR

No default behavior or values.

Cisco 7304, Cisco 7600 Series, Cisco 12000 Series

No default behavior or values, although it is important to note that the router containing the SIP is configured, by default, to upgrade the FPD images when it detects a version incompatibility between the FPD image on the SIP and the FPD image required to run the SPA with the running Cisco IOS image. The **upgrade hw-module slot** command is used to manually upgrade the FPD images; therefore, the **upgrade hw-module slot** command should only be used when the automatic upgrade default configuration fails to find a compatible FPD image for one of the SPAs or when the automatic upgrade default configuration has been manually disabled. The **no upgrade fpd auto** command can be entered to disable automatic FPD upgrades.

In Cisco IOS Release 12.2(18)SXE, if no FPD incompatibility is detected, this command will not upgrade SPA FPD images unless the **force** option is entered.

In Cisco IOS Release 12.2(25)S3, by default the SPA is not reloaded to complete the FPD upgrade unless the **reload** option is entered. Reloading the SPA drops all traffic traversing that SPA's interfaces. If you want to reload the SPA later to complete the upgrade, do not enter the **reload** option and perform OIR of the SPA later to complete the FPD upgrade.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(18)SXE	This command was introduced.
12.2(25)S3	The force option was removed and replaced by the reload option (Cisco 7304 router).
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.4(4)XD	This command was integrated into Cisco IOS Release 12.4(4)XD, and the npe keyword was added.
12.4(11)T	This command was integrated into Cisco IOS Release 12.4(11)T.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.2(33)SRB	This command was removed. It is not available in Cisco IOS Release 12.2(33)SRB and later Cisco IOS 12.2SR releases. It is replaced by the upgrade hw-module slot fpd file command.
12.4(15)T	This command was removed. It is not available in Cisco IOS Release 12.4(15)T and later Cisco IOS 12.4T releases. It is replaced by the upgrade hw-module slot fpd file command.

Usage Guidelines**Cisco 7200 VXR**

This command is used to manually upgrade FPD images. Note that for a manual FPD upgrade to take effect on the NPE-G2, you must power cycle the router. The router will *not* use the new version of the NPE-G2 FPD image if you reload the router without a power cycle. Other FPD-capable cards require only a router reload after a manual FPD upgrade, not a router power cycle.

Cisco 7304, Cisco 7600 Series, Cisco 12000 Series

This command is used to manually upgrade the FPD images on a SIP. In most cases, the easiest and recommended method of upgrading FPD images is the automatic FPD upgrade, which is enabled by default. The automatic FPD upgrade detects and automatically upgrades all FPD images when an FPD incompatibility is detected.

A manual FPD upgrade is usually used in the following situations:

- The target SIP was disabled by the system because of an incompatible FPD image (the system could not find the required FPD image package file).
- A recovery upgrade must be performed.
- A special bug fix to an FPD image is provided in the FPD image package file.

The FPD image upgrade process places the SIP and all the SPAs in the SIP offline. The time required to complete an FPD image upgrade can be lengthy. The **show upgrade fpd progress** command can be used to gather more information about estimated FPD image download times for a particular SIP.

For more information about FPD upgrades on SPA interface processors (SIPs) and shared port adapters (SPAs), see the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*.

Examples**Cisco 7200 VXR**

The following example shows a sample manual FPD upgrade of the FPD image package for the NPE-G2:

```
Router# upgrade hw-module slot npe file
tftp://mytftpserver/myname/myfpdpgk/c7200-fpd-pkg.124-4.XD.pkg
% The following FPD(s) will be updated for NPE-G2 (H/W ver = 0.0) in NPE slot:
```

Field Programmable Device: "ID-Name"	Current Version	Upgrade Version	Estimated Upgrade Time
1-NPEG2 I/O FPGA	0.7	0.8	00:01:00

```
% NOTES:
- Use 'show upgrade fpd progress' command to view the progress of the FPD upgrade.
- The target card will be automatically reload after the upgrade operation. This reload will interrupt normal operation of the card. If necessary, ensure that appropriate actions have been taken to redirect card traffic before starting the FPD upgrade.

% Are you sure that you want to perform this operation? [no]: yes
% Initiating the upgrade operation on the target card ...

Router#
*Jan 1 00:33:41.611: %FPD_MGMT-6-UPGRADE_TIME: Estimated total FPD image upgrade time for NPE-G2 card in NPE slot = 00:01:00.
*Jan 1 00:33:41.615: %FPD_MGMT-6-UPGRADE_START: NPEG2 I/O FPGA (FPD ID=1) image upgrade in progress for NPE-G2 card in NPE slot. Updating to version 0.8. PLEASE DO NOT INTERRUPT DURING THE UPGRADE PROCESS (estimated upgrade completion time = 00:01:00) ...

*Jan 1 00:34:14.279: %FPD_MGMT-6-UPGRADE_PASSED: NPEG2 I/O FPGA (FPD ID=1) image in the NPE-G2 card in NPE slot has been successfully updated from version 0.7 to version 0.8. Upgrading time = 00:00:32.664
*Jan 1 00:34:14.279: %FPD_MGMT-6-OVERALL_UPGRADE: All the attempts to upgrade the required FPD images have been completed for NPE-G2 card in NPE slot. Number of successful/failure upgrade(s): 1/0.
```

```
*Jan 1 00:34:14.279: %FPD_MGMT-5-CARD_POWER_CYCLE: NPE-G2 card in NPE slot is being power
cycled for the FPD image upgrade to take effect.
```

Cisco 7600 Series

The following example shows a sample manual FPD upgrade:

```
Router# upgrade hw-module slot 4 file disk0:c7600-fpd-pkg.122-18.SXE.pkg
```

```
% The following FPD(s) will be upgraded for 7600-SIP-200 (H/W ver = 0.550) in slot 4:
```

```
=====
Field Programmable   Current      Upgrade      Estimated
Device:"ID-Name"     Version      Version      Upgrade Time
=====
5-ROMMON             1.1         1.2         00:02:00
=====
```

```
% Are you sure that you want to perform this operation? [no]:y
% Restarting the target card in slot 4 for FPD image upgrade. Please wait ...
```

```
Router#
Mar 25 16:39:37:%CWAN_RP-6-CARDRELOAD:Module reloaded on slot 4/0
SLOT 4:00:00:06:%SSA-5-FABRICSYNC_DONE:Fabric sync on Primary channel done.
Mar 25 16:39:40:%MLS_RATE-4-DISABLING:The Layer2 Rate Limiters have been disabled.
Mar 25 16:39:40:%FPD_MGMT-6-UPGRADE_TIME:Estimated total FPD image upgrade time for
7600-SIP-200 card in slot 4 = 00:02:00.
Mar 25 16:39:40:%FPD_MGMT-6-UPGRADE_START:ROMMON (FPD ID=5) image upgrade in progress for
7600-SIP-200 card in slot 4. Updating to version 1.2. PLEASE DO NOT INTERRUPT DURING THE
UPGRADE PROCESS (estimated upgrade completion time = 00:02:00) ...
Mar 25 16:39:39:%DIAG-SP-6-RUN_COMPLETE:Module 4:Running Complete Diagnostics...
Mar 25 16:39:40:%DIAG-SP-6-DIAG_OK:Module 4:Passed Online Diagnostics
SLOT 1:Mar 26 00:39:40:%SSA-5-FABRICSYNC_DONE:Fabric sync on Primary channel done.
Mar 25 16:39:40:%OIR-SP-6-INSCARD:Card inserted in slot 4, interfaces are now online
Mar 25 16:39:46:%FPD_MGMT-6-UPGRADE_PASSED:ROMMON (FPD ID=5) image in the 7600-SIP-200
card in slot 4 has been successfully updated from version 1.1 to version 1.2. Upgrading
time = 00:00:06.000
Mar 25 16:39:46:%FPD_MGMT-6-OVERALL_UPGRADE:All the attempts to upgrade the required FPD
images have been completed for 7600-SIP-200 card in slot 4. Number of successful/failure
upgrade(s):1/0.
Mar 25 16:39:47:%FPD_MGMT-5-CARD_POWER_CYCLE:7600-SIP-200 card in slot 4 is being power
cycled for the FPD image upgrade to take effect.
Mar 25 16:39:47:%OIR-6-REMCARD:Card removed from slot 4, interfaces disabled
Mar 25 16:39:47:%C6KPWR-SP-4-DISABLED:power to module in slot 4 set off (Reset)
Mar 25 16:40:38:%CWAN_RP-6-CARDRELOAD:Module reloaded on slot 4/0
SLOT 4:00:00:06:%SSA-5-FABRICSYNC_DONE:Fabric sync on Primary channel done.
Mar 25 16:40:41:%MLS_RATE-4-DISABLING:The Layer2 Rate Limiters have been disabled.
Mar 25 16:40:40:%DIAG-SP-6-RUN_COMPLETE:Module 4:Running Complete Diagnostics...
Mar 25 16:40:41:%DIAG-SP-6-DIAG_OK:Module 4:Passed Online Diagnostics
SLOT 1:Mar 26 00:40:41:%SSA-5-FABRICSYNC_DONE:Fabric sync on Primary channel done.
Mar 25 16:40:41:%OIR-SP-6-INSCARD:Card inserted in slot 4, interfaces are now online
```

Related Commands

Command	Description
show hw-module all fpd	Displays the current versions of all FPDs for all of the supported card types on a router.
show hw-module slot fpd	Displays the current versions of all FPDs for a SIP in the specified slot location and for all of the SPAs installed in that SIP or any FPD-capable cards.

Command	Description
show hw-module subslot fpd	Displays the current versions of all FPDs for a particular SPA or all of the active SPAs on a router.
show upgrade fpd file	Displays the contents of an FPD image package file.
show upgrade fpd package default	Displays which FPD image package is needed for the router to properly support the SPAs or other FPD-capable cards.
show upgrade fpd progress	Displays the progress of the FPD upgrade while an FPD upgrade is taking place.
show upgrade fpd table	Displays various information used by the Cisco IOS software to manage the FPD image package file.
upgrade fpd auto	Configures the router to automatically upgrade the FPD image when an FPD version incompatibility is detected.
upgrade fpd path	Specifies the location from where the FPD image package should be loaded when an automatic FPD upgrade is initiated by the router.
upgrade hw-module subslot	Manually upgrades the current FPD image on the specified SPA.

upgrade hw-module slot fpd file

To manually upgrade the current FPD image package on a SIP or any FPD-capable cards, use the **upgrade hw-module slot fpd file** command in privileged EXEC mode.

Cisco 7200 VXR

```
upgrade hw-module slot {slot | npe} fpd file file-url
```

Cisco 7600 Series

```
upgrade hw-module slot slot fpd file file-url [force]
```

Syntax Description

<i>slot</i>	Chassis slot number. Refer to the appropriate hardware manual for slot information. For SIPs, refer to the platform-specific SPA hardware installation guide or the corresponding “Identifying Slots and Subslots for SIPs and SPAs” topic in the platform-specific SPA software configuration guide. For slot numbering in the Cisco 7200 VXR router, refer to the <i>Cisco 7200 VXR Installation and Configuration Guide</i> .
npe	NPE-G2 network processing engine in the Cisco 7200 VXR router.
<i>file-url</i>	Specifies the location of the FPD image package file, beginning with the location or type of storage device (examples include disk0 , slot0 , tftp , or ftp) and followed by the path to the FPD image package file.
force	(Optional) Forces the update of all compatible FPD images in the indicated FPD image package file on the SPA that meet the minimal version requirements. Without this option, the manual upgrade will only upgrade incompatible FPD images.

Defaults

Cisco 7200 VXR

No default behavior or values.

Cisco 7600 Series

No default behavior or values, although it is important to note that the router containing the SIP is configured, by default, to upgrade the FPD images when it detects a version incompatibility between the FPD image on the SIP and the FPD image required to run the SPA with the running Cisco IOS image. Manual upgrade of FPD images is recommended only when the automatic upgrade default configuration fails to find a compatible FPD image for one of the SPAs, or when the automatic upgrade default configuration has been manually disabled. The **no upgrade fpd auto** command can be entered to disable automatic FPD upgrades.

If no FPD incompatibility is detected, this command will not upgrade SPA FPD images unless the **force** option is entered.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SRB	This command was introduced. This command replaces the upgrade hw-module slot command.
12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.

Usage Guidelines**Cisco 7200 VXR**

This command is used to manually upgrade FPD images. In most cases, the easiest and recommended method of upgrading FPD images is the automatic FPD upgrade, which is enabled by default. Note that for a manual FPD upgrade to take effect on the NPE-G2, you must power cycle the router. The router will *not* use the new version of the NPE-G2 FPD image if you reload the router without a power cycle. Other FPD-capable cards require only a router reload after a manual FPD upgrade, not a router power cycle.

Cisco 7600 Series

This command is used to manually upgrade the FPD images on a SIP. In most cases, the easiest and recommended method of upgrading FPD images is the automatic FPD upgrade, which is enabled by default. The automatic FPD upgrade detects and automatically upgrades all FPD images when an FPD incompatibility is detected.

A manual FPD upgrade is usually used in the following situations:

- The target SIP was disabled by the system because of an incompatible FPD image (the system could not find the required FPD image package file).
- A recovery upgrade must be performed.
- A special bug fix to an FPD image is provided in the FPD image package file.

The FPD image upgrade process places the SIP and all the SPAs in the SIP offline. The time required to complete an FPD image upgrade can be lengthy. The **show upgrade fpd progress** command can be used to gather more information about estimated FPD image download times for a particular SIP.

For more information about FPD upgrades on SPA interface processors (SIPs) and shared port adapters (SPAs), see the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*.

Examples**Cisco 7200 VXR**

The following example shows a sample manual FPD upgrade of the FPD image package for the NPE-G2:

```
Router# upgrade hw-module slot npe fpd file
tftp://mytftpserver/myname/myfpdpgk/c7200-fpd-pkg.124-4.XD.pkg

% The following FPD(s) will be updated for NPE-G2 (H/W ver = 0.0) in NPE slot:
```

```
=====
Field Programmable  Current      Upgrade      Estimated
Device: "ID-Name"   Version      Version      Upgrade Time
=====
1-NPEG2 I/O FPGA    0.7          0.8          00:01:00
=====
```

% NOTES:

- Use 'show upgrade fpd progress' command to view the progress of the FPD upgrade.
- The target card will be automatically reload after the upgrade

operation. This reload will interrupt normal operation of the card. If necessary, ensure that appropriate actions have been taken to redirect card traffic before starting the FPD upgrade.

% Are you sure that you want to perform this operation? [no]: yes
 % Initiating the upgrade operation on the target card ...

Router#

*Jan 1 00:33:41.611: %FPD_MGMT-6-UPGRADE_TIME: Estimated total FPD image upgrade time for NPE-G2 card in NPE slot = 00:01:00.

*Jan 1 00:33:41.615: %FPD_MGMT-6-UPGRADE_START: NPEG2 I/O FPGA (FPD ID=1) image upgrade in progress for NPE-G2 card in NPE slot. Updating to version 0.8. PLEASE DO NOT INTERRUPT DURING THE UPGRADE PROCESS (estimated upgrade completion time = 00:01:00) ...

*Jan 1 00:34:14.279: %FPD_MGMT-6-UPGRADE_PASSED: NPEG2 I/O FPGA (FPD ID=1) image in the NPE-G2 card in NPE slot has been successfully updated from version 0.7 to version 0.8. Upgrading time = 00:00:32.664

*Jan 1 00:34:14.279: %FPD_MGMT-6-OVERALL_UPGRADE: All the attempts to upgrade the required FPD images have been completed for NPE-G2 card in NPE slot. Number of successful/failure upgrade(s): 1/0.

*Jan 1 00:34:14.279: %FPD_MGMT-5-CARD_POWER_CYCLE: NPE-G2 card in NPE slot is being power cycled for the FPD image upgrade to take effect.

Cisco 7600 Series

The following example shows a sample manual FPD upgrade:

Router# **upgrade hw-module slot 4 fpd file disk0:c7600-fpd-pkg.122-18.SXE.pkg**

% The following FPD(s) will be upgraded for 7600-SIP-200 (H/W ver = 0.550) in slot 4:

Field Programmable Device:"ID-Name"	Current Version	Upgrade Version	Estimated Upgrade Time
5-ROMMON	1.1	1.2	00:02:00

% Are you sure that you want to perform this operation? [no]:**y**
 % Restarting the target card in slot 4 for FPD image upgrade. Please wait ...

Router#

Mar 25 16:39:37:%CWAN_RP-6-CARDRELOAD:Module reloaded on slot 4/0

SLOT 4:00:00:06:%SSA-5-FABRICSYNC_DONE:Fabric sync on Primary channel done.

Mar 25 16:39:40:%MLS_RATE-4-DISABLING:The Layer2 Rate Limiters have been disabled.

Mar 25 16:39:40:%FPD_MGMT-6-UPGRADE_TIME:Estimated total FPD image upgrade time for 7600-SIP-200 card in slot 4 = 00:02:00.

Mar 25 16:39:40:%FPD_MGMT-6-UPGRADE_START:ROMMON (FPD ID=5) image upgrade in progress for 7600-SIP-200 card in slot 4. Updating to version 1.2. PLEASE DO NOT INTERRUPT DURING THE UPGRADE PROCESS (estimated upgrade completion time = 00:02:00) ...

Mar 25 16:39:39:%DIAG-SP-6-RUN_COMPLETE:Module 4:Running Complete Diagnostics...

Mar 25 16:39:40:%DIAG-SP-6-DIAG_OK:Module 4:Passed Online Diagnostics

SLOT 1:Mar 26 00:39:40:%SSA-5-FABRICSYNC_DONE:Fabric sync on Primary channel done.

Mar 25 16:39:40:%OIR-SP-6-INSCARD:Card inserted in slot 4, interfaces are now online

Mar 25 16:39:46:%FPD_MGMT-6-UPGRADE_PASSED:ROMMON (FPD ID=5) image in the 7600-SIP-200 card in slot 4 has been successfully updated from version 1.1 to version 1.2. Upgrading time = 00:00:06.000

Mar 25 16:39:46:%FPD_MGMT-6-OVERALL_UPGRADE:All the attempts to upgrade the required FPD images have been completed for 7600-SIP-200 card in slot 4. Number of successful/failure upgrade(s):1/0.

Mar 25 16:39:47:%FPD_MGMT-5-CARD_POWER_CYCLE:7600-SIP-200 card in slot 4 is being power cycled for the FPD image upgrade to take effect.

upgrade hw-module slot fpd file

```

Mar 25 16:39:47:%OIR-6-REMCARD:Card removed from slot 4, interfaces disabled
Mar 25 16:39:47:%C6KPWR-SP-4-DISABLED:power to module in slot 4 set off (Reset)
Mar 25 16:40:38:%CWAN_RP-6-CARDRELOAD:Module reloaded on slot 4/0
SLOT 4:00:00:06:%SSA-5-FABRICSYNC_DONE:Fabric sync on Primary channel done.
Mar 25 16:40:41:%MLS_RATE-4-DISABLING:The Layer2 Rate Limiters have been disabled.
Mar 25 16:40:40:%DIAG-SP-6-RUN_COMPLETE:Module 4:Running Complete Diagnostics...
Mar 25 16:40:41:%DIAG-SP-6-DIAG_OK:Module 4:Passed Online Diagnostics
SLOT 1:Mar 26 00:40:41:%SSA-5-FABRICSYNC_DONE:Fabric sync on Primary channel done.
Mar 25 16:40:41:%OIR-SP-6-INSCARD:Card inserted in slot 4, interfaces are now online

```

Related Commands

Command	Description
show hw-module all fpd	Displays the current versions of all FPDs for all of the supported card types on a router.
show hw-module slot fpd	Displays the current versions of all FPDs for a SIP in the specified slot location and for all of the SPAs installed in that SIP or any FPD-capable cards.
show hw-module subslot fpd	Displays the current versions of all FPDs for a particular SPA or all of the active SPAs on a router.
show upgrade fpd file	Displays the contents of an FPD image package file.
show upgrade fpd package default	Displays which FPD image package is needed for the router to properly support the SPAs or other FPD-capable cards.
show upgrade fpd progress	Displays the progress of the FPD upgrade while an FPD upgrade is taking place.
show upgrade fpd table	Displays various information used by the Cisco IOS software to manage the FPD image package file.
upgrade fpd auto	Configures the router to automatically upgrade the FPD image when an FPD version incompatibility is detected.
upgrade fpd path	Specifies the location from where the FPD image package should be loaded when an automatic FPD upgrade is initiated by the router.
upgrade hw-module subslot	Manually upgrades the current FPD image on the specified SPA.

Feature Information for Field-Programmable Device Upgrades

Table 1 lists the release history for this feature.

Not all commands may be available in your Cisco IOS software release. For release information about a specific command, see the command reference documentation.

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which Cisco IOS and Catalyst OS software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.



Note

Table 1 lists only the Cisco IOS software release that introduced support for a given feature in a given Cisco IOS software release train. Unless noted otherwise, subsequent releases of that Cisco IOS software release train also support that feature.

Table 1 Feature Information for Field-Programmable Device Upgrades

Feature Name	Releases	Feature Information
Field-Programmable Device Upgrades	12.2(31)SB2 12.4(11)T 12.4(4)XD	<p>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 some cards in Cisco routers. The term “FPD” in general describes any type of programmable hardware device, including FPGAs.</p> <p>In Cisco IOS Release 12.4(4)XD, this feature was introduced on the Cisco 7200 VXR router.</p> <p>In Cisco IOS Release 12.4(4)XD2, the output of the upgrade hw-module slot fpd command for the manual FPD upgrade example was revised.</p> <p>In Cisco IOS Release 12.4(4)XD3, support for the VPN Services Adapter was added (this service adapter is not supported in Cisco IOS Release 12.2(31)SB2).</p> <p>In Cisco IOS Release 12.4(15)T, support for automatic FPD upgrade was added for the NPE-G2.</p>

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