



Cisco ONS 15530 Software Upgrade Guide

This chapter describes how to manage system images, functional images, and configuration files. This chapter includes the following sections:

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Accessing and Displaying File System Devices

The active processor can read, write, and format files on both the active and standby CPU switch modules. To access devices on the standby CPU switch module from the active CPU switch module, add the prefix “sby-” to the device name.

To display the contents of a file system directory and copy files, use the following commands at the active processor CLI (command-line interface):

Command	Purpose
dir [<i>fs-name</i>]	Displays the contents of a file system directory.
copy <i>fs-name1</i> [<i>filename1</i>] <i>fs-name2</i> [<i>filename2</i>]	Copies files from one file system to another.

Examples

The following example shows the file system devices accessible from the active CPU switch module:

```
Switch# dir ?
```



```

/all          List all files
/recursive   List files recursively
all-filesystems List files on all filesystems
bootflash:   Directory or file name
disk0:       Directory or file name
null:        Directory or file name
nvram:       Directory or file name
sby-bootflash: Directory or file name
sby-disk0:   Directory or file name
sby-nvram:   Directory or file name
system:      Directory or file name
<cr>

```

The following example shows how to copy a file from the CompactFlash card on the active CPU switch module to the bootflash: on the active CPU switch module:

```
Switch# copy disk0:ons15530-i-mz.1 bootflash:ons15530-i-mx.1
```

The following example shows the contents of the standby CPU switch module bootflash directory listed on a terminal accessing the active CPU switch module:

```
Switch# dir sby-bootflash:
Directory of sby-bootflash:/

 1  -rw-          772   May 29 2001 11:28:51  running-
 2  -rw-        2452192  May 29 2001 11:27:34  ons15530-i-mz.1
```

Using Flash Memory

This section describes how to use onboard Flash memory, or bootflash memory, and CompactFlash cards to copy system images and make standard configurations. CompactFlash cards use a type of Flash memory that provide expanded file storage for your Cisco ONS 15530. CompactFlash cards, unlike the onboard Flash memory SIMM (bootflash), are not required for the operation of the system.

CompactFlash cards store a copy of the system image. The following sections describe how to format, delete, configure, and copy files between the onboard Flash memory SIMM (Single In-Line Memory Module), network servers, and CompactFlash cards.

Formatting CompactFlash Cards

A newly purchased CompactFlash card is blank and must be formatted before use.



Caution

The formatting procedure erases all information on the CompactFlash card.

After inserting the CompactFlash card, format it using the following privileged EXEC command:

Command	Purpose
format disk0:	Formats the CompactFlash card.

Example

The following example shows how to format a CompactFlash card:

```
Switch# format disk0:

Format operation may take a while. Continue? [confirm] y
Format operation will destroy all data in `disk0:`. Continue? [confirm] y
Format:Drive communication & 1st Sector Write OK...
Writing Monlib
sectors.....
.....
Monlib write complete

Format:All system sectors written. OK...

Format:Total sectors in formatted partition:81760
Format:Total bytes in formatted partition:49861120
Format:Operation completed successfully.

Format of disk0:complete
```



Note

For more information on inserting a CompactFlash card, refer to the *Cisco ONS 15530 Hardware Installation Guide*.

Copying the Startup Configuration Files to Flash Memory

To copy the startup configuration file from NVRAM to bootflash memory or to a CompactFlash card, once the CompactFlash card is formatted and ready to use, use the following privileged EXEC command:

Command	Purpose
copy nvram:startup-config {bootflash: disk0: sby-disk0:}	Copies the startup-config file from NVRAM to Flash memory.

Example

The following example shows how to copy the startup configuration file to the CompactFlash card; the default filename is used:

```
Switch# copy nvram:startup-config disk0:
Destination filename [startup-config]? y
386 bytes copied in 0.268 secs
Switch#
```

Copying Files Between Flash Memory Devices

On platforms with multiple Flash memory file systems, you can copy files from one Flash memory file system, such as internal Flash memory or a CompactFlash card, to another Flash memory file system. Copying files to different Flash memory file systems lets you create backup copies of working configurations, duplicate configurations for other devices, and make copies of system images.

The following example describes how to copy a new system image from Flash memory on the active CPU switch module to a Flash memory on the standby CPU switch module that contains an old system image. If you are copying to a CompactFlash card, first insert the CompactFlash card in the target CPU switch module.

**Tips**

Make sure that the new system image file fits on the CompactFlash card in the standby CPU switch module along with the old system image file.

To copy the new system image file from the CompactFlash card on the active CPU switch module to the CompactFlash card on the standby CPU switch module that contains the old system image file, enter this command from privileged EXEC mode:

```
Switch# copy disk0:image.new sby-disk0:image.new
```

Viewing the Contents of Flash Memory

This section describes commands you can use with the onboard Flash memory SIMM (bootflash) and CompactFlash cards.

Determining the Current File System Device

To determine which file system device you are accessing, use the **pwd** (print working directory) command, as shown in the following example:

```
Switch# pwd
disk0:/
```

Moving Between Flash Memory Devices

To move between Flash memory devices, use the **cd** command, as shown in the following example:

```
Switch# cd bootflash:
Switch# pwd
bootflash:/
```

Listing the Flash Memory Directory Contents

To list the directory contents of any Flash memory media, use the **dir** command, as shown in the following example:

```
Switch# dir disk0:
Directory of disk0:/

 1 -rw-      2438216   May 21 2001 11:44:35  ons15530-i-mz.1
 2 -rw-      2426828   May 23 2001 16:02:49  ons15530-i-mz.2
```

Deleting Files from Bootflash Memory

When you delete a file from bootflash memory, the system marks the file as deleted, allowing you to later recover a deleted file using the **undelete** command. Erased files cannot be recovered. To permanently erase the configuration file, use the **squeeze** command.

The **squeeze** command permanently removes files marked for deletion, and pushes all the other undeleted files together to eliminate spaces between them. To prevent data loss due to sudden power loss, the “squeezed” data is temporarily saved to another location in bootflash memory. The **squeeze** command keeps a log of the functions performed so that if a power failure occurs, the system continues the process when the power resumes.

**Caution**

When deleting files from memory, be careful not to delete all the system images. If you delete all existing system images, you can no longer boot the system from local memory.

For an example of using the **delete** and **squeeze** commands, see the [“Updating with Hot-Standby Compatible System Images”](#) section on page 15.

Copying a System Image from a TFTP Server to Flash Memory

You can copy system image files from a TFTP server to Flash memory for use in booting the Cisco ONS 15530 or for backup purposes. If the system image on internal Flash memory becomes corrupted, you can replace the system software by copying the backup system image from the CompactFlash card to the onboard Flash memory.

To create a backup of the system software on a TFTP server, perform the following steps:

	Command	Purpose
Step 1	Switch# show {bootflash: disk0: sby-disk0:}	Displays the contents of the specified Flash memory device, including the amount of free space that is available. If enough free space is available, skip to Step 4
Step 2	Switch# delete {bootflash: disk0: sby-disk0:} filename	Deletes an old file to make room for the new file.
Step 3	Switch# squeeze bootflash:	Recovers the space used by the files marked as deleted on onboard Flash memory. This command is not necessary for CompactFlash cards.
Step 4	Switch# copy tftp: {bootflash: disk0: sby-disk0:}	Copies a file from a TFTP server to a Flash memory device.

Example

The following example shows how to copy a system image file from the default TFTP server to the CompactFlash card:

```
Switch# copy tftp: disk0:
Address or name of remote host []? 172.68.16.129
Source filename []? ons15530-i-mz
Destination filename [ons15530-i-mz]? y
```

Booting from a CompactFlash Card

The Cisco ONS 15530 can be booted, automatically or manually, from a variety of sources, including a network server or Flash memory device. This section describes how to configure the Cisco ONS 15530 to boot automatically from a system image on a CompactFlash card. For an example of configuring the system to boot manually from a CompactFlash card, see the [“Updating System Images”](#) section on page 11.

To enable booting from a CompactFlash card, perform the following steps:

	Command	Purpose
Step 1	Switch# configure terminal Switch(config)#	Enters global configuration mode.
Step 2	Switch(config)# no boot system	Disables booting from bootflash.
Step 3	Switch(config)# boot system flash [bootflash: disk0:][partition-number:][filename]	Enables booting from the specified system image on the specified Flash file system.
Step 4	Switch(config)# config-register 0x2102	Sets the configuration register for automatic booting. ¹
Step 5	Switch(config)# end Switch#	Exits global configuration mode.
Step 6	Switch# copy system:running-config nvram:startup-config	Saves the configuration to NVRAM.
Step 7	Switch# reload	Reboots the system.

1. This is the default configuration register setting. For details on using the configuration register to set boot parameters, refer to the *Cisco ONS 15530 Configuration Guide*.

When you enter **boot system** commands, be careful not to insert extra spaces because they influence the way the system interprets the command. Notice the difference in the following examples:

Examples

The following command correctly instructs the system to boot the *image1* file in onboard Flash memory.

```
Switch(config)# boot system flash bootflash:image1
```

The following command incorrectly contains a space between “disk0:” and “image2.” The system finds the *filename* field blank and so boots the first file on the CompactFlash card.

```
Switch(config)# boot system flash disk0: image2
```

Accessing System Images on TFTP Servers

For ease of management, the Cisco ONS 15530 can access TFTP servers for booting and archiving purposes. This sections describes how to access system images on a TFTP server.

Booting from a TFTP Server

This section describes how to configure the Cisco ONS 15530 to boot a system image located on a TFTP server. To boot the standby CPU switch module with an image located on a TFTP server, you must configure the fastethernet-sby 0 interface with a unique IP address on a subnet separate from the subnet used by the fastethernet 0 interface. This configuration prevents conflicts with the fastethernet 0 interface on the active CPU switch module.



Note

The IP address and subnet mask must be different from the IP address and subnet mask for the fastethernet 0 interface on the active processor

To configure booting of a system image located on a TFTP server, perform the following steps:

	Command	Purpose
Step 1	Switch# configure terminal Switch(config)#	Enters global configuration mode.
Step 2	Switch(config)# config-register 0x2102	Sets the configuration register for automatic booting. ¹
	Switch(config)# config-register 0x0	Sets the configuration register for manual booting.
Step 3	Switch(config)# boot system tftp:filename [<i>ip-address</i>]	Enables booting a system image located on a TFTP server for automatic booting.
Step 4	Switch(config)# interface fastethernet 0 Switch(config-if)#	Enters interface configuration mode for interface fastethernet 0, the NME interface on the active CPU switch module.
Step 5	Switch(config-if)# ip address ip-address <i>subnet-mask</i>	Specifies the IP address and IP subnet mask for the active NME interface.
Step 6	Switch(config-if)# speed {10 100 auto}	Specifies the transmission speed. The default is auto (autonegotiation).
Step 7	Switch(config-if)# duplex {auto full half}	Specifies the duplex mode. The default is auto (autonegotiation).
Step 8	Switch(config-if)# exit Switch(config)#	Exits interface configuration mode and returns to global configuration mode.
Step 9	Switch(config)# interface fastethernet-sby 0 Switch(config-if)#	Enters interface configuration mode for interface fastethernet-sby 0, the NME interface on the standby CPU switch module.
Step 10	Switch(config-if)# ip address ip-address <i>subnet-mask</i>	Specifies the IP address and IP subnet mask for the standby NME interface. Note The IP address and subnet mask must be different from the IP address and subnet mask for the NME interface on the active processor.
Step 11	Switch(config-if)# speed {10 100 auto}	Specifies the transmission speed. The default is auto (autonegotiation). Note The speed must be the same as the speed configured on the NME interface on the active CPU switch module for processor switchovers to succeed.
Step 12	Switch(config-if)# duplex {auto full half}	Specifies the duplex mode. The default is auto (autonegotiation). Note The duplex mode must be the same as the duplex mode configured on the NME interface on the active CPU switch module for processor switchovers to succeed.
Step 13	Switch(config-if)# end Switch#	Exits interface configuration mode.

	Command	Purpose
Step 14	Switch# copy system:running-config nvram:startup-config	Saves the configuration to NVRAM.
Step 15	Switch# reload	Reboots the system.

1. This is the default configuration register setting. For details on using the configuration register to set boot parameters, refer to the *Cisco ONS 15530 Configuration Guide*.



Note

You cannot use the IP address on the fastethernet-sby 0 interface for Telnet sessions or for network management system sessions.

For more information on booting system images, refer to the [Cisco IOS Configuration Fundamentals Configuration Guide](#).

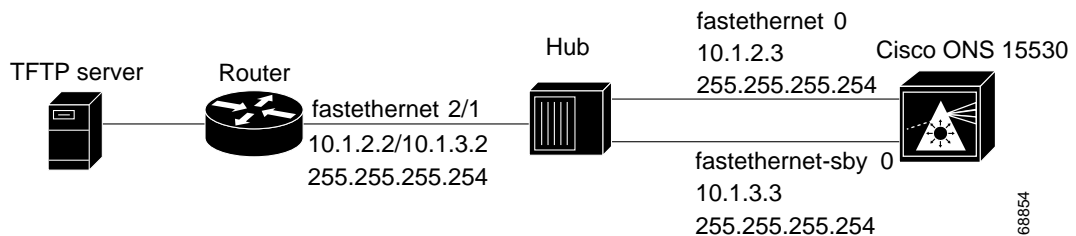
Examples

The following example shows how to configure the Cisco ONS 15530 to automatically boot using a system image located on a TFTP server.

```
Switch> enable
Switch# configure terminal
Switch(config)# boot system tftp ons15530-i-mz.1 172.20.51.30
Switch(config)# config-register 0x2102
Switch(config)# interface fastethernet 0
Switch(config-if)# ip address 172.20.42.105 255.255.255.254
Switch(config-if)# speed 100
Switch(config-if)# duplex full
Switch(config-if)# exit
Switch(config)# interface fastethernet-sby 0
Switch(config-if)# ip address 172.20.42.106 255.255.255.254
Switch(config-if)# speed 100
Switch(config-if)# duplex full
Switch(config-if)# end
Switch# copy system:running-config nvram:startup-config
Switch# reboot
```

Figure 1 shows a simple network configuration with a TFTP server, a router, a hub, and a Cisco ONS 15530.

Figure 1 Example Network with TFTP Server, Router, Hub, and Cisco ONS 15530



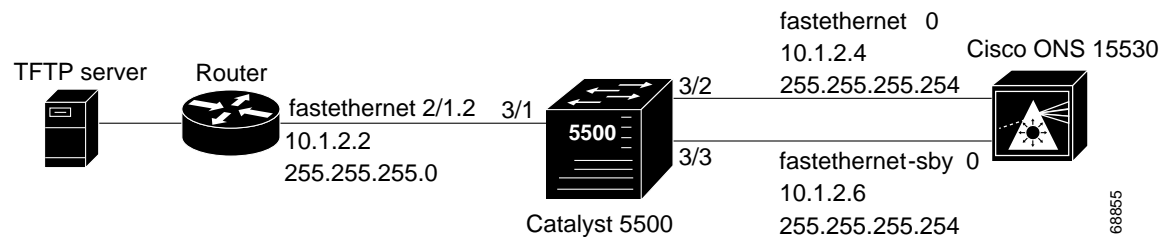
The following example shows how to configure the network example shown in [Figure 1](#).

```
router(config)# interface fastethernet2/1
router(config-if)# ip address 10.1.2.2 255.255.255.254
router(config-if)# ip address 10.1.3.2 255.255.255.254 secondary

ons15530(config)# interface fastethernet 0
ons15530(config-if)# ip address 10.1.2.3 255.255.255.254
ons15530(config-if)# exit
ons15530(config)# interface fastethernet-sby 0
ons15530(config-if)# ip address 10.1.3.3 255.255.255.254
```

[Figure 2](#) shows a simple network configuration with a TFTP server, a router, a Catalyst 5500, and a Cisco ONS 15530.

Figure 2 Example Network with TFTP Server, Router, Catalyst 5500, Cisco ONS 15530, and VLAN Trunk



The following example shows how to configure the network example shown in [Figure 2](#) with a VLAN trunk.

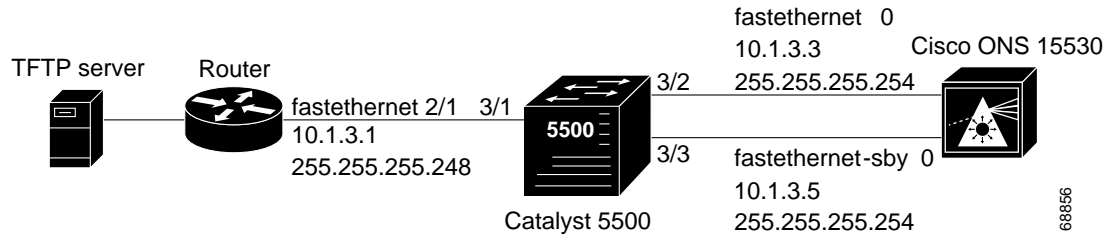
```
router(config)# interface fastethernet2/1.2
router(config-subif)# encapsulation isl 2
router(config-subif)# ip address 10.1.2.2 255.255.255.0

Cat5500> (enable) set vtp domain Corporate
Cat5500> (enable) set vtp mode server
Cat5500> (enable) set vlan 2
Cat5500> (enable) set vlan 2 3/2
Cat5500> (enable) set vlan 2 3/3
Cat5500> (enable) set trunk 3/1 on

ons15530(config)# interface fastethernet 0
ons15530(config-if)# ip address 10.1.2.4 255.255.255.254
ons15530(config-if)# exit
ons15530(config)# interface fastethernet-sby 0
ons15530(config-if)# ip address 10.1.2.6 255.255.255.254
```

Figure 3 shows a simple network configuration with a TFTP server, a router, a Catalyst 5500, and a Cisco ONS 15530.

Figure 3 Example Network with TFTP Server, Router, Catalyst 5500, Cisco ONS 15530, and VLAN



The following example shows how to configure the network example shown in Figure 3 with a VLAN.

```

router(config)# interface fastethernet2/1
router(config-if)# ip address 10.1.3.1 255.255.255.248

Cat5500> (enable) set vlan 2
Cat5500> (enable) set vlan 2 3/1
Cat5500> (enable) set vlan 2 3/2
Cat5500> (enable) set vlan 2 3/3

ons15530(config)# interface fastethernet 0
ons15530(config-if)# ip address 10.1.3.3 255.255.255.254
ons15530(config-if)# exit
ons15530(config)# interface fastethernet-sby 0
ons15530(config-if)# ip address 10.1.3.5 255.255.255.254
    
```

Backing Up a System Image to a TFTP Server

To create a backup copy of your system image, or to verify that the copy in Flash memory is the same as the original file on disk, you can copy system images from Flash memory to a TFTP (Trivial File Transfer Protocol) server.

In some implementations of TFTP, you must create a dummy file on the TFTP server and give it read, write, and execute permissions before copying the file over it. Refer to your TFTP documentation for more information.

Before you copy software between the network server and Flash memory in the router, do the following:

- Make sure you have access to the network server, and obtain its IP address and name.
- Verify that the server has sufficient room to accommodate the Cisco IOS system image.
- Check the filename requirements and file space of the network server.
- Create a dummy file on the server with read-write-execute permission. You copy the system image to this file.

To create a backup of the system software on a TFTP server, perform the following steps:

	Command	Purpose
Step 1	Switch# show { bootflash: disk0: sby-disk0: sby-bootflash: }	Displays the contents of the specified Flash memory device, including the names of the system images that currently reside there. Note the name of the system image file you want to copy.
Step 2	Switch# copy { bootflash: disk0: sby-disk0: sby-bootflash: } tftp:	Copies a file from a Flash memory device to a TFTP server.

Example

The following example shows how to copy a specified system image file from the current Flash memory device to the default TFTP server:

```
Switch# copy disk0: tftp:
Address or name of remote host []? 172.68.16.129
Source filename [] ons15530-i-mz
Destination filename [ons15530-i-mz]? y
```

Updating System Images

This section provides minimal instructions for updating system images on your Cisco ONS 15530. The default system configuration causes the system to boot automatically from the system image specified in the BOOT environment variable. This procedure also describes how to update and manually boot the system from a system image on a CompactFlash card. For additional information on booting options and maintaining system images, refer to the [Cisco IOS Configuration Fundamentals Configuration Guide](#).

Downloading System Images from Cisco.com

Cisco IOS system images, along with other software, are available from the Software Center on Cisco.com at <http://www.cisco.com>. You can download system images from Cisco.com using your browser's FTP capability, using conventional FTP, or using Cisco.com asynchronous dial-up interface.

For instructions on accessing and downloading software from Cisco.com, refer to the document "Using the Software Center" at the [Software Center](#) on [Cisco.com](#).

Copying System Images to the Cisco ONS 15530

You can copy the system image to the Cisco ONS 15530 using either TFTP, FTP, or RCP. If the system you used to download the system image from Cisco.com does not function as a TFTP, FTP, or RCP server, you must first copy the file to an intermediate server that provides those services to your system.



Note

Before copying the system image from the server to the system, check the size of the file to make sure you have enough room for it on the Flash memory device. On UNIX file systems, use the **ls -la** command from the directory where the file is stored to display the file size.



Note Be sure that you have a properly formatted the CompactFlash card before beginning this procedure.

To copy the system image from a TFTP server to the Flash memory, initiate a Telnet session or console connection to the system and perform the following steps in privileged EXEC mode:

	Command	Purpose
Step 1	Switch# dir { bootflash: disk0: sby-disk0: sby-bootflash: }	Displays the contents and available space on the Flash memory device. If there is not enough free space to copy the new system image, perform Step 2 and Step 4 . Otherwise, proceed to Step 5 .
Step 2	Switch# delete { bootflash: disk0: sby-disk0: sby-bootflash: } <i>filename</i>	Marks a file as deleted. If you have older system images stored on the file system, we recommend that you delete the oldest one and leave a newer one in case you need to revert.
Step 3	Switch# squeeze { bootflash: sby-bootflash: }	Recovers the space used by the files marked as deleted on onboard Flash memory. This command is not necessary for CompactFlash cards.
Step 4	Switch# copy tftp: { bootflash: disk0: sby-disk0: sby-bootflash: }	Initiates a TFTP session to copy the system image from the TFTP server. The system prompts you for a TFTP server name and filename.
Step 5	Switch# dir { bootflash: disk0: sby-disk0: sby-bootflash: }	Displays the contents of the file system. This step confirms that the file was copied as expected.

Example

The following example shows how to delete a file from the CompactFlash card and copy a new system image to it using TFTP:

```
Switch# dir disk0:
Directory of disk0:/
   1 -rw-      2538248   Dec 05 2001 01:42:30  ons15530-i-mz.121-7a.EY2.bin

20578304 bytes total (18040056 bytes free)
Switch# delete disk0:ons15530-i-mz.121-7a.EY2.bin
Delete filename [ons15530-i-mz.121-7a.EY2.bin]? y
Delete disk0:ons15530-i-mz.121-7a.EY2 [confirm] y
Switch# copy tftp: disk0:
Address or name of remote host [] mocha
Source filename [] joe/ons15530-i-mz
Destination filename [ons15530-i-mz]
Switch# dir disk0:
Directory of disk0:/

20530200 bytes total (20530200 bytes free)
```



Note Be sure that the file size is the same after it was copied as it is on the server.

Manually Booting the Cisco ONS 15530

When the configuration register is set for manual booting, issuing the **reload** command causes the system to enter ROM monitor mode, where you enter the **boot** command and the name of the system image to use. To perform this procedure, you must be connected to the console port, which provides access to a system in ROM monitor mode. For automatic booting you can issue the **reload** command from an Ethernet connection to the processor.



Note This procedure assumes that you need to change the boot field in the configuration register from its default value so that the system reverts to ROM monitor mode when the **reload** command is issued.

To reload the Cisco ONS 15530 with the new system image on the CompactFlash card, perform the following steps, beginning in global configuration mode:

	Command	Purpose
Step 1	Switch(config)# config-register 0x0	Sets the configuration register for manual booting from ROM monitor mode. ¹
Step 2	Switch(config)# end Switch#	Returns to privileged EXEC mode.
Step 3	Switch# copy system:running-config nvram:startup-config	Saves your configuration changes to NVRAM.
Step 4	Switch# reload	Initiates a reload of the system software. The system prompts you to save the modified configuration before you can proceed. You then enter ROM monitor mode.
Step 5	rommon 1> dir filesystem:	Displays the contents of the file system. Perform this optional step to display and copy the name of the system image to the clipboard for use in the next step.
Step 6	rommon 2> boot filesystem:filename	Reboots the system with the new system image. You can paste the filename from the clipboard if you copied it in the previous step.
Step 7	Switch> show version	Displays the system software version information. Use this step to confirm that the system is loaded with the expected software version.

1. For details on using the configuration register to set boot parameters, refer to the [Cisco IOS Configuration Fundamentals Configuration Guide](#).

Example

The following example shows how to set the configuration register, save the configuration, and reload the Cisco ONS 15530 with the new system image on the CompactFlash card:

```
Switch(config)# config-register 0x0
Switch(config)# end
Switch# copy system:running-config nvram:startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
Switch# reload
System configuration has been modified. Save? [yes/no]: y
Warning: Attempting to overwrite an NVRAM configuration previously written
by a different version of the system image.
Overwrite the previous NVRAM configuration?[confirm] y
Building configuration...
[OK]
Proceed with reload? [confirm]
rommon 1> dir disk0:
Directory of disk0:/
  1  -rw-      2506076   Jan 01 2000 00:59:36  ons15530-i-mz.121-99.UBLDIT188
  2  -rw-      2519840   Jan 01 2000 00:02:01  ons15530-i-mz.121-99.UBLDT020101

20530200 bytes total (6270284 bytes free)
rommon 2> boot disk0:ons15530-i-mz.121-99.UBLDIT188

<The system boots.>

Switch# show version
Cisco Internetwork Operating System Software
IOS (tm) ONS-15530 Software (ONS15530-I-M)
Copyright (c) 1986-2001 by cisco Systems, Inc.
Compiled Wed 15-Aug-01 13:32 by jko
Image text-base: 0x60010950, data-base: 0x60630000

ROM: System Bootstrap, Version 12.1(20010726:234219) [ffrazer-lh4 102], DEVELOPMENT
SOFTWARE

man1 uptime is 14 hours, 59 minutes
System returned to ROM by reload
System image file is "disk0:ons15530-i-mz"

cisco ONS15530 (QUEENS-CPU) processor with 98304K/32768K bytes of memory.
R7000 CPU at 234Mhz, Implementation 39, Rev 2.1, 256KB L2, 2048KB L3 Cache

Last reset from power-on
2 FastEthernet/IEEE 802.3 interface(s)
509K bytes of non-volatile configuration memory.

16384K bytes of Flash internal SIMM (Sector size 256K).
Configuration register is 0x0
```

Updating System Images on Redundant Processors

The Cisco ONS 15530 supports software upgrades and downgrades with no interruption of data traffic. You can enter all commands from the currently active processor console connection or Telnet session.

The following upgrade procedures allow you to qualify a new image on one CPU switch module while optionally keeping an older trusted image on the redundant peer CPU switch module.

**Caution**

If you are upgrading or downgrading with system images that differ by more than one major release, the standby CPU switch module might not reach the hot-standby state. If a switchover occurs while not in the hot-standby state, there is a risk of loss of the configuration. If the processor cannot reach the hot-standby state, use the procedure described in the [“Updating with Non-Hot-Standby Compatible System Images”](#) section on page 17.

Updating with Hot-Standby Compatible System Images

The following procedure describes how to copy a new hot-standby compatible system image from the network to the bootflash device.

Step 1 Verify that the system is configured with the default auto-boot configuration, automatic synchronization enabled for both the running-config and startup-config files, and the standby processor in the hot-standby software state.

Step 2 Copy the new system image to the standby CPU switch module bootflash using the CLI on the active CPU switch module. Delete the old system image from the standby processor bootflash if there is not room.



Note Make sure the active CPU switch module bootflash only contains the old system image name and not the new system image name.

Step 3 Rearrange any existing **boot system** commands so the new system image appears as the first boot image on the list. Optionally, you can configure the original system image as the second boot image.



Note Because the new system image is only present on the standby CPU switch module bootflash, only the standby CPU switch module will load it. When the former active CPU switch module reloads, it will load the original system image after trying and failing to load the missing new system image.

Step 4 Reload the original standby processor with the new system image and make sure it goes to the hot-standby state. (At this point, we recommend that you copy the running-config file to the startup-config file before continuing.)

Step 5 Initiate a switchover that causes the new system image reload on the new active CPU switch module. After the switchover, verify that the new standby CPU switch module, which is running the original system image, goes to the hot-standby state.

Step 6 Configure new features, and, if desired, qualify the new system image for an extended period of time on the new active CPU switch module with the old system image running on the standby CPU switch module.



Note If a switchover occurs back to a processor running an older system image, all configuration commands supported by the older software version are retained. Any new configuration features do not appear in the running configuration. New configuration features saved in the startup configuration will remain.

- Step 7 Copy the new system image to the other processor after qualifying the new system image, and, if desired, delete the old system image.
- Step 8 Reload the new system image on the standby CPU switch module.

To update the system images on redundant processors, perform the following steps, beginning in privileged EXEC mode:

	Command	Purpose
Step 1	Switch> enable	Enters privileged EXEC mode on the active CPU switch module NME interface.
Step 2	Switch# show version	Displays the configuration register contents. The default autoconfiguration value is 0x2102.
Step 3	Switch# show bootvar	Displays the automatic database synchronization configuration.
Step 4	Switch# show redundancy	Displays the hardware and software redundancy states of the CPU switch modules.
Step 5	Switch# dir sby-bootflash:	Displays the contents and available space on the Flash memory device on the standby processor. If there is not enough free space to copy the new system image, perform Step 6 and Step 7 . Otherwise, proceed to Step 8 .
Step 6	Switch# delete sby-bootflash:filename	Marks a file as deleted on the standby CPU switch module. If you have older system images stored on the file system, we recommend that you delete the oldest one and leave a newer one in case you need to revert.
Step 7	Switch# squeeze sby-bootflash:	Recovers the space used by the files marked as deleted.
Step 8	Switch# copy tftp:new-image-name sby-bootflash:	Initiates a TFTP session to copy the system image from the TFTP server to the Flash memory device on the standby CPU switch module. The system prompts you for a TFTP server name and filename.
Step 9	Switch# dir sby-bootflash:	Displays the contents of the standby CPU switch module file system and confirms that the file was copied as expected.
Step 10	Switch# configure terminal	Enters global configuration mode.
Step 11	Switch(config)# boot system bootflash:new-image-name	Adds the new system image to the system boot list.
Step 12	Switch(config)# no boot system bootflash:old-image-name	Removes the old system image from the top of the system boot list.
Step 13	Switch(config)# boot system bootflash:old-image-name	Adds the old system image to the system boot list after the new system image.
Step 14	Switch(config)# exit	Exits global configuration mode.
Step 15	Switch# show running-config	Shows the current running configuration to verify the order of the boot system commands. The new system image should appear first.
Step 16	Switch# copy system:running-config nvram:startup-config	Saves the configuration to NVRAM.

	Command	Purpose
Step 17	Switch# copy system:running-config tftp:	Saves the configuration to a TFTP server. (Optional)
Step 18	Switch# redundancy reload peer	Initiates a reload of the system image on the standby CPU switch module.
Step 19	Switch# show redundancy	Displays the CPU switch module redundancy status and images. Verify that the standby CPU switch module is running the desired new image. Note If the standby CPU switch module fails to reach the hot-standby state, follow the procedure described in the “Updating with Non-Hot-Standby Compatible System Images” section on page 17.
Step 20	Switch# redundancy switch-activity	Switches system control over to the standby CPU switch module by reloading the system image on the active CPU switch module. Repeat Step 1 through Step 9 and then Step 16 through Step 19 if no problems occur with the new system image on the active CPU switch module.

Updating with Non-Hot-Standby Compatible System Images

System images with widely different version numbers might not allow the standby CPU switch module to reach hot-standby state. A different upgrade procedure is necessary to handle these cases.



Caution

This procedure might cause a short data interruption, unlike the procedure described in the previous section, [“Updating with Hot-Standby Compatible System Images.”](#)

To update between system images that are not hot-standby compatible, perform the following steps on the active CPU switch module:

	Command	Purpose
Step 1	Switch> enable Switch#	Enters privileged EXEC mode on the active CPU switch module NME interface.
Step 2	Switch# show version	Displays the configuration register contents. The default autoconfiguration value is 0x2102.
Step 3	Switch# show bootvar	Displays the automatic database synchronization configuration.
Step 4	Switch# show redundancy	Displays the hardware and software redundancy states of the CPU switch modules.
Step 5	Switch# dir bootflash:	Displays the contents and available space on the Flash memory device on the active CPU switch module. If there is not enough free space to copy the new system image, perform Step 6 and Step 7 . Otherwise, proceed to Step 8 .

	Command	Purpose
Step 6	Switch# delete bootflash: <i>filename</i>	Marks a file as deleted on the active CPU switch module. If you have older system images stored on the file system, we recommend that you delete the oldest one and leave a newer one in case you need to revert.
Step 7	Switch# squeeze bootflash:	Recovers the space used by the files marked as deleted.
Step 8	Switch# copy tftp: <i>new-image-name</i> bootflash:	Initiates a TFTP session to copy the system image from the TFTP server to the Flash memory device on the active CPU switch module. The system prompts you for a TFTP server name and filename.
Step 9	Switch# dir bootflash:	Displays the contents of the active CPU switch module file system and confirms that the file was copied as expected.
Step 10	Switch# dir sby-bootflash:	Displays the contents and available space on the Flash memory device on the standby CPU switch module. If there is not enough free space to copy the new system image, perform Step 11 and Step 12 . Otherwise, proceed to Step 13 .
Step 11	Switch# delete sby-bootflash: <i>filename</i>	Marks a file as deleted on the standby CPU switch module. If you have older system images stored on the file system, we recommend that you delete the oldest one and leave a newer one in case you need to revert.
Step 12	Switch# squeeze sby-bootflash:	Recovers the space used by the files marked as deleted.
Step 13	Switch# copy tftp: <i>new-image-name</i> sby-bootflash:	Initiates a TFTP session to copy the system image from the TFTP server to the Flash memory device on the standby CPU switch module. The system prompts you for a TFTP server name and filename.
Step 14	Switch# dir sby-bootflash:	Displays the contents of the standby CPU switch module file system and confirms that the file was copied as expected.
Step 15	Switch# configure terminal Switch(config)#	Enters global configuration mode.
Step 16	Switch(config)# boot system bootflash: <i>new-image-name</i>	Adds the new system image to the system boot list.
Step 17	Switch(config)# no boot system bootflash: <i>old-image-name</i>	Removes the old system image from top of the system boot list.
Step 18	Switch(config)# boot system bootflash: <i>old-image-name</i>	Adds the old system image to the system boot list after the new system image.
Step 19	Switch(config)# exit Switch#	Exits global configuration mode.
Step 20	Switch# show running-config	Shows the current running configuration to verify the order of the boot system commands. The new system image should appear first.
Step 21	Switch# copy system:running-config nvrnram:startup-config	Saves the configuration to NVRAM.

	Command	Purpose
Step 22	Switch# copy system:running-config tftp:	Saves the configuration to a TFTP server. (Optional)
Step 23	Switch# configure terminal Switch(config)#	Enters global configuration mode.
Step 24	Switch(config)# redundancy Switch(config-red)#	Enters redundancy configuration mode.
Step 25	Switch(config-red)# maintenance-mode	Disables database autosynchronization between the CPU switch modules and puts the standby CPU switch module in cold-standby state.
Step 26	Switch(config-red)# end Switch#	Returns to privileged EXEC mode.
Step 27	Switch# redundancy reload peer	Initiates a reload of the system image on the standby CPU switch module.
Step 28	Switch# show redundancy	Displays the CPU switch module redundancy status and images. Verify that the standby CPU switch module is running the desired new image and is in either the NEGOTIATION state or the STANDBY COLD state.
Step 29	Switch# redundancy switch-activity force	Switches system control over to the standby CPU switch module by reloading the system image on the active CPU switch module.

Updating Functional Images

You can load functional images used by certain hardware controllers in the Cisco ONS 15530. This section describes the function and maintenance of functional image.

Understanding Functional Images

Functional images provide the low-level operating functionality for various hardware controllers. On hardware controllers with insystem programmable devices, such as field programmable gate arrays (FPGAs) and Erasable Programmable Logic Devices (EPLDs), the hardware functional images can be reprogrammed independently of loading the system image and without removing the devices from the controller.

On the Cisco ONS 15530, you can reprogram the functional images on the CPU switch modules, OSC modules, WB-VOA modules, PB-OE module, and line cards.

All new hardware is shipped with functional images preloaded. Loading a different functional image is required only when upgrading or downgrading functional image versions.

About Version Diagnostics for ROMMON and Functional Images

The ROMMON and functional images must be upgraded correctly to ensure proper functioning of the system. To ensure that the correct functional image versions are installed on your system, you can download a data file that you can use to verify your system status.

You can download the version diagnostics data file from Cisco.com from the following URL:

<http://www.cisco.com/cgi-bin/tablebuild.pl/ons15530-fpga>

Copying Version Diagnostics Data File for ROMMON and Functional Images

You can copy the data file with version diagnostics for the ROMMON and functional images from either a TFTP server or from an FTP server.

Copying a Version Diagnostics Data File from a TFTP Server to Flash Memory

To download a version diagnostics data file from a TFTP server, perform the following steps:

	Command	Purpose
Step 1	Switch# dir { bootflash: disk0: }	Verifies that space is available in Flash memory on the active CPU switch module. If space is available, continue to Step 3 .
Step 2	Switch# delete { bootflash: disk0: } <i>filename</i>	(Optional) Deletes a file from Flash memory.
Step 3	Switch# squeeze bootflash:	(Optional) Recovers the space in onboard Flash memory.
Step 4	Switch# copy tftp: [[[// <i>location</i>]/ <i>directory</i>]/ <i>filename</i>] { bootflash: disk0: } <i>filename</i>	<p>Copies the data file from the TFTP server to the Flash memory device.</p> <p>Reply to any CLI prompts for additional information or confirmation. The prompting depends on how much information you provide in the copy command.</p> <p>Note Wait until after the download finishes before attempting any commands on the switch. Confirm that the image download is done in binary mode and check file sizes before and after download.</p>
Step 5	Switch# dir { bootflash: disk0: }	Displays information about the files in Flash memory, including the file sizes. Use the file size information to ensure that the entire file downloaded correctly.

Example

The following example shows how to download a version diagnostics data file from a TFTP server:

```
Switch# dir bootflash:
Directory of bootflash:/

   1  -rw-      3241396  Mar 06 2000 22:18:02  ons15530-i-mz.v121_12ev
   2  -rw-         7593  Jul 03 2003 15:59:54  running-config

15990784 bytes total (9485748 bytes free)
Switch# copy tftp: bootflash:
Address or name of remote host? 10.0.0.1
Source filename?fi-ons15530-index.006.dat
Destination filename [fi-ons15530-index.006.dat]?
Accessing tftp://10.0.0.1/fi-ons15530-index.006.dat...
Loading /tftpboot/fi-ons15530-index.006.dat from 10.0.0.1 (via FastEthernet0): !
[OK - 2860 bytes]

2860 bytes copied in 0.216 secs (13241 bytes/sec)
Switch# dir bootflash:
Directory of bootflash:/

   1  -rw-      3241396  Mar 06 2000 22:18:02  ons15530-i-mz.v121_12ev
   2  -rw-         7593  Jul 03 2003 15:59:54  running-config
   3  -rw-         2860  Sep 13 2003 17:00:22  fi-ons15530-index.006.dat

15990784 bytes total (9482760 bytes free)
```

Copying a Version Diagnostics Data File from an FTP Server to Flash Memory

To download a version diagnostics data file from an FTP server, perform the following steps:

	Command	Purpose
Step 1	Switch# configure terminal Switch(config)#	(Optional) Enters configuration mode from the terminal. This step is required only if you override the default remote username (see Step 2 and Step 3). Otherwise, continue to Step 5 .
Step 2	Switch(config)# ip ftp username <i>username</i>	(Optional) Changes the default remote username.
Step 3	Switch(config)# ip ftp password <i>password</i>	(Optional) Changes the default password.
Step 4	Switch(config)# end Switch#	(Optional) Exits configuration mode. This step is required only if you override the default remote username (see Step 2 and Step 3).
Step 5	Switch# dir { bootflash: disk0: }	Verifies that space is available in Flash memory. If space is available, continue to Step 8 .
Step 6	Switch# delete { bootflash: disk0: } <i>filename</i>	(Optional) Deletes a file from Flash memory.
Step 7	Switch# squeeze bootflash:	(Optional) Recovers the space in onboard Flash memory.

	Command	Purpose
Step 8	Switch# copy ftp:[[/[username[:password]@]location]/ directory]/filename { bootflash: disk0: } [filename]	Copies the data file from the FTP server to the Flash memory device. Reply to any CLI prompts for additional information or confirmation. The prompting depends on how much information you provide in the copy command. Note Wait until after the download finishes before attempting any commands on the switch. Confirm that the image download is done in binary mode and check file sizes before and after download.
Step 9	Switch# dir { bootflash: disk0: }	Displays information about the files in Flash memory, including the file sizes. Use the file size information to ensure that the entire file downloaded correctly.

Example

```
Switch# dir bootflash:
Directory of bootflash:/

 1 -rw-      3241396   Mar 06 2000 22:18:02  ons15530-i-mz.v121_12ev
 2 -rw-         7593   Jul 03 2003 15:59:54  running-config

15990784 bytes total (9485748 bytes free)

Switch# copy ftp://myuser:mypass@theserver/tftpboot/fi-ons15530-index.006.dat
disk0:fi-ons15530-index.006.dat

Switch# dir bootflash:
Directory of bootflash:/

 1 -rw-      3241396   Mar 06 2000 22:18:02  ons15530-i-mz.v121_12ev
 2 -rw-         7593   Jul 03 2003 15:59:54  running-config
 3 -rw-         2860   Sep 13 2003 17:00:22  fi-ons15530-index.006.dat

15990784 bytes total (9482760 bytes free)
```

Displaying Version Diagnostics for ROMMON and Functional Images

To display the most recent data file with the ROMMON and functional image version diagnostics, perform the following steps:

Command	Purpose
Switch# show update-info functional-image { all latest-version [software-compatible]} dat-file <i>device:filename</i> [detail]	Displays the ROMMON and functional image version diagnostics.

Example

The following example shows how display the functional image version information for the system:

```
Switch# show upgrade-info functional-image all dat-file fi-ons15530-index.010.dat
Validating CRC...100%
```

```
Generating Functional Image Upgrade Information for the currently running IOS
using DAT file fi-ons15530-index.010.dat, created on Thu Aug 21 00:23:10 PST 2003.
```

```
Please ensure that you are using the latest DAT file from
Cisco Connection Online (CCO) Webpage
```

```
Abbr: Cur.FV = Functional Image Version of the Card.
      Lis.FV = List of Func. Image Versions found in the DAT-file for the
              corresponding card.
      (U)    = IOS Software upgrade is required, to upgrade to
              the recommended functional image version.
```

Slot	Product No	Cur.FV	Lis.FV	Listed Functional Image
1/*	15530-TSP1-2912=	3.12	3.12	No Func. Image Upgrade Required
1/0	Unknown	1.A2	1.A2	No Func. Image Upgrade Required
2/*	15530-TSP1-3112	3.55	3.55	No Func. Image Upgrade Required
2/0	Unknown	1.F2	1.F2	No Func. Image Upgrade Required
3/*	15530-TSP1-2911	3.11	3.12	fi-ons15530-tpd.A.3-12.exo
3/0	Unknown	1.9F	1.A0	fi-ons15540-tlcmdb.A.1-A0.exo
4/*	PROTO-HAMPTON-ESCON	2.33	2.36	fi-ons15530-escon.A.2-36.exo
5/*	PROTO-HAMPTON-CPU	1.43	1.43	No Func. Image Upgrade Required
5/0	Active Rommon	1.1	1.1	No Func. Image Upgrade Required
6/*	PROTO-HAMPTON-CPU	1.43	1.43	No Func. Image Upgrade Required
6/0	Standby Rommon	1.1	1.1	No Func. Image Upgrade Required
8/*	PROTO-HAMPTON-OSCM	1.37	1.37	No Func. Image Upgrade Required
8/0	15530-OSCM	0.58	0.58	No Func. Image Upgrade Required
8/1	15530-OSCM	0.58	0.58	No Func. Image Upgrade Required

Updating a CPU Switch Module Functional Image Release

The CPU switch modules on the Cisco ONS 15530 have two images, a ROMMON image and a functional image.

To update a CPU switch module functional images for the active and redundant CPU switch modules, follow these steps:

-
- Step 1** Determine the release version of the CPU switch module functional image.
 - Step 2** Check the available space on Flash memory (bootflash or disk0) on the active CPU switch module. Make space available, if necessary.
 - Step 3** Copy the CPU switch module functional image to Flash memory on the standby CPU switch module.
 - Step 4** Load the CPU switch module functional image from Flash memory to the standby CPU switch module.
 - Step 5** Repeat [Step 2](#) through [Step 4](#) on the redundant CPU switch module after a switchover.
-

**Note**

You can manage CPU switch module functional image files like any other image file on the Cisco ONS 15530. For more information on downloading and managing image files, refer to the [Cisco IOS Configuration Fundamentals Configuration Guide, Release 12.1](#).

**Caution**

Do not interrupt the reprogramming process. A failure during reprogramming can result in the CPU switch module being unusable. The CPU switch module functional image cannot be reverted once reprogramming starts.

Determining the CPU Switch Module Functional Image Release Version

To determine the existing CPU switch module functional image or CPU switch module functional image release version, use the following command in EXEC mode:

Command	Purpose
show hardware detail linecard slot	Displays the functional image information.
show version	Displays the ROMMON image information.

Example

The following example shows the ROMMON image version information:

```
Switch# show version

Cisco Internetwork Operating System Software
IOS (tm) ONS-15530 Software (ONS15530-i-mz), Release Version 12.1(10)EV
Copyright (c) 1986-2001 by cisco Systems, Inc.
Compiled Fri 23-Mar-02 15:23 by
Image text-base:0x60010950, data-base:0x604E8000

→ ROM:System Bootstrap, Version 12.1(12c)E1, RELEASE SOFTWARE

Switch uptime is 30 minutes
System returned to ROM by power-on
System image file is "disk0:ONS15530-m0-mz"

cisco (QUEENS-CPU) processor with 98304K/32768K bytes of memory.
R7000 CPU at 234Mhz, Implementation 39, Rev 2.1, 256KB L2, 2048KB L3 Cache

Last reset from power-on
2 Ethernet/IEEE 802.3 interface(s)
509K bytes of non-volatile configuration memory.

20480K bytes of Flash PCMCIA card at slot 0 (Sector size 128K).
16384K bytes of Flash internal SIMM (Sector size 64K).
Configuration register is 0x102
```

The following example shows the functional image version for the CPU switch module in slot 5:

```
Switch# show hardware linecard 5
-----
Slot Number           : 5/*
Controller Type       : 0x1100
On-Board Description  : Prote-Hampton_CPU
Orderable Product Number: PROTO-HAMPTON-CPU
Board Part Number     : 73-6572-04
Board Revision        : 06
```



```

Serial Number       : CAB0602M9XX
Manufacturing Date  : mm/dd/2001
Hardware Version    : 4.6
RMA Number         :
RMA Failure Code    :
→ Functional Image Version: 1.41 (dec), 1.29 (hex)

```

Updating a CPU Switch Module Functional Image from a TFTP Server

To download a CPU switch module functional image from a TFTP server and upgrade the functional image on both CPU switch modules, perform the following steps, starting with the active CPU switch module:

	Command	Purpose
Step 1	Switch# show { bootflash: disk0: }	Verifies that space is available in Flash memory on the active CPU switch module. If space is available, continue to Step 4 .
Step 2	Switch# delete { bootflash: disk0: } <i>filename</i>	(Optional) Deletes a file from Flash memory.
Step 3	Switch# squeeze bootflash:	(Optional) Recovers the space in onboard Flash memory.
Step 4	Switch# copy tftp: [[[//location]/directory]/filename] { bootflash: disk0: } <i>filename</i>	<p>Copies the image from the TFTP server to the Flash memory device.</p> <p>Reply to any CLI prompts for additional information or confirmation. The prompting depends on how much information you provide in the copy command.</p> <p>Note Wait until after the download finishes before attempting any commands on the switch. Confirm that the image download is done in binary mode and check file sizes before and after download.</p>
Step 5	Switch# show { sby-bootflash: sby-disk0: }	Verifies that space is available in Flash memory on the standby CPU switch module. If space is available, continue to Step 8 .
Step 6	Switch# delete { sby-bootflash: sby-disk0: } <i>filename</i>	(Optional) Deletes a file from Flash memory.
Step 7	Switch# squeeze sby-bootflash:	(Optional) Recovers the space in onboard Flash memory.

	Command	Purpose
Step 8	Switch# copy tftp: [[[//location]/directory]/filename] {sby-bootflash: sby-disk0:}{filename}	<p>Copies the image from the TFTP server to the Flash memory device.</p> <p>Reply to any CLI prompts for additional information or confirmation. The prompting depends on how much information you provide in the copy command.</p> <p>Note Wait until after the download finishes before attempting any commands on the switch. Confirm that the image download is done in binary mode and check file sizes before and after download.</p>
Step 9	Switch# reprogram {sby-bootflash: sby-disk0:}filename {slot sby-rommon}	Updates the CPU switch module functional image on the CPU switch module and returns the CPU switch module to ROMMON mode.
Step 10	rommon 1 > boot [{bootflash: disk0:}filename]	(Optional) Boots the IOS system image on the standby CPU switch module if it does not boot automatically.
Step 11	Switch# redundancy switch-activity [force]	<p>Switches over control to the standby CPU switch module.</p> <p>Repeat Step 9 through Step 10 on the new standby CPU switch module.</p>



Note

For Cisco ONS 15530 systems with only one CPU switch module, you must either power cycle the shelf or remove and reinsert the CPU switch module for the functional image upgrade to take affect.

Example

The following example shows how to download a ROMMON image from a TFTP server and update the ROMMON image on the active CPU switch module:

```
Switch# show disk0:
-#- ED --type-- --crc--- -seek-- nlen -length- -----date/time----- name
1  .. image    1BD2EA73  2A7B24   26  2652836 Feb 11 2002 18:07:41 ons15530-i-mz
2  .. config   36DC62E3  2AAC54   14   12461 Feb 11 2002 18:10:34 running-config

17912748 bytes available (2665556 bytes used)

Switch# copy tftp: disk0:
Address or name of remote host []? 10.0.0.1
Source filename []? ONS15530_RM.srec
Destination filename [ONS15530_RM.srec]? y

Loading tftpboot/ONS15530_RM.srec from 10.0.0.1 (via Ethernet3/0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 629458/17912748 bytes]

629458 bytes copied
```

Updating a CPU Switch Module Functional Image from an FTP Server

To download a CPU switch module functional image from an FTP server and upgrade the functional image on both CPU switch modules, perform the following steps, starting with the active CPU switch module:

	Command	Purpose
Step 1	Switch# configure terminal Switch(config)#	(Optional) Enters configuration mode from the terminal. This step is required only if you override the default remote username (see Step 2 and Step 3). Otherwise, continue to Step 9 .
Step 2	Switch(config)# ip ftp username <i>username</i>	(Optional) Changes the default remote username.
Step 3	Switch(config)# ip ftp password <i>password</i>	(Optional) Changes the default password.
Step 4	Switch(config)# end Switch#	(Optional) Exits configuration mode. This step is required only if you override the default remote username (see Step 2 and Step 3).
Step 5	Switch# show {bootflash: disk0:}	Verifies that space is available in Flash memory on the active CPU switch module. If space is available, continue to Step 8 .
Step 6	Switch# delete {bootflash: disk0:}filename	(Optional) Deletes a file from Flash memory.
Step 7	Switch# squeeze bootflash:	(Optional) Recovers the space in onboard Flash memory.
Step 8	Switch# copy ftp:[[/[username[:password]@]/location]/directory]/filename { bootflash: disk0: } <i>filename</i>	<p>Copies the image from the FTP server to the Flash memory device.</p> <p>Reply to any CLI prompts for additional information or confirmation. The prompting depends on how much information you provide in the copy command.</p> <p>Note Wait until after the download finishes before attempting any commands on the switch. Confirm that the image download is done in binary mode and check file sizes before and after download.</p>
Step 9	Switch# show {sby-bootflash: sby-disk0:}	Verifies that space is available in Flash memory on the standby CPU switch module. If space is available, continue to Step 12 .
Step 10	Switch# delete {sby-bootflash: sby-disk0:}filename	(Optional) Deletes a file from Flash memory.
Step 11	Switch# squeeze sby-bootflash:	(Optional) Recovers the space in onboard Flash memory.

	Command	Purpose
Step 12	Switch# copy ftp: [[[/[username[:password]@]location]/ directory]/filename] {sby-bootflash: sby-disk0: }filename]	Copies the image from the FTP server to the Flash memory device. Reply to any CLI prompts for additional information or confirmation. The prompting depends on how much information you provide in the copy command. Note Wait until after the download finishes before attempting any commands on the switch. Confirm that the image download is done in binary mode and check file sizes before and after download.
Step 13	Switch# reprogram {sby-bootflash: sby-disk0: }filename {slot sby-rommon }	Updates the functional image on the standby CPU switch module and returns the standby CPU switch module to ROMMON mode.
Step 14	rommon 1 > boot [{bootflash: disk0: }filename]	(Optional) Boots the IOS system image on the standby CPU switch module if it does not boot automatically.
Step 15	Switch# redundancy switch-activity [force]	Switches over control to the standby CPU switch module. Repeat Step 13 through Step 14 on the new standby CPU switch module.



Note

For Cisco ONS 15530 systems with only one CPU switch module, you must either power cycle the shelf or remove and reinsert the CPU switch module for the functional image upgrade to take affect.

The following example shows the functional image information in the controller for the line card in slot 3:

```
Switch# show hardware linecard 3
-----
Slot Number           : 3/*
Controller Type       : 0x1101
On-Board Description  : HAMPTON-ESCON
Orderable Product Number: PROTO-HAMPTON-ESCON
Board Part Number     : 73-7710-03
Board Revision        : 01
Serial Number         : CAB0602M9PV
Manufacturing Date    : 04/08/2002
Hardware Version      : 3.2
RMA Number           :
RMA Failure Code      :
Functional Image Version: 2.36 (dec), 2.24 (hex)
```

Copying a Line Card Functional Image from a TFTP Server to Flash Memory

To download a line card functional image from a TFTP server, perform the following steps:

	Command	Purpose
Step 1	Switch# show {bootflash: disk0:}	Verifies that space is available in Flash memory on the active CPU switch module. If space is available, continue to Step 3 .
Step 2	Switch# delete {bootflash: disk0:}filename	(Optional) Deletes a file from Flash memory.
Step 3	Switch# squeeze bootflash:	(Optional) Recovers the space in onboard Flash memory.
Step 4	Switch# copy tftp: [[[//location]/directory]/filename] {bootflash: disk0:}filename]	<p>Copies the image from the TFTP server to the Flash memory device.</p> <p>Reply to any CLI prompts for additional information or confirmation. The prompting depends on how much information you provide in the copy command.</p> <p>Note Wait until after the download finishes before attempting any commands on the switch. Confirm that the image download is done in binary mode and check file sizes before and after download.</p>

Example

The following example shows how to download a functional image from a TFTP server and update the functional image on the active CPU switch module:

```
Switch# show disk0:
-#- ED --type-- --crc--- -seek-- nlen -length- -----date/time----- name
1  .. image    1BD2EA73 2A7B24  26  2652836 Feb 11 2002 18:07:41 ons15530-i-mz
2  .. config   36DC62E3 2AAC54  14   12461 Feb 11 2002 18:10:34 running-config

17912748 bytes available (2665556 bytes used)

Switch# copy tftp: disk0:
Address or name of remote host []? 10.0.0.1
Source filename []? fi-ons15530-escon.A.2-36.exo
Destination filename [fi-ons15530-escon.A.2-36.exo]? y

Loading tftpboot/ fi-ons15530-escon.A.2-36.exo from 10.0.0.1 (via Ethernet3/0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 5779602/17912748 bytes]

5779602 bytes copied
```

Copying a Line Card Functional Image from an FTP Server to Flash Memory

To download a line card functional image from an FTP server, perform the following steps:

	Command	Purpose
Step 1	Switch# configure terminal Switch(config)#	(Optional) Enters configuration mode from the terminal. This step is required only if you override the default remote username (see Step 2 and Step 3). Otherwise, continue to Step 5 .
Step 2	Switch(config)# ip ftp username <i>username</i>	(Optional) Changes the default remote username.
Step 3	Switch(config)# ip ftp password <i>password</i>	(Optional) Changes the default password.
Step 4	Switch(config)# end Switch#	(Optional) Exits configuration mode. This step is required only if you override the default remote username (see Step 2 and Step 3).
Step 5	Switch# show {bootflash: disk0:}	Verifies that space is available in Flash memory. If space is available, continue to Step 8 .
Step 6	Switch# delete {bootflash: disk0:}filename	(Optional) Deletes a file from Flash memory.

The **reprogram** command checks the compatibility of the image for the selected card type before downloading the functional image. If you have specified a slot number without a subcard, the functional image is downloaded to the full-width module that occupies that slot.



Caution

The download process impacts traffic through the line card.



Caution

Do not interrupt the download process. Wait until it has finished before attempting any commands on the switch.

Example

The following example demonstrates loading the functional image `fpga_image` from the CompactFlash Card to the controller for the processor in slot 8.

```
Switch# reprogram disk0:fpga_image 8
```

Updating Module Functional Images

You can update the functional image for the OSC modules.

Update a module functional image in three steps:

-
- Step 1 Determine the module functional image version.
 - Step 2 Copy the image to Flash memory (bootflash or disk0).
 - Step 3 Load the image from Flash memory to the hardware controller.
-

Determining the Module Functional Image Version

To determine the functional image version in a module hardware controller, use the following command in privileged EXEC mode:

Command	Purpose
<code>show hardware linecard slot</code>	Displays the functional image information.

The following example shows the functional image information in the controller for the line card in slot 2:

```
Switch# show hardware linecard 2
-----
Slot Number           : 2/*
Controller Type       : 0x1103
On-Board Description  : Prototype Hampton Oscmb
Orderable Product Number: PROTO-HAMPTON-OSCMB
Board Part Number     : 73-6838-04
Board Revision        : 01
Serial Number         : CAB0603MAJ1
Manufacturing Date    : 01/24/2002
Hardware Version      : 4.0
RMA Number            :
RMA Failure Code      :
Functional Image Version: 1.36
Function-ID           : 0
-----
Slot Number           : 2/0
Controller Type       : 0x1107
On-Board Description  : Prototype Hampton Oscdc
Orderable Product Number: PROTO-HAMPTON-OSCDC
Board Part Number     : 73-7238-03
Board Revision        : 03
Serial Number         : CAB0602MA36
Manufacturing Date    : 12/07/2001
Hardware Version      : 3.1
RMA Number            :
RMA Failure Code      :
Functional Image Version: 0.52
Function-ID           : 0
Transceiver type      : Non-pluggable Transceiver
-----
Slot Number           : 2/1
Controller Type       : 0x1107
On-Board Description  : Prototype Hampton Oscdc
Orderable Product Number: PROTO-HAMPTON-OSCDC
Board Part Number     : 73-7238-03
Board Revision        : 03
Serial Number         : CAB0602MA3H
Manufacturing Date    : 12/07/2001
Hardware Version      : 3.1
RMA Number            :
RMA Failure Code      :
Functional Image Version: 0.52
Function-ID           : 0
Transceiver type      : Non-pluggable Transceiver
```

Copying a Module Functional Image from a TFTP Server to Flash Memory

To download a module functional image from a TFTP server, perform the following steps:

	Command	Purpose
Step 1	Switch# show {bootflash: disk0:}	Verifies that space is available in Flash memory on the active CPU switch module. If space is available, continue to Step 3 .
Step 2	Switch# delete {bootflash: disk0:}filename	(Optional) Deletes a file from Flash memory.

	Command	Purpose
Step 3	Switch# squeeze bootflash:	(Optional) Recovers the space in onboard Flash memory.
Step 4	Switch# copy tftp: [[[//location]/directory]/filename] {bootflash: disk0:}[filename]	<p>Copies the image from the TFTP server to the Flash memory device.</p> <p>Reply to any CLI prompts for additional information or confirmation. The prompting depends on how much information you provide in the copy command.</p> <p>Note Wait until after the download finishes before attempting any commands on the switch. Confirm that the image download is done in binary mode and check file sizes before and after download.</p>

Example

The following example shows how to download a functional image from a TFTP server and update the functional image on the active CPU switch module:

```
Switch# show disk0:
-#- ED --type-- --crc--- -seek-- nlen -length- -----date/time----- name
1  .. image    1BD2EA73  2A7B24   26  2652836 Feb 11 2002 18:07:41 ons15530-i-mz
2  .. config   36DC62E3  2AAC54   14   12461 Feb 11 2002 18:10:34 running-config

17912748 bytes available (2665556 bytes used)

Switch# copy tftp: disk0:
Address or name of remote host []? 10.0.0.1
Source filename []? fi-ons15530-escon.A.2-36.exo
Destination filename [fi-ons15530-escon.A.2-36.exo]? y

Loading tftpboot/ fi-ons15530-escon.A.2-36.exo from 10.0.0.1 (via Ethernet3/0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 5779602/17912748 bytes]

5779602 bytes copied
```

Copying a Module Functional Image from an FTP Server to Flash Memory

To download a module functional image from an FTP server, perform the following steps:

	Command	Purpose
Step 1	Switch# configure terminal Switch(config)#	(Optional) Enters configuration mode from the terminal. This step is required only if you override the default remote username (see Step 2 and Step 3). Otherwise, continue to Step 5 .
Step 2	Switch(config)# ip ftp username <i>username</i>	(Optional) Changes the default remote username.
Step 3	Switch(config)# ip ftp password <i>password</i>	(Optional) Changes the default password.

Updating the Module Functional Image

To update a module functional image from a Flash memory device to a hardware controller, use the following command in privileged EXEC mode from a console session:

Command	Purpose
<code>reprogram device:filename slot subcard</code>	Updates the functional image with the specified filename to a device.

The **reprogram** command checks the compatibility of the image for the selected card type before downloading the functional image.



Caution

The download process impacts traffic through the module.



Caution

Do not interrupt the download process. Wait until it has finished before attempting any commands on the switch.

Example

The following example demonstrates loading the functional image `fpga_image` from the CompactFlash Card to the controller for the processor in slot 8.

```
Switch# reprogram disk0:fpga_image 2 0
```

Related Documentation

Refer to the following documents for more information about the Cisco ONS 15530:

- [Regulatory Compliance and Safety Information for the Cisco ONS 15500 Series](#)
- [Cisco ONS 15530 Planning Guide](#)
- [Cisco ONS 15530 Hardware Installation Guide](#)
- [Cisco ONS 15530 Cleaning Procedures for Fiber Optic Connections](#)
- [Cisco ONS 15530 Optical Turn-up and Test Guide](#)
- [Cisco ONS 15530 Configuration Guide](#)
- [Cisco ONS 15530 Command Reference](#)
- [Cisco ONS 15530 CLI Command Reference](#)
- [Cisco ONS 15530 Alarms and Error Messages](#)
- [Cisco ONS 15530 Troubleshooting Guide](#)
- [Network Management for the Cisco ONS 15530](#)
- [MIB Quick Reference for the Cisco ONS 15500 Series](#)

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Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool automatically provides recommended solutions. If your issue is not resolved using the recommended resources, your service request will be assigned to a Cisco TAC engineer. The TAC Service Request Tool is located at this URL:

<http://www.cisco.com/techsupport/servicerequest>

For S1 or S2 service requests or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco TAC engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)

EMEA: +32 2 704 55 55

USA: 1 800 553 2447

For a complete list of Cisco TAC contacts, go to this URL:

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Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—Your network is “down,” or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

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- *Packet* magazine is the Cisco Systems technical user magazine for maximizing Internet and networking investments. Each quarter, Packet delivers coverage of the latest industry trends, technology breakthroughs, and Cisco products and solutions, as well as network deployment and troubleshooting tips, configuration examples, customer case studies, certification and training information, and links to scores of in-depth online resources. You can access Packet magazine at this URL:

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