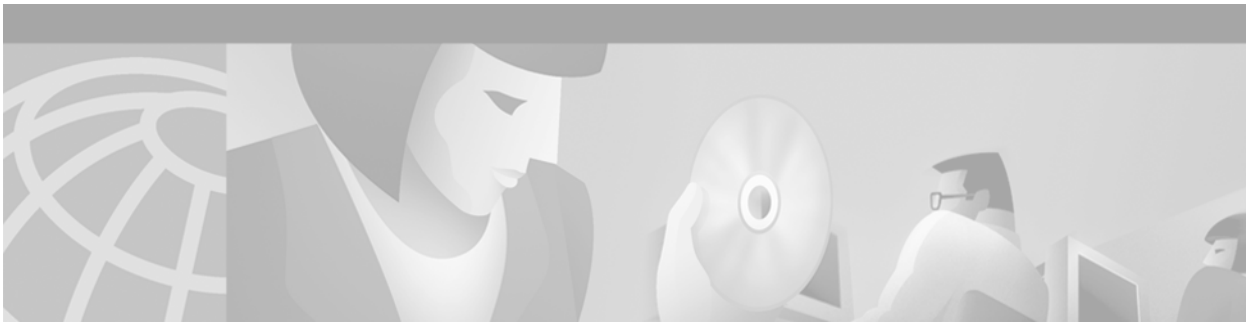

System Image and Microcode Commands

This chapter provides detailed descriptions of the commands used to load and copy system images and microcode images. System images contain the system software. Microcode images contain microcode to be downloaded to various hardware devices.

For configuration information and examples, refer to the "Loading and Maintaining System Images" chapter in the Release 12.2 *Cisco IOS Configuration Fundamentals Configuration Guide*.

Flash Memory File System Types

Cisco platforms generally use one of three different Flash memory file system types. Some commands in this chapter are supported on only one or two file system types.

Use Table 34 to determine which Flash memory file system type your platform uses.

Table 34 Flash Memory File System Types

Type	Platforms
Class A	Cisco 7000 family, Cisco 12000 series routers, LightStream LS1010 switches
Class B	Cisco 1003, Cisco 1004, Cisco 1005, Cisco 2500 series, Cisco 3600 series, and Cisco 4000 series routers, and Cisco AS5200 access servers
Class C	Cisco MC3810 multiservice concentrators, disk0 of Cisco SC3640 system controllers

Replaced Commands

Some commands found in this chapter in previous releases of this book have been replaced. Older commands generally continue to provide the same functionality in the current release, but are no longer documented. Support for the older version of these commands may already be removed on your system, or may be removed in a future Cisco IOS software release.

Table 35 maps the old commands to their replacements.

Table 35 Replaced Commands

Old Command	New Command
copy erase flash	**erase flash:** (Class B Flash file systems only) **format** (Class A and C Flash file systems only)
copy verify	**verify**
copy verify bootflash	**verify bootflash:**
copy verify flash	**verify flash:**
copy xmodem	**xmodem**
copy ymodem	**xmodem -y**
show flh-log	**more flh: logfile**
verify bootflash	**verify bootflash:**
verify flash	**verify flash:**

For a description of the **copy** and **verify** commands, see the "Cisco IOS File System Commands" chapter.

copy erase flash

The **copy erase flash** command has been replaced by the **erase flash:**command. See the description of the **erase** command in the "Cisco IOS File System Commands" chapter for more information.

copy verify

The **copy verify** command has been replaced by the **verify** command. See the description of the **verify** command in the "Cisco IOS File System Commands" chapter for more information.

copy verify bootflash

The **copy verify bootflash** command has been replaced by the **verify bootflash:** command. See the description of the **verify** command in the "Cisco IOS File System Commands" chapter for more information.

copy verify flash

The **copy verify flash** command has been replaced the **verify flash:** command. See the description of the **verify** command in the "Cisco IOS File System Commands" chapter for more information.

copy xmodem:

To copy a Cisco IOS image from a local or remote computer (such as a PC, Macintosh, or UNIX workstation) to Flash memory on a Cisco 3600 series router using the Xmodem protocol, use the **copy xmodem:** EXEC command.

copy xmodem: *flash-filesystem***:**

Syntax Description

*flash-filesystem***:**	Destination of the copied file, followed by a colon.

Command Modes

EXEC

Command History

Release	Modification
11.2 P	This command was introduced.

Usage Guidelines

This command is a form of the **copy** command. The **copy xmodem:** and **copy xmodem** commands are identical. See the description of the **copy** command for more information.

Copying a file using FTP, rcp, or TFTP is much faster than copying a file using Xmodem. Use the **copy xmodem:** command only if you do not have access to an FTP, TFTP, or rcp server.

This copy operation is performed through the console or AUX port. The AUX port, which supports hardware flow control, is recommended.

No output is displayed on the port over which the transfer is occurring. You can use the **logging buffered** command to log all router messages sent to the console port during the file transfer.

Examples

The following example initiates a file transfer from a local or remote computer to the router's internal Flash memory using the Xmodem protocol:

```
copy xmodem: flash:
```

Related Commands

Command	Description
copy	Copies any file from a source to a destination.
copy ymodem:	Copies a Cisco IOS image from a local or remote computer (such as a PC, Macintosh, or UNIX workstation) to Flash memory on a Cisco 3600 series router using the Ymodem protocol.

copy ymodem:

To copy a Cisco IOS image from a local or remote computer (such as a PC, Macintosh, or UNIX workstation) to Flash memory on a Cisco 3600 series router using the Ymodem protocol, use the **copy ymodem:** EXEC command.

copy ymodem: *flash-filesystem***:**

Syntax Description

*flash-filesystem***:**	Destination of the copied file, followed by a colon.

Command Modes

EXEC

Command History

Release	Modification
11.2 P	This command was introduced.

Usage Guidelines

The **copy ymodem:** and **copy ymodem** commands are identical. See the description of the **copy** command for more information.

Copying a file using FTP, rcp, or TFTP is much faster than copying a file using Ymodem. Use the **copy ymodem:** command only if you do not have access to an FTP, rcp, or TFTP server.

This copy operation is performed through the console or AUX port. The AUX port, which supports hardware flow control, is recommended.

No output is displayed on the port over which the transfer is occurring. You can use the **logging buffered** command to log all router messages sent to the console port during the file transfer.

Examples

The following example initiates a file transfer from a local or remote computer to the router's internal Flash memory using the Ymodem protocol:

```
copy ymodem: flash:
```

Related Commands

Command	Description
copy xmodem:	Copies a Cisco IOS image from a local or remote computer (such as a PC, Macintosh, or UNIX workstation) to Flash memory on a Cisco 3600 series router using the Xmodem protocol.

erase flash:

The **erase flash:** and **erase flash** commands are identical. See the description of the **erase** command in the "Cisco IOS File System Commands" chapter for more information.

microcode (7000/7500)

To specify the location of the microcode that you want to download from Flash memory into the writable control store (WCS) on Cisco 7000 series (including RSP based routers) or Cisco 7500 series routers, use the **microcode** global configuration command. To load the microcode bundled with the system image, use the **no** form of this command.

microcode *interface-type* {*flash-filesystem***:***filename* [*slot*] | **rom** | **system** [*slot*]]}

no microcode *interface-type* {*flash-filesystem***:***filename* [*slot*] | **rom** | **system** [*slot*]}

Syntax Description

interface-type	One of the following interface processor names: **aip**, **cip**, **eip**, **feip**, **fip**, **fsip**, **hip**, **mip**, **sip**, **sp**, **ssp**, **trip**, **vip**, or **vip2**.
*flash-filesystem***:**	Flash file system, followed by a colon. Valid file systems are **bootflash**, **slot0**, and **slot1**. Slave devices such as slaveslot0 are invalid. The slave's file system is not available during microcode reloads.
filename	Name of the microcode file.
slot	(Optional) Number of the slot. Range is from 0 to 15.
rom	If ROM is specified, the router loads from the onboard ROM microcode.
system	If the **system** keyword is specified, the router loads the microcode from the microcode bundled into the system image you are running for that interface type.

Defaults

The default is to load from the microcode bundled in the system image.

Command Modes

Global configuration

Command History

Release	Modification
10.3	This command was introduced.

Usage Guidelines

If you do not use the **microcode reload** command after using the **microcode** command, the **microcode reload** command will be written to the configuration file automatically.

When using Dual RSPs for simple hardware backup, ensure that the master and slave RSP card contain the same microcode image in the same location when the router is to load the interface processor microcode from a Flash file system. Thus, if the slave RSP becomes the master, it will be able to find the microcode image and download it to the interface processor.

Examples

In the following example, all FIP cards will be loaded with the microcode found in Flash memory file fip.v141-7 when the system is booted, when a card is inserted or removed, or when the **microcode reload** global configuration command is issued. The configuration is then written to the startup configuration file.

```
Router(config)# microcode fip slot0:fip.v141-7
Router(config)# end
Router# copy system:running-config nvram:startup-config
```

Related Commands

Command	Description
more flh:logfile	Displays the system console output generated during the Flash load helper operation.

microcode (7200)

To configure a default override for the microcode that is downloaded to the hardware on a Cisco 7200 series router, use the **microcode** global configuration command. To revert to the default microcode for the current running version of the Cisco IOS software, use the **no** form of this command.

microcode {**ecpa** | **pcpa**} *location*

no microcode {**ecpa** | **pcpa**}

Syntax Description

ecpa	ESCON Channel Port Adapter (CPA) interface.
pcpa	Parallel CPA interface.
location	Location of microcode, including the device and filename.

Defaults

If the default or **no** form of the command is specified, the driver uses the default microcode for the current running version of the Cisco IOS software.

Command Modes

Global configuration

Command History

Release	Modification
11.3(3)T	This command was introduced.

Usage Guidelines

If there are any default overrides when the configuration is written, then the **microcode reload** command will be written to the configuration automatically. This action enables the configured microcode to be downloaded at system startup.

The CPA microcode image is preloaded on Flash memory cards for Cisco 7200-series routers for Cisco IOS Release 11.3(3)T and later releases. You may be required to copy a new image to Flash memory when a new microcode image becomes available.

For more information on the CPA configuration and maintenance, refer to the "Configuring Cisco Mainframe Channel Connection Adapters" chapter in the Release 12.2 *Cisco IOS Bridging and IBM Networking Configuration Guide*.

Examples

The following example instructs the Cisco IOS software to load the microcode from an individual microcode image that is stored as a file on the Flash card inserted in Flash card slot 0:

```
microcode ecpa slot0:xcpa26-1
```

Related Commands

Command	Description
microcode reload (7200)	Resets and reloads the specified hardware in a Cisco 7200 series router.
show microcode	Displays microcode information.

microcode (12000)

To load a Cisco IOS software image on a line card from Flash memory or the GRP card on a Cisco 12000 series Gigabit Switch Router (GSR), use the **microcode** global configuration command. To load the microcode bundled with the GRP system image, use the **no** form of this command.

microcode {**oc12-atm** | **oc12-pos** | **oc3-pos4**} {**flash** *file-id* [*slot*] | **system** [*slot*]}

no microcode {**oc12-atm** | **oc12-pos** | **oc3-pos4**} [**flash** *file-id* [*slot*] | **system** [*slot*]]

Syntax Description

oc12-atm | **oc12-pos** | **oc3-pos4**	Interface name.
flash	Loads the image from the Flash file system.
file-id	Specifies the device and filename of the image file to download from Flash memory. A colon (:) must separate the device and filename (for example, slot0:gsr-p-mz). Valid devices include: • **bootflash:**—Internal Flash memory. • **slot0:**—First PCMCIA slot. • **slot1:**—Second PCMCIA slot.
slot	(Optional) Slot number of the line card that you want to copy the software image to. Slot numbers range from 0 to 11 for the Cisco 12012 router and 0 to 7 for the Cisco 12008 router. If you do not specify a slot number, the Cisco IOS software image is downloaded on all line cards.
system	Loads the image from the software image on the GRP card.

Defaults

The default is to load the image from the GRP card (**system**).

Command Modes

Global configuration

Command History

Release	Modification
11.2 GS	This command was introduced for Cisco 12000 series GSRs.

Usage Guidelines

In addition to the Cisco IOS image that resides on the GRP card, each line card on a Cisco 12000 series has a Cisco IOS image. When the router is reloaded, the specified image is loaded onto the GRP card and then automatically downloaded to all the line cards.

Normally, you want the same Cisco IOS image on the GRP card and all line cards. However, if you want to upgrade a line card with a new version of microcode for testing or to fix a defect, you might need to load a Cisco IOS image that is different from the one on the line card. Additionally, you might need to load a new image on the line card to work around a problem that is affecting only one of the line cards.

To load a Cisco IOS image on a line card, first use the **copy tftp** command to download the Cisco IOS image to a slot on one of the PCMCIA Flash memory cards. Then use the **microcode** command to download the image to the line card, followed by the **microcode reload** command to start the image. Immediately after you enter the **microcode reload** command and press Return, the system reloads all microcode. Global configuration mode remains enabled. After the reloading is complete, enter the **exit** command to return to the EXEC system prompt.

To verify that the correct image is running on the line card, use the **execute-on slot** *slot* **show version** command.

For additional information on GSR configuration, refer to the documentation specific to your Cisco IOS software release.

Examples

In the following example, the Cisco IOS software image in slot 0 is downloaded to the line card in slot 10. This software image is used when the system is booted, a line card is inserted or removed, or the **microcode reload** global configuration command is issued.

```
microcode oc3-POS-4 flash slot0:fip.v141-7 10
microcode reload 10
```

In this example, the user would issue the **execute-on slot 10 show version** command to verify that the correct version is loaded.

Related Commands

Command	Description
microcode reload (12000)	Reloads microcode on Cisco 12000 series GSRs.

microcode reload (7000/7500)

To reload the processor card on the Cisco 7000 series with RSP7000 or Cisco 7500 series routers, use the **microcode reload** global configuration command.

microcode reload

Syntax Description

This command has no arguments or keywords.

Defaults

No default behaviors or values.

Command Modes

Global configuration

Command History

Release	Modification
10.3	This command was introduced for Cisco 7500 series routers.

Usage Guidelines

This command reloads the microcode without rebooting the router. Immediately after you enter the **microcode reload** command and press Return, the system reloads all microcode. Global configuration mode remains enabled.

Note If you modify the system configuration to load a microcode image, the **microcode reload** command will be written to the configuration file automatically following the use of a **microcode** command. This action enables the configured microcode to be downloaded at system startup.

Examples

In the following example, all controllers are reset, and the microcode specified in the current configuration is loaded:

```
microcode reload
```

Related Commands

Command	Description
microcode (7000/7500)	Specifes the location from where microcode should be loaded when the **microcode reload** command is executed on RSP-based routers.

microcode reload (7200)

To reload the Cisco IOS microcode image on an ESCON CPA card in the Cisco 7200 series router, use the **microcode reload** command in privileged EXEC configuration mode.

microcode reload {all | ecpa [slot *slot#***] | pcpa [slot** *slot#***]}**

Syntax Description

all	Resets and reloads all hardware types that support downloadable microcode.
ecpa	Resets and reloads only those slots that contain hardware type **ecpa**.
pcpa	Resets and reloads only those slots that contain hardware type **pcpa**.
slot *slot#*	(Optional) Resets and reloads only the slot specified, and only if it contains the hardware specified.

Defaults

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.3(3)T	This command was introduced.

Usage Guidelines

Hardware types that do not support downloadable microcode are unaffected by the **microcode reload all** command.

You will be prompted for confirmation before the **microcode reload** command is executed.

Examples

The following example reloads the ESCON CPA microcode in slot 5 with the currently configured microcode:

```
microcode reload ecpa slot 5
```

Related Commands

Command	Description
microcode (7200)	Configures a default override for the microcode that is downloaded to the hardware on a Cisco 7200 series router.
show microcode	Displays the microcode bundled into a Cisco 7000 series with RSP7000, Cisco 7200 series, or Cisco 7500 series router.

microcode reload (12000)

To reload the Cisco IOS image from a line card on Cisco 12000 series routers, use the **microcode reload** global configuration command.

microcode reload [*slot-number*]

Syntax Description

slot-number	(Optional) Slot number of the line card that you want to reload the Cisco IOS software image on. Slot numbers range from 0 to 11 for the Cisco 12012 and from 0 to 7 for the Cisco 12008 router. If you do not specify a slot number, the Cisco IOS software image is reloaded on all line cards.

Command Modes

Global configuration

Command History

Release	Modification
11.2 GS	This command was introduced for Cisco 12000 series GSRs.

Usage Guidelines

In addition to the Cisco IOS image that resides on the GRP card, each line card on Cisco 12000 series routers has a Cisco IOS image. When the router is reloaded, the specified Cisco IOS image is loaded onto the GRP card and automatically downloaded to all the line cards.

Normally, you want the same Cisco IOS image on the GRP card and all line cards. However, if you want to upgrade a line card with a new version of microcode for testing or to fix a defect, you might need to load a different Cisco IOS image. Additionally, you might need to load a new image on the line card to work around a problem affecting only one of the line cards.

To load a Cisco IOS image on a line card, first use the **copy tftp** command to download the Cisco IOS image to a slot on one of the PCMCIA Flash memory cards. Then use the **microcode** command to download the image to the line card, followed by the **microcode reload** command to start the image. To verify that the correct image is running on the line card, use the **execute-on slot** *slot* **show version** command.

For additional information on GSR configuration, refer to the "Observing System Startup and Performing a Basic Configuration" chapter in the Cisco 12000 series installation and configuration guides.

The **microcode reload** (12000) command allows you to issue another command immediately.

Note Issuing a **microcode reload** command on any of the line cards in a Cisco 12000 GSR immediately returns the console command prompt. This allows you to issue a subsequent command immediately to the reloading line card. However, any commands entered at this time will not execute, and often no indication will be given that such a command failed to run. Verify that the microcode has reloaded before issuing new commands.

Examples

In the following example, the Cisco IOS software is reloaded on the line card in slot 10:

```
microcode reload 10
```

Related Commands

Command	Description
microcode (12000)	Loads a Cisco IOS software image on a line card from Flash memory or the GRP card on a Cisco 12000 series GSR.

more flh:logfile

To view the system console output generated during the Flash load helper operation, use the **more flh:logfile** privileged EXEC command.

more flh:logfile

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.3 AA	This command was introduced.

Usage Guidelines

If you are a remote Telnet user performing the Flash upgrade without a console connection, this command allows you to retrieve console output when your Telnet connection has terminated due to the switch to the ROM image. The output indicates what happened during the download, and is particularly useful if the download fails.

This command is a form of the **more** command. See the **more** command for more information.

Examples

The following is sample output from the **more flh:logfile** command:

```
Router# more flh:logfile

%FLH: abc/igs-kf.914 from 172.16.1.111 to flash...

System flash directory:
File  Length   Name/status
  1   2251320  abc/igs-kf.914

[2251384 bytes used, 1942920 available, 4194304 total]
Accessing file 'abc/igs-kf.914' on 172.16.1.111...
Loading from 172.16.13.111:

Erasing device..... erased
Loading from 172.16.13.111:
- [OK -
2251320/4194304 bytes]

Verifying checksum... OK (0x97FA)
Flash copy took 79292 msecs
%FLH: Re-booting system after download
Loading abc/igs-kf.914 at 0x3000040, size = 2251320 bytes [OK]

F3: 2183364+67924+259584 at 0x3000060
```

```
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                170 West Tasman Drive
                San Jose, California 95134

Cisco Internetwork Operating System Software
Cisco IOS (tm) GS Software (GS7), Version 11.0
Copyright (c) 1986-1995 by cisco Systems, Inc.
Compiled Tue 06-Dec-94 14:01 by smith
Image text-base: 0x00001000, data-base: 0x005A9C94

cisco 2500 (68030) processor (revision 0x00) with 4092K/2048K bytes of
memory.
Processor board serial number 00000000
DDN X.25 software, Version 2.0, NET2 and BFE compliant.
ISDN software, Version 1.0.
Bridging software.
Enterprise software set supported. (0x0)
1 Ethernet/IEEE 802.3 interface.
2 Serial network interfaces.
 --More--

1 ISDN Basic Rate interface.
32K bytes of non-volatile configuration memory.

4096K bytes of processor board System flash (Read ONLY)
```

Related Commands

Command	Description
more	Displays a file.

show flh-log

The **show flh-log** command has been replaced by the **more flh:logfile** command. See the description of the **more flh:logfile** command in this chapter for more information.

show microcode

To display microcode image information available on line cards, use the **show microcode** EXEC command.

show microcode

Syntax Description

This command has no arguments or keywords.

Command Modes

EXEC

Command History

Release	Modification
10.0	This command was introduced.

Examples

The following is sample output from the **show microcode** command:

```
Router# show microcode

Microcode bundled in system

Card    Microcode    Target Hardware    Description
Type    Version      Version
----    ---------    ---------------    -----------
SP         2.3            11.x          SP version 2.3
EIP        1.1             1.x          EIP version 1.1
TRIP       1.2             1.x          TRIP version 1.2
FIP        1.4             2.x          FIP version 1.4
HIP        1.1             1.x          HIP version 1.1
SIP        1.1             1.x          SIP version 1.1
FSIP       1.1             1.x          FSIP version 1.1
```

In the following example for the Cisco 7200 series router, the output from the **show microcode** command lists the hardware types that support microcode download. For each type, the default microcode image name is displayed. If there is a configured default override, that name also is displayed.

```
router# show microcode

Microcode images for downloadable hardware
HW Type             Microcode image names
-----------------------------------------
ecpa     default    slot0:xcpa26-0
         configured slot0:xcpa26-2
pcpa     default    slot0:xcpa26-4
```

Related Commands

Command	Description
microcode (7000/7500)	Specifies where microcode should be loaded from on Cisco 7500/7000RSP routers.
microcode (7200)	Configures a default override for the microcode that is downloaded to the hardware on a Cisco 7200 series router.

xmodem

To copy a Cisco IOS image to a router using the ROM monitor and the Xmodem or Ymodem protocol, use the **xmodem** ROM monitor command.

xmodem [**-c**] [**-y**] [**-e**] [**-f**] [**-r**] [**-x**] [**-s** *data-rate*] [*filename*]

Syntax Description

-c	(Optional) CRC-16 checksumming, which is more sophisticated and thorough than standard checksumming.
-y	(Optional) Uses the Ymodem protocol for higher throughput.
-e	(Optional) Erases the first partition in Flash memory before starting the download. This option is only valid for the Cisco 1600 series.
-f	(Optional) Erases all of Flash memory before starting the download. This option is only valid for the Cisco 1600 series.
-r	(Optional) Downloads the file to DRAM. The default is Flash memory.
-x	(Optional) Do not execute Cisco IOS image on completion of the download.
-s *data-rate*	(Optional) Sets the console port's data rate during file transfer. Values are **1200**, **2400**, **4800**, **9600**, **19200**, **38400**, and **115200 bps**. The default rate is specified in the configuration register. This option is only valid for the Cisco 1600 series.
filename	(Optional) Filename to copy. This argument is ignored when the **-r** keyword is specified, because only one file can be copied to DRAM. On the Cisco 1600 series routers, files are loaded to the ROM for execution.

Defaults

Xmodem protocol with 8-bit CRC, file downloaded into Flash memory and executed on completion.

Command Modes

ROM monitor

Command History

Release	Modification
11.2 P	This command was introduced.

Usage Guidelines

The Cisco 3600 series routers does not support XBOOT functionality. If your Cisco IOS image is erased or damaged, you cannot load a new image over the network.

Use the **xmodem** ROM monitor command to download a new system image to your router from a local personal computer (such as a PC, Mac, or UNIX workstation), or a remote computer over a modem connection, to the router's console port. The computer must have a terminal emulation application that supports these protocols.

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Your router must have enough DRAM to hold the file being transferred, even if you are copying to Flash memory. The image is copied to the first file in internal Flash memory. Any existing files in Flash memory are erased. There is no support for partitions or copying as a second file.

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If you include the **-r** option, your router must have enough DRAM to hold the file being transferred. To run from Flash, an image must be positioned as the first file in Flash memory. If you are copying a new image to boot from Flash, erase all existing files first.

Caution A modem connection from the telephone network to your console port introduces security issues that you should consider before enabling the connection. For example, remote users can dial in to your modem and access the router's configuration settings.

Note If the file to be downloaded is not a valid router image, the copy operation is automatically terminated.

Examples

The following example uses the **xmodem -c** *filename* ROM monitor command to copy the file named new-ios-image from a remote or local computer:

```
rommon > xmodem -c new-ios-image

Do not start the sending program yet...
         File size           Checksum   File name
   1738244 bytes (0x1a8604)   0xdd25 george-admin/c3600-i-mz

WARNING: All existing data in bootflash will be lost!
Invoke this application only for disaster recovery.
Do you wish to continue? y/n  [n]:  yes
Ready to receive file new-ios-image ...
```

Related Commands

Command	Description
copy xmodem:	Copies a Cisco IOS image from a local or remote computer (such as a PC, Macintosh, or UNIX workstation) to Flash memory on a Cisco 3600 series router using the Xmodem protocol.
copy ymodem:	Copies a Cisco IOS image from a local or remote computer (such as a PC, Macintosh, or UNIX workstation) to Flash memory on a Cisco 3600 series router using the Ymodem protocol.