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Release Notes for Cisco IOS Release 11.1(7)— Cisco 3600 Feature Packs

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These release notes identify the Cisco Internetwork Operating System (Cisco IOS) Release 11.1 feature sets for Cisco 3600 series routers. Product numbers supported are as follows:

- CD362-A-11.1= (IP Feature Pack for Cisco 3620)
- CD362-DS-11.1= (IP/IPX IBM Feature Pack for Cisco 3620)
- CD362-B-11.1= (IP/IPX/AppleTalk Feature Pack for Cisco 3620)
- CD362-F-11.1= (Desktop Feature Pack for Cisco 3620)
- CD362-G-11.1= (Enterprise Feature Pack for Cisco 3620)
- CD364-A-11.1= (IP Feature Pack for Cisco 3640)
- CD364-B-11.1= (IP/IPX/AppleTalk Feature Pack for Cisco 3640)
- CD364-DS-11.1= (IP/IPX IBM Feature Pack for Cisco 3640)
- CD364-F-11.1= (Desktop Feature Pack for Cisco 3640)
- CD364-G-11.1= (Enterprise Feature Pack for Cisco 3640)

Note The feature packs listed here are supported in Cisco IOS Release 11.1(7)AA.

These release notes describe the feature packs and the specific features of the available feature sets for each supported Cisco 3600 series router. These release notes also help you navigate the Cisco IOS Release 11.1 online documentation. The router image loader, which is on the same CD-ROM as the Cisco IOS feature sets, runs in Microsoft Windows 95 on PCs. These release notes also describe how to install the Cisco IOS feature sets using Windows 3.1.

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Introduction

These release notes contain the following sections:

- Feature Pack Descriptions, page 2
- Memory Requirements and Upgrades, page 3
- Cisco IOS Release 11.1 (7)AA Feature Sets for Cisco 3600 Series Routers, page 4
- Installing the Router Software Using Microsoft Windows 3.1, page 7
- Additional Release Note Information, page 15
- About Cisco IOS Software Electronic Documentation, page 15
- Cisco Connection Online, page 16

Feature Pack Descriptions

This section describes the feature packs, and lists the software feature sets in each pack. You can use this information to identify your feature pack together with the information in Table 4, “Cisco IOS Release 11.1(7)AA Feature Sets for Cisco CPA3620 and CPA3640 Routers” on page 4.

Software Feature Packs

Table 1 identifies each feature pack as specified on the label of the CD containing the router software. It also lists the feature sets comprising the feature pack, giving the DOS and UNIX filenames of the images. The table provides a brief description of each feature set and the router platform on which the feature set runs.

Table 1 Feature Pack Feature Sets for Cisco 3600 Series Routers

Feature Sets Included	DOS Filename	UNIX Filename	Description
IP Feature Pack Release 11.1 (part number CD362-A-11.1=)			
IP	80128601.bin	cpa3620-i-mz.111-7AA	IP feature set for Cisco 3620
IP/IPX IBM Feature Pack Release 11.1 (part number CD362-DS-11.1=)			
IP/IPX IBM	80128701.bin	cpa3620-inr-mz.111-7AA	IP/IPX IBM feature set for Cisco 3620
IP/IPX AppleTalk Feature Pack Release 11.1 (part number CD362-B-11.1=)			
IP/IPX/AppleTalk	80129101.bin	cpa3620-d-mz-111.7AA	IP/IPX/AppleTalk feature set for Cisco 3620
Desktop Feature Pack Release 11.1 (part number CD362-F-11.1=)			
Desktop	80132401.bin	cpa3620-d-mz.111-7.AA	Desktop feature set for Cisco 3620
Enterprise Feature Pack Release 11.1 (part number CD362-G-11.1=)			
Enterprise	80132501.bin	cpa3620-j-mz.111-7.AA	Enterprise feature set for Cisco 3620
IP Feature Pack Release 11.1 (part number CD364-A-11.1=)			
IP	80128801.bin	cpa3640-i-mz.111-7.AA	IP feature set for Cisco 3640
IP/IPX AppleTalk Feature Pack Release 11.1 (part number CD364-B-11.1=)			
IP/IPX/AppleTalk	80128901.bin	cpa3640-d-mz.111-7.AA	IP/IPX/AppleTalk feature set for Cisco 3640

Feature Sets Included	DOS Filename	UNIX Filename	Description
IP/IPX IBM Feature Pack Release 11.1 (part number CD364-DS-11.1=)			
IP/IPX IBM	80129001.bin	cpa3640-inr-mz.111-7.AA	IP/IPX IBM feature set for Cisco 3640
Desktop Feature Pack Release 11.1 (part number CD364-F-11.1=)			
Desktop	80132601.bin	CPA3640-d-mz-111-7.AA	Desktop feature set for Cisco 3640
Enterprise Feature Pack Release 11.1 (part number CD364-G-11.1=)			
Enterprise	80132701.bin	CPA3640-j-mz.111-7.AA	Enterprise feature set for Cisco 3640

Memory Requirements and Upgrades

Table 2 shows the amounts of both Flash and DRAM required by Cisco 3600 feature sets. Table 3 lists factory default memory and the upgrade options that are available.

Table 2 CPA3620 and CPA3640 Feature Set Memory Requirements

Feature Set	DRAM	Flash Memory
IP	16 MB (default)	4 MB (default)
IP/IPX IBM	16 MB (default)	4 MB (default)
IP/IPX/AT	16 MB (default)	4 MB (default)
Desktop	16 MB (default)	4 MB (default)
Enterprise	24 MB (upgrade)	4 MB (default)

Table 3 CPA3620 and CPA3640 Default Memory and Upgrade Options

Router Type	Memory Type	Default	Upgrade Options
CPA3620 and CPA 3640	Flash	4 MB	8-MB-flash memory MEM3600-8FS
CPA3620	DRAM	16 MB	Expandable to 64 MB: 4-MB DRAM MEM3620-4D 8-MB DRAM MEM3620-8D 16-MB DRAM MEM3620-16D
CPA3640	DRAM	16 MB	Expandable to 128 MB: 4-MB DRAM MEM3640-4D 8-MB DRAM MEM3640-8D 16-MB DRAM MEM3640-16D 32-MB DRAM MEM3640-32D

Special Note for Routers with ISDN BRI or ISDN PRI Interfaces

Cisco 3600 series router memory is organized as one contiguous address space, which is divided into processor memory and I/O memory. System configurations with multiple ISDN PRI interfaces or 12 or more ISDN BRI interfaces require more I/O memory than the default.

Cisco 3600 routers ship with a 75/25 I/O memory split. If your router has 2 ISDN PRI interfaces or more than 12 ISDN BRI interfaces, you must change the memory split to 60/40. Use the **memory-size iomem** command to reallocate memory, as follows:

`memory-size iomem 40`

For more information about the **memory-size iomem** command, see the *Configuration Notes for Cisco IOS Release 11.1* publication (part number 78-3939-xx) that shipped with your feature pack.

Cisco IOS Release 11.1 (7)AA Feature Sets for Cisco 3600 Series Routers

Table 4 lists specific features in categories of features that are supported on Cisco 3600 series routers. “Yes” indicates that this feature is supported; “–” indicates that this feature is not supported. You can use the information in this table together with the information provided in the section “Feature Pack Descriptions” on page 2 to determine which features a particular feature set supports on your router.

Table 4 Cisco IOS Release 11.1(7)AA Feature Sets for Cisco CPA3620 and CPA3640 Routers

Features	IP	IP/IPX IBM	IP/IPX/AT	Desktop	Enterprise
LAN Support					
Apollo Domain	–	–	–	–	Yes
AppleTalk 1 and 2	–	–	Yes	Yes	Yes
Banyan VINES	–	–	–	–	Yes
Concurrent routing and bridging	Yes	Yes	Yes	Yes	Yes
DECnet IV	–	–	–	Yes	Yes
DECnet V	–	–	–	–	Yes
GRE tunneling	Yes	Yes	Yes	Yes	Yes
Integrated routing and bridging (IRB)	–	–	–	–	–
IP	Yes	Yes	Yes	Yes	Yes
LAN extension host	Yes	Yes	Yes	Yes	Yes
Multiring	Yes	Yes	–	Yes	Yes
Novell IPX	–	Yes	Yes	Yes	Yes
OSI	–	–	–	–	Yes
Source-route bridging	Yes	Yes	–	Yes	Yes
Transparent bridging	Yes	Yes	Yes	Yes	Yes
Translational bridging	Yes	Yes	Yes	Yes	Yes
XNS	–	–	–	–	Yes
WAN Services					
Asynchronous	Yes	Yes	Yes	Yes	Yes
Frame Relay	Yes	Yes	Yes	Yes	Yes
HDLC	Yes	Yes	Yes	Yes	Yes
IPXWAN 2.0	–	Yes	Yes	Yes	Yes
ISDN	Yes	Yes	Yes	Yes	Yes
PPP	Yes	Yes	Yes	Yes	Yes
SMDS	Yes	Yes	Yes	Yes	Yes
Switched 56	Yes	Yes	Yes	Yes	Yes

Features	IP	IP/IPX IBM	IP/IPX/AT	Desktop	Enterprise
X.25	Yes	Yes	Yes	Yes	Yes
SLIP asynchronous only	Yes	Yes	Yes	Yes	Yes
WAN Optimization					
Bandwidth-on-demand	Yes	Yes	Yes	Yes	Yes
Custom and priority queuing	Yes	Yes	Yes	Yes	Yes
Dial backup	Yes	Yes	Yes	Yes	Yes
Dial-on-demand	Yes	Yes	Yes	Yes	Yes
Header, link and payload compression	Yes	Yes	Yes	Yes	Yes
Snapshot routing	Yes	Yes	Yes	Yes	Yes
Weighted fair queuing	Yes	Yes	Yes	Yes	Yes
IPX and SPX spoofing	–	Yes	Yes	Yes	Yes
IP Routing					
AppleTalk SMRP Multicast	–	–	–	–	–
BGP	Yes	Yes	Yes	Yes	Yes
EGP	Yes	Yes	Yes	Yes	Yes
Enhanced IGRP	Yes	Yes	Yes	Yes	Yes
OSPF	Yes	Yes	Yes	Yes	Yes
OSPF On Demand Circuit	–	–	–	–	–
IP Multicast (PIM)	Yes	Yes	Yes	Yes	Yes
ES-IS	–	–	–	–	Yes
IGRP	Yes	Yes	Yes	Yes	Yes
IS-IS	–	–	–	–	Yes
Policy-based routing	Yes	Yes	Yes	Yes	Yes
RIP	Yes	Yes	Yes	Yes	Yes
RIP Version 2	Yes	Yes	Yes	Yes	Yes
Other Routing					
AURP	–	–	Yes	Yes	Yes
IPX RIP	–	Yes	Yes	Yes	Yes
NLSP	–	Yes	Yes	Yes	Yes
RTMP	–	–	Yes	Yes	Yes
SMRP	–	–	Yes	Yes	Yes
S RTP	–	–	–	–	Yes
Management					
AutoInstall	Yes	Yes	Yes	Yes	Yes
Automatic modem configuration	Yes	Yes	Yes	Yes	Yes
RMON events and alarms	Yes	Yes	Yes	Yes	Yes
SNMP	Yes	Yes	Yes	Yes	Yes
Telnet	Yes	Yes	Yes	Yes	Yes

Cisco IOS Release 11.1 (7)AA Feature Sets for Cisco 3600 Series Routers

Features	IP	IP/IPX IBM	IP/IPX/AT	Desktop	Enterprise
Security					
Access lists	Yes	Yes	Yes	Yes	Yes
Access security	Yes	Yes	Yes	Yes	Yes
Extended access lists	Yes	Yes	Yes	Yes	Yes
Kerberized login	–	–	–	–	Yes
Kerberos V client support	–	–	–	–	–
Lock and key	Yes	Yes	Yes	Yes	Yes
MAC security for hubs	–	–	–	–	–
MD5 routing authentication	Yes	Yes	Yes	Yes	Yes
RADIUS	–	–	–	–	Yes
TACACS+	Yes	Yes	Yes	Yes	Yes
IBM Support					
APPN	–	–	–	–	–
BAN for SNA Frame Relay support	–	Yes	–	–	Yes
Bisync	–	Yes	–	–	Yes
Caching and filtering	–	Yes	–	–	Yes
DLSw+	–	Yes	–	–	Yes
Downstream PU concentration (DSPU)	–	–	–	–	–
Frame Relay SNA Support (RFC 1490)	–	Yes	–	–	Yes
NetView Native Service Point	–	Yes	–	–	Yes
QLLC	–	Yes	–	–	Yes
SDLC integration	–	Yes	–	–	Yes
SDLC transport (STUN)	–	Yes	–	–	Yes
SDLC-to-LAN conversion (SDLLC)	–	Yes	–	–	Yes
SNA and NetBIOS WAN optimization via local acknowledgment	–	Yes	–	–	Yes
SRB/RSRB	–	Yes	–	–	Yes
SRT	–	Yes	–	–	Yes
TG/COS	–	–	–	–	Yes
Protocol Translation					
LAT	–	–	Yes	–	Yes
PPP	–	–	Yes	–	Yes
Rlogin	–	–	Yes	–	Yes
Telnet	–	–	Yes	–	Yes
TN3270	–	–	Yes	–	Yes
X.25	–	–	Yes	–	Yes
Remote Node					
ARAP 1.0/2.0	–	–	–	–	–
Asynchronous master interfaces	Yes	Yes	Yes	Yes	Yes
ATCP	–	–	Yes	Yes	Yes

Features	IP	IP/IPX IBM	IP/IPX/AT	Desktop	Enterprise
CHAP	Yes	Yes	Yes	Yes	Yes
CSLIP	Yes	Yes	Yes	Yes	Yes
DHCP	Yes	Yes	Yes	Yes	Yes
IP pooling	Yes	Yes	Yes	Yes	Yes
IPX and ARAP on virtual asynch interfaces	–	–	–	–	–
IPXCP	–	Yes	Yes	Yes	Yes
MacIP	–	–	Yes	Yes	Yes
NASl	–	Yes	Yes	Yes	Yes
NetBEUI over PPP	Yes	Yes	Yes	Yes	Yes
PPP	Yes	Yes	Yes	Yes	Yes
SLIP	Yes	Yes	Yes	Yes	Yes
Terminal Services					
LAT	–	–	Yes	–	Yes
Rlogin	Yes	Yes	Yes	Yes	Yes
Telnet	Yes	Yes	Yes	Yes	Yes
TN3270	–	–	Yes	–	Yes
X.25 PAD	Yes	Yes	Yes	Yes	Yes
Xremote	–	–	Yes	–	Yes

Installing the Router Software Using Microsoft Windows 3.1

In addition to the Cisco IOS feature sets, the CD-ROM also contains the router image loader, which you can use to download the software to the router. The router image loader is designed to work with a PC running Microsoft Windows 95. The booklet included with the CD-ROM explains how to perform this simple process. However, you cannot use the router image loader on a system running Microsoft Windows 3.1.

This section describes an alternative method you can use to install the router software from the CD-ROM onto the router using a PC running Microsoft Windows 3.1. The process requires that you first obtain a Trivial File Transfer Protocol (TFTP) application or a remote copy protocol (rcp) application, which you can use to set up your PC as a TFTP server or an rcp server. You can use either the **copy tftp flash** or **copy rcp flash** command to download the router software images to the router from a system running Microsoft Windows 3.1.

Note If you do not already have a TFTP or rcp application, you can choose from a number of TFTP or rcp applications that are available from independent software vendors. In addition, a number of TFTP programs are available as shareware from public sources on the World Wide Web.

Installation Process

This section provides steps that describe how to install the router software using a Microsoft Windows 3.1 PC with a TFTP application. To install the software using an rcp application, follow the procedure and substitute rcp for TFTP in the instructions. You must also substitute the **copy rcp flash** command for the **copy TFTP flash** command in Step 6.

- Step 1** Install the TFTP application on the PC.
- Step 2** Launch the TFTP application on the PC. You commonly do this by double-clicking the application icon or its filename.
- Step 3** Set up the PC as a TFTP server using the TFTP application setup or configuration facility.

The user interface of most TFTP applications includes a setup facility that allows you to specify the PC as a server. For example, from the TFTP menu of one application, you can select **Settings** to display a panel that includes a checkbox beside the word Server. To configure the local PC as a server, you click in this checkbox.



Caution Be certain to set up your local PC as a TFTP server. If you overlook this step, you will not be able to perform the copy procedure. This reminder also applies if you are using rcp on your system instead of TFTP.

- Step 4** Establish a console session from your local PC (which is now configured as a TFTP server) to the Cisco router.

You can do this in either of two ways:

- Connect the PC's COM port to the router's console port.

This is the recommended method. If you use this method, when you reload the router to cause the image to take effect in Step 11, you will remain connected to the router. (Using Telnet, you will lose connection to the router at that point in the process.)

- Establish a Telnet session from the PC to the router.

- Step 5** Connect your PC's Ethernet port to the router's Ethernet port using the 10BaseT crossover cable provided.

Note Use straight-through cables if you are connecting by means of a 10BaseT hub.

- Step 6** At the router prompt, enter the following command to copy the new software image from the CD-ROM drive of the PC to the router:

```
# copy tftp flash
```

Note If you are using rcp, enter **copy rcp flash** instead.

- Step 7** When prompted, enter the IP address of your local Microsoft Windows 3.1-based PC as in the following example:

```
Address or name of remote host [255.255.255.255]? 131.108.1.1
```


This is the IP address of your local PC not the router.

- Step 8** When prompted, enter the full path name of the image to be copied to the router as in the following example:

```
Source file name? d:\images\cisco.mz
```

- Step 9** In response to the prompt, enter the destination filename and press **Enter** to indicate that you want to copy the image:

```
Destination file name [d:\images\cisco.mz]?cisco.mz
```

(This is the location and name of the image file on the router, not the full path name of the image on the CD-ROM attached to the PC.)

During the transfer process, the software displays messages indicating that it has accessed the file you have specified and is loading it.

- Step 10** Enter **Yes** or **No** in response to the prompt asking if you want to erase the existing image copy resident in the router's Flash memory before copying the new one:

```
Erase flash device before writing? [confirm] yes
```

When copying to internal Flash memory, the system provides an option to erase existing internal Flash memory before writing onto it. The entire copying process takes several minutes and differs from network to network.

The exclamation point (!) indicates that the copy process is taking place. Each exclamation point (!) indicates that ten packets have been transferred successfully. A series of "V" characters indicates that a checksum verification of the image is occurring after the image is written to Flash memory.

- Step 11** Enter the **reload** command to reload the router:

```
# reload
```

Command Reference Pages for rcp and TFTP

This section includes reference pages providing detailed information about the **copy rcp flash** and **copy tftp flash** commands. This information supplements the information provided in the steps described earlier in the section "Installation Process," page 8.

copy rcp flash

To copy a file from a network server to the router or to another destination using rcp, use the **copy rcp flash EXEC** command.

copy rcp flash

Syntax Description

flash Specifies internal Flash memory as the destination of the copy operation.

Command Mode

EXEC

Usage Guidelines

The rcp protocol requires that a client send the remote username of an rcp request to the server. When you issue the **copy rcp flash** command, by default the Cisco IOS software sends the username associated with the current teletype (TTY), if that name is valid. For example, if the user is connected to the router through Telnet and the user was authenticated through the **username** command, then the software sends that username as the remote username.

Note For Cisco, TTY lines are commonly used for access services. The concept of TTY originated with UNIX. For UNIX systems, each physical device is represented in the file system. Terminals are called TTY devices, which stands for teletype, the original UNIX terminal.

If the TTY username is invalid, the software uses the host name as the both the remote and local usernames. To specify a different remote username to be sent to the rcp server, use the **ip rcmd remote-username** command. You can also specify the path of an existing directory along with the remote username.



Caution The remote username must be associated with an account on the destination server. If you do not use the **ip rcmd remote-username** command to specify the name of a remote user associated with an account on the server, then the remote username associated with the current TTY process must be associated with an account on the server. If there is no username for the current TTY process, then the host name must be associated with an account on the server. If the network administrator of the destination server did not establish accounts for the remote username used, this command will not execute successfully when a default remote username is used.

If you copy a system image from a personal computer used as a file server, the remote host computer must support the remote shell (rsh) protocol.

Use the **copy rcp flash** command to copy a system image from a network server to the router's internal Flash memory using rcp. The Cisco IOS software prompts for the address of the rcp server and rcp filename. When you issue this command, the system provides an option to erase existing Flash memory before writing onto it. The entire copying process takes several minutes and differs from network to network.

Before booting from Flash memory, verify that the checksum of the image in internal Flash memory matches the checksum listed in the README file distributed with the system software image. The checksum of the image in Flash memory is displayed at the bottom of the screen when you issue the **copy rcp flash** command. The README file was copied to the rcp server automatically when you installed the system software image.



Caution If the checksum value does not match the value in the README file, do not reboot the router. Reissue the **copy rcp flash** command and compare the checksums again. If the checksum is repeatedly wrong, copy the original system software image back into Flash memory *before* you reboot the router from Flash memory. If you have a corrupted image in Flash memory and try to boot from Flash memory, the router starts the system image contained in ROM (assuming booting from a network server is not configured). If ROM does not contain a fully functional system image, the router cannot function and must be reconfigured through a direct console port connection.

Examples

The following example shows how to use the **copy rcp flash** command on a Cisco 4500 router. The interface might differ slightly on other systems. This example copies a system image named file1 from the netadmin1 directory on the remote server named SERVER1.CISCO.COM with an IP address of 131.108.101.101 to Flash memory. To ensure that enough Flash memory is available to accommodate the system image to be copied, the Cisco IOS software allows you to erase the contents of Flash memory first.

```
Router1# configure terminal

Router1(config)# rcmd remote-username netadmin1
Router(config)# Ctrl-Z
Router# copy rcp flash

System flash directory, partition 2:
File Length Name/status
  1   984   file1 [deleted]
  2   984   file1
[2096 bytes used, 8386512 available, 8388608 total]
Address or name of remote host [255.255.255.255]? 131.108.101.101
Source file name? file1
Destination file name [file1]?
Accessing file 'file1' on 131.108.101.101...
Loading dirt/ssangiah/file1 .from 131.108.101.101 (via Ethernet0): ! [OK]

Erase flash device before writing? [confirm]
Flash contains files. Are you sure you want to erase? [confirm]

Copy 'file1' from server
  as 'file1' into Flash WITH erase? [yes/no] yes
Erasing device... eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee ..erased
Loading file1 from 131.108.101.101 (via Ethernet0): !
[OK - 984/8388608 bytes]

Verifying checksum... OK (0x14B3)
Flash copy took 0:00:01 [hh:mm:ss]
```

The following example shows sample output resulting from copying a system image into a partition of Flash memory. The system prompts only if there are two or more read/write partitions or one read-only and one read/write partition and dual Flash memory bank support in boot ROMs. If the partition entered is not valid, the process terminates. You have the option to enter a partition number, a question mark (?) for a directory display of all partitions, or a question mark and a number (?number) for a directory display of a particular partition. The default is the first read/write partition.

```
Router# copy rcp flash

System flash partition information:
Partition  Size    Used    Free    Bank-Size  State      Copy-Mode
  1         4096K   2048K   2048K   2048K      Read Only  RXBOOT-FLH
  2         4096K   2048K   2048K   2048K      Read/Write Direct

[Type ?<no> for partition directory; ? for full directory; q to abort]
Which partition? [default = 2]
```

If the partition is read-only and has dual Flash memory bank support in boot ROMs, the session continues as follows:

```
**** NOTICE ****

Flash load helper v1.0
This process will accept the copy options and then terminate
the current system image to use the ROM based image for the copy.
Routing functionality will not be available during that time.
```

If you are logged in via telnet, this connection will terminate.
Users with console access can see the results of the copy operation.

---- ***** ----

```
Proceed? [confirm]
System flash directory, partition 1:
File Length Name/status
  1  3459720 master/igs-bfpx.100-4.3
[3459784 bytes used, 734520 available, 4194304 total]
Address or name of remote host [255.255.255.255]? 131.108.1.1
Source file name? master/igs-bfpx-100.4.3
Destination file name [default = source name]?
```

The file will be copied into the partition given earlier by the user:

```
Loading master/igs-bfpx.100-4.3 from 131.108.1.111: !
Erase flash device before writing? [confirm]
Flash contains files. Are you sure? [confirm]
Copy 'master/igs-bfpx.100-4.3' from TFTP server
as 'master/igs-bfpx.100-4.3' into Flash WITH erase? [yes/no] yes
```

If the partition is read/write, the session continues as follows:

```
System flash directory, partition 2:
File Length Name/status
  1  3459720 master/igs-bfpx.100-4.3
[3459784 bytes used, 734520 available, 4194304 total]
Address or name of remote host [255.255.255.255]? 131.108.1.1
Source file name? master/igs-bfpx.100-4.3
Destination file name [default = source name]?
```

The file will be copied into the partition given earlier by the user:

```
Accessing file 'master/igs-bfpx.100-4.3' on ABC.CISCO.COM...
Loading master/igs-bfpx.100-4.3 from 131.108.1.111: !
Erase flash device before writing? [confirm]
Flash contains files. Are you sure? [confirm]
Copy 'master/igs-bfpx.100-4.3' from TFTP server
as 'master/igs-bfpx.100-4.3' into Flash WITH erase? [yes/no] yes
```

Related Commands

- boot config**
- boot system flash**
- cd**
- copy flash rcp**
- ip rcmd remote-username**
- verify flash**

copy tftp flash

To copy a file from a TFTP server to the router or to another destination, use the **copy tftp flash** EXEC command.

copy tftp flash

Syntax Description

flash Specifies internal Flash memory as the destination of the copy operation.

Command Mode

EXEC

Usage Guidelines

The system prompts for the address of the TFTP server and TFTP filename if you do not provide them at the command line. When copying to internal Flash memory, the system provides an option to erase existing internal Flash memory before writing onto it. The entire copying process takes several minutes and differs from network to network.

Before booting from Flash memory, verify that the checksum of the image in Flash memory matches the checksum listed in the README file distributed with the system software image. The checksum of the image in Flash memory is displayed at the bottom of the screen when you issue the **copy tftp flash** command. The README file was copied to the TFTP server automatically when you installed the system software image.



Caution If the checksum value is not correct according to the value in the README file, do not reboot the router. Issue the **copy tftp flash** command and compare the checksums again. If the checksum is repeatedly wrong, copy the original system software image back into Flash memory *before* you reboot the router from Flash memory. If you have a corrupted image in Flash memory and try to boot from Flash memory, the router starts the system image contained in ROM (assuming booting from a network server is not configured). If ROM does not contain a fully functional system image, the router cannot function and must be reconfigured through a direct console port connection.

Examples

The following example shows sample output of copying a system image named file1 into Flash memory:

```
Router# copy tftp flash

System flash directory, partition 2:
File Length Name/status
  1  984  file1 [deleted]
  2  984  file1
[2096 bytes used, 8386512 available, 8388608 total]
Address or name of remote host [255.255.255.255]? 223.255.254.254
Source file name? file1
Destination file name [file1]?
Accessing file 'file1' on 223.255.254.254...
Loading dirt/ssangiah/file1 .from 223.255.254.254 (via Ethernet0): - [OK]
```

```

Erase flash device before writing? [confirm]
Flash contains files. Are you sure you want to erase? [confirm]

Copy 'file1' from server
  as 'file1' into Flash WITH erase? [yes/no] yes
Erasing device... eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee ..erased
Loading file1 from 223.255.254.254 (via Ethernet0): !!!!!...
[OK - 984/8388608 bytes]

Verifying checksum... OK (0x14B3)
Flash copy took 0:00:01 [hh:mm:ss]

```

The exclamation point (!) indicates that the copy process is taking place. Each exclamation point (!) indicates that ten packets have been transferred successfully. A series of “V” characters indicates that a checksum verification of the image is occurring after the image is written to Flash memory.

The following example shows sample output resulting from copying a system image into a partition of Flash memory. The system will prompt only if there are two or more read/write partitions or one read-only and one read/write partition and dual Flash memory bank support in boot ROMs. If the partition entered is not valid, the process terminates. You can enter a partition number, a question mark (?) for a directory display of all partitions, or a question mark and a number (?*number*) for directory display of a particular partition. The default is the first read/write partition.

```

Router# copy tftp flash

System flash partition information:
Partition  Size  Used  Free  Bank-Size  State  Copy-Mode
   1         4096K  2048K  2048K  2048K      Read Only  RXBOOT-FLH
   2         4096K  2048K  2048K  2048K      Read/Write  Direct

[Type ?<no> for partition directory; ? for full directory; q to abort]
Which partition? [default = 2]

```

If the partition is read-only and has dual Flash memory bank support in boot ROMs, the session continues as follows:

```

          **** NOTICE ****

Flash load helper v1.0
This process will accept the copy options and then terminate
the current system image to use the ROM based image for the copy.
Routing functionality will not be available during that time.
If you are logged in via telnet, this connection will terminate.
Users with console access can see the results of the copy operation.
          ---- ***** ----

Proceed? [confirm]
System flash directory, partition 1:
File Length Name/status
   1  3459720 master/igs-bfpx.100-4.3
[3459784 bytes used, 734520 available, 4194304 total]
Address or name of remote host [255.255.255.255]? 131.108.1.1
Source file name? master/igs-bfpx-100.4.3
Destination file name [default = source name]?

```

The file will be copied into the partition given earlier by the user:

```

Loading master/igs-bfpx.100-4.3 from 131.108.1.111: !
Erase flash device before writing? [confirm]
Flash contains files. Are you sure? [confirm]
Copy 'master/igs-bfpx.100-4.3' from TFTP server
as 'master/igs-bfpx.100-4.3' into Flash WITH erase? [yes/no] yes

```

If the partition is read/write, the session continues as follows:

```

System flash directory, partition 2:

```

```

File Length Name/status
  1 3459720 master/igs-bfpx.100-4.3
[3459784 bytes used, 734520 available, 4194304 total]
Address or name of remote host [255.255.255.255]? 131.108.1.1
Source file name? master/igs-bfpx.100-4.3
Destination file name [default = source name]?

```

The file will be copied into the partition given earlier by the user:

```

Accessing file 'master/igs-bfpx.100-4.3' on ABC.CISCO.COM...
Loading master/igs-bfpx.100-4.3 from 131.108.1.111: !
Erase flash device before writing? [confirm]
Flash contains files. Are you sure? [confirm]
Copy 'master/igs-bfpx.100-4.3' from TFTP server
as 'master/igs-bfpx.100-4.3' into Flash WITH erase? [yes/no] yes

```

Related Commands

```

copy flash tftp
verify
verify flash

```

Additional Release Note Information

For detailed information about this software release, see the Cisco IOS release notes shipped with your router and also located on the Documentation CD-ROM. Information about the feature pack described in this release note includes the following:

- New features
- Important notes
- Caveats

Note The release notes shipped with your router are designed as reference material. The feature pack release notes (this document) should be sufficient for installing your software.

About Cisco IOS Software Electronic Documentation

Cisco IOS software documentation is provided on the Documentation CD that is included with your feature pack. Documentation about Cisco IOS Release 11.1(7)AA describes the software images included on the feature pack CD.

To locate this documentation, go to the Cisco Connection Documentation home page on the Web (www.cisco.com) or the CD, select **Cisco IOS Software Configuration**, and select **Cisco IOS Release 11.2**. The documentation is organized as follows:

- Release Notes—*Release Notes for Cisco IOS Release 11.1* and *Release Note and Updates to Cisco IOS Release 11.1AA*.
- Six modules that comprise the configuration guides and command references.
- Cisco IOS Support Documentation:
 - *Cisco IOS Command Summary*—summarizes the commands in the command reference publications. For each command, the summary provides complete syntax, the purpose of the command, and a description of each keyword and argument in the command syntax.

- *System Error Messages*—describes system error messages reported by Cisco IOS software.
- *Cisco Access Connection Guide*—explains how to use an access server or router to connect to network hosts.
- *Cisco Management Information Base (MIB) User Quick Reference*—describes the Cisco Systems private, or local, Management Information Base (MIB), which is provided with all Cisco software releases and with CiscoWorks router management software. A MIB file contains variables that can be set or read to provide information on network devices and interfaces. The Cisco MIB is a set of variables that are private extensions to the Internet standard MIB II.
- *Debug Command Reference*—provides information about using debug commands to troubleshoot your internetwork. The *Debug Command Reference* is intended for network administrators who already know how to configure a router and are familiar with all relevant network equipment.

- Caveats

Cisco IOS configuration guides describe system configuration and maintenance tasks and provide comprehensive configuration examples. The configuration guides do not include command syntax for every command, so you should use them in conjunction with the command references. The Cisco configuration guides give in-depth descriptions of configuration tasks.

Cisco IOS command references describe the commands necessary for configuring and maintaining your system. If you are new to Cisco software, you should use the Cisco command references in conjunction with the configuration guides to reference commands and detailed information pertaining to their use. If you are an experienced network administrator, you might want to use the Cisco command references as standalone manuals.

Cisco Connection Online

Cisco Connection Online (CCO) is Cisco Systems' primary, real-time support channel. Maintenance customers and partners can self-register on CCO to obtain additional information and services.

Available 24 hours a day, 7 days a week, CCO provides a wealth of standard and value-added services to Cisco's customers and business partners. CCO services include product information, product documentation, software updates, release notes, technical tips, the Bug Navigator, configuration notes, brochures, descriptions of service offerings, and download access to public and authorized files.

CCO serves a wide variety of users through two interfaces that are updated and enhanced simultaneously: a character-based version and a multimedia version that resides on the World Wide Web (WWW). The character-based CCO supports Zmodem, Kermit, Xmodem, FTP, and Internet e-mail, and it is excellent for quick access to information over lower bandwidths. The WWW version of CCO provides richly formatted documents with photographs, figures, graphics, and video, as well as hyperlinks to related information.

You can access CCO in the following ways:

- WWW: <http://www.cisco.com>
- WWW: <http://www-europe.cisco.com>
- WWW: <http://www-china.cisco.com>
- Telnet: cco.cisco.com
- Modem: From North America, 408 526-8070; from Europe, 33 1 64 46 40 82. Use the following terminal settings: VT100 emulation; databits: 8; parity: none; stop bits: 1; and connection rates up to 28.8 kbps.

For a copy of CCO's Frequently Asked Questions (FAQ), contact cco-help@cisco.com. For additional information, contact cco-team@cisco.com.

Note If you are a network administrator and need personal technical assistance with a Cisco product that is under warranty or covered by a maintenance contract, contact Cisco's Technical Assistance Center (TAC) at 800 553-2447, 408 526-7209, or tac@cisco.com. To obtain general information about Cisco Systems, Cisco products, or upgrades, contact 800 553-6387, 408 526-7208, or cs-rep@cisco.com.

This document is to be used in conjunction with the *Cisco IOS configuration guide* and *command reference* publications.

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