

# System Image, Microcode Image, and Configuration File Load Commands

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This chapter provides detailed descriptions of the commands used to load and copy system images, microcode images, and configuration files. Microcode images contain microcode to be downloaded to various hardware devices. System images contain the system software. Configuration files contain commands entered to customize the function of the router.

For router configuration information and examples, refer to the “Loading System Images, Microcode Images, and Configuration Files” chapter in the *Router Products Configuration Guide*.

## async-bootp

Use the **async-bootp** global configuration command to enable support for extended BOOTP requests as defined in RFC 1084 when the router is configured for SLIP. Use the **no async-bootp** global configuration command to restore the default.

```
async-bootp tag [:hostname] data
no async-bootp
```

### Syntax Description

- tag*                      Item being requested; expressed as filename, integer, or IP dotted-decimal address. See Table 3-1 for possible values.
  
- :hostname*                (Optional) This entry applies only to the host specified. The argument *:hostname* accepts both an IP address and a logical host name.
  
- data*                      List of IP addresses entered in dotted-decimal notation or as logical host names, a number, or a quoted string.

**Table 3-1 Async-BOOTP Tag Keywords**

Keyword	Description
<b>bootfile</b>	Specifies use of a server boot file from which to download the boot program. Use the optional <i>:hostname</i> and <i>data</i> arguments to specify the filename.
<b>subnet-mask</b> <i>mask</i>	Dotted-decimal address specifying the network and local subnetwork mask (as defined by RFC 950).
<b>time-offset</b> <i>offset</i>	Signed 32-bit integer specifying the time offset of the local subnetwork in seconds from Universal Coordinated Time (UTC).
<b>gateway</b> <i>address</i>	Dotted-decimal address specifying the IP addresses of gateways for this subnetwork. A preferred gateway should be listed first.
<b>time-server</b> <i>address</i>	Dotted-decimal address specifying the IP address of time servers (as defined by RFC 868).
<b>IEN116-server</b> <i>address</i>	Dotted-decimal address specifying the IP address of name servers (as defined by IEN 116).
<b>DNS-server</b> <i>address</i>	Dotted-decimal address specifying the IP address of Domain Name Servers (as defined by RFC 1034).
<b>log-server</b> <i>address</i>	Dotted-decimal address specifying the IP address of an MIT-LCS UDP log server.
<b>quote-server</b> <i>address</i>	Dotted-decimal address specifying the IP address of Quote of the Day servers (as defined in RFC 865).
<b>lpr-server</b> <i>address</i>	Dotted-decimal address specifying the IP address of Berkeley UNIX Version 4 BSD servers.
<b>impress-server</b> <i>address</i>	Dotted-decimal address specifying the IP address of Impress network image servers.

Keyword	Description
<b>rlp-server</b> <i>address</i>	Dotted-decimal address specifying the IP address of Resource Location Protocol (RLP) servers (as defined in RFC 887).
<b>hostname</b> <i>name</i>	The name of the client, which may or may not be domain qualified, depending upon the site.
<b>bootfile-size</b> <i>value</i>	A two-octet value specifying the number of 512-octet (byte) blocks in the default boot file.

### Default

If no extended BOOTP commands are entered, the router software generates a gateway and subnet mask appropriate for the local network.

### Command Mode

Global configuration

### Usage Guidelines

Use the EXEC command **show async-bootp** to list the configured parameters. Use the **no async-bootp** command to clear the list.

### Examples

The following example illustrates how to specify different boot files: one for a PC, and one for a Macintosh. With this configuration, a BOOTP request from the host on 128.128.1.1 results in a reply listing the boot filename as *pcboot*. A BOOTP request from the host named *mac* results in a reply listing the boot filename as *macboot*.

```
async-bootp bootfile :128.128.1.1 "pcboot"
async-bootp bootfile :mac "macboot"
```

The following example specifies a subnet mask of 255.255.0.0:

```
async-bootp subnet-mask 255.255.0.0
```

The following example specifies a negative time offset of the local subnetwork of -3600 seconds:

```
async-bootp time-offset -3600
```

The following example specifies the IP address of a time server:

```
async-bootp time-server 128.128.1.1
```

### Related Command

**show async-bootp**

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**b**

To manually boot the router, use the **b** ROM monitor command:

```
b  
b filename [ip-address]  
b flash [filename]  
b flash [device:][partition-number:][filename]  
b mop filename [mac-address] [interface]
```

### Syntax Description

<i>filename</i>	Name of the system image from which to netboot.
<i>ip-address</i>	(Optional) IP address of the TFTP server on which the system image resides. If omitted, this value defaults to the IP broadcast address of 255.255.255.255.
<b>flash</b> <i>filename</i>	(Optional) Boots the router from Flash memory with the optional filename of the image you want loaded. The filename is case sensitive. Without <i>filename</i> , the first valid file in Flash memory is loaded.
<i>device:</i>	(Optional) Valid value is <b>flash</b> .
<i>partition-number:</i>	(Optional) Boots the router from Flash memory with the optional filename of the image you want loaded from the specified Flash partition. If you do not specify a filename, the first valid file in the specified partition of Flash memory is loaded.
<i>filename</i>	(Optional) Boots the router from Flash memory with the filename of the image you want loaded from the specified Flash partition, if a partition is specified. If a partition is not specified, the system boots with the filename from the first partition. The filename is case sensitive. If you do not specify a filename, the first valid file in the specified partition of Flash memory is loaded.
<b>mop</b> <i>filename</i>	Boots the router interactively using MOP. The filename is the name of the file image to load. Note that for VMS systems, the file on the host always ends with the .SYS extension; do not include this extension as part of the file name.
<i>mac-address</i>	(Optional) Hardware address of the host from which to load the image. If omitted, a broadcast message is sent to all MOP boot servers, and the first MOP server to indicate that it has the file becomes the server from which the router load the image.
<i>interface</i>	(Optional) Interface from which the image is loaded. If omitted, a request is sent on all interfaces that have MOP enabled, and the interface that responds first is the one used to load the image.





## boot bootstrap

To configure the filename that is used to boot a secondary bootstrap image, use the **boot bootstrap** global configuration command. Use the **no boot bootstrap** command to disable booting from a secondary bootstrap image.

```
boot bootstrap flash filename
no boot bootstrap flash filename
```

```
boot bootstrap mop filename [mac-address] [interface]
no boot bootstrap mop filename [mac-address] [interface]
```

```
boot bootstrap [tftp] filename [ip-address]
no boot bootstrap [tftp] filename [ip-address]
```

### Syntax Description

<b>flash</b>	Indicates that the router will be booted from Flash memory.
<b>mop</b>	Indicates that the router will be netbooted from a system image stored on a DEC MOP server.
<b>tftp</b>	(Optional) Indicates that the router will be netbooted from a system image stored on a TFTP server.
<i>filename</i>	(Optional with <b>flash</b> .) Name of the system image from which you want to netboot. If you omit the filename when booting from Flash, the router uses the first system image stored in Flash memory.
<i>ip-address</i>	(Optional) IP address of the TFTP server on which the system image resides. If omitted, this value defaults to the IP broadcast address of 255.255.255.255.
<i>mac-address</i>	(Optional) MAC address of the MOP server on which the file resides. If the MAC address argument is not included, a broadcast message is sent to all MOP boot servers. The first MOP server to indicate that it has the file will be the server from which the router gets the boot image.
<i>interface</i>	(Optional) Interface out which the router should send MOP requests to reach the MOP server. The interface options are <b>async</b> , <b>dialer</b> , <b>Ethernet</b> , <b>loopback</b> , <b>null</b> , <b>serial</b> , and <b>tunnel</b> . If the interface argument is not specified, a request will be sent on all interfaces that have MOP enabled, and the interface from which the first response is received will be used to load the software.

### Default

No secondary bootstrap

### Command Mode

Global configuration

### Usage Guidelines

The **boot bootstrap** command, in conjunction with setting bit 9 on the configuration register of an AGS, CGS, or MGS router, causes the router to load a secondary bootstrap image over the network. The secondary bootstrap image then loads the specified system image file. The name of the secondary bootstrap file is boot-csc3 or boot-csc4, depending on the router model. See the appropriate hardware installation guide for details on the configuration register and secondary bootstrap filename.

Use this command when you have attempted to load a system image but have run out of memory even after compressing the system image. Secondary bootstrap allows you to load a larger system image through a smaller secondary image.

### Example

In the following example, the system image file *sysimage-2* will be loaded by using a secondary bootstrap image:

```
boot bootstrap sysimage-2
```



## boot buffersize

To modify the buffer size used to load configuration files, use the **boot buffersize** global configuration command. Use the **no boot buffersize** command to return to the default setting.

**boot buffersize** *bytes*  
**no boot buffersize**

### Syntax Description

*bytes* Specifies the size of the buffer to be used. There is no minimum or maximum size that can be specified.

### Default

Buffer size of the nonvolatile memory

### Command Mode

Global configuration

### Usage Guidelines

Normally, the router uses a buffer the size of the system nonvolatile memory to hold configuration commands read from the network. You can increase this size if you have a very complex configuration.

### Example

The following example sets the buffer size to 64000:

```
configure terminal
boot buffersize 64000
```

## boot host

To change the default name of the host configuration filename from which you want to load configuration commands, use the **boot host** global configuration command. Use the **no boot host** command to restore the host configuration filename to the default.

```
boot host mop filename [mac-address] [interface]
no boot host mop filename [mac-address] [interface]
```

```
boot host [tftp] filename [ip-address]
no boot host [tftp] filename [ip-address]
```

### Syntax Description

<b>mop</b>	Indicates that the router will be configured from a configuration file stored on a DEC MOP server.
<b>tftp</b>	(Optional) Indicates that the router will be configured from a configuration file stored on a TFTP server.
<i>filename</i>	Name of the file from which you want to load configuration commands.
<i>ip-address</i>	(Optional) IP address of the TFTP server on which the file resides. If omitted, this value defaults to the IP broadcast address of 255.255.255.255.
<i>mac-address</i>	(Optional) MAC address of the MOP server on which the file resides. If the MAC address argument is not included, a broadcast message is sent to all MOP boot servers. The first MOP server to indicate that it has the file will be the server from which the router gets the boot image.
<i>interface</i>	(Optional) Interface out which the router should send MOP requests to reach the MOP server. The interface options are <b>async</b> , <b>dialer</b> , <b>ethernet</b> , <b>serial</b> , and <b>tunnel</b> . If the interface argument is not specified, a request will be sent on all interfaces that have MOP enabled, and the interface from which the first response is received will be used to load the software.

### Default

The router uses its host name to form a host configuration filename. To form this name, the router converts its name to all lowercase letters, removes all domain information, and appends *-config*.

### Command Mode

Global configuration

### Usage Guidelines

Use the **service config** command to enable the loading of the specified configuration file at reboot time. Without this command, the router ignores the **boot host** command and uses the configuration information in NVRAM. If the configuration information in NVRAM is invalid or missing, the **service config** command is enabled automatically.

The network server will attempt to load two configuration files from remote hosts. The first is the network configuration file containing commands that apply to all network servers on a network. The second is the host configuration file containing commands that apply to one network server in particular.

### Example

The following example sets the host filename to *wilma-config* at address 192.31.7.19:

```
boot host /usr/local/tftpdire/wilma-config 192.31.7.19
```

### Related Commands

**boot network**  
**service config**

## boot network

To change the default name of the network configuration file from which you want to load configuration commands, use the **boot network** global configuration command. Use the **no boot network** command to restore the network configuration filename to the default.

```
boot network mop filename [mac-address] [interface]  
no boot network mop filename [mac-address] [interface]
```

```
boot network [tftp | rcp] filename [ip-address]  
no boot network [tftp | rcp] filename [ip-address]
```

### Syntax Description

<b>mop</b>	Configures the router to download the configuration file from a network server using the Digital MOP protocol.
<b>tftp</b>	(Optional) Configures the router to download the configuration file from a network server using TFTP. If omitted and <b>rcp</b> is not specified, defaults to <b>tftp</b> .
<b>rcp</b>	(Optional) Configures the router to download the configuration file from a network server using rcp. If omitted, defaults to <b>tftp</b> .
<i>filename</i>	Name of the file from which you want to load configuration commands. The default filename is <i>network-config</i> .
<i>ip-address</i>	(Optional) If <b>rcp</b> or <b>tftp</b> is specified, the IP address of the network server on which the compressed image file resides. If the IP address is omitted, this value defaults to the IP broadcast address of 255.255.255.255.
<i>mac-address</i>	(Optional) If <b>MOP</b> is specified, the MAC address of the network server on which the file resides. If the MAC address argument is not included, a broadcast message is sent to all MOP boot servers. The first server to indicate that it has the file will be the server from which the router gets the boot image.
<i>interface</i>	(Optional) If MOP is specified, interface out which the router should send MOP requests to reach the server. The interface options are <b>async</b> , <b>dialer</b> , <b>ethernet</b> , <b>serial</b> , and <b>tunnel</b> . If the interface argument is not specified, a request will be sent on all interfaces that have MOP enabled, and the interface from which the first response is received will be used to load the software.

### Default

The default filename is *network-config*. The default transfer protocol type is TFTP, if neither **tftp** nor **rcp** is specified.

### Command Mode

Global configuration

## Usage Guidelines

When booting from a network server, routers ignore routing information, static IP routes, and bridging information. As a result, intermediate routers are responsible for handling rcp or TFTP requests correctly. Before booting from a network server, verify that a server is available by using the **ping** command.

Use the **service config** command to enable the loading of the specified configuration file at reboot time. Without this command, the router ignores the **boot network** command and uses the configuration information in NVRAM. If the configuration information in NVRAM is invalid or missing, the **service config** command is enabled automatically.

The network server will attempt to load two configuration files from remote hosts. The first is the network configuration file containing commands that apply to all network servers on a network. Use the **boot network** command to identify the network configuration file.

The rcp software requires that a client send the remote username on each rcp request to the network server. When the **boot network rcp** command is executed, the router software sends the router host name as the both the remote and local usernames. The rcp implementation searches for the configuration files to be used relative to the account directory of the remote username on the network server, if the server has a directory structure, for example, as do UNIX systems.

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

## Examples

The following example changes the network configuration filename to *bridge\_9.1* and uses the default broadcast address:

```
boot network bridge_9.1
service config
```

The following example changes the network configuration filename to *bridge\_9.1*, specifies that rcp is to be used as the transport mechanism, and gives 131.108.1.111 as the IP address of the server on which the network configuration file resides:

```
boot network rcp bridge_9.1 131.108.1.111
service config
```

## Related Commands

**boot host**

**service config**

## boot system

To change the filename of the system image that is loaded onto the router at reboot time, use the **boot system** global configuration command. Use the **no boot system** command to remove the name.

```
boot system flash [filename]  
no boot system flash [filename]
```

```
boot system mop filename [mac-address] [interface]  
no boot system mop filename [mac-address] [interface]
```

```
boot system rom  
no boot system rom
```

```
boot system [tftp | rcp] filename [ip-address]  
no boot system [tftp | rcp] filename [ip-address]
```

```
boot system flash [device:][partition-number:][filename]
```

```
no boot system
```

### Syntax Description

<b>flash</b>	Indicates that the router will be booted from Flash memory.
<b>mop</b>	Indicates that the router will be booted from a system image on a network server using MOP.
<b>rom</b>	Indicates that the router will be booted from ROM.
<b>rcp</b>	(Optional) Indicates that the router will be booted from a system image stored on a network server using rcp. If the keywords <b>tftp</b> and <b>rcp</b> are omitted, defaults to <b>tftp</b> .
<b>tftp</b>	(Optional) Indicates that the router will be booted from a system image stored on a network server using TFTP. If the keywords <b>tftp</b> and <b>rcp</b> are omitted, defaults to <b>tftp</b> .
<i>filename</i>	(Optional with <b>flash</b> ) Name of the configuration file from which you want to netboot. It is case sensitive.
<i>ip-address</i>	(Optional) For TFTP or rcp, the IP address of the server on which the image file resides. Defaults to the IP broadcast address of 255.255.255.255.
<i>mac-address</i>	(Optional) If MOP is used, the MAC address of the server on which the file resides. If the MAC address argument is not included, a broadcast message is sent to all MOP boot servers. The first server to indicate that it has the file will be the server from which the router gets the boot image.
<i>interface</i>	(Optional) Interface out which the router should send MOP requests to reach the server. The interface options are <b>async</b> , <b>dialer</b> , <b>ethernet</b> , <b>serial</b> , and <b>tunnel</b> . If the interface argument is not specified, a request will be sent on all interfaces that have MOP enabled, and the interface from which the first response is received will be used to load the software.

- device:* (Optional) Valid value is **flash**.
- partition-number:* (Optional) Boots the router from Flash memory with the optional filename of the image you want loaded from the specified Flash partition. If you do not specify a filename, the first valid file in the specified partition of Flash memory is loaded.
- filename* (Optional) Boots the router from Flash memory with the filename of the image you want loaded from the specified Flash partition. The filename is case sensitive. If you do not specify a filename, the first valid file in the specified partition of Flash memory will be loaded.

### Default

If you do not specify a system image file with the **boot system** command, the router uses the configuration register settings to determine the default system image filename for netbooting. The router forms the default boot filename by starting with the word *cisco* and then appending the octal equivalent of the boot field number in the configuration register, followed by a hyphen, and the processor type name (*cisconn-cpu*). See the appropriate hardware installation guide for details on the configuration register and default filename. See also the command **config-register**. See also the Syntax Description section preceding this section. See also the command **config-register**.

The default transfer protocol type is TFTP, if neither TFTP or rcp is specified.

### Command Mode

Global configuration

### Usage Guidelines

In order for this command to work, the **config-register** command must be set properly.

Enter several **boot system** commands to provide a fail-safe method for booting your router. Use the **boot system rom** command to specify use of the ROM system image as a backup to other **boot** commands in the configuration. You can enter the different types of **boot system** commands in any order. The router attempts to load from Flash memory first, then from a network server using rcp, TFTP, or MOP, and finally from ROM. If you enter multiple boot commands of the same type—for example, if you enter two commands that instruct the router to boot from different network servers—then the router tries them in the order they are entered.

Each time you write a new software image to Flash memory, you must delete the existing filename in the configuration file with the **no boot system flash filename** command. Then add a new line in the configuration file with the **boot system flash filename** command.

---

**Note** The **no boot system** global configuration command disables all **boot system** configuration commands regardless of argument. Specifying the **flash** keyword or the *filename* argument with the **no boot system** command disables only the command specified by these arguments.

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You can boot from a compressed image on a network. When booting software from a network server, the image being booted and the running image must both fit into memory. Use compressed images to ensure that there is enough available memory to boot the router. You can produce a compressed software image on any UNIX platform using the `compress` command. Refer to your UNIX platform's documentation for the exact usage of the `compress` command. (You can also uncompress data with the UNIX `uncompress` command.)

The rcp protocol requires that a client send the remote username on an rcp request to a server. When the `boot system rcp` command is executed, by default the router software sends the router host name as the both the remote and local usernames. The rcp software searches for the system image to be booted from the remote server relative to the directory of the remote username, if the server has a directory structure, for example, as do UNIX systems.

### Examples

The following example shows a list specifying two possible internetwork locations for a system image, with the ROM software being used as a backup. When the system image is booted from either of the internetwork locations, TFTP is used as the transport mechanism.

```
boot system cs3-rx.90-1 192.31.7.24
boot system cs3-rx.83-2 192.31.7.19
boot system rom
```

The following example boots the system boot relocatable image file `igs-bpx-1` from partition 2 of the Flash device.

```
boot system flash flash:2:igs-bpx-1
```

### Related Commands

- `config-register`
- `copy flash rcp`
- `copy flash tftp`
- `copy rcp flash`
- `copy tftp flash`
- `rcmd remote-username`



## config-register

To change the router configuration register settings, use the **config-register** global configuration command.

**config-register** *value*

### Syntax Description

*value* Hexadecimal or decimal value that represents the 16-bit configuration register value you want to use the next time the router is restarted. The value range is from 0x0 to 0xFFFF (0 to 65535 in decimal).

### Default

For the router models without Flash memory, the default is 0x101, which causes the router to boot from ROM and the Break key to be ignored. For router models with Flash memory, the default is 0x10F, which causes the router to boot from Flash memory and the Break key to be ignored.

### Command Mode

Global configuration

### Usage Guidelines

This command applies only to the Cisco 2000, Cisco 3000, Cisco 4000 series, or to the Cisco 7000 series. All other models use a hardware configuration register.

The lowest four bits of the configuration register (bits 3, 2, 1, and 0) form the boot field. The boot field determines if the router boots manually, from ROM, or from Flash or the network. Bit 8 controls the console Break key; when set to 1, it causes the Break key to be ignored. The remaining bits control other features of the router and are typically set to 0.

To change the boot field value and leave all other bits set to their default values, follow these guidelines:

- If you set the configuration register value to 0x100, you must boot the operating system manually with the **b** command.
- If you set the configuration register value to 0x101, the router boots using the default ROM software.
- If you set the configuration register to any value from 0x102 to 0x10F, the router uses the boot field value to form a default boot filename for netbooting.

For more information about the configuration register bit settings and default filenames, see the appropriate router hardware installation guide.

### Example

In the following example, the configuration register is set to boot the system image from Flash memory:

```
config-register 0x010F
```

**Related Commands**

**boot system**

**o**

**show version**

## configure

To enter global configuration mode, use the **configure** privileged EXEC command. You must be in global configuration mode to enter global configuration commands.

```
configure {terminal | memory | network}
```

### Syntax Description

- terminal** Executes configuration commands from the terminal.
- memory** Executes the configuration commands stored in NVRAM.
- network** Retrieves the configuration commands stored in a file on a server.

### Default

None

### Command Mode

Privileged EXEC

### Usage Guidelines

If you do not specify **terminal**, **memory**, or **network**, the router prompts you for the source of configuration commands. After you enter the **configure** command, the system prompt changes from `<router-name>#` to `<router-name>(config)#`, indicating that you are in global configuration mode. To leave global configuration mode and return to the privileged EXEC prompt, press Ctrl-Z.

---

**Note** The commands **configure net network** and **configure net host** commands no longer clear line parameters.

---

### Examples

In the following example, the router is configured from the terminal:

```
Router# configure

Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
```

In the following example, the router is configured from the file *tokyo-confg* at IP address 131.108.2.155:

```
router1# configure network

Host or network configuration file [host]?
IP address of remote host [255.255.255.255]? 131.108.2.155
Name of configuration file [tokyo-confg]?
Configure using tokyo-confg from 131.108.2.155? [confirm] y
Booting tokyo-confg from 131.108.2.155:!! [OK - 874/16000 bytes]
```

**Related Commands**

**show configuration**

**write memory**

**write terminal**

## configure overwrite

To load a configuration file directly into NVRAM, use the **configure overwrite** privileged EXEC command.

**configure overwrite**

### Syntax Description

This command has no arguments or keywords.

### Default

Disabled

### Command Mode

Privileged EXEC

### Usage Guidelines

Use caution when entering the filename, because this command is not run through the parser. Also be careful not to load a file that is larger than NVRAM.

This command is useful if you are running an older version of software and are going to upgrade to a new IOS release. For example, if you have IOS Release 9.1 ROMs, you could save time by loading a 10.2 configuration file before you get the Release 10.2 software. That way, you will be ready to reboot when you receive the 10.2 software image.

This command also allows you to replace an entire old configuration, knowing that none of the old configuration will remain.

### Example

```
doc-ags+1# configure overwrite
Host or network configuration file [host]?
Address of remote host [255.255.255.255]?
Name of configuration file [doc-ags+1-confg]?
Configure using doc-ags+1-confg from 255.255.255.255? [confirm]
Loading doc-ags+1-confg...
```

## copy bootflash rcp

To use rcp to copy a bootstrap image from Flash memory on a Cisco 4500 router to a network server, use the **copy bootflash rcp** EXEC command.

### **copy bootflash rcp**

#### Syntax Description

This command has no arguments or keywords.

#### Command Mode

EXEC

#### Usage Guidelines

This command is supported on the Cisco 4500 router only. The copy of the bootstrap image can serve as a backup copy and also can be used to verify that the copy in Flash memory is the same as the original file on disk.

The rcp protocol requires that a client send the remote username on an rcp request to the server. When you issue the **copy bootflash rcp** command, by default the router software sends the remote username associated with the current TTY process, 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 router software sends that username as the remote username.

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**Note** For Cisco, TTYs are commonly used in communications servers. The concept of TTYs 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 router software uses the router 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 **rcmd remote-username** command. The rcp software copies the bootstrap image to the remote server relative to the directory of the remote username, if the server has a directory structure, for example, as do UNIX systems.



**Caution** The remote username must be associated with an account on the destination server. If you do not use the **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 router 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.

If you copy the bootstrap image to a personal computer used as a file server, the remote host computer must support the remote shell protocol.

## Example

The following example shows how to use this command on a Cisco 4500 router:

```
Router# rcmd remote-username netadmin1
Router# copy bootflash rcp
System flash directory:
File name/status
  1 btxx
[2076072 bytes used, 21080 bytes available]

Name of file to copy? btxx
Address or name of remote host [UNKNOWN]? 131.108.1.111
File name to write to? btxx
Verifying checksum for 'btxx' (file # 1)...[OK]

Writing btxx !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Router#
```

The exclamation points (!) indicate that the copy process is taking place. Each exclamation point (!) indicates that ten packets have been transferred successfully.

## Related Commands

**copy rcp bootflash**  
**rcmd remote-username**

## copy bootflash tftp

To copy a boot image from Flash memory to a TFTP server, use the **copy bootflash tftp** EXEC command.

### **copy bootflash tftp**

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Usage Guidelines

You can use this command only on routers that have two banks of Flash: one bank for the boot image and the second bank for the system image.

You might want to copy the boot image in order to save a backup copy of it or to verify that the copy in Flash is the same as on the original file.

### Example

The following example illustrates how to use this command:

```
Router# copy bootflash tftp
Boot flash directory:
File name/status
  1 c4500-xboot
[2557136 bytes used, 1637168 bytes available]

Address or name of remote host [255.255.255.255]? barney.cisco.com
Name of file to copy? c4500-xboot
Verifying checksum for 'c4500-xboot' (file # 1)... [OK]
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Router#
```

### Related Commands

- copy erase bootflash**
- copy mop bootflash**
- copy tftp bootflash**
- copy verify bootflash**
- show bootflash**



## copy erase bootflash

To erase the boot image in Flash memory, use the **copy erase bootflash EXEC** command.

**copy erase bootflash**

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Usage Guidelines

You can use this command only on routers that have two banks of Flash: one bank for the boot image and the second bank for the system image.

### Example

The following example erases the boot image in Flash memory:

```
copy erase bootflash
```

### Related Commands

**copy bootflash tftp**  
**copy mop bootflash**  
**copy tftp bootflash**  
**copy verify bootflash**  
**show bootflash**

## copy fffffff bootflash

To erase the boot image in Flash memory, use the **copy fffffff bootflash** EXEC command.

**copy fffffff bootflash**

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Usage Guidelines

You can use this command only on routers that have two banks of Flash: one bank for the boot image and the second bank for the system image.

This command is identical to the **copy erase bootflash** EXEC command.

### Example

The following example erases the boot image in Flash memory:

```
copy fffffff bootflash
```

### Related Command

**copy erase bootflash**

## copy flash rcp

To copy a system image from Flash memory to a network server using rcp, use the **copy flash rcp EXEC** command.

### copy flash rcp

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Usage Guidelines

You can use the copy of the system image as a backup copy. You can also use it to verify that the copy in Flash memory is the same as on the original file on disk.

The rcp protocol requires that a client send the remote username on each rcp request to the server. When you issue the **copy flash rcp** command, by default the router software sends the remote username associated with the current TTY process, 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 router software sends that username as the remote username

If the TTY username is invalid, the router software uses the router host name as the both the remote and local usernames.

---

**Note** For Cisco, TTYs are commonly used in communications servers. The concept of TTYs 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).

---

To specify a different remote username to be sent to the server, use the **rcmd remote-username** command. The rcp software copies the system image to the remote server relative to the directory of the remote username, if the server has a directory structure, for example, as do UNIX systems.



**Caution** The remote username must be associated with an account on the destination server. If you do not use the **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 router 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 if a default remote username is used.

If you copy the system image to a personal computer used as a file server, the computer must support the rsh protocol.

## Examples

The following example shows how to use this command on a Cisco 4500 router:

```
Router# configure terminal
Router# rcmd remote-username netadmin1
Ctrl-Z
Router# copy flash rcp
System flash directory:
File name/status
  1 gsxx
[2076072 bytes used, 21080 bytes available]

Name of file to copy? gsxx
Address or name of remote host [UNKNOWN]? 131.108.1.111
File name to write to? gsxx
Verifying checksum for 'gsxx' (file # 1)...[OK]

Writing gsxx !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Router#
```

The exclamation points (!) indicate that the copy process is taking place. Each exclamation point (!) indicates that ten packets have been transferred successfully.

The following example illustrates how to use this command:

```
Router# copy flash rcp
IP address of remote host [255.255.255.255]? 101.2.13.110
Name of file to copy? gsxx
writing gsxx !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!copy complete
```

The following example illustrates how to use this command when copying from a particular partition of Flash memory.

```
Router# copy flash rcp
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 ?<number> for partition directory; ? for full directory; q to abort]
Which partition? [default = 1]
```

The system will prompt if there are two or more partitions. If the partition entered is not valid, the process terminates. You have the option to enter a partition number, ? for directory display of all partitions, or ?*number* for directory display of a particular partition. The default is the first partition.

```
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 [ABC.CISCO.COM]?
Source file name?
```

The file will be copied from the partition given by the user earlier.

```
Destination file name [default = source name]?
Verifying checksum for 'master/igs-bfpx.100-4.3' (file # 1)... OK
Copy 'master/igs-bfpx.100-4.3' from Flash to server
as 'master/igs-bfpx.100-4.3'? [yes/no] yes
```

**Related Commands**

**boot system flash**

**copy rcp flash**

**rcmd remote-username**

## copy flash tftp

To copy a system image from Flash memory to a TFTP server, use the **copy flash tftp** EXEC command.

### **copy flash tftp**

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Usage Guidelines

You can use the copy of the system image can serve as a backup copy. You can also use it to verify that the copy in Flash memory is the same as on the original file on disk.

### Examples

The following example illustrates how to use this command:

```
Router# copy flash tftp
IP address of remote host [255.255.255.255]? 101.2.13.110
Name of file to copy? gsxx
writing gsxx !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!copy complete
```

The following example illustrates how to use this command when copying from a particular partition of Flash memory.

```
Router# copy flash tftp
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 ?<number> for partition directory; ? for full directory; q to abort]
Which partition? [default = 1]
```

The system will prompt if there are two or more partitions. If the partition entered is not valid, the process terminates. You have the option to enter a partition number, ? for directory display of all partitions, or ?*number* for directory display of a particular partition. The default is the first partition.

```
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 [ABC.CISCO.COM]?
Source file name?
```

The file will be copied from the partition given by the user earlier.

```
Destination file name [default = source name]?
Verifying checksum for 'master/igs-bfpx.100-4.3' (file # 1)... OK
Copy 'master/igs-bfpx.100-4.3' from Flash to server
as 'master/igs-bfpx.100-4.3'? [yes/no] yes
```

**Related Commands**

**boot system flash**

**copy tftp flash**

## copy mop bootflash

To copy a boot image from a MOP server to Flash, use the **copy mop bootflash** EXEC command.

**copy mop bootflash**

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Usage Guidelines

You can use this command only on routers that have two banks of Flash: one bank for the boot image and the second bank for the system image.

The router prompts for the name of the image file. It provides an option to erase the existing boot image in Flash before writing the new image into Flash. If no free space is available, or if files have never been written to Flash memory, you must erase Flash memory before copying the MOP image.

You do not need to specify the address of a MOP server. The router automatically solicits a MOP boot server for the specified file by sending a multicast file-request message.

The copying process takes several minutes; the actual time 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 that was distributed with the boot software image. The checksum of the boot image in Flash memory is displayed when the **copy mop bootflash** command completes. The README file was copied to the MOP server automatically when you installed the boot software image.



**Caution** If the checksum values do not match, do not reboot the router. Instead, reissue the **copy mop bootflash** command and compare the checksums again. If the checksum is repeatedly wrong, copy the original boot software image back into Flash memory *before* you reboot the router from Flash memory.



## Example

The following example shows how to use this command to copy the boot image *c4500-k*:

```
Router# copy mop bootflash
System bootflash directory:
File  name/status
   1   c4500-k.101
[4529048 bytes used, 3859560 bytes available]

Name of file to copy? c4500-k.101-beta
Copy c4500-k.101-beta from MOP server? [confirm]
Erase flash device before writing? [confirm]
Are you sure? [confirm]
Erasing device... eeeeeeeeeevvvvvvvvv ... erased.

Loading c4500-k.101-beta from MOP server: !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!
```

## Related Commands

**copy bootflash tftp**  
**copy erase bootflash**  
**copy tftp bootflash**  
**copy verify bootflash**  
**show bootflash**

## copy mop flash

To use MOP to copy a system image to Flash memory, use the **copy mop flash** EXEC command.

### copy mop flash

#### Syntax Description

This command has no arguments or keywords.

#### Command Mode

EXEC

#### Usage Guidelines

MOP must be enabled on the relevant interfaces before you can use this command.

The router prompts for the MOP filename. It provides an option to erase existing Flash memory before writing onto it. The entire copying process takes several minutes and will differ 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 that was 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 mop flash** command.



**Caution** If the checksum value is not correct according to the value in the README file, do not reboot the router. Issue the **copy mop 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 bad image in Flash memory and try to boot from Flash, the router will start the system image contained in ROM (assuming netbooting is not configured). If ROM does not contain a fully functional system image, the router might not function and will have to be reconfigured through a direct console port connection.

#### Examples

The following example shows a sample output of the **copy mop flash** command. In this example, the system image *c4500-k*, which already exists in Flash memory, is copied to Flash, and there is enough memory to copy the file without erasing any existing files.

```
Router# copy mop flash
System flash directory:
File name/status
  1 old-c4500-k
[2557136 bytes used, 1637168 bytes available]

Name of file to copy ? c4500-k
Copy c4500-k from MOP server? [confirm] y
Erase flash device before writing? [confirm] n

Loading c4500-k from MOP server: !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!
```

In the following example, Flash memory has no space available for the MOP file.

```
Router# copy mop flash

Flash is filled to capacity.
Erasure is needed before flash may be written.
Erase flash before writing? [confirm]
```

If Flash memory is filled to capacity, the command terminates. If you enter a **y**, the erase process will start. If Flash is not filled to capacity and you enter **n** after the “Erase flash before writing?” prompt, the copy process continues.

---

**Note** Make sure you have enough Flash memory space before entering **n** at the “Erase flash before writing?” prompt. The Flash directory information displayed after you enter the **copy mop flash** command and before the prompts indicates the amount of free and total space in Flash memory.

---

The following example shows sample output of copying a system image into a partition of Flash memory.

```
Router# copy mop 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]
```

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 bank support in boot ROMs. If the partition entered is not valid, the process terminates. You have the option to enter a partition number, **?** for directory display of all partitions, or **?number** for directory display of a particular partition. The default is the first read/write partition.

If the partition is read-only and has dual Flash 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]
Source file name? master/igs-bfpx-100.4.3
Destination file name [default = source name]?
```

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

```
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 MOP 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]
Source file name? master/igs-bfpx.100-4.3
Destination file name [default = source name]?
```

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

```
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 MOP server
as 'master/igs-bfpx.100-4.3' into Flash WITH erase? [yes/no] yes
```

### Related Commands

- boot system flash**
- copy flash tftp**
- copy verify**

## copy rcp bootflash

To copy a bootstrap image from a network server to Flash memory on a Cisco 4500 router using rcp, use the **copy rcp bootflash** EXEC command.

### **copy rcp bootflash**

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Usage Guidelines

Use this command to copy a bootstrap image to Flash memory on a Cisco 4500 router. The router prompts for the name or address of the server and the name of the file to be copied. It provides an option to erase existing Flash memory before writing onto it, and allows you to confirm the erasure. The entire copying process takes several minutes and will differ from network to network.

Before loading the router from Flash memory, verify that the checksum of the bootstrap image in Flash memory matches the checksum listed in the README file that was distributed with the system software image.

The checksum of the bootstrap image in Flash memory is displayed at the bottom of the screen when you issue the **copy rcp bootflash** command. The README file was copied to the server automatically when you installed the system software.



**Caution** If the checksum value does not match the value in the README file, do not reboot the router. Issue the copy request and compare the checksums again. If the checksum is repeatedly wrong, copy the original bootstrap image back into Flash memory *before* you reboot the router from Flash memory. If you have a bad image in Flash memory and try to boot from Flash, the router will start the system image contained in ROM (assuming netbooting is not configured).

The rcp protocol requires that a client send the remote username on each rcp request to the rcp server. By default the router software sends the remote username associated with the current TTY process, 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 router software sends that username as the remote username

If the TTY username is invalid, the router software uses the router host name as the both the remote and local usernames.

---

**Note** For Cisco, TTYs are commonly used in communications servers. The concept of TTYs 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).

---

To specify a different remote username to be sent to the rcp server, use the **rcmd remote-username** command. The rcp software searches for the bootstrap image to copy from the remote server relative to the directory of the remote username, if the server has a directory structure, for example, as do UNIX systems.



**Caution** The remote username must be associated with an account on the destination server. If you do not use the **rcmd remote-username** command to specify the name of a remote user associated with an account on the server, then the router 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 if a default remote username is used.

If you copy the bootstrap image from a personal computer used as a file server, the computer must support the rsh protocol.

### Example

The following example shows how to use this command on a Cisco 4500 router:

```
Router# configure terminal
Router# rcmd remote-username netadmin1
Ctrl-Z
Router# copy rcp bootflash
System flash directory:
File name/status
  1 btxx
[2076072 bytes used, 21080 bytes available]

Address or name of remote host[UNKNOWN]? 131.108.1.111
Name of file to copy? btxx
Copy btxx from UTOPIA.CISCO.COM?[confirm]

Checking for file 'btxx' on UTOPIA.CISCO.COM...[OK]

Erase flash device before writing?[confirm]
Are you sure?[confirm]
Erasing device ...ezeeze...erased.

Connected to 131.108.1.111

Loading 2076007 byte file btxx:
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!![OK]

Verifying checksum... (0x87FD)...[OK]
Router#
```

The exclamation points (!) indicate that the copy process is taking place. Each exclamation point (!) indicates that ten packets have been transferred successfully.

### Related Commands

- boot system flash**
- copy flash rcp**
- rcmd remote-username**

## copy rcp flash

To copy a system image from a network server into Flash memory using rcp, use the **copy rcp flash EXEC** command.

### copy rcp flash

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Usage Guidelines

The router prompts for the name or address of the server and the name of the file to be copied using rcp. It provides an option to erase existing Flash memory before writing onto it, and allows you to confirm the erasure. The entire copying process takes several minutes and will differ 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 that was 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 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. Issue 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 bad image in Flash memory and try to boot from Flash, the router will start the system image contained in ROM (assuming netbooting is not configured). If ROM does not contain a fully functional system image, the router will not function and will have to be reconfigured through a direct console port connection.

The rcp protocol requires that a client send the remote username on each rcp request to the server. When you issue the **copy rcp flash** command, by default the router software sends the remote username associated with the current TTY process, 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 router software sends that username as the remote username.

---

**Note** For Cisco, TTYs are commonly used in communications servers. The concept of TTYs 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 router software uses the router 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 **rcmd remote-username** command. The rcp software copies the system image from the remote server relative to the directory of the remote username, if the server has a directory structure, for example, as do UNIX systems.



**Caution** The remote username must be associated with an account on the destination server. If you do not use the **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 router 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 if a default remote username is used.

If you copy the system image from a personal computer used as a file server, the remote host computer must support rcp.

### Example

The following example shows how to use this command on a Cisco 4500 system. The interface might differ slightly on other systems. This example copies a system image named *IJ09140z* from the *netadmin1* directory on the remote server named *SERVER1.CISCO.COM* with an IP address of 131.108.101.101 to the router's Flash memory. To ensure that enough Flash memory is available to accommodate the system image to be copied, the router software allows you to erase the contents of Flash memory first.

```
Router1# configure terminal
Router1# rcmd remote-username netadmin1
Ctrl-Z
Router# copy rcp flash
System flash directory:
File name/status
  1 IJ09140Z
[2076072 bytes used, 21080 bytes available]

Address or name of remote host[UNKNOWN]? 131.108.101.101
Name of file to copy? IJ09140Z
Copy IJ09140z from SERVER1.CISCO.COM?[confirm]

Checking for file 'IJ09140Z' on SERVER1.CISCO.COM...[OK]

Erase flash device before writing?[confirm]
Are you sure?[confirm]
Erasing device...ezeeze...erased.

Connected to 131.108.101.101

Loading 2076007 byte file IJ09140Z:
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!![OK]

Verifying checksum... (0x87FD)...[OK]
Router#
```



The exclamation points (!) indicate that the copy process is taking place. Each exclamation point (!) indicates that ten packets have been transferred successfully.

The following example shows sample output of copying a system image named *IJ09140Z* into Flash memory:

```

Router# copy rcp flash
IP address or name of remote host [255.255.255.255]? server1
Name of rcop filename to copy into flash []? IJ09140Z
copy IJ09140Z from 131.131.101.101 into flash memory? [confirm] <Return>
xxxxxxx bytes available for writing without erasure.
erase flash before writing? [confirm] <Return>
Clearing and initializing flash memory (please wait)###...
Loading from 101.2.13.110: !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!... [OK - 324572/524212 bytes]
Verifying checksum...
VVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVV...
Flash verification successful. Length = 1204637, checksum = 0x95D9
```

The exclamation points (!) indicate the copy process. The series of Vs in the sample output indicates that a checksum verification of the image is occurring after the image is written to Flash memory.

The following example shows sample output when copying a system image into a partition of Flash memory.

```

Router# copy rcop 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]
```

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 bank support in boot ROMs. If the partition entered is not valid, the process terminates. You have the option to enter a partition number, ? for directory display of all partitions, or ?*number* for directory display of a particular partition. The default is the first read/write partition.

If the partition is read-only and has dual Flash bank support in boot ROM, 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 by the user earlier:

```

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 by the user earlier:

```
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 system flash**
- copy flash rcp**
- rcmd remote-username**
- copy verify**

---

## copy rcp running-config

To use rcp to copy a configuration file from a network server to the router, then run that configuration, use the **copy rcp running-config** EXEC command.

**copy rcp running-config**

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Usage Guidelines

Use this command to copy either a host configuration file or a network configuration file from a remote server to the router using rcp, load the configuration file into RAM, and run it on the router.

The router software allows you to specify the type of configuration file to be copied. Accept the default value of *host* to copy and load a host configuration file containing commands that apply to one network server in particular. Enter a value for *network* to copy and load a network configuration file containing commands that apply to all network servers on a network.

The rcp protocol requires that a client send the remote username on each rcp request to a server. When you issue the **copy rcp running-config** command, by default the router software sends the remote username associated with the current TTY process, 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 router software sends that username as the remote username.

If the TTY username is invalid, the router software uses the router 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 **rcmd remote-username** command. The rcp protocol copies the configuration file from the remote server relative to the directory of the remote username, if the server has a directory structure, for example, as do UNIX systems.



**Caution** The remote username must be associated with an account on the destination server. If you do not use the **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 router 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 if a default remote username is used.

---

**Note** For Cisco, TTYs are commonly used in communications servers. The concept of TTYs 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 you copy the configuration file from a personal computer used as a file server, the computer must support the rsh protocol.

### Example

The following example shows how to use this command on a Cisco 4500 system. The interface might differ slightly on other systems. This example specifies a remote username of *netadmin1*. Then it copy and runs a host configuration file name *host1-config* from the *netadmin1* directory on the remote server with an IP address of 131.108.101.101:

```
Router# configure terminal
Router# rcmd remote-username netadmin1
Ctrl-Z
Router# copy rcp running-config
Host or network configuration file [host]?
Address of remote host [255.255.255.255]? 131.108.101.101
Name of configuration file [Router-config]? host1-config
Configure using host1-config from 131.108.101.101? [confirm]
Connected to 131.108.101.101
Loading 1112 byte file host1-config:![OK]
Router#
%SYS-5-CONFIG: Configured from host1-config by rcp from 131.108.101.101
```

### Related Commands

**copy running-config rcp**  
**rcmd remote-username**

## copy rcp startup-config

To copy a configuration file from a network server to the router's NVRAM using rcp, use the **copy rcp startup-config** EXEC command.

```
copy rcp startup-config
```

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Usage Guidelines

Use this command to retrieve the commands stored in a configuration file on a server and write them to a file of the same name stored in NVRAM on the router.

The router software allows you to specify the type of configuration file to be copied. Accept the default value of *host* to copy and store a host configuration file containing commands that apply to one network server in particular. Enter *network* to copy and store a network configuration file containing commands that apply to all network servers on a network.

The rcp protocol requires that a client send the remote username on each rcp request to the server. When you issue the **copy rcp startup-config** command, by default the router software sends the remote username associated with the current TTY process, 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 router software sends that username as the remote username. If the TTY username is invalid, the router software uses the router host name as the both the remote and local usernames.

---

**Note** For Cisco, TTYs are commonly used in communications servers. The concept of TTYs 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).

---

To specify a different remote username to be sent to the server, use the **rcmd remote-username** command. The rcp software copies the configuration file from the remote server relative to the directory of the remote username, if the server has a directory structure, for example, as do UNIX systems.



**Caution** The remote username must be associated with an account on the destination server. If you do not use the **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 router 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 if a default remote username is used.

### Example

The following example shows how to use this command on a Cisco 4000 system. The interface might differ slightly on other systems. This example specifies a remote username of *netadmin1*. Then it copies and stores a host configuration file *host2-config* from the *netadmin1* directory on the remote server with an IP address of 131.108.101.101:

```
Router# configure terminal
Router# rcmd remote-username netadmin1
Ctrl-Z
Router# copy rcp startup-config
Host or network configuration file [host]?
Address of remote host [255.255.255.255]? 131.108.101.101
Name of configuration file[rtr2-config]? host2-config
Configure using rtr2-config from 131.108.101.101?[confirm]
Connected to 131.108.101.101
Loading 1112 byte file rtr2-config:![OK]
[OK]
Router#
%SYS-5-CONFIG_NV:Non-volatile store configured from rtr2-config by rcp from
131.108.101.101
```

### Related Commands

**copy startup-config rcp**  
**rcmd remote-username**

## copy running-config rcp

To copy the running configuration file from the router to a network server using rcp, use the **copy running-config rcp** EXEC command.

**copy running-config rcp**

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Usage Guidelines

This command copies the current configuration file to a server on the network. The copy of the configuration file can serve as a backup copy. You are prompted for a destination host and filename.

The rcp protocol requires that a client send the remote username on each rcp request to the server. When you issue the **copy running-config rcp** command, by default the router software sends the remote username associated with the current TTY process, 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 router software sends that username as the remote username.

If the TTY username is invalid, the router software uses the router host name as the both the remote and local usernames.

---

**Note** For Cisco, TTYs are commonly used in communications servers. The concept of TTYs 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).

---

To specify a different remote username to be sent to the server, use the **rcmd remote-username** command. The rcp software copies the running configuration file to the remote server relative to the directory of the remote username that you specify, if the server has a directory structure, for example, as do UNIX systems.



**Caution** The remote username must be associated with an account on the destination server. If you do not use the **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 router 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 if a default remote username is used.

If you copy the configuration file to a personal computer used as a file server, the computer must support the rsh protocol.

To run this command, the router must contain Flash memory.

### Example

The following example shows how to use this command on a Cisco 4500 system. The interface may differ slightly on other systems. This example specifies a remote username of *netadmin1*. Then it copies the running configuration file, named *Rtr2-config* to the *netadmin1* directory on the remote host with an IP address of 131.108.101.101:

```
Router# configure terminal
Router# rcmd remote-username netadmin1
Ctrl-Z
Router# copy running-config rcp
Remote host[]? 131.108.101.101
Name of configuration file to write [Rtr2-config]?
Write file rtr2-config on host 131.108.101.101?[confirm]
###[OK]
Connected to 131.108.101.101
Router#
```

### Related Commands

**copy rcp running-config**  
**rcmd remote-username**



## copy startup-config rcp

To copy a startup configuration file to a network server using rcp, use the **copy startup-config rcp** EXEC command.

**copy startup-config rcp**

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Usage Guidelines

Use this command to copy the contents of the configuration file in NVRAM to a network server.

The rcp protocol requires that a client send the remote username on each rcp request to the server. When you issue the **copy startup-config rcp** command, by default the router software sends the remote username associated with the current TTY process, 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 router software sends that username as the remote username.

If the TTY username is invalid, the router software uses the router host name as the both the remote and local usernames.

---

**Note** For Cisco, TTYs are commonly used in communications servers. The concept of TTYs 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).

---

To specify a different remote username to be sent to the server, use the **rcmd remote-username** command. The rcp software copies the system image to the remote server relative to the directory of the remote username, if the server has a directory structure, for example, as do UNIX systems.



**Caution** The remote username must be associated with an account on the destination server. If you do not use the **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 router 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 if a default remote username is used.

If you copy the configuration file to a personal computer used as a server, the computer must support the rsh protocol.

### Example

The following example shows how to use this command on a Cisco 4500 router. The interface might differ slightly on other systems:

```
Router# configure terminal
Router# rcmd remote-username netadmin2
Ctrl-Z
Router# copy startup-config rcp
Remote host[]? 131.108.101.101
Name of configuration file to write [rtr2-config]? <cr>
Write file rtr2-config on host 131.108.101.101?[confirm] <cr>
![OK]
```

### Related Commands

**copy rcp startup-config**  
**rcmd remote-username**

## copy tftp bootflash

To copy a boot image from a TFTP server to Flash, use the **copy tftp bootflash** EXEC command.

**copy tftp bootflash**

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Usage Guidelines

You can use this command only on routers that have two banks of Flash: one bank for the boot image and the second bank for the system image.

The router prompts for the address of the TFTP server and the name of the file. It provides an option to erase the existing boot image in Flash before writing the new image into Flash. The copying process takes several minutes; the actual time 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 that was distributed with the boot software image. The checksum of the boot image in Flash memory is displayed when the **copy tftp bootflash** command completes. The README file was copied to the TFTP server automatically when you installed the boot software image.



**Caution** If the checksum values do not match, do not reboot the router. Instead, reissue the **copy tftp bootflash** command and compare the checksums again. If the checksum is repeatedly wrong, copy the original boot software image back into Flash memory *before* you reboot the router from Flash memory.

### Example

The following example shows how to use this command:

```
Router# copy tftp bootflash
Boot flash directory:
File  name/status
   1  old-c4500-xboot
[2557136 bytes used, 1637168 bytes available]

Address or name of remote host [255.255.255.255]? barney.cisco.com
Name of file to copy? c4500-xboot
Copy c4500-xboot from BARNEY.CISCO.COM? [confirm]y
Checking for file 'c4500-xboot' on BARNEY.CISCO.COM... [OK]

Erase flash device before writing? [confirm]y
Are you sure? [confirm]y
Erasing device... eeeeeeeevvvvvvvv ... erased.

Loading c4500-xboot from 198.92.30.32: !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!

[OK - 1387269/4194304 bytes]

Verifying checksum... (0x142A) [OK]
Router#
```

### Related Commands

- copy bootflash tftp**
- copy erase bootflash**
- copy mop bootflash**
- copy verify bootflash**
- show bootflash**



The following example shows sample output when copying a system image into a partition of Flash memory.

```
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]
```

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 bank support in boot ROMs. If the partition entered is not valid, the process terminates. You have the option to enter a partition number, ? for directory display of all partitions, or ?*number* for directory display of a particular partition. The default is the first read/write partition.

If the partition is read-only and has dual Flash bank support in boot ROM, 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 by the user earlier:

```
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 by the user earlier:

```
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 system flash**

**copy flash tftp**

**copy verify**

## copy verify

To verify the checksum of a system image in Flash memory, use the **copy verify** EXEC command.

**copy verify**

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Usage Guidelines

The **copy verify** command works on Cisco 3000, Cisco 4000 series, and Cisco 7000 series routers only.

Each system software or microcode image that is distributed on disk uses a single checksum for the entire image. This checksum is displayed only when the image is copied into Flash memory; it is *not* displayed when the image file is copied from one disk to another.

The README file (which is included with the image on the disk) lists the name, file size, and checksum of the image. Review the contents of the README file before loading or duplicating the new image so that you can verify the checksum when you copy it into the Flash memory or onto a TFTP server.

To display the contents of Flash memory, use the **show flash** or **show flash all** command. The Flash content listing does not include the checksum of individual files. To recompute and verify the image checksum after the image is copied into Flash memory, use the **copy verify** command. When you enter the command, the screen prompts you for the filename to verify. By default, it prompts for the last file in Flash (most recent). Press Return to recompute the default file checksum or enter the filename of a different file at the prompt.

### Example

The following example illustrates how to use this command:

```
Router# copy verify

Name of file to verify [gsxx]?
Verifying via checksum...
vvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvv

Flash verification successful. Length = 1923712, checksum = 0xA0C1
Router#
```

### Related Command

**copy tftp flash**



## copy verify bootflash

To verify the checksum of a boot image in Flash memory, use the **copy verify bootflash** EXEC command.

### **copy verify bootflash**

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Usage Guidelines

You can use this command only on routers that have two banks of Flash: one bank for the boot image and the second bank for the system image.

Each boot software image that is distributed on disk uses a single checksum for the entire image. This checksum is displayed only when the image is copied into Flash memory; it is not displayed when the image file is copied from one disk to another.

The README file, which is included with the image on the disk, lists the name, file size, and checksum of the image. Review the contents of the README file before loading or duplicating the new image so that you can verify the checksum when you copy it into Flash memory or onto a server.

To display the contents of Flash memory, use the **show flash** command. The Flash contents listing does not include the checksum of individual files. To recompute and verify the image checksum after the image has been copied into Flash memory, use the **copy verify bootflash** command. When you enter the command, the system prompts you for the filename to verify. By default, it prompts for the last file (most recent) in Flash. Press Return to recompute the default file checksum, or enter the name of a different file at the prompt.

### Example

The following example illustrates how to use this command:

```
Router# copy verify bootflash
Boot flash directory:
File  name/status
   1  c4500-xboot
[1387336 bytes used, 2806968 bytes available]

Name of file to verify? c4500-xboot
Verifying checksum for 'c4500-xboot' (file # 1)... [OK]

Router#
```

### Related Commands

**copy bootflash tftp**  
**copy erase bootflash**  
**copy mop bootflash**  
**copy tftp bootflash**  
**show bootflash**

## erase flash

To erase Flash memory, use the **erase flash** EXEC command.

**erase flash**

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Usage Guidelines

This command performs the same action as the **copy erase flash** command.

### Example

The following example illustrates how to use this command:

```
Router# erase 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]
```

The system will prompt only if there are two or more read/write partitions. If the partition entered is not valid or is the read-only partition, the process terminates. You have the option to enter a partition number, **?** for directory display of all partitions, or **?number** for directory display of a particular partition. The default is the first read/write partition.

```
System flash directory, partition 2:
File Length Name/status
  1  3459720 master/igs-bfpx.100-4.3
[3459784 bytes used, 734520 available, 4194304 total]

Erase flash device, partition 2? [confirm] <Return>
```

## ip rarp-server

Use the **ip rarp-server** interface configuration command to allow the router to act as a Reverse Address Resolution Protocol (RARP) server. Use the **no ip rarp-server** command to restore the interface to the default of no RARP server support.

```
ip rarp-server ip-address  
no ip rarp-server ip-address
```

### Syntax Description

*ip-address* IP address that is to be provided in the source protocol address field of the RARP response packet. Normally, this is set to whatever address you configure as the primary address for the interface.

### Default

Disabled

### Command Mode

Interface configuration

### Usage Guidelines

This feature makes diskless booting of clients possible between network subnets where the client and server are on separate subnets.

RARP server support is configurable on a per interface basis, so that the router does not interfere with RARP traffic on subnets that do not need RARP assistance from the router.

The router answers incoming RARP requests only if both of the following two conditions are met:

- The **ip rarp-server** command has been configured for the interface on which the request was received.
- There is a static entry found in the IP ARP table that maps the MAC address contained in the RARP request to an IP address.

Use the **show ip arp EXEC** command to display the contents of the IP ARP cache.

Sun Microsystems, Inc. makes use of RARP and UDP-based network services to facilitate network-based booting of SunOS on their workstations. By bridging RARP packets and using both the **ip helper-address** interface configuration command and the **ip forward-protocol** global configuration command, the router should be able to perform the necessary packet switching to enable booting of Sun workstations across subnets. Unfortunately, some Sun workstations assume that the sender of the RARP response, in this case the router, is the host the client can contact to TFTP load the bootstrap image. This causes the workstations to fail to boot.

By using the **ip rarp-server** feature, the router can be configured to answer these RARP requests, and the client machine should be able to reach its server by having its TFTP requests forwarded through the router that acts as the RARP server.

In the case of RARP responses to Sun workstations attempting to diskless boot, the IP address specified in the **ip rarp-server** interface configuration command should be the IP address of the TFTP server. In addition to configuring RARP service, the router must also be configured to forward UDP-based Sun portmapper requests to completely support diskless booting of Sun workstations. This can be accomplished using configuration commands of the form:

```
ip forward-protocol udp 111
interface interface name
ip helper-address target-address
```

RFC 903 documents the Reverse Address Resolution Protocol.

### Examples

The following partial example configures the router to act as a RARP server. The router is configured to use the primary address of the specified interface in its RARP responses.

```
arp 128.105.2.5 0800.2002.ff5b arpa
interface ethernet 0
ip address 128.105.3.100 255.255.255.0
ip rarp-server 128.105.3.100
```

In the following example, the router is configured to act as a RARP server, with TFTP and portmapper requests forwarded to the Sun server:

```
! Allow the router to forward broadcast portmapper requests
ip forward-protocol udp 111
! Provide the router with the IP address of the diskless sun
arp 128.105.2.5 0800.2002.ff5b arpa
interface ethernet 0
! Configure the router to act as a RARP server, using the Sun Server's IP
! address in the RARP response packet.
ip rarp-server 128.105.3.100
! Portmapper broadcasts from this interface are sent to the Sun Server.
ip helper-address 128.105.3.100
```

### Related Commands

A dagger (†) indicates that the command is documented in another chapter.

**ip forward-protocol** †

**ip helper-address** †

## microcode

To specify the location of the microcode you want to download from Flash memory into the writable control store (WCS) on a Cisco 7000 series, use the **microcode** interface configuration command.

```
microcode interface [flash | rom | system] [filename]  
no microcode interface [flash | rom] [filename]
```

### Syntax Description

<i>interface</i>	One of the following interface processor names: <b>aip</b> , <b>fip</b> , <b>fsip</b> , <b>hip</b> , <b>mip</b> , <b>trip</b> , <b>eip</b> , or <b>sp</b> .
<b>flash</b>	(Optional) If the <b>flash</b> keyword is specified, a <i>filename</i> argument is required, unless you are using the <b>no microcode interface flash</b> command.
<b>rom</b>	(Optional) If the <b>rom</b> keyword is specified, no further arguments are necessary. For example, the command <b>microcode fip rom</b> specifies that all FDDI Interface Processors (FIPs) should be loaded from their onboard ROM microcode. This onboard ROM microcode is not the same as the eight ROMs on the RP that contain the system image.
<b>system</b>	(Optional) If <b>system</b> is specified, the router loads the microcode from the microcode bundled into the system image you are running for that interface type.
<i>filename</i>	(Optional) Filename of the microcode in Flash memory that you want to download. This argument is only used with the <b>flash</b> keyword. If you use the <b>flash</b> keyword, the name of the microcode file in Flash is required unless the command is <b>no microcode interface flash</b> . (This command results in the same default condition as the command <b>microcode interface rom</b> , which indicates that the card should be loaded from its onboard ROM microcode.)

### Default

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

### Command Mode

Interface configuration

### Examples

In the following example, all FIP cards will use their onboard ROM microcode:

```
microcode fip rom
```

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** interface configuration command is issued. The configuration is then written to NVRAM.

```
microcode fip flash fip.v141-7
^Z
> write memory
```

### Related Command

**microcode reload**

## microcode reload

To signal to the Cisco 7000 series that all microcode configuration commands have been entered and the processor cards should be reloaded, use the **microcode reload** interface configuration command.

### **microcode reload**

### Syntax Description

This command has no arguments or keywords.

### Command Mode

Interface configuration

### Example

In the following example, all controllers are reset, the specified microcode is loaded, and the CxBus complex is reinitialized according to the microcode configuration commands that have been written to memory:

```
microcode reload
```

### Related Command

**microcode**

## mop device-code

To identify the type of device sending MOP sysid messages and request program messages, use the **mop device-code** global configuration command. Use the **no mop device-code** command to set the identity to the default value.

```
mop device-code { cisco | ds200 }  
no mop device-code { cisco | ds200 }
```

### Syntax Description

<b>cisco</b>	Denotes a Cisco device code.
<b>ds200</b>	Denotes a DECserver 200 device code.

### Default

Cisco device code

### Command Mode

Global configuration

### Usage Guidelines

The sysid messages and request program messages use the identity information indicated by this command.

### Example

The following example identifies a DECserver 200 device as sending MOP sysid and request program messages:

```
mop device-code ds200
```

### Related Command

A dagger (†) indicates that the command is documented in another chapter.

**mop sysid** †



## mop retransmit-timer

To configure the length of time the router waits before retransmitting boot requests to a MOP server, use the **mop retransmit-timer** global configuration command. Use the **no mop retransmit-timer** command to reinstate the default value.

```
mop retransmit-timer seconds  
no mop retransmit-timer
```

### Syntax Description

*seconds* Sets the length of time, in seconds, that the router waits before retransmitting a message. The value is a number from 1 to 20.

### Default

4 seconds

### Command Mode

Global configuration

### Usage Guidelines

By default, when the router transmits a request that requires a response from a MOP boot server and the server does not respond, the message will be retransmitted after 4 seconds. If the MOP boot server and router are separated by a slow serial link, it may take longer than 4 seconds for the router to receive a response to its message. Therefore, you might want to configure the router to wait longer than 4 seconds before retransmitting the message if you are using such a link.

### Example

In the following example, if the MOP boot server does not respond within 10 seconds after the router sends a message, the server will retransmit the message:

```
mop retransmit-timer 10
```

### Related Commands

A dagger (†) indicates that the command is documented in another chapter.

```
mop device-code  
mop retries  
mop enabled †
```

## mop retries

To configure the number of times a router will retransmit boot requests to a MOP server, use the **mop retries** global configuration command. Use the **no mop retries** command to reinstate the default value.

**mop retries** *count*  
**no mop retries**

### Syntax Description

*count* Indicates the number of times a router will retransmit a MOP boot request. The value is a number from 3 to 24.

### Default

8 times

### Command Mode

Global configuration

### Example

In the following example, the router will attempt to retransmit a message to an unresponsive host 11 times before declaring a failure:

```
mop retries 11
```

### Related Commands

A dagger (†) indicates that the command is documented in another chapter.

**mop device-code**  
**mop retransmit-timer**  
**mop enabled** †

## 0

To list the value of the boot field (bits 0-3) in the configuration register, use the ROM monitor **o** command. To reset the value of the boot field so that the router boots from ROM, use the ROM monitor **o/r** command.

**o**  
**o/r**

### Syntax Description

This command has no arguments or keywords.

### Default

Refer to the appropriate hardware installation guide for default values.

### Command Mode

ROM monitor

### Usage Guidelines

To get to the ROM monitor prompt at a Cisco 2000, Cisco 3000, Cisco 4000, or Cisco 7000 series, use the **reload EXEC** command if the configuration register has a boot value of 0. (For systems with a software configuration register, a value can be included on the **o/r** command line.) Use the **i** command in conjunction with the **o/r** command to initialize the router. (The **i** command is documented in the *Hardware Installation and Maintenance* publication for your product.) The **o/r** command resets the configuration register to 0x141, which disables the Break key, ignores the NVRAM configuration, and boots the default system image from ROM.

### Examples

The following is an example of the **o** command:

```
> o

Bit#      Configuration register option settings:
15        Diagnostic mode disabled
14        IP broadcasts do not have network numbers
13        Do not boot default ROM software if network boot fails
12-11     Console speed is 9600 baud
10        IP broadcasts with ones
09        Do not use secondary bootstrap
08        Break enabled
07        OEM disabled
06        Ignore configuration disabled
03-00     Boot to ROM monitor

>
```

The following is an example of the **o/r** and **i** commands used to reset and boot the default system image from ROM:

```
> o/r
> i
```

**Related Command**  
**config-register**

## partition flash

To partition Flash memory into two partitions, use the **partition flash** global configuration command. Use the **no** form of this command to undo partitioning, restoring Flash to one partition.

```
partition flash partitions [size1 size2]  
no partition flash
```

### Syntax Description

<i>partitions</i>	Number of partitions in Flash memory. Can be 1 or 2.
<i>size1</i>	(Optional) Size of the first partition in megabytes.
<i>size2</i>	(Optional) Size of the second partition in megabytes.

### Default

Flash memory consists of one partition.

### Command Mode

Global configuration

### Usage Guidelines

To undo partitioning, use either the **partition flash 1** or **no partition flash** command.

### Example

The following example creates two partitions of 4 MB each in Flash memory:

```
partition flash 2 4 4
```

## rcmd domain-lookup

To enable Domain Name System (DNS) security for rcp and rsh, use the **rcmd domain-lookup** global configuration command. To bypass DNS security for rcp and rsh, use the **no** form of this command.

**rcmd domain-lookup**  
**no rcmd domain-lookup**

### Syntax Description

This command has no arguments or keywords.

### Default

Enabled

### Command Mode

Global configuration

### Usage Guidelines

If you do not want to use DNS for rcmd queries and DNS has been enabled with the **ip domain-lookup** command, use the **no rcmd domain-lookup** command.

The **no rcmd domain-lookup** command turns off DNS lookups for rcp and rsh only. The **no ip domain-lookup** command takes precedence over the **rcmd domain-lookup** command. If you disable **ip domain-lookup** using the **no ip domain-lookup** command, DNS is bypassed for rcp and rsh even if you enable **rcmd domain-lookup**.

### Example

The following example disables DNS security for rcp and rsh:

```
no rcmd domain-lookup
```

### Related Command

**ip domain-lookup**

## rcmd remote-host

To allow remote users to execute commands on the router using rsh or rcp, use the **rcmd remote-host** global configuration command to create an entry for the remote user in a local authentication database. Use the **no rcmd remote-host** command to remove an entry for a remote user from the local authentication database.

```
rcmd remote-host local-username {ip-address | host} remote-username [enable]
no rcmd remote-host local-username {ip-address | host} remote-username [enable]
```

### Syntax Description

<i>local-username</i>	Name of the user on the local router. You can specify the router host name as the username. This name needs to be communicated to the network administrator or the user on the remote system. To be allowed to remotely execute commands on the router, the remote user must specify this value correctly.
<i>ip-address</i>	IP address of the remote host from which the local router will accept remotely executed commands. Either the IP address or the host name is required.
<i>host</i>	Name of the remote host from which the local router will accept remotely executed commands. Either the host name or the IP address is required.
<i>remote-username</i>	Name of the user on the remote host from which the router will accept remotely executed commands.
<b>enable</b>	(Optional) Enables the remote user to execute privileged EXEC commands using rsh. This keyword does not apply to rcp.

### Command Mode

Global configuration

### Usage Guidelines

To allow a remote user to execute rcp or rsh commands on a local router, you must create an entry for the remote user in the local router's authentication database. You must also enable the router to act as an rsh or rcp server.

To enable the router to act as an rsh server, issue the **rsh-enable** command. To enable the router to act as an rcp server, issue the **rcp-enable** command. The router cannot act as a server for either of these protocols unless you explicitly enable the capacity.

A local authentication database, which is similar in concept and use to a UNIX *.rhosts* file, is used to enforce security on the router through access control. Each entry that you configure in the authentication database identifies the local user, the remote host, and the remote user. To permit a remote user of rsh to execute commands in privileged EXEC mode, specify the **enable** keyword.

An entry that you configure in the router authentication database differs from an entry in a UNIX *.rhost* file in the following aspect. Because the *.rhosts* file on a UNIX system resides in the home directory of a local user account, an entry in a UNIX *.rhosts* file does not need to include the local

username; the local username is determined from the user account. To provide equivalent support on a router configured, specify the local username along with the remote host and remote username in each authentication database entry that you configure.

For a remote user to be able to execute commands on the router in its capacity as a server, the local username, host address or name, and remote username sent with the remote client request must match values configured in an entry in the local authentication file.

A remote client host should be registered with DNS. The router software uses DNS to authenticate the remote host's name and address. Because DNS can return several valid IP addresses for a host name, the router software checks the address of the requesting client against all of the IP addresses for the named host returned by DNS. If the address sent by the requester is considered invalid, that is, it does not match any address listed with DNS for the host name, then the router software will reject the remote-command execution request.

Note that if no DNS servers are configured for the router, then the router cannot authenticate the host in this manner. In this case, the router software will send a broadcast request to attempt to gain access to DNS services on another server. If DNS services are not available, you must use the **no ip domain-lookup** command to disable the router's attempt to gain access to a DNS server by sending a broadcast request.

If DNS services are not available and, therefore, you bypass the DNS security check, the router software will accept the request to remotely execute a command *only if* all three values sent with the request match exactly the values configured for an entry in the local authentication file.

### Example

The following example allows the remote user *netadmin3* on a remote host with the IP address 131.108.101.101 to execute commands on *router1* using the rsh protocol. For rsh, user *netadmin3* is allowed to execute commands in privileged EXEC mode:

```
rcmd remote-host router1 131.108.101.101 netadmin3 enable
```

### Related Commands

A dagger (†) indicates that the command is documented in another chapter.

**rcp-enable**

**rsh-enable**

**no ip domain-lookup** †



## rcmd remote-username

To configure the remote username to be used when requesting a remote copy using rcp, use the **rcmd remote-username** global configuration command. To remove from the configuration the remote username, use the **no rcmd remote-username** command.

```
rcmd remote-username username  
no rcmd remote-username username
```

### Syntax Description

<i>username</i>	Name of the remote user on the server. This name is used for rcp copy requests. All files and images to be copied are searched for or written relative to the directory of the remote user's account, if the server has a directory structure, for example, as do UNIX systems.
-----------------	---

### Command Mode

Global configuration

### Usage Guidelines

The rcp protocol requires that a client send the remote username on an rcp request to the server. Use this command to specify the remote username to be sent to the server for an rcp copy request. All files and images to be copied are searched for or written relative to the directory of the remote user's account, if the server has a directory structure, for example, as do UNIX systems.

### Default

If you do not issue this command, the router software sends the remote username associated with the current TTY process, if that name is valid, for rcp copy commands. For example, if the user is connected to the router through Telnet and the user was authenticated through the **username** command, then the router software sends that username as the remote username.

If the username for the current TTY process is not valid, the router software sends the host name as the remote username. For rcp boot commands, the router software sends the router host name by default.

---

**Note** For Cisco, TTYs are commonly used in communications servers. The concept of TTYs 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).

---



**Caution** The remote username must be associated with an account on the destination server.

### Example

The following example shows how to use this command:

```
Router1# configure terminal  
Router1# rcmd remote-username netadmin1  
Ctrl-Z
```

### Related Commands

- boot network rcp**
- boot system rcp**
- copy bootflash rcp**
- copy flash rcp**
- copy rcp bootflash**
- copy rcp flash**
- copy rcp running-config**
- copy rcp startup-config**
- copy running-config rcp**
- copy startup-config rcp**

## rcp-enable

To configure the router to allow remote users to copy files to and from the router, use the **rcp-enable** global configuration command. Use the **no rcp-enable** command to disable a router that is enabled for rcp.

**rcp-enable**  
**no rcp-enable**

### Syntax Description

This command has no arguments or keywords.

### Default

To ensure security, the router is not enabled for rcp by default.

### Command Mode

Global configuration

### Usage Guidelines

To allow a remote user to execute rcp commands on the router, you must also create an entry for the remote user in the local router's authentication database.

The **no rcp-enable command** does not prohibit a local user from using rcp to copy system images and configuration files to and from the router.

To protect against undesirable users copying the system image or configuration files without consent, the router is not enabled for rcp by default.

### Example

The following example shows how to use this command to enable the router for rcp:

```
rcp-enable
```

### Related Command

**rcmd remote-host**

## reload

To reload the operating system, use the **reload** EXEC command.

**reload**

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Usage Guidelines

The **reload** command halts the system. If the system is set to restart on error, it reboots itself. The **reload** command is used after configuration information is entered into a file and saved into NVRAM.

### Example

The following example illustrates how to enter the **reload** command at the privileged EXEC prompt:

```
Router# reload
```

### Related Command

**write memory**

## rsh

To execute a command remotely on a remote rsh host, use the **rsh** EXEC command.

```
rsh {ip-address | host} [/user username] remote-command
```

### Syntax Description

<i>ip-address</i>	IP address of the remote host on which to execute the rsh command. Either the IP address or the host name is required.
<i>host</i>	Name of the remote host on which to execute the command. Either the host name or the IP address is required.
<b>/user</b> <i>username</i>	(Optional) Remote username.
<i>remote-command</i>	Command to be executed remotely. This is a required parameter.

### Default

If you do not specify the **/user** keyword and argument, the router sends a default remote username. As the default value of the remote username, the router software sends the remote username associated with the current TTY process, 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 router software sends that username as the remote username. If the TTY username is invalid, the router software uses the router host name as the both the remote and local usernames.

---

**Note** For Cisco, TTYs are commonly used in communications servers. The concept of TTYs 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).

---

### Command Mode

Privileged EXEC

### Usage Guidelines

Use the **rsh** command to execute commands remotely. The host on which you remotely execute the command must support the rsh protocol, and the *.rhosts* files on the rsh host must include an entry that permits you to remotely execute commands on that host.

For security reasons, the router software does not default to a remote login if no command is specific, as does UNIX. Instead, the router provides Telnet and connect services that you can use rather than rsh.

## rsh-enable

To configure the router to allow remote users to execute commands on the router using rsh, use the **rsh-enable** global configuration command. Use the **no rsh-enable** command to disable a router that is enabled for rsh.

**rsh-enable**  
**no rsh-enable**

### Syntax Description

This command has no arguments or keywords.

### Default

To ensure security, the router is not enabled for rsh by default.

### Command Mode

Global configuration

### Usage Guidelines

Use this command to enable the router to receive rsh requests from remote users. In addition to issuing this command, to allow a remote user to execute rsh commands on the router, you must create an entry for the remote user in the local router's authentication database.

The **no rsh-enable command** does not prohibit a local user of the router from executing a command on other routers and UNIX hosts on the network using rsh.

### Example

The following example shows how to use this command to enable the router as an rsh server:

```
rsh-enable
```

### Related Command

**rcmd remote-host**

### Example

The following command specifies that user *sharon* attempts to remotely execute the UNIX **ls** command with the **-a** argument on the remote host *mysys.cisco.com*. The command output resulting from the remote execution follows the command example:

```
Router1# rsh mysys.cisco.com /user sharon ls -a
.
..
.alias
.cshrc
.emacs
.exrc
.history
.login
.mailrc
.newsrc
.oldnewsrc
.rhosts
.twmrc
.xsession
jazz
Router1#
```

## service compress-config

To compress configuration files on the Cisco 7000 series, Cisco 4000 series, Cisco 3000, and AGS+ routers, which have NVRAM, use the **service compress-config** global configuration command. To disable compression, use the **no** form of this command.

```
service compress-config  
no service compress-config
```

### Syntax Description

This command has no arguments or keywords.

### Default

Disabled

### Command Mode

Global configuration

### Usage Guidelines

If the file compression completes successfully, the following message is displayed:

```
Compressing configuration from configuration-size to compressed-size  
[OK]
```

If the boot ROMs do not recognize a compressed configuration, the following message is displayed:

```
Boot ROMs do not support NVRAM compression Config NOT written to NVRAM
```

If the file compression fails, the following message is displayed:

```
Error trying to compress nvram
```

One way to determine whether a configuration file will compress enough to fit into NVRAM is to use a text editor to enter the configuration, then use the UNIX **compress** command to check the compressed size. To get a closer approximation of the compression ratio, use the UNIX command **compress -b12**.

Once the configuration file has been compressed, the router functions normally. A **show configuration** command would uncompress the configuration before displaying it. At boot time, the system would recognize that the configuration file was compressed, uncompress it, and proceed normally.

To disable compression of the configuration file, enter configuration mode and specify the **no service compress-config** command. Then enter the **write memory** command. The router displays an OK message if it is able to successfully write the uncompressed configuration to NVRAM. Otherwise, the router displays an error message indicating that the configuration is too large to store. If the configuration file is larger than the physical NVRAM, the following message is displayed:

```
###Configuration too large to fit uncompressed in NVRAM Truncate configuration? [confirm]
```

To truncate and save the configuration, type **Y**. To not truncate and not save the configuration, type **N**.



**Example**

In the following example, the configuration file is compressed:

```
service compress-config
```

**Related Command**

**show configuration**

## service config

To enable autoloading of configuration files from a network server, use the **service config** global configuration command. Use the **no service config** command to restore the default.

**service config**  
**no service config**

### Syntax Description

This command has no arguments or keywords.

### Default

Disabled, except on systems without NVRAM or with invalid or incomplete information in NVRAM. In these cases, autoloading of configuration files from a network server is enabled automatically.

### Command Mode

Global configuration

### Usage Guidelines

Usually, the **service config** command is used in conjunction with the **boot host** or **boot network** command. You must enter the **service config** command to enable the router to automatically configure the system from the file specified by the **boot host** or **boot network** command.

The **service config** command can also be used without the **boot host** or **boot network** command. If you do not specify host or network configuration filenames, the router uses the default configuration files. The default network configuration file is *network-config*. The default host configuration file is *host-config*, where *host* is the host name of the router. If the router cannot resolve its host name, the default host configuration file is *router-config*.

### Example

In the following example, the router is configured to autoload the default host configuration file:

```
boot host
service config
```

### Related Commands

**boot host**  
**boot network**

## show async-bootp

Use the **show async-bootp** privileged EXEC command to display the parameters that have been configured for SLIP extended BOOTP requests.

**show async-bootp**

### Syntax Description

This command has no arguments or keywords.

### Command Mode

Privileged EXEC

### Sample Display

The following is a sample output of the **show async-bootp** command:

```
Router# show async-bootp

The following extended data will be sent in BOOTP responses:

bootfile (for address 128.128.1.1) "pcboot"
bootfile (for address 131.108.1.111) "dirtboot"
subnet-mask 255.255.0.0
time-offset -3600
time-server 128.128.1.1
```

Table 3-2 describes significant fields shown in the display.

**Table 3-2 Show Async-BOOTP Field Descriptions**

Field	Description
bootfile... "pcboot"	Boot file for address 128.128.1.1 is named pcboot.
subnet-mask 255.255.0.0	Subnet mask.
time-offset -3600	Local time is one hour (3600 seconds) earlier than UTC time.
time-server 128.128.1.1	Address of the time server for the network.

### Related Command

**async-bootp**

## show bootflash

To verify boot Flash memory, use the **show bootflash** EXEC command.

**show bootflash**

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Usage Guidelines

You can use this command only on routers that have two banks of Flash: one bank for the boot image and the second bank for the system image.

The **show bootflash** command displays the type of boot Flash memory present, any files that may currently exist in boot Flash memory, and the amount of boot Flash memory used and remaining.

### Sample Display

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

```
Router# show bootflash
Boot flash directory:
File name/status
  1 c4500-xboot
[1387336 bytes used, 2806968 bytes available]
```

Table 3-3 describes the fields shown in the output.

**Table 3-3 Show Bootflash Field Descriptions**

Field	Description
Boot File	Number of the boot file.
flash directory: name/status	Name and status of the boot file. The status is displayed if appropriate and can be one of the following: <ul style="list-style-type: none"><li>• [deleted]—File has been deleted.</li><li>• [invalid checksum]—File has an incorrect checksum.</li></ul>

## show configuration

Use the **show configuration** EXEC command to display the contents of the nonvolatile memory, if present and valid.

### **show configuration**

The nonvolatile memory stores the configuration information in the network server in text form as configuration commands. The **show configuration** command shows the version number of the software used when you last executed the **write memory** command.

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Sample Display

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

```
Router# show configuration

Using 5057 out of 32768 bytes
!
enable-password xxxx
service pad
!
boot system dross-system 131.108.13.111
boot system dross-system 131.108.1.111
!
exception dump 131.108.13.111
!
no ip ipname-lookup
!
decnet routing 13.1
decnet node-type area
decnet max-address 1023
!
interface Ethernet 0
ip address 131.108.1.1 255.255.255.0
ip helper-address 131.120.1.0
ip accounting
ip gdp
decnet cost 3
!
ip domain-name CISCO.COM
ip name-server 255.255.255.255
!
end
```

The following is partial sample output from the **show configuration** command when the configuration file has been compressed:

```
Router# show configuration
Using 21542 out of 65536 bytes, uncompressed size = 142085 bytes
!
version 9.22
service compress-config
!
hostname hosehead
!
boot system flash gs7-k.sthormod_clean
boot system rom
```

### Related Commands

A dagger (†) indicates that the command is documented in another chapter.

- configure**
- description** †
- service compress-config**
- write memory**
- write terminal**

## show flash

Use the **show flash** EXEC command to verify Flash memory. The **show flash** command displays the type of Flash memory present, any files that might currently exist in Flash memory, and the amounts of Flash memory used and remaining.

```
show flash [all | chips | detailed | err | partition number [all | chips | detailed | err ] |  
summary]
```

### Syntax Description

<b>all</b>	(Optional) Shows complete information about Flash memory, including information about the individual ROM devices in Flash memory and the names and sizes of all system image files stored in Flash memory, including those that are invalidated.
<b>chips</b>	(Optional) Shows information per partition and per chip, including which bank the chip is in, its code, size, and name.
<b>detailed</b>	(Optional) Shows information per partition, including file length, address, name, Flash checksum, computer checksum, bytes used, bytes available, total bytes, and bytes of system Flash memory.
<b>err</b>	(Optional) Shows write or erase failures in the form of number of retries.
<b>partition number</b>	(Optional) Shows output for the specified partition number. If you specify the <b>partition</b> keyword, you must specify a partition number. You can use this keyword only when Flash memory has multiple partitions.
<b>summary</b>	(Optional) Shows summary information per partition, including the partition size, bank size, state, and method by which files can be copied into a particular partition. You can use this keyword only when Flash memory has multiple partitions.

### Command Mode

EXEC

### Sample Display

The following is sample output from the **show flash** command on the Cisco 3000 and Cisco 7000 series:

```
Router# show flash
4096K bytes of flash memory sized on embedded flash.

File      name/status
  0      ahp4/gs7-k
  1      micro/eip1-0
  2      micro/sp1-3
  3      micro/trip1-1
  4      micro/hip1-0
  5      micro/fip1-1
  6      fsipucode
  7      spucode
  8      tripucode
  9      fipucode
 10      eipucode
 11      hipucode
 12      sipucode
 13      sp_q160-1
 14      ahp4/sp160-3 [deleted]
 15      ahp4/sp160-3
[682680/4194304 bytes free/total]
```

Table 3-4 describes the **show flash** display fields for the Cisco 3000 and Cisco 7000 series.

**Table 3-4 Show Flash Field Descriptions**

Field	Description
File	Number of file in flash memory.
name/status	Files that currently exist in flash memory.
bytes free	Amount of flash memory remaining.
[deleted]	Flag indicating that another file exists with the same name or that process has been aborted.

As the display shows, the Flash memory can store and display multiple, independent software images for booting itself or for TFTP server software for other products. This feature is useful for storing default system software. These images can be stored in compressed format (but cannot be compressed by the router).

To eliminate any files from Flash (invalidated or otherwise) and free up all available memory space, the entire Flash memory must be erased; individual files cannot be erased from Flash memory.

The following is a sample output from the **show flash** command on a router that has Flash memory partitioned:

```
Router# show flash

System flash directory, partition 1:
File Length Name/status
  1 3459720 master/igs-bfpx.100-4.3
[3459784 bytes used, 734520 available, 4194304 total]
4096K bytes of processor board System flash (Read Only)

System flash directory, partition 2:
File Length Name/status
  1 3459720 igs-kf
[3459784 bytes used, 734520 available, 4194304 total]
```



4096K bytes of processor board System flash (Read/Write)

The following is a sample output from the **show flash all** command on the Cisco 3000 and Cisco 7000. The format of the display is different on different router models. The format of your display might differ.

Router# **show flash all**

4096K bytes of flash memory sized on embedded flash.

Chip	socket	code	bytes	name
0	U63	89BD	0x040000	INTEL 28F020
1	U62	89BD	0x040000	INTEL 28F020
2	U61	89BD	0x040000	INTEL 28F020
3	U60	89BD	0x040000	INTEL 28F020
4	U48	89BD	0x040000	INTEL 28F020
5	U47	89BD	0x040000	INTEL 28F020
6	U46	89BD	0x040000	INTEL 28F020
7	U45	89BD	0x040000	INTEL 28F020
8	U30	89BD	0x040000	INTEL 28F020
9	U29	89BD	0x040000	INTEL 28F020
10	U28	89BD	0x040000	INTEL 28F020
11	U27	89BD	0x040000	INTEL 28F020
12	U17	89BD	0x040000	INTEL 28F020
13	U16	89BD	0x040000	INTEL 28F020
14	U15	89BD	0x040000	INTEL 28F020
15	U14	89BD	0x040000	INTEL 28F020

Flash file directory:

File	name/status	addr	length	fcksum	ccksum
0	gs7-k	0x12000080	2601100	0x4015	0x4015
1	micro/eip1-0	0x1227B14C	53364	0x0	0x0
2	micro/sp1-3	0x12288200	55418	0x0	0x0
3	micro/trip1-1	0x12295ABC	105806	0x0	0x0
4	micro/hip1-0	0x122AF84C	35528	0x0	0x0
5	micro/fip1-1	0x122B8354	97070	0x0	0x0
6	fsipucode	0x122CFEC4	6590	0x0	0x0
7	spucode	0x122D18C4	55418	0x0	0x0
8	tripucode	0x122DF180	105806	0x0	0x0
9	fipucode	0x122F8F10	97070	0x0	0x0
10	eipucode	0x12310A80	53330	0x60A1	0x60A1
11	hipucode	0x1231DB14	35528	0x0	0x0
12	sipucode	0x1232661C	54040	0x0	0x0
13	sp_q160-1	0x1233974	42912	0x0	0x0
14	ahp4/sp160-3 [deleted]	0x1233E154	55730	0x0	0x0

```

15 ahp4/sp160-3
    0x1234BB48 55808 0x0 0x0
[682680/4194304 bytes free/total]

```

Table 3-5 describes the **show flash all** display fields for the Cisco 3000 and Cisco 7000 series.

**Table 3-5 Show Flash All Field Descriptions**

Field	Description
bytes of flash memory sized on embedded flash	Total amount of Flash memory present.
Chip	Identifies the ROM unit.
socket	Location of the ROM unit.
code	Vendor code identifying the vendor of the ROM unit.
bytes	Size of the ROM unit (in hex bytes).
name (in row beginning with Chip)	Vendor name and chip part number of the ROM unit.
security jumper, flash memory	Security jumper is/is not installed. Flash memory is programmable or read-only. If the security jumper is not installed, you will see the <b>show flash</b> display with a message indicating that the jumper is not installed.
File	Number of the system image file. If no filename is specified in the <b>boot system flash</b> command, the router boots the system image file with the lowest file number.
name/status	Filename and status of a system image file. The status [invalidated] appears when a file has been rewritten (recopied) into Flash memory. The first (now invalidated) copy of the file is still present within Flash memory, but it is rendered unusable in favor of the newest version. The [invalidated] status can also indicate an incomplete file that results from the user aborting the copy process, a network timeout, or a Flash memory overflow.
addr	Address of the file in Flash memory.
length	Size of the system image file (in bytes).
fcksum	Checksum recorded in Flash memory.
ccksum	Computer checksum.
[deleted]	Flag indicating that another file exists with the same name or that process has been aborted.
bytes free/total	Amount of Flash memory used/total amount of Flash memory.

In the following example, the security jumper is not installed and you cannot write to Flash memory until the security jumper is installed:

```

Router> show flash all
4096K bytes of flash memory on embedded flash (in RP1).
  security jumper(12V) is not installed,
flash memory is read-only.

file      offset length  name
00xDCD0  1903892  gs7-k [deleted]
10x1DEA24 1903912  gs7-k
[329908/4194304 bytes free]

```

The following is sample output for the **show flash all** command on a Cisco 3000 that has Flash memory partitioned:

```

Router# show flash all

```

```

System flash partition information:
Partition  Size    Used    Free    Bank-Size  State    Copy-Mode
    1      4096K   3459K   637K   4096K     Read Only  RXBOOT-FLH
    2      4096K   3224K   872K   4096K     Read/Write Direct

System flash directory, partition 1:
File Length  Name/status
      addr      fcksum  ccksum
    1  3459720  master/igs-bfpx.100-4.3
      0x40      0x3DE1  0x3DE1
[3459784 bytes used, 734520 available, 4194304 total]
4096K bytes of processor board System flash (Read ONLY)

    Chip    Bank    Code    Size    Name
    1       1      89A2    1024KB  INTEL 28F008SA
    2       1      89A2    1024KB  INTEL 28F008SA
    3       1      89A2    1024KB  INTEL 28F008SA
    4       1      89A2    1024KB  INTEL 28F008SA
Executing current image from System flash [partition 1]

System flash directory, partition2:
File Length  Name/status
      addr      fcksum  ccksum
    1  3224008  igs-kf.100
      0x40      0xEE91  0xEE91
[3224072 bytes used, 970232 available, 4194304 total]
4096K bytes of processor board System flash (Read/Write)

    Chip    Bank    Code    Size    Name
    1       2      89A2    1024KB  INTEL 28F008SA
    2       2      89A2    1024KB  INTEL 28F008SA
    3       2      89A2    1024KB  INTEL 28F008SA
    4       2      89A2    1024KB  INTEL 28F008SA

```

Table 3-6 describes the additional fields in the display.

**Table 3-6 Show Flash All Fields for Partitioned Flash Memory**

Field	Description
Partition	Partition number in Flash memory.
Size	Size of partition in bytes.
Used	Number of bytes used in partition.
Free	Number of bytes free in partition.
Bank-Size	Size of bank in bytes.
State	State of the partition. It can be one of the following values: <ul style="list-style-type: none"> <li>Read-Only indicates the partition that is being executed from.</li> <li>Read/Write is a partition that can be copied to.</li> </ul>
Copy-Mode	Method by which the partition can be copied to: <ul style="list-style-type: none"> <li>RXBOOT-FLH indicates copy via Flash load helper.</li> <li>Direct indicates user can copy directly into Flash memory.</li> <li>None indicates that it is not possible to copy into that partition.</li> <li>.</li> </ul>
Chip	Chip number.
Bank	Bank number.
Code	Code number.

Field	Description
Size	Size of chip.
Name	Name of chip.

The following is sample output for the **show flash chips** command on a router that has Flash memory partitioned:

```
Router# show flash chips

System flash partition 1:
4096K bytes of processor board System flash (Read ONLY)

  Chip   Bank   Code   Size   Name
  ----   -
  1      1      89A2   1024KB INTEL 28F008SA
  2      1      89A2   1024KB INTEL 28F008SA
  3      1      89A2   1024KB INTEL 28F008SA
  4      1      89A2   1024KB INTEL 28F008SA
Executing current image from System flash [partition 1]

System flash partition 2:
4096K bytes of processor board System flash (Read/Write)

  Chip   Bank   Code   Size   Name
  ----   -
  1      2      89A2   1024KB INTEL 28F008SA
  2      2      89A2   1024KB INTEL 28F008SA
  3      2      89A2   1024KB INTEL 28F008SA
  4      2      89A2   1024KB INTEL 28F008SA
```

The following is sample output for the **show flash detailed** command on a router that has Flash memory partitioned.

```
Router# show flash detailed
System flash directory, partition 1:
File Length Name/status
      addr fcksum ccksum
  1 3224008 igs-kf.100
      0x40 0xEE91 0xEE91
[3224072 bytes used, 970232 available, 4194304 total]
4096K bytes of processor board System flash (Read/Write)

System flash directory, partition 2:
File Length Name/status
      addr fcksum ccksum
  1 3224008 igs-kf.100
      0x40 0xEE91 0xEE91
[3224072 bytes used, 970232 available, 4194304 total]
4096K bytes of processor board System flash (Read/Write)
```

The following is sample output for the **show flash err** command on a Cisco 3000 that has Flash memory partitioned.

```
Router# show flash err
System flash directory, partition 1:
File Length Name/status
  1 37376 master/igs-bfpx.100-4.3 [invalid checksum]
[37440 bytes used, 4156864 available, 4194304 total]
4096K bytes of processor board System flash (Read/Write)

  Chip   Bank   Code   Size   Name           erase write
  ----   -
  1      1      89A2   1024KB INTEL 28F008SA  0      0
  2      1      89A2   1024KB INTEL 28F008SA  0      0
```

```

      3      1      89A2      1024KB      INTEL 28F008SA      0      0
      4      1      89A2      1024KB      INTEL 28F008SA      0      0
Executing current image from System flash [partition 1]

```

```

System flash directory, partition 2:
File Length Name/status
  1  37376  master/igs-bfpx.100-4.3 [invalid checksum]
[37440 bytes used, 4156864 available, 4194304 total]
4096K bytes of processor board System flash (Read/Write)

```

Chip	Bank	Code	Size	Name	erase	write
1	2	89A2	1024KB	INTEL 28F008SA	0	0
2	2	89A2	1024KB	INTEL 28F008SA	0	0
3	2	89A2	1024KB	INTEL 28F008SA	0	0
4	2	89A2	1024KB	INTEL 28F008SA	0	0

The following is sample output for the **show flash summary** command on a router that has Flash memory partitioned. The partition that indicates a state of “Read Only” is the partition that is being executed from.

```

Router# show flash summary
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

```

The following are possible values for Copy-Mode:

- RXBOOT-MANUAL—Copy manually by reloading to the boot ROM image.
- RXBOOT-FLH—Copy via Flash load helper
- Direct—Copy directly into flash memory
- None—Copy not allowed

## show flh-log

To view the system console output generated during the Flash load helper operation, use the **show flh-log EXEC** command.

```
show flh-log
```

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Usage Guidelines

Because you might be 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.

### Sample Output

The following is sample output of the **show-flh** command:

```
Router# show flh-log
%FLH: abc/igs-kf.914 from 131.108.1.111 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 131.108.1.111...
Loading from 131.108.13.111:

Erasing device... .. erased
Loading from 131.108.13.111:
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!! [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
```

#### Restricted Rights Legend

```
Use, duplication, or disclosure by the Government is
subject to restrictions as set forth in subparagraph
(c) of the Commercial Computer Software - Restricted
--More--
```

```
Rights clause at FAR sec. 52.227-19 and subparagraph
(c) (1) (ii) of the Rights in Technical Data and Computer
Software clause at DFARS sec. 252.227-7013.
```

---

cisco Systems, Inc.  
1525 O'Brien Drive  
Menlo Park, California 94025

3000 Software (IGS-KF), Engineering Version 9.14(7.6)

Copyright (c) 1986-1994 by cisco Systems, Inc.  
Compiled Thu 07-Jul-94 13:26 [enf 1048]

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 Command

**copy tftp flash**

## show microcode

To show the microcode bundled into a 7000 Series system, use the **show microcode EXEC** command.

**show microcode**

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Sample Display

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

```
Router# show micro
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
```



## show version

Use the **show version** EXEC command to display the configuration of the system hardware, the software version, the names and sources of configuration files, and the boot images.

### show version

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Sample Display

The following is sample output from the **show version** command from a Cisco 7000 series:

```
Router> show version

GS Software (GS7), Version 10.0
Copyright (c) 1986-1993 by cisco Systems, Inc.
Compiled Mon 11-Jan-93 14:44

System Bootstrap, Version 4.6(1)

Current date and time is Fri 2-26-1993 2:18:52
Boot date and time is Fri 1-29-1993 11:42:38
Router uptime is 3 weeks, 6 days, 14 hours, 36 minutes
System restarted by power-on
Running default software
Network configuration file is "Router", booted via tftp from 131.108.2.333

RP1 (68040) processor with 16384K bytes of memory.
X.25 software.
Bridging software.
1 Switch Processor.
1 TRIP controller (4 Token Ring).
4 Token Ring/IEEE 802.5 interface.
1 AIP controller (1(ATM))
1 ATM network interface
4096K bytes of flash memory on embedded flash (in RP1).
Configuration register is 0x0
```

Table 3-7 describes significant fields shown in the display.

**Table 3-7 Show Version Field Descriptions**

Field	Description
GS Software, Version 10.0	Always specify the complete version number when reporting a possible software problem. In the example output, the version number is 10.0.
System Bootstrap, Version	Bootstrap version string.
Current date and time Boot date and time Router uptime is	Current date and time, the date and time the system was last booted, and <i>uptime</i> , or the amount of time the system has been up and running.
System restarted by power-on	Also displayed is a log of how the system was last booted, both as a result of normal system startup and of system error. For example, information can be displayed to indicate a bus error that is generally the result of an attempt to access a nonexistent address, as follows:  System restarted by bus error at PC 0xC4CA, address 0x210C0C0
Running default software	If the software was booted over the network, the Internet address of the boot host is shown. If the software was loaded from onboard ROM, this line reads “running default software.” In addition, the names and sources of the host and network configuration files are shown.
RPI....	The remaining output shows the hardware configuration and any nonstandard software options. The configuration register contents are displayed in hexadecimal notation.

The output of the **show version EXEC** command can also provide certain messages, such as bus error messages. If such error messages appear, report the complete text of this message to your technical support specialist.

## tftp-server system

To specify TFTP server operation for a router, use the **tftp-server system** global configuration command. To remove a previously defined filename, use the **no tftp-server system** command with the appropriate filename and, optionally, the IP access list number.

```
tftp-server system filename [access-list-number]
no tftp-server system filename [access-list-number]
tftp-server system [flash:][partition-number:]filename [access-list-number]
```

### Syntax Description

<i>filename</i>	Name you give the router Flash file.
<i>access-list-number</i>	(Optional) IP access list number.
<b>flash:</b>	(Optional) Specifies TFTP server operation from the file in the first partition of Flash.
<i>partition-number:</i>	(Optional) Specifies TFTP server operation from the file in the specified partition of Flash. If the partition number is not specified, the file in the first partition is used.
<i>filename</i>	Filename in the first or specified partition of Flash memory.

### Default

Disabled

See also the Syntax Description and Usage Guidelines sections for more defaults.

### Command Mode

Global configuration

### Usage Guidelines

You can specify multiple filenames by repeating the **tftp-server system** command. The system sends a copy of the system image contained in ROM or one of the system images contained in Flash to any host that issues a TFTP read request with this filename.

The following algorithm is used when deciding whether to send the ROM or Flash image:

- If you omit *filename* from the **tftp-server system** command, the TFTP request is rejected.
- If the specified *filename* is not stored in Flash memory, the ROM image is sent.
- If the specified *filename* exists in Flash memory, a copy of the Flash image is sent.

Images that run from ROM cannot be loaded over the network. Therefore, it does not make sense to use TFTP to offer the ROMs on these images.

### Examples

Assuming there is a file in Flash named *version-9.0*, the following example causes the router to send, via TFTP, a copy of the Flash software when it receives a TFTP read request for the file *version-9.0*. The requesting host is checked against access list 22.

```
tftp-server system version-9.0 22
```

The following example causes the router to send, via TFTP, a copy of the ROM software when it receives a TFTP read request for the file *version-9.0*. The requesting host is checked against access list 22.

```
tftp-server system version-9.0 22
```

### Related Command

A dagger (†) indicates that the command is documented in another chapter.

**access-list** †

## verify flash

To verify the checksums of files in Flash memory, use the **verify flash** EXEC command.

**verify flash**

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Usage Guidelines

This command performs the same action as the **copy verify flash** command.

### Example

The following example illustrates how to use this command:

```
Router# verify 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]
```

The system will prompt only if there are two or more read/write partitions. If the partition entered is not valid, the process terminates. You have the option to enter a partition number, **?** for directory display of all partitions, or **?number** for directory display of a particular partition. The default is the first partition.

```
File Length Name/status
  1  3459720 master/igs-bfpx.100-4.3
[3459784 bytes used, 734520 available, 4194304 total]

Name of file to verify? master/igs-bfpx.100-4.3
Verifying checksum for 'master/igs-bfpx.100-4.3' (file # 1)... OK
```

## write erase

To erase the configuration information in nonvolatile memory, use the **write erase** EXEC command.

```
write erase
```

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Example

The following example illustrates how to erase the configuration in nonvolatile memory:

```
write erase
```

## write memory

To copy the current configuration information to nonvolatile memory, use the **write memory EXEC** command.

**write memory**

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Usage Guidelines

Use the **write memory** command in conjunction with the **reload** command to restart the router with the configuration information stored in NVRAM.

If you issue the **write memory** command from a bootstrap system image, a warning displays that the previous NVRAM configuration will be overwritten and some of the configuration commands will be lost unless you answer no. This warning will not display if NVRAM does not contain a valid configuration or if the previous configuration in NVRAM was generated by a bootstrap system image.

### Examples

The following example illustrates how to copy the current configuration information to nonvolatile memory:

```
Router# write memory
```

The following is an example of the warning the system provides if you are trying to save configuration information from bootstrap into the system:

```
router (boot)# write memory
```

```
Warning: Attempting to overwrite an NVRAM configuration written by a full system image.  
This bootstrap software does not support a full configuration command set. If you write  
memory now, some configuration commands may be lost.  
Overwrite the previous NVRAM configuration? [confirm]
```

Enter **no** to escape writing the configuration information to memory.

### Related Commands

**configure**

**reload**

**show configuration**

## write network

To copy the current configuration information to a network server, use the **write network** EXEC command.

**write network**

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Usage Guidelines

This command copies the current configuration to a server host on the network. You are prompted for a destination host and filename.

### Example

The following example illustrates how to begin the prompts for writing configuration information to a network host:

```
Router# write network
Remote host [0.0.0.0]? 131.108.1.111
Name of configuration file to write [Router-config]?
Write file Router-config on host 131.108.1.111? [confirm]
#
Writing Router-config !! [OK]
Router#
```



## write terminal

To display the current configuration information on the terminal, use the **write terminal EXEC** command.

**write terminal**

### Syntax Description

This command has no arguments or keywords.

### Command Mode

EXEC

### Usage Guidelines

Use this command in conjunction with the **show configuration** command to compare the information in running memory to the information stored in NVRAM.

### Example

The following example illustrates how to display the current configuration information:

```
write terminal
```

### Related Commands

**configure**

**show configuration**

