CHAPTER 3

System Image, Microcode Image, and Configuration File Load Commands

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 communication server.

For communication server configuration information and examples, refer to the *Communication Server Configuration Guide*.

b flash

To manually boot the system from Flash memory, use the **b flash** ROM monitor command.

b flash [*filename*]

Syntax Description

filename	(Optional.) The filename of the image you want loaded. It is case sensitive. Without this argument, all files in Flash memory will be loaded.

Default

All files in Flash memory are loaded.

Command Mode

ROM monitor (>)

Usage Guidelines

The ASM-CS has flash memory, the 500-CS does not.

Examples

The following example shows the **boot flash** command without the *filename* argument. In this example, all files in Flash memory will be loaded.

```
> b flash
F3: 1858656+45204+166896 at 0x1000

Booting gs7-k from flash memory RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR
RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR
RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR
RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR
RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR
RRRRRRRRRRRRRRRRRRRRRRRRRRRRRR [OK - 1903912/13765276 bytes]
F3: 1858676+45204+166896 at 0x1000

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```

In the following example, the **b flash** command is used with the filename gs7-k. That is the file that will be loaded.

```
> b flash gs7-k
F3: 1858656+45204+166896 at 0x1000

Booting gs7-k from flash memory RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR
RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR
RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR
RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR
RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR
RRRRRRRRRRRRRR [OK - 1903912/13765276 bytes]
F3: 1858676+45204+166896 at 0x1000

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(c) of the Commercial Computer Software - Restricted
System Bootstrap, Version 4.6(1012) [mlw 99], INTERIM SOFTWARE
Copyright (c) 1986-1992 by cisco Systems
RP1 processor with 16384 Kbytes of memory
```

b mop

To boot a system image using MOP, use the **b mop** ROM monitor command

b mop *filename* [*MAC-address*] [*interface*]

Syntax Description

filename	The name of the file image that is being loaded.
MAC-address	Optional argument. The hardware address of the host from which you are loading the software.
interface	The interface from which the software will be loaded.

Default

Non.

Type

ROM monitor command

Usage Guidelines

This feature typically is used to verify that system software has been properly installed on the MOP boot server before configuring the router is configured to automatically boot the system software image.

To boot an image, bring the system up to the system prompt

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 filename.

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.

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.

Example

The following example will boot the router from the file xx-k. No MAC address or interface is specified, so the system will broadcast on all interfaces that have MOP enabled, looking for a MOP boot server on which the file xx-k resides.

```
System Bootstrap, Version 4.6(1)
Copyright (c) 1986-1991 by cisco Systems
CSC3 processor with 4096 Kbytes of memory
> b mop xx-k
F3: 1167860+27556+88156 at 0x1000
Booting xx-k from interface Ethernet0 address aa00.0400.9005:!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!! [OK - 2008576 / 2572528 bytes]
F3: 1963576+44528+168244 at 0x1000
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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
GS Software (XX-K), Version 9.1(14),
Copyright (c) 1986-1992 by cisco Systems, Inc.
Compiled Mon 16-Nov-92 17:52
cisco 4000 (68030) processor (revision 0xA0) with 4096K/1024K bytes of memory.
Processor board serial number 00000076
DDN X.25 software.
Bridging software.
1 Ethernet/IEEE 802.3 interface.
2 Token Ring/IEEE 802.5 interface.
4 Serial network interface.
1 FDDI network interface.
128K bytes of non-volatile configuration memory.
2048K bytes of flash memory sized on embedded flash.
Configuration register is 0x0
Press RETURN to get started!
```

Related Commands

boot system mop

b (ROM monitor)

To manually boot the communication server, use the **b** ROM monitor command.

b [*filename* [*address*]]

Syntax Description

filename	(Optional.) Name of the system image from which you want to netboot.
address	(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.

Default

If you enter the **b** command and press Return, the communication server boots from ROM by default.

Command Mode

ROM monitor (>)

Usage Guidelines

Use this command only when your communication server cannot find the configuration information needed in NVRAM. To get to the ROM monitor prompt, enter the **reload** EXEC command, and then press the Break key during the first 60 seconds of startup.

Examples

In the following example, the communication server is manually booted from ROM:

```
> b
F3:
(ROM Monitor copyrights)
```

In the following example, the file cstest is netbooted from IP address 131.108.15.112:

```
> b cstest 131.108.15.112
F3:
(ROM Monitor copyrights)
```

boot bootstrap

To cause the system 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* [*MA- address*] [*interface*]

boot bootstrap [**tftp**] *filename* [*address*]
no boot bootstrap [**tftp**] *filename* [*address*]

Syntax Description

flash	Indicates that the communication server will be booted from Flash memory.
mop	Indicates that the communication server will be netbooted from a system image stored on a DEC MOP server.
tftp	(Optional.) Indicates that the communication server will be netbooted from a system image stored on a TFTP server.
filename	(Optional with **flash.)** Name of the system image from which you want to netboot. If you omit the filename when booting from Flash, the communication server uses the first system image stored in Flash memory.
MAC address	(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 communication server gets the boot image.
interface	(Optional.) Interface out which the communication server should send MOP requests to reach the MOP server. The interface options are **async**, **dialer**, **Ethernet**, **loopback**, **null**, **serial**, and **tunnel**. 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.
address	(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.

Default

The default method is to netboot from a TFTP server.

Command Mode

Global configuration

Usage Guidelines

The **boot bootstrap** command is equivalent to setting bit 9 on the configuration register of an AGS, CGS, or MGS router. It causes the communication server 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 communication server 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

The size of the nonvolatile memory.

Command Mode

Global configuration

Usage Guidelines

Normally, the communication server 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 file 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* [*address*]
no boot host [**tftp**] *filename* [*address*]

Syntax Description

mop	Indicates that the communication server will be configured from a configuration file stored on a DEC MOP server.
tftp	(Optional.) Indicates that the communication server will be configured from a configuration file stored on a TFTP server.
filename	Name of the file from which you want to load configuration commands.
MAC-address	(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 communication server gets the boot image.
interface	(Optional.) Interface out which the communication server should send MOP requests to reach the MOP server. The interface options are **async**, **dialer**, **ethernet**, **serial**, and **tunnel**. 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.
address	(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.

Default

By default, the communication server uses its hostname to form a host configuration filename. To form this name, the communication server converts its name to all lowercase letters, removes all domain information, and appends *-confg.*

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 communication server 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-confg at address 192.31.7.19:

```
boot host /usr/local/tftpdir/wilma-confg 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**] *filename* [*address*]
no boot network [**tftp**] *filename* [*address*]

Syntax Description

mop	Indicates that the communication server will be configured from a configuration file stored on a Digital MOP server.
tftp	(Optional.) Indicates that the communication server will be configured from a configuration file stored on a TFTP server.
filename	Name of the file from which you want to load configuration commands.
MAC address	(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 communication server gets the boot image.
interface	(Optional.) Interface out which the communication server should send MOP requests to reach the MOP server. The interface options are **async**, **dialer**, **ethernet**, **serial**, and **tunnel**. 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.
address	(Optional.) IP address of the TFTP server on which the compressed image file resides. If omitted, this value defaults to the IP broadcast address of 255.255.255.255.

Default

The default filename is network-config.

Command Mode

Global configuration

Usage Guidelines

When netbooting, communication servers ignore routing information, static IP routes, and bridging information. As a result, intermediate communication servers are responsible for handling TFTP requests correctly. Before netbooting, 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 communication server 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. The second is the host configuration file containing commands that apply to one network server in particular.

Example

This example changes the network configuration filename to bridge_9.1 and uses the default broadcast address:

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

Related Commands

boot host
service config

boot system

To change the filename of the system image that is loaded onto the communication server 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**] *filename* [*ip-address*]
no boot system [**tftp**] *filename* [*ip-address*]

no boot system

Syntax Description

flash	Indicates that the communication server will be booted from Flash memory.
mop	Indicates that the communication server will be netbooted from a system image stored on a Digital MOP server.
rom	Indicates the communication server will be booted from ROM.
tftp	(Optional.) Indicates that the communication server will be netbooted from a system image stored on a TFTP server.
filename	(Optional for Flash.) Name of the configuration file from which you want to netboot. It is case sensitive.
MAC-address	(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 communication server gets the boot image.
interface	(Optional.) Interface out which the communication server should send MOP requests to reach the MOP server. The interface options are **async**, **dialer**, **ethernet**, **serial**, and **tunnel**. 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.
address	(Optional.) IP address of the TFTP server on which the image file resides. If omitted, this value defaults to the IP broadcast address of 255.255.255.255.

Default

If you do not specify a system image file with the **boot system** command, the communication server uses the configuration register settings to determine the default system image filename for netbooting. The communication server 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 (cisco*nn-cpu*). See the appropriate hardware installation guide for details on the configuration register and default filename.

Command Mode

Global configuration

Usage Guidelines

Enter several **boot system** commands to provide a fail-safe method for booting your communication server. 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 communication server attempts to load from Flash memory first, then from a TFTP or MOP server, and finally from ROM. If you enter multiple boot commands of the same type—for example, if you enter two commands that instruct the communication server to boot from different network servers—then the communication server 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.

You can netboot from a compressed image. When a server netboots software, 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 communication server. You can produce a compressed software image on any UNIX platform using the compress program. Refer to your UNIX platform's documentation for the exact usage of the compress program.

Example

The following example illustrates a list specifying two possible internetwork locations for a system image, with the ROM software being used as a backup:

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

Related Commands

copy flash tftp
copy tftp flash

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 communication server prompts you for the source of configuration commands. After you enter the **configure** command, the system prompt changes from cs# to cs(config)#, indicating that you are in global configuration mode. To leave global configuration mode and return to the privileged EXEC prompt, press Ctrl-Z.

Examples

In the following example, the communication server is configured from the terminal:

```
cs# configure

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

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

```
cs1# 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

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

The copy of the system image can serve as a backup copy and also can be used to verify that the copy in Flash is the same as on the original file on disk.

Example

The following example illustrates how to use this command:

```
cs# 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
Router#
```

Related Commands

boot system flash
copy tftp flash

copy tftp flash

To copy a system image using TFTP into Flash memory, use the **copy tftp flash** EXEC command.

copy tftp flash

Syntax Description

This command has no arguments or keywords.

Command Mode

EXEC

Usage Guidelines

If the image fits into the current Flash configuration when this command is executed, it prompts for the IP address of the TFTP server and TFTP 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 tftp flash** command. The README file was copied to the TFTP server automatically when you installed the system software image.

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

Example

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

```
cs# copy tftp flash
IP address or name of remote host [255.255.255.255]? server1
Name of tftp filename to copy into flash []? IJ09140Z
copy IJ09140Z from 131.131.101.101 into flash memory? [confirm] <Return>
xxxxxxxx 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...
VVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVVV...
Flash verification successful. Length = 1204637, checksum = 0x95D9
```

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

Related Commands

boot system flash
copy flash tftp

ip rarp-server

Use the **ip rarp-server** interface configuration command to allow the communication server 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 *address*
no ip rarp-server *address*

Syntax Description

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 command 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 communication server does not interfere with RARP traffic on subnets that do not need RARP assistance from the communication server.

The communication server 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 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 communication server 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 communication server, 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 communication server 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 communication server 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 communication server 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 <broadcast-address>
```

RFC 903 documents the Reverse Address Resolution Protocol.

Examples

The following partial example configures the communication server to act as a RARP server. The communication server 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 communication server is configured to act as a RARP server, with TFTP and portmapper requests forwarded to the Sun server:

```
! Allow the communication server to forward broadcast portmapper requests
ip forward-protocol udp 111
! Provide the communication server with the IP address of the diskless sun
arp 128.105.2.5 0800.2002.ff5b arpa
interface ethernet 0
! Configure the communication server 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 †

mop retransmit-timer

To configure the length of time the communication server 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 communication server 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 communication server 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 communication server are separated by a slow serial link, it may take longer than 4 seconds for the communication server to receive a response to its message. Therefore, you might want to configure the communication server 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 communication server 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 retries
mop enabled †

mop retries

To configure the number of times a communication server 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 communication server 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 communication server 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 retransmit-timer
mop enabled †

o (ROM monitor)

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 communication server 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

Use the **i** command in conjunction with the **o/r** command to initialize the communication server. 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
```

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:

```
cs# reload
```

Related Command

write memory

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 communication server 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 communication server uses the default configuration files. The default network configuration file is network-confg. The default host configuration file is *host*-confg, where *host* is the host name of the communication server. If the communication server cannot resolve its host name, the default host configuration file is communication server-confg.

Example

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

```
boot host
service config
```

Related Commands

boot host
boot network

show configuration

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

show configuration

Syntax Description

This command has no arguments or keywords.

Command Mode

EXEC

Usage Guidelines

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.

Sample Display

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

```
cs# 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
!
!
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
```

Related Commands

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

configure
description †
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 may currently exist in Flash memory, and the amounts of Flash memory used and remaining.

show flash [**all**]

Syntax Description

all	(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, including those that are invalidated.

Command Mode

EXEC

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

Example

The following example is sample output of the **show version** command.

```
cs# show ver
CS Software (CS3-K), Version 9.21(4536) [orange 103]
Copyright (c) 1986-1993 by cisco Systems, Inc.
Compiled Thu 09-Dec-93 23:08

ROM: System Bootstrap, Version 4.6(1), SOFTWARE

cs uptime is 1 week, 1 day, 13 hours, 2 minutes
System restarted by reload
System image file is "orange/cs3-k", booted via tftp from 131.108.13.111

CSC3 (68020) processor with 4096K bytes of memory.
X.25 software, Version 2.0, NET2, BFE and GOSIP compliant.
SuperLAT software (copyright 1990 by Meridian Technology Corp).
1 MCI controller (1 Ethernet, 0 Serial).
1 Ethernet/IEEE 802.3 interface.
16 terminal lines.
32K bytes of non-volatile configuration memory.
Configuration register is 0x0
```

tftp-server system

To specify TFTP server operation for a communication server, 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, access-list number.

tftp-server system *filename* [*IP-access-list*]
no tftp-server system *filename* [*IP-access-list*]

Syntax Description

filename	Name you give the communication server ROM file.
IP-access-list	(Optional.) IP access list number.

Default

Disabled

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.

Example

The following example causes the communication server 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 †

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:

```
cs# 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 communication server 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:

```
cs# 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:

```
cs (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:

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

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:

```
cs# write terminal
```

Related Commands

configure
show configuration