

# Cisco 4500-M and Cisco 4700-M ROM Monitor

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This appendix describes the Cisco 4500-M and Cisco 4700-M ROM monitor, the first software to run when the router is powered up or reset. The Cisco 4500-M and Cisco 4700-M ROM monitor supports more features than the familiar Cisco 4000-M ROM monitor. The ROM Monitor can help you isolate or rule out hardware problems encountered when installing your router. A summary of the ROM monitor diagnostic tests and command options is provided.

## Entering the ROM Monitor Program

The ROM monitor diagnostics help initialize the processor hardware and boot the main operating system software. If you set the software configuration register (bits 3, 2, 1, and 0) to zero, you can start the router in the standalone ROM monitor. An example of the Cisco 4500-M and Cisco 4700-M ROM monitor prompt follows:

```
rommon 1 >
```

To enable Break and to default to booting at the ROM monitor while running the system software, reset the configuration register to 0x0 by entering configuration mode, then enter the following configuration command:

```
config-reg 0x0
```

The new configuration register value, 0x0, takes effect after the router is rebooted when you enter the **reload** command. If you set the configuration to 0x0, you will have to manually boot the system from the console each time you reload the router.

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**Timesaver** Break (system interrupt) is always enabled for 60 seconds after rebooting the system, regardless of whether Break is configured to be off by setting the configuration register. During the 60-second window, you can use Break to get to the ROM monitor prompt.

## Available ROM Monitor Commands

At the ROM monitor prompt, enter **?** or **help** at the **rommon 1 >** prompt to display a list of available commands and options, as follows:

```
rommon 1 > ?
help          monitor builtin command help
boot         boot up an external process
dir          list files in file system
dev          list the device table
confreg      configuration register utility
reset        system reset
stack        produce a stack trace
context      display the context of a loaded image
frame        print out a selected stack frame
sysret       print out info from last system return
meminfo      main memory information
rommon 2 >
```

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**Note** Further information about a command can be displayed by entering the command name with a **-?** option, which will cause the command usage message to be printed.

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## ROM Monitor Command Conventions

Following are ROM monitor command conventions:

- Brackets [ ] denote an optional field. If a minus option is followed by a colon (for example: [-s:]) the user must provide an argument for the option.
- A word in *italics* means that the user must fill in the appropriate information.
- All of the built-in commands can be aborted (user interrupt signal) by pressing the Break key at the console.

The following case-sensitive ROM monitor commands are among the most useful:

- **help**—The **help** command prints a summary of the ROM monitor commands to the console screen. This is the same output as entering **?**.
- **boot** or **b**—Boot an image. The **boot** command with no arguments will boot the first image in boot Flash memory. You can include an argument, *filename*, to specify a file to be booted over the network using the Trivial File Transfer Protocol (TFTP). The local device (see the description of the **b device** command following) can be specified by entering the device specifier (*dev*). If the specified device name is not recognized by the ROM monitor, the system will attempt to boot the image (*imagename*) from a network TFTP server. Do not insert a space between *dev* and *imagename*. Options to the boot command are **-x**, load image but do not execute, and **-v**, verbose. The form of the **boot** command follows:

```
boot [-xv] [dev][imagename]
```

**b**—Boots the default system software from ROM.

**b filename [host]**—Boots using a network TFTP server. When a host is specified, either by name or IP address, the **boot** command will boot from that source.

**b flash:**—Boots the first file in Flash memory.

**b device:**—Boots the first file found in the Flash device. The Flash device specified can be either *flash:*, to boot the Cisco Internetwork Operating System (Cisco IOS) software, or *bootflash:*, to boot the boot image in Flash memory.

**b device:name**—An extension of the above command, allows you to specify a particular filename in the flash memory.

- **reset** or **i**—Resets and initializes the system, similar to power on.
- **dev**—Lists boot device identifications on the router.

For example:

```
rommon 10 > dev
Devices in device table:
      id  name
flash:  flash
bootflash:  boot flash
eprom:  eprom
```

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- **dir**—Lists the files on the named device, **dir device**, where the device is flash or bootflash; lists the available files on that device.

For example:

```
rommon 11 > dir flash:
      File size           Checksum   File name
2229799 bytes (0x220627)  0x469e    C4500-k
```

## Debugging Commands

Most of the debugging commands are functional only when the Cisco IOS software has crashed or is aborted. If you enter the debug commands and Cisco IOS crash information is not available, the screen will display the following error message:

```
"xxx: kernel context state is invalid, can not proceed."
```

- **stack** or **k**—Produces a stack trace.
- **context**—Displays the processor context.
- **frame**—Displays an individual stack frame.
- **sysret**—Displays the return information from the last booted system image. This includes the reason for terminating the image, a stack dump of up to eight frames, and if an exception is involved, the address where the exception occurred.

For example:

```
rommon 8 > sysret
System Return Info:
count: 19, reason: user break
pc:0x60043754, error address: 0x0
Stack Trace:
FP: 0x80007e78, PC: 0x60043754
FP: 0x80007ed8, PC: 0x6001540c
FP: 0x80007ef8, PC: 0x600087f0
FP: 0x80007f18, PC: 0x80008734
```

- **meminfo**—Displays the size in bytes, the starting address, the available range of the main memory, the starting point and size of packet memory, and the size of nonvolatile random-access memory (NVRAM).

```
rommon 9 > meminfo

Main memory size: 8 MB. Packet memory size: 4 MB
Available main memory starts at 0xa000e001, size 0x7f1fff
Packet memory starts at 0xa8000000
NVRAM size: 0x20000
```

## Configuration Register

The configuration register resides in NVRAM. The configuration register is identical in operation to other Cisco routers. Enter the **confreg** command for the menu-driven system, or enter the new value of the register in hexadecimal.

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**Note** The value is always interpreted as hex. The **confreg** command will print a before and after view of the configuration register when used in menu-driven mode.

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- **confreg** [*hexnum*]—Executing the **confreg** command with the argument *hexnum* will change the virtual configuration register to match the hex number specified. Without the argument, **confreg** will dump the contents of the virtual configuration register in English and allow the user to alter the contents. The user is prompted to change or keep the information held in each bit of the virtual configuration register. In either case the new virtual configuration register value is written into NVRAM and does not take effect until the user resets or power cycles the platform.

For example:

```
rommon 7 > confreg

Configuration Summary
enabled are:
console baud: 9600
boot: the ROM Monitor
```

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```
do you wish to change the configuration? y/n [n]: y
enable "diagnostic mode"? y/n [n]: y
enable "use net in IP bcast address"? y/n [n]:
enable "load rom after netboot fails"? y/n [n]:
enable "use all zero broadcast"? y/n [n]:
enable "break/abort has effect"? y/n [n]:
enable "ignore system config info"? y/n [n]:
change console baud rate? y/n [n]: y
enter rate: 0 = 9600, 1 = 4800, 2 = 1200, 3 = 2400 [0]: 0
change the boot characteristics? y/n [n]: y
enter to boot:
  0 = ROM Monitor
  1 = the boot helper image
  2-15 = boot system
  [0]: 0
```

```
Configuration Summary
enabled are:
diagnostic mode
console baud: 9600
boot: the ROM Monitor
```

```
do you wish to change the configuration? y/n [n]:
```

You must reset or power cycle for new config to take effect