APPENDIX C

ROM Monitor

The ROM monitor firmware runs when the router is powered up or reset. The firmware helps to initialize the processor hardware and boot the operating system software. You can use the ROM monitor to perform certain configuration tasks, such as recovering a lost password or downloading software over the console port. If there is no Cisco IOS software image loaded on the router, the ROM monitor runs the router.

This appendix contains the following sections:

Entering the ROM Monitor

To use the ROM monitor, you must be using a terminal or PC that is connected to the router over the console port.

Perform these steps to configure the router to boot up in ROM monitor mode the next time it is rebooted.

	Command	Purpose
Step 1	**enable**	Enters privileged EXEC mode. Enter your password if prompted.
Step 2	**configure terminal**	Enters global configuration mode.
Step 3	**config-reg 0x0**	Resets the configuration register.

	Command	Purpose
Step 4	**exit**	Exits global configuration mode.
Step 5	**reload**	Reboots the router with the new configuration register value. The router remains in ROM monitor and does not boot the Cisco IOS software. As long as the configuration value is 0x0, you must manually boot the operating system from the console. See the **boot** command in the "Command Descriptions" section on page C-3. After the router reboots, it is in ROM monitor mode. The number in the prompt increments with each new line.

Timesaver Break (system interrupt) is always enabled for 60 seconds after the router reboots, regardless of whether it is set to on or off in the configuration register. During this 60-second window, you can break to the ROM monitor prompt by pressing the Break key.

ROM Monitor Commands

Enter **?** or **help** at the ROM monitor prompt to display a list of available commands and options, as follows:

```
rommon 1 > ?
alias           set and display aliases command
boot            boot up an external process
break           set/show/clear the breakpoint
confreg         configuration register utility
cont            continue executing a downloaded image
context         display the context of a loaded image
cookie          display contents of cookie PROM in hex
copy            Copy a file-copy [-b <buffer_size>] <src_file> <dst_file>
delete          Delete file(s)-delete <filenames ...>
dir             List files in directories-dir <directory>
dis             display instruction stream
dnld            serial download a program module
format          Format a filesystem-format <filessystem>
frame           print out a selected stack frame
fsck            Check filesystem consistency-fsck <filesystem>
help            monitor builtin command help
history         monitor command history
meminfo         main memory information
mkdir           Create dir(s)-mkdir <dirnames ...>
more            Concatenate (type) file(s)-cat <filenames ...>
rename          Rename a file-rename <old_name> <new_name>
repeat          repeat a monitor command
reset           system reset
rmdir           Remove a directory
set             display the monitor variables
stack           produce a stack trace
sync            write monitor environment to NVRAM
sysret          print out info from last system return
tftpdnld        tftp image download
unalias         unset an alias
unset           unset a monitor variable
xmodem          x/ymodem image download
```

Commands are case sensitive. You can halt any command by pressing the Break key on a terminal. If you are using a PC, most terminal emulation programs halt a command when you press the Ctrl and the Break keys at the same time. If you are using another type of terminal emulator or terminal emulation software, see the documentation for that product for information on how to send a **Break** command.

Command Descriptions

Table C-1 describes the most commonly used ROM monitor commands.

Table C-1 Commonly Used ROM Monitor Commands

Command	Description
help or **?**	Displays a summary of all available ROM monitor commands.

-?	Displays information about command syntax; for example:
	`rommon 16 > dis -?`
	`usage : dis [addr] [length]`
	
	The output for this command is slightly different for the **xmodem** download command:
	`rommon 11 > xmodem -?`
	`xmodem: illegal option -- ?`
	`usage: xmodem [-cyrxu] <destination filename>`
	`-c  CRC-16`
	`-y  ymodem-batch protocol`
	`-r  copy image to dram for launch`
	`-x  do not launch on download completion`
	`-u  upgrade ROMMON, System will reboot after upgrade`

reset or **i**	Resets and initializes the router, similar to a power up.

dir *device***:**	Lists the files on the named device; for example, flash memory files:
	`rommon 4 > dir flash:`
	`Directory of flash:/`
	`2 -rwx 10283208 <date> c880-advsecurityk9-mz`
	`9064448 bytes available (10289152 bytes used)`

boot commands	For more information about the ROM monitor boot commands, see *Cisco IOS Configuration Fundamentals and Network Management Guide*.
b	Boots the first image in flash memory.
b flash: [*filename*]	Attempts to boot the image directly from the first partition of flash memory. If you do not enter a filename, this command will boot this first image in flash memory.

Disaster Recovery with TFTP Download

The standard way to load new software on your router is to use the **copy tftp flash** privileged EXEC command from the Cisco IOS software command-line interface (CLI). However, if the router is unable to boot Cisco IOS software, you can load new software while in ROM monitor mode.

This section describes how to load a Cisco IOS software image from a remote TFTP server to the router flash memory. Use the **tftpdnld** command only for disaster recovery because it erases all existing data in flash memory before downloading a new software image to the router.

TFTP Download Command Variables

This section describes the system variables that can be set in ROM monitor mode and that are used during the TFTP download process. There are both required variables and optional variables.

Note The commands described in this section are case sensitive and must be entered exactly as shown.

Required Variables

These variables must be set with these commands before you use the **tftpdnld** command:

Variable	Command
WAN GE setting	**FE_PORT**=4
Switch port setting	**FE_PORT=**{0-3}
IP address of the router	**IP_ADDRESS**=*ip_address*
Subnet mask of the router	**IP_SUBNET_MASK**=*ip_address*
IP address of the default gateway of the router	**DEFAULT_GATEWAY**=***ip_address***
IP address of the TFTP server from which the software will be downloaded	**TFTP_SERVER**=*ip_address*
Name of the file that will be downloaded to the router	**TFTP_FILE**=*filename*

Optional Variables

These variables can be set with these commands before using the **tftpdnld** command:

Variable	Command
Configures how the router displays file download progress. 0—No progress is displayed. 1—Exclamation points (!!!) are displayed to indicate file download progress. This is the default setting. 2—Detailed progress is displayed during the file download process; for example: • Initializing interface. • Interface link state up. • ARPing for 1.4.0.1 • ARP reply for 1.4.0.1 received. MAC address 00:00:0c:07:ac:01	**TFTP_VERBOSE**=*setting*
Number of times the router attempts ARP and TFTP download. The default is 7.	**TFTP_RETRY_COUNT=***retry_times*
Length of time, in seconds, before the download process times out. The default is 2400 seconds (40 minutes).	**TFTP_TIMEOUT**=*time*
Whether or not the router performs a checksum test on the downloaded image: 1—Checksum test is performed. 0—No checksum test is performed.	**TFTP_CHECKSUM**=*setting*

Using the TFTP Download Command

To download a file through TFTP, perform these steps in ROM monitor mode.

Step 1 Use the appropriate commands to enter all the required variables and any optional variables described in preceding sections.

Step 2 Enter the **tftpdnld** command as follows:

```
rommon 1 > tftpdnld -r
```

Note The **-r** variable is optional. Entering this variable downloads and boots the new software but does not save the software to flash memory. You can then use the image that is in flash memory the next time you enter the **reload** command.

You will see an output similar to the following:

```
IP_ADDRESS: 10.3.6.7
IP_SUBNET_MASK: 255.255.0.0
DEFAULT_GATEWAY: 10.3.0.1
TFTP_SERVER: 192.168.254.254
TFTP_FILE: c880-advsecurityk9-mz
Do you wish to continue? y/n:  [n]:
```

Step 3 If you are sure that you want to continue, enter **y** in response to the question in the output:

```
Do you wish to continue? y/n:  [n]:y
```

The router begins to download the new file.

If you mistakenly entered yes, you can enter **Ctrl-C** or **Break** to stop the transfer before the flash memory is erased.

Examples

The following shows the example configuration for TFTP support with WAN interface:

```
rommon 1 >
rommon 1 >
rommon 1 > set
PS1=rommon ! >
RTC_STAT=0
GE_SPEED_MODE=4
LICENSE_BOOT_LEVEL=advipservices,all:c800;
WARM_REBOOT=FALSE
TFTP_SERVER=209.165.200.225
IP_SUBNET_MASK=255.255.255.224
DEFAULT_GATEWAY=209.165.200.225
IP_ADDRESS=209.165.200.226
TFTP_FILE=c800-universalk9-mz.SPA.152-3.16.M0.1
FE_PORT=4
?=0
RELOAD_TYPE=1
CRASHINFO=flash:crashinfo_20120406-133436-UTC
BSI=0
RANDOM_NUM=683383170
RET_2_RTS=22:51:49 UTC Fri Jul 13 2012
RET_2_RCALTS=1342219899
rommon 2 >
rommon 2 >
rommon 2 > tftpdnld -r

          IP_ADDRESS: 209.165.200.225
      IP_SUBNET_MASK: 255.255.255.224
     DEFAULT_GATEWAY: 209.165.200.225
         TFTP_SERVER: 209.165.200.225
           TFTP_FILE: c800-universalk9-mz.SPA.152-3.16.M0.1
        TFTP_MACADDR: 00:22:bd:ec:23:f4
    TFTP_DESTINATION: flash:
        TFTP_VERBOSE: Progress
    TFTP_RETRY_COUNT: 18
        TFTP_TIMEOUT: 7200
       TFTP_CHECKSUM: Yes
             FE_PORT: 4
.......
```

```
Receiving c800-universalk9-mz.SPA.152-3.16.M0.1 from 209.165.200.225
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!
File reception completed.
IOS Image Load Test
___________________
Digitally Signed Production Software

Validating checksum.

loading image c800-universalk9-mz.SPA.152-3.16.M0.1
program load complete, entry point: 0x4000000, size: 0x307eeb0
Self decompressing the image :
##########################################################################################
##########################################################################################
##########################################################################################
##########################################################################################
################################################################### [OK]
*** No sreloc section
Smart Init is enabled
smart init is sizing iomem
                 TYPE      MEMORY_REQ
    Onboard devices &
         buffer pools      0x020ECEC0
-----------------------------------------------
               TOTAL:      0x020ECEC0

Rounded IOMEM up to: 32Mb.
Using 3 percent iomem. [32Mb/896Mb]

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Software clause at DFARS sec. 252.227-7013.

           cisco Systems, Inc.
           170 West Tasman Drive
           San Jose, California 95134-1706

Cisco IOS Software, C800 Software (C800-UNIVERSALK9-M), Version 15.2(3.16)M0.1,
MAINTENANCE INTERIM SOFTWARE
Technical Support: http://www.cisco.com/techsupport
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Compiled Thu 07-Jun-12 04:44 by prod_rel_team

WDC is not configured
This product contains cryptographic features and is subject to United
States and local country laws governing import, export, transfer and
use. Delivery of Cisco cryptographic products does not imply
third-party authority to import, export, distribute or use encryption.
Importers, exporters, distributors and users are responsible for
compliance with U.S. and local country laws. By using this product you
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to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to
```

```
export@cisco.com.

Installed image archive
Cisco C819HGW+7-A-A-K9 (revision 4.0) with 883788K/33715K bytes of memory.
Processor board ID FAC15455YYZ
4 FastEthernet interfaces
2 Gigabit Ethernet interfaces
1 Serial(sync/async) interface
2 terminal lines
1 Virtual Private Network (VPN) Module
1 Cellular interface
1 cisco Embedded AP (s)
DRAM configuration is 32 bits wide
255K bytes of non-volatile configuration memory.
961128K bytes of ATA System CompactFlash (Read/Write)

Press RETURN to get started!

*Jan  2 00:00:02.391: %IOS_LICENSE_IMAGE_APPLICATION-6-LICENSE_LEVEL: Module name = c800
Next reboot level = advipservices and License = advipservices
*Jul 13 23:00:20.435: %VPN_HW-6-INFO_LOC: Crypto engine: onboard 0  State changed to:
Initialized
*Jul 13 23:00:20.515: %VPN_HW-6-INFO_LOC: Crypto engine: onboard 0  State changed to:
Enabled
*Jul 13 23:00:24.431: c3600_scp_set_dstaddr2_idb(184)add = 0 name is Wlan-GigabitEthernet0
*Jul 13 23:00:41.395: %LINEPROTO-5-UPDOWN: Line protocol on Interface wlan-ap0, changed
state to up
*Jul 13 23:00:41.395: %LINK-3-UPDOWN: Interface GigabitEthernet0, changed state to up
*Jul 13 23:00:41.399: %LINK-3-UPDOWN: Interface Serial0, changed state to down
*Jul 13 23:00:42.187: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state
to down
*Jul 13 23:00:42.395: %LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0,
changed state to up
*Jul 13 23:00:42.399: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0, changed
state to down
*Jul 13 23:00:55.915: %SYS-5-CONFIG_I: Configured from memory by console
*Jul 13 23:00:56.159: %FW-6-INIT: Firewall inspection startup completed; beginning
operation.
*Jul 13 23:00:56.255: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan114, changed
state to down
*Jul 13 23:00:56.255: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan192, changed
state to down
*Jul 13 23:00:56.255: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan193, changed
state to down
*Jul 13 23:00:56.255: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan194, changed
state to down
*Jul 13 23:00:56.255: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan195, changed
state to down
*Jul 13 23:00:57.011: %SYS-5-RESTART: System restarted --
Cisco IOS Software, C800 Software (C800-UNIVERSALK9-M), Version 15.2(3.16)M0.1,
MAINTENANCE INTERIM SOFTWARE
Technical Support: http://www.cisco.com/techsupport
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*Jul 13 23:00:57.095: %SNMP-5-COLDSTART: SNMP agent on host router is undergoing a cold
start
*Jul 13 23:00:57.103: %SYS-6-BOOTTIME: Time taken to reboot after reload =  558 seconds
*Jul 13 23:00:57.167: %SSH-5-ENABLED: SSH 1.99 has been enabled
*Jul 13 23:00:57.175: %LINK-5-CHANGED: Interface Serial0, changed state to
administratively down
*Jul 13 23:00:57.203: %CRYPTO-6-ISAKMP_ON_OFF: ISAKMP is OFF
*Jul 13 23:00:57.203: %CRYPTO-6-GDOI_ON_OFF: GDOI is OFF
Jul 13 23:00:57.303: %SYS-6-LOGGINGHOST_STARTSTOP: Logging to host 195.168.100.234 port
514 started - CLI initiated
```

```
Jul 13 23:00:57.303: %SYS-6-LOGGINGHOST_STARTSTOP: Logging to host 100.100.100.100 port
520 started - CLI initiated
Jul 13 23:00:58.059: %LINK-3-UPDOWN: Interface FastEthernet0, changed state to up
Jul 13 23:00:58.079: %LINK-3-UPDOWN: Interface FastEthernet1, changed state to up
Jul 13 23:00:58.099: %LINK-3-UPDOWN: Interface FastEthernet2, changed state to up
Jul 13 23:00:58.111: %LINK-3-UPDOWN: Interface FastEthernet3, changed state to up
Jul 13 23:00:58.123: %LINK-3-UPDOWN: Interface Wlan-GigabitEthernet0, changed state to up
Jul 13 23:00:59.059: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0,
changed state to down
Jul 13 23:00:59.079: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1,
changed state to down
Jul 13 23:00:59.123: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet2,
changed state to down
Jul 13 23:00:59.123: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3,
changed state to down
Jul 13 23:00:59.123: %LINEPROTO-5-UPDOWN: Line protocol on Interface
Wlan-GigabitEthernet0, changed state to up
Jul 13 23:00:59.883: %DTP-5-TRUNKPORTON: Port Fa3 has become dot1q trunk
Jul 13 23:01:01.091: %LINK-3-UPDOWN: Interface FastEthernet0, changed state to up
Jul 13 23:01:01.231: %LINK-3-UPDOWN: Interface FastEthernet1, changed state to up
Jul 13 23:01:01.259: %LINK-3-UPDOWN: Interface FastEthernet2, changed state to up
Jul 13 23:01:01.375: %LINK-3-UPDOWN: Interface FastEthernet3, changed state to up
Jul 13 23:01:02.091: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0,
changed state to up
Jul 13 23:01:02.527: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1,
changed state to up
Jul 13 23:01:02.527: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet2,
changed state to up
Jul 13 23:01:02.527: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3,
changed state to up
Jul 13 23:01:07.811: %SECONDCORE-5-BOOTSTAGE: ROMMON on 2nd core UP
Jul 13 23:01:07.915: %SECONDCORE-5-BOOTSTAGE: AP-BOOTLOADER on 2nd core UP
Jul 13 23:01:09.687: %CISCO800-6-SIM_STATUS: SIM in slot 1 is not present
router>
router>
router>
router>en
router#
router#
router#
router#
Jul 13 23:01:17.063: %CISCO800-2-MODEM_DOWN: Cellular0 modem is now DOWN.sh
router#sh pla
router#sh platform ver
router#sh platform versions

Platform Revisions/Versions :
============================
FPGA       : 1.02   [Val = 0x12]]
Env Rev    : 4.5    [Val = 0x405]
Rework Rev : 00 00 00 00 00 00
CPU Name   : P1021SEC
CPU Ver    : 1.1    [Val = SVR:0x80EC0311]
Core Rev   : 5.1    [Val = PVR:0x80212051]
CCB CLOCK  : 269 MHz

IOS        :
Cisco IOS Software, C800 Software (C800-UNIVERSALK9-M), Version 15.2(3.16)M0.1,
MAINTENANCE INTERIM SOFTWARE
Technical Support: http://www.cisco.com/techsupport
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ROMMON (Readonly) :
```

```
System Bootstrap, Version 15.2(2r)T, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
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WLAN AP Boot loader (bundled):
AP802 Boot Loader (AP802-BOOT-M) Version 12.4(25e)JA1, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Compiled Wed 30-May-12 03:46 by prod_rel_team

router#
Jul 13 23:01:25.291: %CELLWAN-2-SIM_FAILURE: [Cellular0]: SIM read failed for slot 0
Jul 13 23:01:25.391: %CISCO800-2-MODEM_UP: Cellular0 modem is now UP.
Jul 13 23:01:25.391: %CISCO800-6-SIM_STATUS: SIM in slot 0 is not present
router#
router#
router#
router#
Jul 13 23:01:27.163: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state
to up
router#
router#
router#
Jul 13 23:01:30.123: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan114, changed
state to up
Jul 13 23:01:30.263: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan193, changed
state to up
Jul 13 23:01:30.295: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan194, changed
state to up
Jul 13 23:01:30.543: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan195, changed
state to up
router#
router#
router#
router#
router#sh inv
NAME: "C819HGW+7-A-A-K9", DESCR: "C819HGW+7-A-A-K9 chassis, Hw Serial#: FAC15455YYZ, Hw
Revision: 4.0"
PID: C819HGW+7-A-A-K9  , VID: V01, SN: FAC15455YYZ

NAME: "C819HGW Mother board on Slot 0", DESCR: "C819HGW Mother board"
PID: C819HGW+7-A-A-K9  , VID: V01, SN: FOC15455YYZ

NAME: "Modem 0 on Cellular0", DESCR: "Sierra Wireless Mini Card MC8705 HSPA+R7 modem"
PID: MC8705            , VID: 1.0, SN: 357115040057411

router#
router#
router#
router#
```

Configuration Register

The virtual configuration register is in nonvolatile NVRAM and has the same functionality as other Cisco routers. You can view or modify the virtual configuration register from either the ROM monitor or the operating system software. Within the ROM monitor, you can change the configuration register by entering the register value in hexadecimal format or by allowing the ROM monitor to prompt you for the setting of each bit.

Changing the Configuration Register Manually

To change the virtual configuration register from the ROM monitor manually, enter the **confreg** command followed by the new value of the register in hexadecimal format, as shown in the following example:

```
rommon 1 > confreg 0x2101


You must reset or power cycle for new config to take effect
rommon 2 >
```

The value is always interpreted as hexadecimal. The new virtual configuration register value is written into NVRAM but does not take effect until you reset or reboot the router.

Changing the Configuration Register Using Prompts

Entering the **confreg** command without an argument displays the contents of the virtual configuration register and a prompt to alter the contents by describing the meaning of each bit.

In either case, the new virtual configuration register value is written into NVRAM but does not take effect until you reset or reboot the router.

The following display shows an example of entering the **confreg** command:

```
rommon 7> confreg

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

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
```

Console Download

You can use console download, which is a ROM monitor function, to download either a software image or a configuration file over the router console port. After download, the file is either saved to the mini-flash memory module or to main memory for execution (image files only).

Use console download when you do not have access to a TFTP server.

Note If you want to download a software image or a configuration file to the router over the console port, you must use the ROM monitor **dnld** command.

Note If you are using a PC to download a Cisco IOS image over the router console port at 115,200 bps, ensure that the PC serial port is using a 16550 universal asynchronous transmitter/receiver (UART). If the PC serial port is not using a 16550 UART, we recommend using a speed of 38,400 bps or less when downloading a Cisco IOS image over the console port.

Command Description

The following are the syntax and descriptions for the **xmodem** console download command:

xmodem [-cyrx] *destination_file_name*

c	Optional. Performs the download using 16-bit cyclic redundancy check (CRC-16) error checking to validate packets. Default is 8-bit CRC.
y	Optional. Sets the router to perform the download using Ymodem protocol. The default is Xmodem protocol. The protocols differ as follows: • Xmodem supports a 128-block transfer size. Ymodem supports a 1024-block transfer size. • Ymodem uses CRC-16 error checking to validate each packet. Depending on the device that the software is being downloaded from, this function might not be supported by Xmodem.
r	Optional. Image is loaded into DRAM for execution. The default is to load the image into flash memory.
x	Optional. Image is loaded into DRAM without being executed.
destination_ file_name	Name of the system image file or the system configuration file. For the router to recognize it, the name of the configuration file must be *router_confg*.

Follow these steps to run Xmodem:

Step 1 Move the image file to the local drive where Xmodem will execute.

Step 2 Enter the **xmodem** command.

Error Reporting

Because the ROM monitor console download uses the console to perform the data transfer, when an error occurs during a data transfer, error messages are only displayed on the console once the data transfer is terminated.

If you have changed the baud rate from the default rate, the error message is followed by a message telling you to restore the terminal to the baud rate specified in the configuration register.

Debug Commands

Most ROM monitor debugging commands are functional only when Cisco IOS software has crashed or is halted. If you enter a debugging command and Cisco IOS crash information is not available, the following error message is displayed:

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

The following are ROM monitor debugging commands:

- **stack** or **k**—Produces a stack trace; for example:

```
rommon 6> stack
Stack trace:
PC = 0x801111b0
Frame 00: FP = 0x80005ea8    PC = 0x801111b0
Frame 01: FP = 0x80005eb4    PC = 0x80113694
Frame 02: FP = 0x80005f74    PC = 0x8010eb44
Frame 03: FP = 0x80005f9c    PC = 0x80008118
Frame 04: FP = 0x80005fac    PC = 0x80008064
Frame 05: FP = 0x80005fc4    PC = 0xfff03d70
```

- **context**—Displays processor context; for example:

```
rommon 7> context
CPU context of the most recent exception:
PC  = 0x801111b0  MSR = 0x00009032  CR  = 0x53000035  LR    = 0x80113694
CTR = 0x801065e4  XER = 0xa0006d36  DAR = 0xffffffff  DSISR = 0xffffffff
DEC = 0xffffffff  TBU = 0xffffffff  TBL = 0xffffffff  IMMR  = 0xffffffff
R0  = 0x00000000  R1  = 0x80005ea8  R2  = 0xffffffff  R3    = 0x00000000
R4  = 0x8fab0d76  R5  = 0x80657d00  R6  = 0x80570000  R7    = 0x80570000
R8  = 0x00000000  R9  = 0x80570000  R10 = 0x0000954c  R11   = 0x00000000
R12 = 0x00000080  R13 = 0xffffffff  R14 = 0xffffffff  R15   = 0xffffffff
R16 = 0xffffffff  R17 = 0xffffffff  R18 = 0xffffffff  R19   = 0xffffffff
R20 = 0xffffffff  R21 = 0xffffffff  R22 = 0xffffffff  R23   = 0xffffffff
R24 = 0xffffffff  R25 = 0xffffffff  R26 = 0xffffffff  R27   = 0xffffffff
R28 = 0xffffffff  R29 = 0xffffffff  R30 = 0xffffffff  R31   = 0xffffffff
```

- **frame**—Displays an individual stack frame.
- **sysret**—Displays return information from the last booted system image. This information 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:0x801111b0,  error address: 0x801111b0
Stack Trace:
FP: 0x80005ea8, PC: 0x801111b0
FP: 0x80005eb4, PC: 0x80113694
FP: 0x80005f74, PC: 0x8010eb44
```

```
FP: 0x80005f9c, PC: 0x80008118
FP: 0x80005fac, PC: 0x80008064
FP: 0x80005fc4, PC: 0xfff03d70
FP: 0x80005ffc, PC: 0x00000000
FP: 0x00000000, PC: 0x00000000
```

- **meminfo**—Displays size in bytes, starting address, available range of main memory, the starting point and size of packet memory, and size of NVRAM; for example:

```
rommon 9> meminfo
Main memory size: 40 MB.
Available main memory starts at 0x10000, size 40896KB
IO (packet) memory size: 5 percent of main memory.
NVRAM size: 32KB
```

Exiting the ROM Monitor

You must set the configuration register to a value from 0x2 to 0xF for the router to boot a Cisco IOS image from flash memory upon startup or reloading.

The following example shows how to reset the configuration register and cause the router to boot a Cisco IOS image stored in flash memory:

```
rommon 1 > confreg 0x2101
```

You must reset or power cycle for the new configuration to take effect:

```
rommon 2 > boot
```

The router will boot the Cisco IOS image in flash memory. The configuration register will change to 0x2101 the next time the router is reset or power cycled.