



# CHAPTER 1

## ROM Monitor Overview and Basic Procedures

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This chapter provides an overview of ROM Monitor concepts and operations. For instructions on how to perform various tasks in ROM Monitor mode (ROMMON), see the other chapters in this book.

This chapter includes the following main topics:

- [ROM Monitor Overview, page 1-1](#)
- [Entering ROM Monitor Mode, page 1-3](#)
- [ROM Monitor Commands, page 1-7](#)
- [Displaying the Configuration Register Setting, page 1-10](#)
- [Environment Variable Settings, page 1-10](#)
- [Exiting ROM Monitor Mode, page 1-14](#)
- [Additional References, page 1-16](#)

## ROM Monitor Overview

The ROM Monitor is a bootstrap program that initializes the ASR 9000 hardware and boots the Cisco IOS XR software when you power on or reload a router. A version of the ROM Monitor software exists on each card and is factory supplied. The ROM Monitor program provides an initial power-on environment for each card. If the Cisco IOS XR software is rebooted or unable to run, the corresponding card returns to the ROM Monitor mode.

When you connect a terminal to a card that is in the ROM Monitor mode, the ROM Monitor CLI prompt is displayed.

### Cisco ASR 9000 Series Router Prompt

```
rommon B1>
```

During normal operation, you cannot see the ROM Monitor prompt or use the ROM Monitor mode. ROM Monitor mode is used only in special circumstances, such as reinstalling the entire software set, resetting the router password, or specifying a configuration file to use at startup.

The ROM Monitor software (or environment) is known by many names. It is sometimes called *ROMMON* because of the CLI prompt in the ROM Monitor mode. The ROM Monitor software is also called *boot software*, *boot image*, or *boot helper*. Although it is distributed with routers that use the Cisco IOS XR software, ROM Monitor is a program that is separate from the Cisco IOS XR software. During normal startup, the ROM Monitor initializes the cards, and then passes control to the Cisco IOS XR software. After the Cisco IOS XR software takes over, ROM Monitor is no longer used.

### Understanding the Role of the Route Switch Processor (RSP) Card

The Cisco ASR 9000 Series Router contains a series of chassis slots, each of which can hold one of several types of line cards (LCs). Two slots in the chassis are reserved for Route Switch Processor (RSP) cards that provide the central point for chassis provisioning and management.

The active RSP for the owner SDR is called the *Designated Shelf Controller (DSC)*. This card performs system-wide provisioning and management functions. If the active RSP card is placed in the ROM Monitor mode, it ceases to be active and will no longer run the Cisco IOS XR software. If a standby RSP card is available, the standby RSP card resumes router operations. If both the RSP cards are not available or if the active RSP (previously, standby) is also placed in the ROM Monitor mode, the router operations stop.

### Accessing the ROM Monitor Mode on the RSP Card

In most situations, you interact with the ROM Monitor mode only on the RSP cards. The active RSP card contains the administration configuration for the entire system and distributes the required software to all the other nodes in the router. All the tasks in this document describe the ROM Monitor mode accessed through the RSP card for the system.

### Environmental Variables and the Configuration Register

Two primary connections exist between ROM Monitor and the Cisco IOS XR software: the ROM Monitor environment variables and the configuration register.

The ROM Monitor environment variables define the location of the Cisco IOS XR software and describe how to load it. After the ROM Monitor has initialized a card, it uses the environment variables to locate and load the Cisco IOS XR software. Common environment variables are `BOOT`, `IP_ADDRESS`, `DEFAULT_GATEWAY`, `TFTP_FILE`, and `SUBNET_MASK`.

The *configuration register* is a software setting that controls how a card starts up and specifies the baud rate of the RSP console and the auxillary serial ports. One of the primary uses of the configuration register is to control whether the card starts in the ROM Monitor mode or the Administration EXEC mode. The configuration register is set in either the ROM Monitor mode or the Administration EXEC mode, as needed. Typically, you set the configuration register using the Cisco IOS XR software prompt on the active RSP when you need to use the ROM Monitor mode. After the maintenance in the ROM Monitor mode is complete, change the configuration register to enable the card to reboot along with the Cisco IOS XR software.



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**Note**

Throughout this guide, the term *RSP* is used to refer to the RSP cards supported on Cisco ASR 9000 Series Routers. If a feature or an issue applies to only one platform, the accompanying text specifies the platform.

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### Accessing the ROM Monitor Mode with a Terminal Connection

When an RSP is in ROM Monitor mode, you can access the ROM Monitor software only from a terminal connected directly to the console port of the card. Because the Cisco IOS XR software (EXEC mode) is not operating, the nonmanagement interfaces (such as Gigabit Ethernet interfaces) are not accessible. Basically, all Cisco IOS XR software resources are unavailable. The hardware is present, but no configuration exists to make use of the hardware.

### Network Management Access and ROM Monitor Mode

Some people get confused when they start to use ROM Monitor mode. It is important to remember that ROM Monitor mode is a router mode, not a mode within the Cisco IOS XR software. It is best to remember that ROM Monitor software and the Cisco IOS XR software are two separate programs that run on the same router. At any given time, the router is running one of these programs, but it never runs both at the same time.

One area that can be confusing when using ROM Monitor and the Cisco IOS XR software is the area that defines the IP configuration for the Management Ethernet interface. Most router users get comfortable with configuring the Management Ethernet interface in the Cisco IOS XR software. When the router is in ROM Monitor mode, however, the router is not running the Cisco IOS XR software, so that Management Ethernet interface configuration is not available.

To access other devices, such as a TFTP server, while in ROM Monitor mode on the Cisco ASR 9000 Series Router, you must configure the ROM Monitor variables with IP access information.

## Entering ROM Monitor Mode

The following sections describe two ways to enter ROM Monitor mode:

- [Resetting the Configuration Register and Reloading a RSP Card to ROM Monitor Mode, page 1-3](#)
- [Manually Halting the Initialization Process During System Reload, page 1-7](#)

## Resetting the Configuration Register and Reloading a RSP Card to ROM Monitor Mode

In normal operating conditions, it should not be necessary to use ROM Monitor mode. If you do find it necessary to place an RSP card in ROM Monitor mode, make sure that the system is in a steady state and that you are prepared for the consequences of a system reload. In particular, verify the items described in the “[Prerequisites](#)” section on page 1-3.

### Prerequisites

Before you place an RSP card in ROM Monitor mode, verify that the system is in a steady state:

1. Prepare the RSP card:
  - a. Anticipate substantial downtime, including the loss of packet forwarding on the system.
  - b. Verify the sanity of the configuration file system using the **cfs check** command in EXEC mode.
  - c. Verify that all changes to the active router configuration are saved with the **commit** command in any configuration mode.
  - d. Verify that all changes to the active software set are saved with the **install commit** command in Administration EXEC mode.
  - e. Verify that all install commit processes are complete with the **show install committed** command in Administration EXEC mode. This command displays the committed packages that become active during the next router boot. If any of the processes are not committed, use the **install commit** command in the Administration mode.
2. Verify that the other nodes in the system are in a steady state:

- a. If a standby RSP is installed, verify that it is in the ready state with the **show redundancy** command in EXEC mode.
- b. Verify that all available nodes in the system are in IOS XR RUN state with the **show platform** command in EXEC mode.

After you have verified that the system is in a stable state, you can enter ROM Monitor mode by setting the configuration register setting and entering the **reload** command, as described in the following steps:

## SUMMARY STEPS

1. Verify that the router is in a steady state.
2. Connect a terminal to the RSP card console port and log in to the router.
3. **admin**
4. Place an RSP card or all RSP cards in ROM Monitor mode:
  - Place an RSP card in the ROM Monitor mode:
    - a. **config-register boot-mode rom-monitor location <node-id>**
    - b. **exit**
    - c. **reload**

or
  - Place all the RSP cards in the ROM Monitor mode:
    - a. **config-register boot-mode rom-monitor location all**
    - b. **reload location all**




### Note

Entering the **config-register boot-mode rom-monitor** command places all the RSP cards in the ROM Monitor mode.

## DETAILED STEPS

	Command or Action	Purpose
Step 1	Verify that the router is in a steady state.	Ensures that all configurations are saved and that no installation processes are running. <ul style="list-style-type: none"> <li>• For more information, see the <a href="#">“Prerequisites” section on page 1-3</a>.</li> </ul>
Step 2	Connect a terminal to the RSP card console port and log in to the router.	Connects a terminal or PC to the RSP card console port and establishes a router management session. <ul style="list-style-type: none"> <li>• For more information on connecting a terminal, see <i>“Connecting and Communicating with the Router”</i> in <i>Cisco ASR 9000 Series Aggregation Services Router Getting Started Guide</i>.</li> </ul>

Command or Action	Purpose
<p><b>Step 3</b></p> <pre>admin</pre> <p><b>Example:</b></p> <pre>RP/0/RSP0/CPU0:router# admin</pre>	<p>Enters administration EXEC mode.</p>
<p><b>Step 4</b></p> <pre>config-register boot-mode rom-monitor location &lt;node-id&gt; exit reload or config-register boot-mode rom-monitor location a ll reload location all</pre> <p><b>Examples:</b></p> <pre>RP/0/RSP0/CPU0:router(admin)# config-register boot-mode rom-monitor location 0 /RSP0/CPU0 RP/0/RSP0/CPU0:router(admin)# exit RP/0/RSP0/CPU0:router# reload</pre> <p>Or,</p> <pre>RP/0/RSP0/CPU0:router(admin)# config-register boot-mode rom-monitor location all RP/0/RSP0/CPU0:router(admin)# reload location all</pre>	<p>Enter the following commands to place only one RSP card (active or standby) in ROM Monitor mode:</p> <ol style="list-style-type: none"> <li>Enter the <b>boot-mode rom-monitor location</b> <i>&lt;node-id&gt;</i> command, where <i>&lt;node-id&gt;</i> is the ID of the card, to set the configuration register for ROM Monitor mode during the next card reload.</li> <li>Enter the <b>exit</b> command to exit administration EXEC mode.</li> <li>Enter the <b>reload</b> command to reload the card and enter ROM Monitor mode.</li> </ol> <p><b>Note</b> If you specify the <b>config-register boot-mode rom-monitor</b> command without the <b>location</b> keyword, then all the RSPs are placed in ROM Monitor mode.</p> <p>Enter the following commands to place all RSPs in ROM Monitor mode:</p> <ol style="list-style-type: none"> <li>Enter the <b>config-register boot-mode rom-monitor location all</b> command to reset the configuration register for all RSPs in the system.</li> <li>Enter the <b>reload location all</b> command in administration EXEC mode to reload all RSPs in the system.</li> </ol> <p><b>Note</b> Make sure you have access to the console ports of both RSP0 and RSP1 cards on the system. To enter the system to the ROM Monitor mode, press <b>Ctrl-C</b> a few times on both RSP0 and RSP1 consoles until you get to the ROM Monitor mode.</p> <p> <b>Caution</b> Resetting the configuration register may change the baud rate for the console.</p>

**Tip**

To verify the configuration register setting, enter the **show variables boot** command in the administration EXEC mode.

## Examples

The following examples show how to place the RSP card in ROM Monitor mode:

- [Verifying the Router State: Example, page 1-6](#)

- [Placing the RSP Cards in ROM Monitor Mode: Example, page 1-6](#)

## Verifying the Router State: Example

The following example shows the redundancy roles of both RSPs and shows that both are operating in IOS XR RUN state:

```
RP/0/RSP0/CPU0:router# show redundancy

Wed Jun 30 21:35:23.656 UTC
Redundancy information for node 0/RSP0/CPU0:
=====
Node 0/RSP0/CPU0 is in ACTIVE role
Partner node (0/RSP1/CPU0) is in STANDBY role
Standby node in 0/RSP1/CPU0 is ready
Standby node in 0/RSP1/CPU0 is NSR-ready

Reload and boot info
-----
A9K-RSP-8G reloaded Tue Jun 29 18:56:15 2010: 1 day, 2 hours, 39 minutes ago
Active node booted Tue Jun 29 18:56:15 2010: 1 day, 2 hours, 39 minutes ago
Standby node boot Tue Jun 29 18:55:54 2010: 1 day, 2 hours, 39 minutes ago
Standby node last went not ready Tue Jun 29 18:58:52 2010: 1 day, 2 hours, 36 \
minutes ago
Standby node last went ready Tue Jun 29 18:59:52 2010: 1 day, 2 hours, 35 minutes \
ago
There have been 0 switch-overs since reload

Active node reload "Cause: Node reload is required by install operation"
Standby node reload "Cause: pID node reload is required by install operation"

RP/0/RSP0/CPU0:router#show redundancy summary
Wed Jun 30 21:35:32.259 UTC
  Active Node      Standby Node
  -----
  0/RSP0/CPU0      0/RSP1/CPU0 (Ready, NSR: Ready)

RP/0/RSP0/CPU0:router# show platform

Wed Jun 30 21:35:35.944 UTC
Node                Type                                State          Config State
-----
0/RSP0/CPU0         A9K-RSP-8G(Active)                 IOS XR RUN     PWR,NSHUT,MON
0/RSP1/CPU0         A9K-RSP-8G(Standby)                IOS XR RUN     PWR,NSHUT,MON
0/1/CPU0            A9K-8T-E                             IOS XR RUN     PWR,NSHUT,MON
0/5/CPU0            A9K-40GE-B                          IOS XR RUN     PWR,NSHUT,MON
0/6/CPU0            A9K-2T20GE-E                       IOS XR RUN     PWR,NSHUT,MON
```

## Placing the RSP Cards in ROM Monitor Mode: Example

The following example shows how to place the RSP in the ROM Monitor mode:

```
RP/0/RSP0/CPU0:router# admin
RP/0/RSP0/CPU0:router(admin)# config-register boot-mode rom-monitor location all

Set to rom-monitor mode for all mgmt nodes:
RP/0/RSP0/CPU0:router(admin)#config-register boot-mode rom-monitor location all
Successfully set config-register to 0x1920 on node 0/RSP0/CPU0
Successfully set config-register to 0x1920 on node 0/RSP1/CPU0
```

## Manually Halting the Initialization Process During System Reload

To force the RSP card to stop loading and enter ROM Monitor mode, press **Ctrl-C** when you see the following message:

```
MBI validation sending request.
HIT Ctrl-C to abort
```

This message usually appears during the first 20 seconds of system startup. Press the **Ctrl-C** key combination immediately. It may be necessary to press the **Ctrl-C** keys repeatedly during this time to ensure that the initialization process stops and the system enters ROM Monitor mode. This ends your Telnet session to the console or auxiliary port.

This operation can be performed only from a terminal directly connected to the RSP card console port. For more information, see the “Connecting and Communicating with the Router” section in *Cisco ASR 9000 Series Aggregation Services Router Getting Started Guide*.



### Note

When the RSP card is placed in ROMMON, it switches over to the standby RSP card, which can then also be placed in ROMMON. Repeat this process for both RSP cards.

## ROM Monitor Commands

The commands in the ROM Monitor mode are different from those available in the Cisco IOS XR software. You can run ROM Monitor commands only while in ROM Monitor mode, and you cannot run Cisco IOS XR software commands. This section includes the following topics:

- [Commonly Used ROM Monitor Commands, page 1-7](#)
- [Displaying the Available ROM Monitor Commands, page 1-8](#)
- [Changing the ROM Monitor Prompt, page 1-10](#)


## Commonly Used ROM Monitor Commands

[Table 1-1](#) summarizes the commands commonly used in ROM Monitor. For specific instructions on using these commands, refer to the relevant procedure in this document.

**Table 1-1** Commonly Used ROM Monitor Commands

ROMMON Command	Description
<code>boot image</code>	Manually boots a vm Cisco IOS XR software image.
<code>boot image -o config-file-path</code>	Manually boots the Cisco IOS XR software with a temporary alternative administration configuration file.
<code>boot tftp://config-file-path/image</code>	Manually boots the Cisco IOS XR software with a temporary default SDR configuration file. The system can also be booted from external compactflash using Cisco ASR 9000 Series Router Image Refresh method. For more information about Image Refresh method, see <a href="#">Appendix A, “Image Refresh Using the Archive and Restore Feature”</a> .

Table 1-1 Commonly Used ROM Monitor Commands (continued)

ROMMON Command	Description
<b>cookie</b>	Displays the system cookie.
<b>confreg</b>	Changes the config-register setting.   <b>Note</b> When the value of confreg is 0, it means autoboot is disabled and you need to manually boot the Cisco IOS XR software image from the ROM Monitor mode. However, if the value of confreg is non-zero value of 0x2, it means autoboot is enabled and the ROM Monitor mode automatically boots the Cisco IOS XR software image given in the BOOT= environment variable.
<b>dev</b>	Displays the available local storage devices (for example, disk0: and disk1:).
<b>dir</b>	Displays the files on a storage device.
<b>bpcookie</b>	Displays the chassis serial number, MAC address, MAC range, PID, Controller type, version, and so on, in a Cisco ASR 9000 Series Router.
<b>reset</b>	Resets the node.
<b>set</b>	Displays the currently set ROM Monitor environmental settings.
<b>sync</b>	Saves the new ROM Monitor environmental settings.
<b>unset</b>	Removes an environmental variable setting.
<b>version</b>	Displays the ROM Monitor version.

## Displaying the Available ROM Monitor Commands

Table 1-2 describes the available **help** commands for ROM Monitor mode.

Table 1-2 Help Commands in ROMMON

Command	Description
<b>help</b> or <b>?</b>	Displays a summary of all available ROM Monitor commands.
<b>-?</b>	Displays information about command syntax.


**Note**

Commands are case sensitive. You can halt any command by pressing **Ctrl-C**.



## Examples

The following example shows what appears when you enter the **?** command on a Cisco ASR 9000 Series Router:

```
rommon B1> ?
alias                set and display aliases command
boot                boot up an external process
bpcookie            display the backplane cookie
cbcinfo            Display information from CBC
cbcmsg             Send a message to the CBC
cbcping            Send "PING" to CBC LED Matrix
clocks             get CPU clock information
confreg            configuration register utility
cookie             display the system cookie
dev                list the device table
dir                list files in file system
dimminfo           Display info for DDR DIMMs
dis                disassemble instruction stream
dnld               serial download a program module
dump              display a block of memory
ddump             display a block of memory as double words
dumpspd          display DDR2 SPD information
fpgainfo          display information about FPGA images
ftcookie          display the fan tray cookie
help              monitor builtin command help
history           monitor command history
meminfo           main memory information
portstatus        Show 6 port switch port status
repeat            repeat a monitor command
reset             system reset
showrobfl         show run logs
rominfo           display the ROMMON header information
scanpci1          scan for devices on PCI bus 1
scanpci2          scan for devices on PCI bus 2
set               display the monitor variables
sync              write monitor environment to NVRAM
unalias           unset an alias
unset             unset a monitor variable
version           display rommon software, board, version
```

The following example shows the parameters for the **dir** (directory) command:

```
rommon B1> dir -?
bad device name
usage: dir <device>
```

The following example shows what appears when you enter the **version** command at the Cisco ASR 9000 Series Router ROM Monitor mode prompt:

```
rommon B1 > version

System Bootstrap, Version 1.0(20081208:173612) [ASR9K ROMMON],
Copyright (c) 1994-2008 by Cisco Systems, Inc.
Compiled Mon 08-Dec-08 09:36 by abc

LNC2:  1.17  [00000001/00000011]
TMPO:  1.13  [00000001/0000000d]
LB_3:  1.14  [00000001/0000000e]
PUNT:  1.4   [00000001/00000004]
CBC:    1.1
BID:    0x0004
```

## Changing the ROM Monitor Prompt

You can change the prompt in ROM Monitor mode by using the **PS1=** command as shown in the following example:

```
rommon B1> PS1= "ASR9K_ROMMON B1 ! >"
```

Changing the prompt is useful if you are working with multiple routers in ROM Monitor at the same time. This example specifies that the prompt is ASR9K\_ROMMON B followed by the line number.

## Displaying the Configuration Register Setting

To display the current configuration register setting, enter the **confreg** command without parameters as follows:

```
rommon B1> confreg

Configuration Summary
(Virtual Configuration Register: 0x1920)
enabled are:
console baud: 9600
boot: the ROM Monitor

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

The configuration register setting is labeled Virtual Configuration Register. Enter the **no** command to avoid changing the configuration register setting. To change the configuration setting with this command, see the [“Changing Configuration Register Settings” section on page 1-14](#).

## Environment Variable Settings

The ROM Monitor environment variables define the attributes of the ROM Monitor, such as the IP address for an RSP control Ethernet port or the location of the Cisco IOS XR software and describe how to load it. Environmental variables are entered like commands and are always followed by the equal sign (=). Environment variable settings are entered in capital letters, followed by a definition. For example:

```
TURBOBOOT=on,disk0,format
```

Under normal operating conditions, you do not need to modify these variables. They are cleared or set only when you need to make changes to the way ROM Monitor operates.


This section includes the following topics:

- [Frequently Used Environmental Variables, page 1-11](#)
- [Displaying Environment Variable Settings, page 1-12](#)
- [Entering Environment Variable Settings, page 1-12](#)
- [Saving Environment Variable Settings, page 1-12](#)
- [Clearing Environment Variable Settings, page 1-13](#)

## Frequently Used Environmental Variables

Table 1-3 shows the main ROM Monitor environmental variables. For instructions on how to use these variables, see the relevant instructions in this document.

**Table 1-3** Frequently Used ROM Monitor Environmental Variables

Environmental variable	Description
TFTP_MGMT_INTF={0   1}	Determines the RSP card Management LAN port to use for TFTP. The default value is port 0.
IP_ADDRESS= <i>ip_address</i>	Sets the IP address for the Management Ethernet interface on the RSP card.
IP_SUBNET_MASK= <i>ip_address</i>	Sets the subnet mask for the Management Ethernet interface on the RSP card.
DEFAULT_GATEWAY= <i>ip_address</i>	Sets the default gateway that serves the RSP card.
TFTP_SERVER= <i>ip_address</i>	Sets the IP address of the TFTP server where a bootable software image is located.
TFTP_FILE= <i>drive : path / file</i>	Sets the directory and filename of a bootable software image.
TURBOBOOT= <i>on, boot-device, options</i>	Completely replaces the existing software when the router is reloaded. For more information on the TURBOBOOT environment variable, see the <a href="#">“About the TURBOBOOT Variable” section on page 2-22</a> .
	 <b>Note</b> The default boot device disk is disk0:.
BOOT= <i>drive : path / file</i>	Identifies the boot software for a node. This variable is usually set automatically when the router boots.
BOOT_DEV_SEQ_OPER= <i>drive :</i>	Specifies the sequence of local storage devices in which the disk-boot operation occurs. (For example, the disk0::disk1: sequence indicates to boot from disk0: device initially and if failure occurs, boot from the disk1: device.
BOOT_DEV_SEQ_CONF= <i>drive:</i>	Indicates the configured primary and secondary devices (disk0: and disk1:) for disk mirroring. This variable is usually set by Cisco IOS XR software.
AUX_AUTHEN_LEVEL= <i>number</i>	Bypasses ksh authentication. A reboot is required only on the card that has to bypass authentication.
IOX_ADMIN_CONFIG_FILE= <i>drive : path / file</i>	Permanently changes the location of the default administration configuration file.
IOX_CONFIG_FILE= <i>drive : path / file</i>	Permanently changes the location of the router configuration file.

**Table 1-3** Frequently Used ROM Monitor Environmental Variables (continued)

Environmental variable	Description
<b>IOX_CONFIG_MEDIUM</b> = <i>drive : path</i>	Permanently changes the default location where configuration files are saved.
<b>MIRROR_ENABLE</b> = <i>value</i>	Sets to Y in Cisco IOS XR software to indicate disk mirroring is enabled. When it is set to N, it indicates disk mirroring is disabled.

## Displaying Environment Variable Settings

To display the current environment variable settings, enter the **set** command at the ROM Monitor mode prompt:

```
rommon B1> set

PS1=RO RSP P4D-17 ! >
IP_ADDRESS=172.29.52.137
DEFAULT_GATEWAY=172.29.52.1
IP_SUBNET_MASK=255.255.255.0
TFTP_SERVER=172.23.16.81
IOX_ADMIN_CONFIG_FILE=
TFTP_MGMT_INTF=0
BOOT_DEV_SEQ_CONF=disk0::disk1:
MIRROR_ENABLE=Y
?=0
TFTP_FILE=/auto/tftpboot-users/lpatton/comp-asr9k-mini.vm-3.9.0.08I.DT_IMAGE
TURBOBOOT=
BSI=0
BOOT_DEV_SEQ_OPER=disk0::disk1:
BOOT=disk0:asr9k-os-mbi-3.9.0.08I/mbiasr9k-rp.vm,1;
ReloadReason=1
```

## Entering Environment Variable Settings

Environment variable settings are entered in capital letters, followed by a definition. The following example shows the environmental variables used to configure the control Ethernet port on a Cisco ASR 9000 Series Router:

```
rommon B1> IP_ADDRESS=1.1.1.1
rommon B2> IP_SUBNET_MASK=255.255.254.0
rommon B3> DEFAULT_GATEWAY=1.1.0.1
```

## Saving Environment Variable Settings

To save the current environment variable settings, enter the **sync** command:

```
rommon B1> sync
```

## Clearing Environment Variable Settings

To clear the environment variable settings, enter the **unset** command:

```
rommon B1> unset
```

To make the change permanent, use the **sync** command.



### Note

Environmental values that are not saved with the **sync** command are discarded whenever the system is reset or booted.

## Viewing Chassis Serial Numbers

The chassis serial number can be read from an RSP that is running in ROM Monitor mode. Viewing the chassis number from the RSP may be necessary if the physical label is missing or damaged.

- Step 1** Attach a console to the console port of an RSP in the chassis. (Only the RSP card needs to run to perform this procedure. Other cards need not be inserted.)
- Step 2** Apply power to the chassis.
- Step 3** Enter ROM Monitor mode, as described in the [“Entering ROM Monitor Mode”](#) section on page 1-3.
- Step 4** Enter the **bpcookie** command in privilege mode of the ROM Monitor prompt to display the chassis serial number.

```
RO RSP2 P3A-27 B1> bpcookie

Controller Family      : ef
Controller Type       : 2fe
Product Number        : ASR-9010-AC
Version Identifier     : V01
UDI Product Name      : ASR-9010-AC
UDI Product Description : ASR-9010 AC Chassis
Part Number (68-bbbb-vv) : 68-3163-02
Part Revision         : B0
Chassis Serial Number  : FOX1316G5TL
Mainboard Serial Number : NWG131300HA
PCB Serial Number     : NWG13310024
PCA Number (73-bbbb-vv) : 73-11674-02
PCA Revision          : A0
CLEI Code             : IPMKK10ARA
Deviation Number # 1  : 0
Deviation Number # 2  : 0
Deviation Number # 3  : 0
Deviation Number # 4  : 0
Deviation Number # 5  : 0
Manufacturing Test Data : 00 00 00 00 00 00 00 00
Base MAC Address       : 0024.f715.1888
MAC Address block size : 1288
Hardware Revision     : 1.0
Capabilities           : 00
Device values         :
```

- Step 5** Return the router to EXEC mode, as described in the [“Resetting to EXEC Mode or MBI Validation Mode” section on page 1-14](#).

## Exiting ROM Monitor Mode

To exit ROM Monitor mode, you must change the configuration register and reset the RSP.

### Changing Configuration Register Settings

To change the configuration register settings in the ROM Monitor mode, enter the **confreg** command at the ROM Monitor mode. Entering this command displays the configuration summary and the prompts used to change the configuration.

#### SUMMARY STEPS

1. **confreg**
2. Respond to each prompt as instructed.
3. **reset**

#### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>confreg</b>  Example: rommon B1> confreg	Starts the configuration register configuration prompts.
Step 2	Respond to each prompt as instructed.	See the example that follows this procedure for more information.
Step 3	<b>reset</b>  Example: rommon B2> reset	Resets and initializes the router.

### Resetting to EXEC Mode or MBI Validation Mode

To exit the ROM Monitor mode and reset to EXEC mode, enter the **confreg** command at the ROM Monitor mode prompt. Respond to prompts as instructed.

The following examples show the prompts when you enter the confreg command.

## Examples

The following example shows how to enable ROM Monitor mode at the next system boot:

```
rommon B5 > confreg

Configuration Summary
(Virtual Configuration Register: 0x1920)
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]: n
change console baud rate? y/n [n]: n
change the boot characteristics? y/n [n]: y
enter boot type:
 0 = ROM Monitor
 2 = MBI Validation Boot Mode
[0]: 0

Configuration Summary
(Virtual Configuration Register: 0x1920)
enabled are:
console baud: 9600
boot: the ROM Monitor

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

You must reset or power cycle for new config to take effect
rommon B6 > reset
```

The following example shows how to enter the minimum boot image (MBI) validation mode or the EXEC mode of Cisco IOS XR software at the next system boot:

```
rommon B7 > confreg

Configuration Summary
(Virtual Configuration Register: 0x1920)
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]: n
change console baud rate? y/n [n]: n
change the boot characteristics? y/n [n]: y
enter boot type:
 0 = ROM Monitor
 2 = MBI Validation Boot Mode
[0]: 2

Configuration Summary
(Virtual Configuration Register: 0x1922)
enabled are:
console baud: 9600
```

```
boot: MBI Boot
```

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

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

```
rommon B8 > reset
```

To reset to the MBI validation mode or EXEC mode, select 2 as the boot type. Enter the **reset** command to boot the RSP in the EXEC mode.

**Note**

MBI validation mode causes the RSP to boot the startup Cisco IOS XR software and configuration.

## Additional References

The following sections provide references related to the ROM Monitor.

## Related Documents

Related Topic	Document Title
Connecting a terminal to a router	“Connecting and Communicating with the Router” in <i>Cisco ASR 9000 Series Aggregation Services Router Getting Started Guide</i>
Configuring a router with Cisco IOS XR software	Cisco IOS XR Software Documentation: <a href="http://www.cisco.com/en/US/products/ps5845/tsd_products_support_series_home.html">http://www.cisco.com/en/US/products/ps5845/tsd_products_support_series_home.html</a>

## Technical Assistance

Description	Link
<p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p>	<a href="http://www.cisco.com/support">http://www.cisco.com/support</a>