



## ROM Monitor Overview

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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 (ROMMON) mode, see the other chapters in this book.

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## Information About ROM Monitor

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>
```

The ROM Monitor software is known by many names. It is sometimes called ROMMON because of the CLI prompt in ROM Monitor mode. The ROM Monitor software is also called the boot software, boot image, or boot helper.

Although it is distributed with routers that use the Cisco IOS XR software, ROM Monitor is a separate program from the Cisco IOS XR software. During normal startup, the ROM Monitor initializes the cards, and then

control passes to the Cisco IOS XR software. After the Cisco IOS XR software takes over, ROM Monitor is no longer in use.

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

The Cisco ASR 9000 Series Router contains 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 processors (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 functions. If the active RSP card is placed in ROM Monitor mode, it is no longer running the Cisco IOS XR software. If a standby RSP card is available, then 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, router operations will stop.

### Designated Secure Domain Router Shelf Controller (DSDRSC)

When the Designated Secure Domain Router Shelf Controller (DSDRSC) in an SDR is placed in ROM Monitor mode, the router operations are transferred to the standby DSDRSC (if available). If both the primary and standby DSDRSCs are in ROM Monitor mode, then the router operations cease because the Cisco IOS XR software is no longer running.

### Accessing 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 ROM Monitor mode accessed through the RSP card for the system.

The line cards have its own ROM Monitor software which can be upgraded using the RSP FPD upgrade operation, if required.

### 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 ROM Monitor has initialized the card, it uses the environment variables to locate and load the Cisco IOS XR software. The common environment variables are BOOT, IP\_ADDRESS, DEFAULT\_GATEWAY, TFTP\_FILE, TURBOBOOT and SUBNET\_MASK.

The configuration register is a software setting that controls how a card starts up. One of the primary uses of the configuration register is to control whether the card starts in ROM Monitor mode or Administration EXEC mode. The configuration register is set in either ROM Monitor mode or 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 ROM Monitor mode. When the maintenance in ROM Monitor mode is complete, you change the configuration register so the card reboots with the Cisco IOS XR software.



#### 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.

### Accessing 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 GigabitEthernet interfaces) are not accessible. Basically, all Cisco IOS XR software resources are unavailable. The hardware is there, 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:

### Prerequisites

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

1. Prepare the RSP card:

- Anticipate substantial downtime, including the loss of packet forwarding on the system.
- Verify the sanity of the configuration file system using the **cfs check** command in EXEC mode.
- Verify that all changes to the active router configuration are saved with the **commit** command in any configuration mode.
- Verify that all changes to the active software set are saved with the **install commit** command in Administration EXEC mode.
- 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:

- If a standby RSP is installed, verify that it is in the ready state with the **show redundancy** command in EXEC mode.

- Verify that all available nodes in the system are in IOS XR RUN state with the **show platform** command in EXEC mode.

3. This process is applicable to Cisco IOS XR 32 bit OS only.

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:

## 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 a 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.

### SUMMARY STEPS

1. Verify 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. config-register boot-mode rom-monitor location *<node-id>* command, **exit** command and **reload** command or config-register boot-mode rom-monitor location all command and **reload location all** command.

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	Verify the router is in a steady state.	Ensures that all configurations are saved and that no installation processes are running.
<b>Step 2</b>	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.  For more information on connecting a terminal, see <i>Connecting and Communicating with the Router</i> in Cisco ASR 9000 Series Aggregation Services Router Getting Started Guide.
<b>Step 3</b>	<b>admin</b>  <b>Example:</b> RP/0/RSP0/CPU0:router# <b>admin</b>	Enters administration EXEC mode.
<b>Step 4</b>	config-register boot-mode rom-monitor location <i>&lt;node-id&gt;</i> command, <b>exit</b> command and <b>reload</b> command or config-register boot-mode rom-monitor location all command and <b>reload location all</b> command.  <b>Example:</b> RP/0/RSP0/CPU0:router(admin)# config-register boot-mode rom-monitor location 0/RSP0/CPU0	<ul style="list-style-type: none"> <li>• Enter the following commands to place only one RSP card (active or standby) in ROM Monitor mode:</li> <li>• Enter the boot-mode rom-monitor location <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 exit command to exit administration EXEC mode.</li> </ul>

Command or Action	Purpose
<pre>RP/0/RSP0/CPU0:router(admin)# exit RP/0/RSP0/CPU0:router# reload Or, RP/0/RSP0/CPU0:router(admin)# config-register boot-mode rom-monitor location all RP/0/RSP0/CPU0:router(admin)# reload location all</pre>	<ul style="list-style-type: none"> <li>Enter the <b>reload</b> command to reload the card and enter ROM Monitor mode.</li> </ul> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>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.</li> </ul> <ul style="list-style-type: none"> <li>Enter the following commands to place all RSPs in ROM Monitor mode:</li> <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> </ul> <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. The default baud rate is 9600.</p> <p><b>Tip</b> To verify the configuration register setting, enter the <b>show variables boot</b> command in the administration EXEC mode.</p>

## 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
```

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

```

-----
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 RP/0/RSP0/CPU0:router
Successfully set config-register to RP/0/RSP0/CPU0:router

```

## 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
TYPE 'Send Break'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.

## How to Set Console Baud in Cisco IOS XR 64 Bit OS

Rommon is not supported in Cisco IOS XR 64 bit OS. Therefore, to set the console baud rate, do the following:

1. Roll back to Cisco IOS XR 32 bit OS.
2. Set the console baud rate in rommon.
3. Roll back to Cisco IOS XR 64 bit OS.

To enter into rommon mode, select the **IOS-XR (32 bit Classic XR)** in boot option, as follows:

```
Please select the operating system and the boot device:
  1) IOS-XR (32 bit Classic XR)
  2) IOS-XR 64 bit Boot previously installed image
  3) IOS-XR 64 bit Mgmt Network boot using DHCP server
  4) IOS-XR 64 bit Mgmt Network boot using local settings (iPXE)
  (Press 'p' for more option)
Selection [1/2/3/4]: 1
Selected IOS-XR (32 bit Classic XR), Continue ? Y/N: y
```

Now in rommon, type **confreg**, and you will be prompted to change the boot settings, as follows:

```
rommon 2 > confreg

Configuration Summary
(Virtual Configuration Register: 0x2142)
enabled are:
console baud: 9600

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]: y
enter rate: 0 = 9600, 1 = 4800, 2 = 1200, 3 = 2400 4 = 19200, 5 = 38400, 6 = 57600, 7 =
115200 [0]: 7
change the boot characteristics? y/n [n]: n

Configuration Summary
(Virtual Configuration Register: 0x3962)
enabled are:
console baud: 115200
boot: MBI Boot
```

Type **y** to change the console baud rate. Select the baud rate option **7** to change the baud rate settings to 115200. The Configuration Summary in the above output shows that the console baud rate updated to 115200.

You must reset or power cycle for the new confreg value to take effect, as follows:

```
rommon 3 > reset -h
```

## 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

The table below 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: Commonly Used ROM Monitor Commands**

ROMMON Command	Description
<b>boot image</b>	Manually boots a vm Cisco IOS XR software image.
<b>boot image -o config-file-path</b>	Manually boots the Cisco IOS XR software with a temporary alternative administration configuration file.
<b>boot tftp://config-file-path/image</b>	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.
<b>cookie</b>	Displays the system cookie.
<b>confreg</b>	<p>Changes the config-register setting.</p> <p><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.</p>
<b>dev</b>	Displays the available local storage devices (for example, disk0: and disk1:).
<b>dir</b>	Displays the files on a storage device.



ROMMON Command	Description
bpcookie	Displays the chassis serial number, MAC address, MAC range, PID, Controller type, version, and so on, in a Cisco ASR 9000 Series Router.
reset	Resets the node.
set	Displays the currently set ROM Monitor environmental settings.
sync	Saves the new ROM Monitor environmental settings.
unset	Removes an environmental variable setting.
version	Displays the ROM Monitor version.

## Displaying the Available ROM Monitor Commands

The table below describes the available **help** commands for ROM Monitor mode.

**Table 2: Help Commands in ROMMON**

	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**.

## Displaying the Available ROM Monitor Commands: 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.

## Environment Variables

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.



### Note

Before loading CISCO IOS XR software image in Cisco ASR 9000 Virtualized Service Module (VSM) Service Card, you must ensure that these environment variables are set at the LC ROMMON prompt:

- TFTP\_EXTERNAL\_BOOT=0
- AUTOMATIC\_BOOT=1

## Frequently Used Environmental Variables

The table below shows the main ROM Monitor environmental variables. For instructions on how to use these variables, see the relevant instructions in this document.

Environmental variable	Description
TFTP_MGMT_INTF={0   1}	Description
IP_ADDRESS= <i>ip_address</i>	Description
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>	Description
TFTP_SERVER= <i>ip_address</i>	Description
TFTP_FILE= <i>drive:path/file</i>	Description

Environmental variable	Description
<b>TURBOBOOT</b> = <i>on, boot-device, options</i>	Sets the subnet mask for the Management Ethernet interface on the RSP card.
<b>BOOT</b> = <i>drive:path/file</i>	Sets the default gateway that serves the RSP card.
<b>BOOT_DEV_SEQ_OPER</b> = <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.
<b>BOOT_DEV_SEQ_CONF</b> = <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.
<b>AUX_AUTHEN_LEVEL</b> = <i>number</i>	Bypasses ksh authentication. A reboot is required only on the card that has to bypass authentication.
<b>IOX_ADMIN_CONFIG_FILE</b> = <i>drive:path/file</i>	Permanently changes the location of the default administration configuration file.
<b>IOX_CONFIG_FILE</b> = <i>drive:path/file</i>	Permanently changes the location of the router configuration file.
<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/tpatton/corpos-9emini.vrn4.2.0/corpos-9emini.vrn4.3.0/corpos-9emini.vrn5.1.0/corpos-9emini.vrn5.2.0/corpos-9emini.vrn5.3.0
TURBOBOOT=
BSI=0
```

```
BOOT_DEV_SEQ_OPER=disk0::disk1:
BOOT=disk0:asr9k-os-mbi-4.2.0asr9k-os-mbi-4.3.0asr9k-os-mbi-5.1.0asr9k-os-mbi-5.2.0/mbiasr9k-rp.vm,1;
ReloadReason=1asr9k-os-mbi-5.3.0
```

## 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
```



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

## 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.

1. Attach a console to the console port of an RSP SC or RP in the chassis. (Only the RSP card SC or RP needs to run to perform this procedure. Other cards need not be inserted.)
2. Apply power to the chassis.

3. Enter ROM Monitor mode.
4. Enter the `bpcookie` command in privilege mode of the ROM Monitor prompt to display the chassis serial number.
5. Return the router to EXEC mode.

## Exiting ROM Monitor Mode

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

## Resetting the Configuration Register Using Prompts

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.

In ROM Monitor mode, you can change the configuration register value using the configuration register prompts, as shown in this procedure.

### SUMMARY STEPS

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

### DETAILED STEPS

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

## Exiting ROM Monitor Mode: 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.

## Attaching to Primary RSP from Standby RSP

You must follow these steps in order to attach to the primary RSP from standby RSP:

- From the console port of the standby RSP, press the ESC key.
- Type **ksh** and press ENTER key.
- Login with a local username and password.
- Attach to the peer RSP using **attach node** command.
- Launch the console using **/pkg/bin/exec -a** command.

```
-- --
```

This (D)RP Node is not ready or active for login /configuration

Username: root

Password:

```
# uname -a
```

```
QNX node0_RSP0_CPU0 6.4.0 2014/01/07-14:26:36PST asr9k-rsp x86
```

```
# attach 0/RSP1/CPU0
```

```
attach: Starting session 1 to node 0/RSP1/CPU0
```

```
# /pkg/bin/exec -a
```

```
RP/0/RSP1/CPU0#show platform
```

```
Mon Apr 21 16:00:37.573 UTC
```

Node	Type	State	Config State
0/RSP0/CPU0	A9K-RSP880-SE(Standby)	IOS XR RUN	PWR, NSHUT, MON
0/RSP1/CPU0	A9K-RSP880-SE(Active)	IOS XR RUN	PWR, NSHUT, MON
0/1/CPU0	A9K-24x10GE-SE	IOS XR RUN	PWR, NSHUT, MON
0/2/CPU0	A9K-SIP-700	IOS XR RUN	PWR, NSHUT, MON
0/2/1	SPA-8XOC3-POS	OK	PWR, NSHUT, MON

```
RP/0/RSP1/CPU0#exit
Terminating attach to node 0/RSP1/CPU0..
```



## Additional References

The following sections provide references related to the ROM Monitor.

### Related Documents

Related Topic	Document Title
Connecting a terminal to a router	<i>Connecting and Communicating with the Router in 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/US/products/58456/products_support_sas_home.html">http://www.cisco.com/US/products/58456/products_support_sas_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>

