



Cisco IOS XR ROM Monitor Configuration Guide for the Cisco XR 12000 Series Router, Release 4.3.x

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CONTENTS

Preface

Preface vii

Changes to This Document vii

Obtaining Documentation and Submitting a Service Request vii

CHAPTER 1

New and Changed ROMMON Features 1

New and Changed Features in ROMMON 1

CHAPTER 2

ROM Monitor Overview 3

Information About ROM Monitor 3

Entering ROM Monitor Mode 5

Prerequisites 5

Resetting the Configuration Register and Reloading a DSC to ROM Monitor Mode 6

Verifying the Router State: Example 7

Placing the DSC in ROM Monitor Mode: Example 8

Manually Halting the Initialization Process During System Reload 9

ROM Monitor Commands 9

Commonly Used ROM Monitor Commands 9

Displaying the Available ROM Monitor Commands 10

Displaying the Available ROM Monitor Commands: Examples 11

Changing the ROM Monitor Prompt 11

Displaying the Configuration Register Setting 12

Environment Variables 12

Frequently Used Environmental Variables 12

Displaying Environment Variable Settings 13

Entering Environment Variable Settings 14

Saving Environment Variable Settings 14

Clearing Environment Variable Settings 14

Exiting ROM Monitor Mode	14
Resetting to EXEC Mode with CLI Commands	14
Resetting the Configuration Register Using Prompts	15
Additional References	16

CHAPTER 3

Router Recovery with ROM Monitor 17

Information About Router Recovery	17
About ROMMON Installation Files	18
Locating Installable Files	18
tar Filenames and Version Numbers	19
vm Filenames and Version Numbers	20
About the TURBOBOOT Variable	22
About the Boot Device (Destination Disk)	22
Reinstalling Cisco IOS XR Software on Cisco XR 12000 Series Router	23
Cisco XR 12000 Series Router Router Installation Overview	24
Installation from a TFTP Server	24
Installation from a Local Storage Device	24
About Boothelper in Cisco XR 12000 Series Routers	25
Boothelper Procedures	25
Starting the Router with Boothelper	25
Starting the Router with Boothelper: Example	27
Configuring the Management Ethernet Interface	28
Configuring Management Ethernet Interface: Example	30
Exiting Boothelper and Starting ROM Monitor	31
Exiting Boothelper and Starting ROM Monitor: Example	32
Reinstalling to a Cisco XR 12000 Series Router from a TFTP Server Image	33
Restrictions for TFTP Services	33
Prerequisites	33
Reinstalling to a Cisco XR 12000 Series Router from a TFTP Server Image	34
Reinstalling to a Cisco XR 12000 Series Router from a TFTP Server Image: Examples	36
Reinstalling to a Cisco XR 12000 Series Router from an Image on a Local Storage Device	36
Reinstalling to a Cisco XR 12000 Series Router from an Image on a Local Storage Device: Examples	40

What to Do Next	40
Bringing Up Non-DSC PRPs on Cisco XR 12000 Series Routers	40
Bringing Up a Non-DSC RP: Example	42
PRP-3 ROMMON Changes	43
PRP-2 ROMMON Changes	43
Additional References	44
Related Documents	44
Technical Assistance	45

CHAPTER 4

Managing Configuration Files in ROM Monitor 47

Information about Configuration Files	47
Specifying an Alternative Administration Configuration	48
Specifying a Temporary Alternative Administrative Configuration with the -o Boot Option	48
Specifying a Permanent Alternative Administrative Configuration File with the IOX_ADMIN_CONFIG_FILE= Variable	49
Specifying an Alternative SDR Configuration	51
Specifying a Temporary SDR Configuration File with the -a Boot Option	52
Specifying a Permanent SDR Configuration File with the IOX_CONFIG_FILE= Variable	53
Specifying an Alternate Storage Location for Configuration Files	55
Additional References	57

CHAPTER 5

Password Recovery in ROM Monitor Mode 59

Information About Password Recovery	59
Recovering the Root Password on Single-RP Routers	59
Recovering the Root Password on Redundant-RP Routers	61
Bypassing ksh Authentication	62
Additional References	62

CHAPTER 6

Upgrading and Downgrading ROM Monitor and Boothelper 65

Information About ROM Monitor and Boothelper Software	65
How to Upgrade or Downgrade Boothelper and ROM Monitor	66
Upgrading or Downgrading Boothelper	66
Upgrading or Downgrading ROM Monitor	67
Upgrade Procedures: Examples	68
Upgrading Boothelper: Example	69

Upgrading ROM Monitor: Example	69
Additional References	71



Preface

The *Cisco IOS XR ROM Monitor Guide for the Cisco XR 12000 Series Router* preface contains these sections:

- [Changes to This Document](#), page vii
- [Obtaining Documentation and Submitting a Service Request](#), page vii

Changes to This Document

This table lists the technical changes made to this document since it was first printed.

Revision	Date	Change Summary
OL-28396-02	May 2013	Republished with documentation updates for Cisco IOS XR Release 4.3.1.
OL-28396-01	December 2012	Initial release of this document.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see [What's New in Cisco Product Documentation](#).

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New and Changed ROMMON Features

This table summarizes the new and changed feature information for the *Cisco IOS XR ROM Monitor Guide for the Cisco XR 12000 Series Router*, and tells you where they are documented.

For a complete list of new and changed features in *Cisco IOS XR Software, Release 4.3.x*, see the [New and Changed Features in Cisco IOS XR Software, Release 4.3.x for Cisco XR 12000 Series Router](#) document.

- [New and Changed Features in ROMMON, page 1](#)

New and Changed Features in ROMMON

Feature	Description	Introduced/Changed in Release	Where Documented
Boothelper for PRP-2 cards	The version of boothelper for PRP-2 cards was updated to c12kprp-boot-mz.120-33.S11.	Release 4.3.1	<i>Router Recovery with ROM Monitor</i> chapter: • Locating Installable Files, on page 18 • About Boothelper in Cisco XR 12000 Series Routers, on page 25 • Reinstalling to a Cisco XR 12000 Series Router from a TFTP Server Image, on page 34 <i>Upgrading and Downgrading ROM Monitor and Boothelper</i> chapter: • Upgrading or Downgrading Boothelper, on page 66

Feature	Description	Introduced/Changed in Release	Where Documented
ROMMON	ROMMON version updates	Release 4.3.0	<i>Upgrading and Downgrading ROM Monitor and Boothelper</i> chapter. Refer <i>Software/Firmware Compatibility Matrix</i> information at http://www.cisco.com/web/Cisco_IOS_XR_Software/index.html link, for details of minimum ROMMON requirements.



ROM Monitor Overview

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.

This chapter includes the following main topics:

- [Information About ROM Monitor, page 3](#)
- [Entering ROM Monitor Mode, page 5](#)
- [ROM Monitor Commands, page 9](#)
- [Displaying the Configuration Register Setting, page 12](#)
- [Environment Variables, page 12](#)
- [Exiting ROM Monitor Mode, page 14](#)
- [Additional References, page 16](#)

Information About ROM Monitor

The ROM Monitor is a bootstrap program that initializes the XR 12000 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 XR 12000 Series Router Prompt

```
rommon1>
```

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. On the Cisco XR 12000 Series Routers, the Boothelper software is different from the ROM Monitor software, except for the Performance Route Processor-3 (PRP-3) cards. For PRP-3 cards, the boot helper is integrated with the ROM Monitor software.

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.

A copy of the ROM Monitor software exists on each card. If a card fails to boot the Cisco IOS XR software, the card is forced to run from the ROM Monitor mode. Because a card in ROM Monitor mode is not running the Cisco IOS XR software, that card becomes unavailable for normal router operations.

Understanding the Role of the DSC

The active Route Processor (RP) for the owner Secure Domain Router (SDR) is called the Designated Shelf Controller (DSC). This card performs system-wide functions, including the creation of additional non-owner SDRs. If the active DSC is placed in ROM Monitor mode, it is no longer running the Cisco IOS XR software. If a standby DSC is available, the standby RP resumes router operations. If a standby DSC is not available or is also placed in the ROM Monitor mode, then router operations stop.

Designated Secure Domain Router Shelf Controller (DSDRSC)

In addition to the DSC, each SDR in the system contains at least one DSDRSC. The DSDRSCs provide configuration and administrative functions for a single SDR only. The DSC also serves as the DSDRSC for the owner SDR.

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 DSC

In most situations, you interact with the ROM Monitor mode only on the DSC (DSDRSC for the owner SDR). The DSC 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 DSC for the system.



Note

The only time you will interact with a non-DSC node is when reinstalling the Cisco IOS XR software on the standby PRP of a Cisco XR 12000 Series Router.

Remember, the DSC is also the DSDRSC for the owner SDR.

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 RP 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 PRP is used to refer to the PRP cards supported on Cisco XR 12000 Series Routers. Cisco XR 12000 Series Router supports both the PRP-2 and the PRP-3 cards. 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 RP 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 POS 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 XR 12000 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 DSC in ROM Monitor mode, verify that the system is in a steady state:

1 Prepare the DSC:

- 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 RP 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.

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 DSC 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 designated shelf controller (DSC) 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 DSC console port and log in to the router.
3. **admin**
4. **config-register 0x0** command, **exit** command and **reload** command or **config-register 0x0** location all command and **reload location all** command.

DETAILED STEPS

	Command or Action	Purpose
Step 1	Verify the router is in a steady state.	Ensures that all configurations are saved and that no installation processes are running.
Step 2	Connect a terminal to the DSC console port and log in to the router.	Connects a terminal or PC to the DSC 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 IOS XR Getting Started Guide for the Cisco XR 12000 Series Router.
Step 3	admin Example: RP/0/0/CPU0:router# admin	Enters administration EXEC mode.

	Command or Action	Purpose
Step 4	config-register 0x0 command, exit command and reload command or config-register 0x0 location all command and reload location all command. Example: <pre>RP/0/0/CPU0:router(admin)# config-register 0x0 RP/0/0/CPU0:router(admin)# exit RP/0/0/CPU0:router# reload Or, RP/0/0/CPU0:router(admin)# config-register 0x0 location all RP/0/0/CPU0:router(admin)# reload location all</pre>	- Enter the following commands to place only the DSC in ROM Monitor mode: - Enter the config-register 0x0 command to set the configuration register for ROM Monitor mode during the next card reload. - Enter the exit command to exit administration EXEC mode. - Enter the reload command to reload the DSC and enter ROM Monitor mode. Note - If there is a standby DSC, the configuration register on the standby DSC is also set to 0x0. When you place the active RP in ROM Monitor mode, the system fails over to the standby RP, which then becomes the active RP. If both RPs need to be in ROM Monitor mode, connect to the new active RP and enter the reload command. - Enter the following commands to place all RPs and SCs in ROM Monitor mode: - Enter the config-register 0x0 location all command to reset the configuration register for all RPs in the system. - Enter the reload location all command in administration EXEC mode to reload all RPs in the system. Note Make sure you have access to the console ports of both RPs on the system. To enter the system to the ROM Monitor mode, press Ctrl-C a few times on both RP consoles until you get to the ROM Monitor mode. Caution Resetting the configuration register may change the baud rate for the console. The default baud rate is 9600. Tip To verify the configuration register setting, enter the show variables boot command in the administration EXEC mode.

Verifying the Router State: Example

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

```
RP/0/0/CPU0:router#show redundancy
Sun Jun  6 13:12:19.880 DST
Redundancy information for node 0/0/CPU0:
=====
Node 0/0/CPU0 is in ACTIVE role
Node 0/0/CPU0 has no valid partner

Reload and boot info
-----
```

```
PRP reloaded Sat Jun 5 00:09:00 2010: 1 day, 13 hours, 3 minutes ago
Active node booted Sat Jun 5 00:09:00 2010: 1 day, 13 hours, 3 minutes ago
```

```
read_last_reboot_record: reboot history looks corrupted (index = 4096)
Unable to read last reboot record, err 89(Function not implemented)
Active node reload : Unable to retrieve reboot reason
```

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

```
Sun Jun 6 13:15:59.580 DST
Node          Type          PLIM          State          Config State
-----
0/0/CPU0      PRP(Active)    N/A           IOS XR RUN     PWR,NSHUT,MON
0/1/CPU0      L3 Service Eng N/A           Admin Down     PWR,SHUT,MON
0/2/CPU0      L3LC Eng 3     OC3-ATM-4     IOS XR RUN     PWR,NSHUT,MON
0/3/CPU0      L3LC Eng 5+    Jacket Card   IOS XR RUN     PWR,NSHUT,MON
0/3/1         SPA            SPA-IPSEC-2G-2  READY         PWR,NSHUT
0/3/2         SPA            SPA-1XCHSTM1/OC  READY         PWR,NSHUT
0/4/CPU0      L3LC Eng 5     Jacket Card   IOS XR RUN     PWR,NSHUT,MON
0/4/0         SPA            SPA-5X1GE      READY         PWR,NSHUT
```

Placing the DSC in ROM Monitor Mode: Example

The following example shows how to place the RP0 in the ROM Monitor mode:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)#
config-register 0x0
```

```
RP/0/0/CPU0:router(admin)# reload
```

```
Proceed with reload? [confirm]
System Bootstrap, Version 12.0(20040624:164256) [assafb-misc1 1.14dev(0.91)] DEV
ELOPMENT SOFTWARE
Copyright (c) 1994-2004 by cisco Systems, Inc.
```

```
DRAM DIMM Slot 1: 512M found, Slot 2: Empty
MPC7450 platform with 524288 Kbytes of main memory
```

```
rommon 1 >
Configuring MPPs ...
Configuring PCMCIA slots ...
```

```
System Bootstrap, Version 2.06 ,
Copyright (c) 1994-2009 by Cisco Systems, Inc.
```

```
Acquiring backplane mastership .... successful
Preparing for fan initialization..... ready
Setting fan speed to 4000 RPMs successful
Reading backplane EEPROM ...
Released backplane mastership ...
```

```
Board type is 0x100002 (1048578)
```

```
Switch 0 initialized
Backplane FE port Up... Enabling
Enabling watchdog
G4(7457-NonSMP-MV64360 Rev 3) platform with 4096 MB of main memory
```

```
rommon B1 >
```

Manually Halting the Initialization Process During System Reload

To force the DSC to stop loading and enter ROM Monitor mode, press Ctrl-] when you see the following message:

```
MBI validation sending request.  
HIT Ctrl-]  
TYPE 'Send Break'to abort
```

This message usually appears during the first 20 seconds of system startup. Press the Ctrl-] key combination immediately. This ends your Telnet session to the console or auxiliary port. Enter **send break** and press the **Return** key repeatedly to ensure that the initialization process stops and the system enters the ROM Monitor mode.

This operation can be performed only from a terminal directly connected to the DSC console port. For more information, see the “Connecting and Communicating with the Router” section in Cisco IOS XR Getting Started Guide for the Cisco XR 12000 Series Router.

**Note**

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

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
boot dsc	Sets up the communication with active RP and downloads MBI to launch Cisco IOS XR software on RP. Note This command is not applicable for PRP-3 card, as PRP-3 does not support single image.
boot image	Manually boots a vm Cisco IOS XR software image.

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

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
help or ?	Displays a summary of all available ROM Monitor commands.
-?	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 XR 12000 Series Router:

```
rommon 2 > ?
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
dev            list the device table
dir            list files in file system
dis            disassemble instruction stream
dnld           serial download a program module
frame          print out a selected stack frame
help           monitor builtin command help
history         monitor command history
meminfo        main memory information
repeat         repeat a monitor command
reset          system reset
set            display the monitor variables
stack          produce a stack trace
sync           write monitor environment to NVRAM
sysret         print out info from last system return
unalias        unset an alias
unset          unset a monitor variable
```

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

```
rommon 2 > dir -?
bad device name
usage: dir <device>
```

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 2 > PS1= "GSR_ROMMON_2!>"
```

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 **GSR_ROMMON_2** 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 2 > confreg
```

```
Configuration Summary
(Virtual Configuration Register: 0x0)
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 RP 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.

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
IP_ADDRESS = <i>ip_address</i>	Sets the IP address for the Management Ethernet interface on the DSC.
IP_SUBNET_MASK = <i>ip_address</i>	Sets the subnet mask for the Management Ethernet interface on the DSC.
DEFAULT_GATEWAY = <i>ip_address</i>	Sets the default gateway that serves the DSC.
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 default gateway that serves the DSC.

Environmental variable	Description
TURBOBOOT = <i>on=on, boot-device, options</i>	Completely replaces the existing software when the router is reloaded.
BOOT = <i>drive:path/file</i>	Sets the directory and filename of a bootable software image.
AUX_AUTHEN_LEVEL = <i>number</i>	Completely replaces the existing software when the router is reloaded.
IOX_ADMIN_CONFIG_FILE = <i>drive:path/file</i>	Identifies the boot software for a node. This variable is usually set automatically when the router boots.
IOX_CONFIG_FILE = <i>drive:path/file</i>	Bypasses ksh authentication. A reboot is required only on the card that has to bypass authentication.
IOX_CONFIG_MEDIUM = <i>drive:path</i>	Permanently changes the default location where configuration files are saved.

Displaying Environment Variable Settings

To display the current environment variable settings, enter the **set** command :

```
rommon 2> set
```

```
PS1=rommon ! >
RET_2_RUTC=1142837696
CONFIG_FILE=
NT_K=0:0:0:0
CONFGEN=74
CHASSIS_SN=TBM10080357
IOX_ADMIN_CONFIG_FILE=
IP_SUBNET_MASK=255.255.255.0
DEFAULT_GATEWAY=172.29.52.1
IP_ADDRESS=172.29.52.226
RET_2_RTS=08:45:17 UTC Tue Jul 3 2007
RET_2_RCATS=1183452318
BOOTLDR=bootflash:c12kprp-boot-mz.120-32.S7.bin
MIRROR_ENABLE=Y
BOOT_DEV_SEQ_CONF=disk0;;disk1:
?=0
TURBOBOOT=
BSI=0
BOOT=disk0:c12k-os-mbi-3.9.0.08I/mbiprp-rp.vm,1;
BOOT_DEV_SEQ_OPER=disk0;;disk1:
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 XR 12000 Series Router:

```
rommon 1> IP_ADDRESS=1.1.1.1
rommon 2> IP_SUBNET_MASK=255.255.254.0
rommon 3> DEFAULT_GATEWAY=1.1.0.1
```

Saving Environment Variable Settings

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

```
rommon 1> 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 1> 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.

Exiting ROM Monitor Mode

To exit ROM Monitor mode, you must change the configuration register to 0x102 and reset the RP. This process can be done by either entering CLI commands or responding to prompts.

Resetting to EXEC Mode with CLI Commands

Perform this task to reset the configuration register in ROM Monitor mode and start the RP in EXEC mode.

SUMMARY STEPS

1. **confreg 0x102**
2. **reset**

DETAILED STEPS

	Command or Action	Purpose
Step 1	confreg 0x102 Example: rommon B1> confreg 0x102	Resets the configuration register to enter EXEC mode after the system is reset.
Step 2	reset Example: rommon B1> reset	Resets and initializes the router.

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.

SUMMARY STEPS

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

DETAILED STEPS

	Command or Action	Purpose
Step 1	confreg 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.

	Command or Action	Purpose
Step 3	reset Example: rommon B2> reset	Resets and initializes the router.

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 IOS XR Getting Started Guide for the Cisco XR 12000 Series Router</i>
Configuring a router with Cisco IOS XR software	Cisco IOS XR Software Documentation: http://www.cisco.com/en/US/products/ps5845/tsd_products_support_series_home.html

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. 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. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/support



Router Recovery with ROM Monitor

This chapter describes the router recovery methods in ROM Monitor (ROMMON) mode of the router.

- [Information About Router Recovery, page 17](#)
- [About ROMMON Installation Files, page 18](#)
- [About the TURBOBOOT Variable, page 22](#)
- [About the Boot Device \(Destination Disk\), page 22](#)
- [Reinstalling Cisco IOS XR Software on Cisco XR 12000 Series Router, page 23](#)
- [Bringing Up Non-DSC PRPs on Cisco XR 12000 Series Routers, page 40](#)
- [PRP-3 ROMMON Changes, page 43](#)
- [PRP-2 ROMMON Changes, page 43](#)
- [Additional References, page 44](#)

Information About Router Recovery

The standard way to install new software on the Designated Shelf Controller (DSC) is by using the **install** command in administration EXEC mode. However, if the DSC is unable to boot the Cisco IOS XR software or you want to completely replace the existing software, you can reinstall the software while the DSC is in ROM Monitor mode. When you install the Cisco IOS XR software from ROM Monitor mode, you must use a special software installation file with a vm file extension. These files are called vm files. You cannot install software in package installation envelope (PIE) files from ROM Monitor mode.



Note

Installation using a vm file in ROM Monitor mode should be performed only from the DSC of the system.

**Caution**

Reinstalling the Cisco IOS XR software from ROM Monitor mode replaces the currently installed router software and causes substantial router downtime. We recommend installing or upgrading software packages from administration EXEC mode using PIE files, as described in the *Upgrading and Managing Cisco IOS XR Software* module of the *Cisco IOS XR System Management Configuration Guide for the Cisco XR 12000 Series Router*.

About ROMMON Installation Files

This section includes the following topics:

Locating Installable Files

To obtain Cisco IOS XR software and version information, use the Cisco Software Delivery System (SDS), available at the following URL:

<http://www.cisco.com/cisco/software/navigator.html?mdfid=279844343&flowid=2130>

To locate Cisco IOS XR software images:

- Select any entry under Cisco XR 12000 Series Router.
- Select IOS XR software to see the image tar files, or choose any of the other categories to see the other files.

The table below lists the software packages that you can install from ROMMON.

Table 3: Downloadable Software for Installation from ROM Monitor

Software Package Name	Description
Cisco IOS XR IP/MPLS Core Software	This package contains two copies of the Cisco IOS XR Unicast Routing Core Bundle. One copy is in the Package Installation Envelope (PIE) file format and can be installed while Cisco IOS XR is running, as described in the <i>Upgrading and Managing Cisco IOS XR Software</i> module of the <i>Cisco IOS XR System Management Configuration Guide for the Cisco XR 12000 Series Router</i> . The other copy is in a vm file that can be installed from ROM Monitor. This package also includes Cisco IOS XR MPLS, Manageability, and Multicast packages (in PIE files).
Cisco IOS XR IP/MPLS Core Software 3DES	This package contains everything in the Cisco IOS XR IP/MPLS Core Software package in addition to Cisco IOS XR Security package (in a PIE file).

The table above lists packages that are distributed in files with tar filename extensions (tar files are assembled with the UNIX tar utility). When you download a tar file, you must unpack the tar file with a software program before you can install any of the files in the package.

The files that you can install from ROM Monitor have a vm filename extension. These files contain the software included in the Cisco IOS XR Unicast Routing Core Bundle. The other files in the packages are PIE files.

**Note**

The tar files contain both PIE files and vm files. If the router is operating properly, you can install the software using the appropriate PIE file with little or no interruption to router traffic, as described in the *Upgrading and Managing Cisco IOS XR Software* module of the *Cisco IOS XR System Management Configuration Guide for the Cisco XR 12000 Series Router*. If the router is not booted with the Cisco IOS XR software, install the core software using the vm file first, and then install any additional packages using the PIE files after the router enters EXEC mode.

The table below describes packages that contain additional files for the Cisco XR 12000 Series Router.

Filename	Description
mbiprp-rp.vm-4.3.0	This software is for all PRPs except the DSC and must be loaded on a PRP before it can communicate with the DSC.
bfprp_romupgrade-1.14.0.91	This software is for the ROM Monitor upgrade of the PRP cards, and later versions may display a different version number at the end of the filename.
c12kprp-boot-mz.120-32.S3	This software is the Boothelper for the PRP cards, and later versions may display a different version number at the end of the filename. c12kprp-boot-mz.120-33.S11 is the Boothelper version required for PRP-2 cards on Cisco IOS XR software release 4.3.1 and later.

tar Filenames and Version Numbers

The format for a tar filename is:

platform-bundle_name-major.minor:maintenance.tar

Table 4: tar Filename Components

Component	Description
platform	Identifies the platform for which the software package is designed. For packages designed for the Cisco XR 12000 Series Router, the platform designation is "XR12000."

Component	Description
bundle_name	Identifies a specific bundle. • <i>IOS XR</i> bundle name indicates a file that includes all packages in the Cisco IOS XR Unicast Routing Core Bundle and the Management, MPLS, and Multicast packages. These packages are described in the <i>Upgrading and Managing Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Management Configuration Guide for the Cisco XR 12000 Series Router</i>. • IOS XR-k9 bundle name indicates a file that includes all packages in the iosxr bundle file plus the security package.
major	Identifies the major release of this package. • Major releases occur when there is a major architectural change to the product (for example, a major new capability is introduced). • All packages operating on the router must be at the same major release level. • Major release is the least frequent release and may require a router reboot.
minor	Identifies the minor release of this package. • Minor releases contain one or more of the following: ◦ New features ◦ Bug fixes • Minor release versions do not have to be identical for all software packages operating on the router, but the operating packages must be certified by Cisco as compatible with each other. • Minor releases may require a router reboot.
maintenance	Identifies the maintenance release of this package. • Maintenance releases contain a collection of bug fixes for a package. • Maintenance release versions do not have to be identical for all software packages operating on the router, but the major and minor versions of the maintenance release must match the those of the package being updated. • Maintenance releases usually do not require a router reboot.

vm Filenames and Version Numbers

The format for a vm filename for Cisco XR 12000 Series Routers is:

comp-platform-package_name.vm-major:minor.maintenance

The “comp” prefix indicates that the file is a composite of multiple packages.

The table below describes the other filename components.

Table 5: vm Filename Components

Component	Description
platform	Identifies the platform for which the software package is designed. For packages designed for Cisco XR 12000 Series Routers, the platform designation is “c12k.” The mbiprp platform name specifies a special file for the Cisco XR 12000 Series Router.
package_name	Identifies a specific package. • Mini package names indicate a composite package that includes all packages in the Cisco IOS XR Unicast Routing Core Bundle, which is described in the <i>Upgrading and Managing Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Management Configuration Guide for the Cisco XR 12000 Series Router</i>. • Rp package names specify a special file for the Cisco XR 12000 Series Router.
major	Identifies the major release of this package. • A major release occurs when there is a major architectural change to the product (for example, a major new capability is introduced). • All packages operating on the router must be at the same major release level. • A major release is the least frequent release and may require a router reboot.
minor	Identifies the minor release of this package. • A minor release contains one or more of the following: ◦ New features ◦ Bug fixes • The minor release version does not have to be identical for all software packages operating on the router, but the operating packages must be certified by Cisco as compatible with each other. • A minor release may require a router reboot.
maintenance	Identifies the maintenance release of this package. • A maintenance release contains a collection of bug fixes for a package. • The maintenance release version does not have to be identical for all software packages operating on the router, but the major and minor versions of the maintenance release must match the those of the package being updated. • A maintenance release usually does not require a router reboot.

The following example shows a composite of multiple mini packages:

```
c12k-mini.vm-4.3.0
```

About the TURBOBOOT Variable

The TURBOBOOT environmental variable automates the software installation process in the ROM Monitor mode and determines the installation settings, such as the boot device (destination disk) for software installation. The following is the syntax for the TURBOBOOT environmental variable:

```
TURBOBOOT=on,{boot-device},{format | clean},{nodisablebreak}
```

In the preceding example, the TURBOBOOT variable is set to **on**, the boot device (destination disk) is the flash disk in **disk0:**, the installation process formats the disk, and the installation process can be terminated prematurely.

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

There are four main arguments and keywords for the TURBOBOOT variable:

- **on**—Installs and activates the Cisco IOS XR software packages when the RP is booted with the *vm* image.
- *boot-device*—Selects the destination disk for software installation.
- [**format** | **clean**]: When the **clean** option is selected, the Cisco IOS XR software is completely replaced, but all other files on the disk are preserved, including configuration files for each secure domain router (SDR). When the **format** option is selected, the Cisco IOS XR software is completely replaced, and only the administration configuration is preserved. All other files on the disk, including all configuration files for the SDRs and all user files, are deleted. The administration configuration contains the configuration that determines SDR name and inventory. The SDR configurations include router configurations such as Border Gateway Protocol (BGP) and interface configurations.
- [**nodisablebreak**]: When the **nodisablebreak** flag is added, the installation process using the TURBOBOOT variable can be prematurely terminated by sending a break from the terminal. The default is to ignore breaks from the terminal.



Note

- Each argument is separated by a comma.
- The default boot device disk is disk0:.

About the Boot Device (Destination Disk)

The boot device determines the location where the Cisco IOS XR software is installed on all RPs. The system uses the boot-device to install the software to the other RP card in the system. Any additional software or software upgrades are automatically saved to the same boot device.

When you install Cisco IOS XR software using the Turboboot method in ROM Monitor mode, you must specify a *boot-device* for the router. The boot device is the local disk on the RP card where the Cisco IOS XR software is installed.

- MBI is always installed on the boot device.
- On the Cisco XR 12000 Series Router, the supported boot devices are disk0:, disk1:, and compact flash.

The boot-device determines the disk slot where all software is installed on all RPs and distributed route processors (DRPs) that act as the designated secure domain router shelf controllers (DSDRSCs). In other words, when you turboboot the Cisco IOS XR software to the DSC, all the other RPs in the system must include a disk in that same slot. The system uses these disks to distribute the software to each RP in the system. Any additional software or software upgrades are automatically saved to the same boot device.

After the Cisco IOS XR software is installed to the boot device using the TURBOBOOT method, all additional software and software upgrades are automatically installed and synchronized to that same boot device and cannot be changed. For example:

- If the Cisco IOS XR software is installed in the RP card using the TURBOBOOT variable, with disk0 (TURBOBOOT=on,disk0), all packages are installed to disk0: and the boot device is disk0:.
- If the Cisco IOS XR software is installed in the RP card using the TURBOBOOT variable, with disk1 (TURBOBOOT=on,disk1), all packages are installed to disk1: and the boot device is "disk1:".
- On a Cisco XR 12000 Series Router, you can also turboboot using compact flash disk as the boot device.
- After you boot the Cisco IOS XR software, you are not allowed to add packages to anywhere other than the boot-device. For example, you cannot boot the DSC to disk1: and decide to add your packages to disk0: or vice versa.

**Note**

We recommend using disk0: as the boot device. Disk0: is pre-installed in most RPs, which ensures that the correct disk is used to store the software packages on the entire system.

Reinstalling Cisco IOS XR Software on Cisco XR 12000 Series Router

**Caution**

Reinstalling Cisco IOS XR software from ROM Monitor mode replaces the currently installed router software and causes substantial router downtime. We recommend that you install or upgrade software packages from the Administration EXEC mode using package installation envelope (PIE) files, as described in the *Upgrading and Managing Cisco IOS XR Software* module of *Cisco IOS XR System Management Configuration Guide for the Cisco XR 12000 Series Router*.

This section includes the following topics:

Cisco XR 12000 Series Router Router Installation Overview

When you reinstall the software from ROM Monitor mode, you can perform either of the following procedures:

- Load the Cisco IOS XR software from a *vm* file on a TFTP server to the DSC.
- Transfer the *vm* file to a local storage device and then load the Cisco IOS XR software from that storage device to the DSC.

Installation from a TFTP Server

To install the Cisco IOS XR software from a TFTP server, perform the following procedures:

- 1 Start the DSC Boothelper and either configure or verify the configuration of the Management Ethernet interface on the PRP to which you are installing the software.
- 2 Place the DSC in ROM Monitor mode.
- 3 Clear any environment variables that might interfere with the installation.
- 4 Configure the TURBOBOOT environment variable to either clean or format the boot device during the installation.
- 5 Boot the Cisco IOS XR software from a *vm* file on the TFTP server. After you boot the Cisco IOS XR software, the Turboboot process either cleans or formats the boot device based on the TURBOBOOT environment variable setting.
- 6 Boot the standby DSC and all other PRPs with the MBI.

**Caution**

If the TURBOBOOT variable is set to format the boot device, all SDR configurations are deleted. Only the administration configuration is preserved.

**Note**

This procedure describes how to install the Cisco IOS XR software on a router that previously ran the Cisco IOS XR software. If you are upgrading a Cisco XR 12000 Series Router that is currently running Cisco IOS software, you need to upgrade the router to Cisco IOS XR software, as described in the document *Migrating from Cisco IOS to Cisco IOS XR Software on the Cisco XR 12000 Series Router*.

Installation from a Local Storage Device

To install the Cisco IOS XR software from a local storage device, perform the following tasks:

- 1 Copy the new Cisco IOS XR software to the local storage device on the DSC. We recommend disk1.
- 2 Place the router in ROM Monitor mode.
- 3 Clear any environment variables that might interfere with the installation.
- 4 Configure the TURBOBOOT environment variable to either clean or format the boot device during the installation.

- 5 Boot the new Cisco IOS XR software from the image on the local storage device. After you boot the Cisco IOS XR software, the Turboboot process either cleans or formats the boot device based on the TURBOBOOT environment variable setting.
- 6 Boot the standby DSC and all other PRPs with the MBI.

**Caution**

If the TURBOBOOT variable is set to format the boot device, all SDR configurations are deleted. Only the administration configuration is preserved.

About Boothelper in Cisco XR 12000 Series Routers

Boothelper software is additional software that extends the capabilities of ROM Monitor on a Cisco XR 12000 Series Router. With Boothelper, ROM Monitor can load images from compact flash and TFTP servers. Without Boothelper, ROM Monitor can only load images from a local storage device (disk0, disk1, and bootflash).

Before you can use Boothelper to connect to remote devices, such as a TFTP server, you must configure the Management Ethernet interface in the Boothelper software. After Boothelper is configured, you do not need to load the software. When the configuration register is set to load software (setting 0x102), the software is loaded in the following sequence:

- 1 ROM Monitor
- 2 Boothelper
- 3 Cisco IOS XR software

If the Boothelper software cannot load, the ROM Monitor prompt appears. If the Cisco IOS XR software cannot load, the Boothelper prompt appears as follows:

```
router(boot)>
```

If all the software loads correctly, the Cisco IOS XR software prompt appears.

**Note**

Before installing Cisco IOS XR software from a TFTP server, ensure that the router has the latest Boothelper image, **c12kprp-boot-mz.iox.120-33.S11**, in its bootflash and that the ROMMON environmental variable, **BOOTLDR**, is set to this particular image. This is applicable to Cisco IOS XR software release 4.3.1 and later. For upgrading Boothelper, refer [Upgrading or Downgrading Boothelper](#), on page 66 section.

Boothelper Procedures

This section provides the following procedures for use on Cisco XR 12000 Series Routers:

Starting the Router with Boothelper

In normal operating conditions, it should not be necessary to start the router with Boothelper. If you want to reinstall software from a vm image on a remote server, you must start Boothelper to verify or configure the Management Ethernet interface.

SUMMARY STEPS

1. Restart the router in ROM Monitor mode.
2. **confreg 0x0**
3. **reset**
4. **unset BOOT**
5. **unset BOOTLDR=**or**set BOOTLDR=bootflash:/filename**
6. **sync**
7. **boot**

DETAILED STEPS

	Command or Action	Purpose
Step 1	Restart the router in ROM Monitor mode.	Restarts the router in ROM Monitor mode.
Step 2	confreg 0x0 Example: <code>rommon 1 > confreg 0x0</code>	Configures the router to restart in ROM Monitor mode. This step and the next are not necessary if you have already set the configuration register to 0x0 in Step 1.
Step 3	reset Example: <code>rommon 2 > reset</code>	Activates the configuration change made in Step 2.
Step 4	unset BOOT Example: <code>rommon 3 > unset boot</code>	Clears the setting of the BOOT environment variable. If the router has been running Cisco IOS XR software, the BOOT variable is probably set to load that software.
Step 5	unset BOOTLDR= or set BOOTLDR=bootflash:/filename Example: <code>rommon 2 > unset BOOTLDR=</code> or <code>rommon 2 > set</code> <code>BOOTLDR=bootflash:/c12kprp-boot-mz</code>	Configures ROM Monitor to load the Boothelper software. unset BOOTLDR= If the Boothelper file is the first file in bootflash (dir bootflash:), it will automatically be loaded when the boot command is run. Unset the Boothelper if the Boothelper file is the first file in bootflash. set BOOTLDR=bootflash:/filename If the Boothelper file is not the first file in bootflash, set the bootflash variable to specify the name and location of the Boothelper file.
Step 6	sync Example: <code>rommon 3 > sync</code>	Saves the configuration change in Step 4.

	Command or Action	Purpose
Step 7	boot	Boots the Boothelper software.
	Example: <pre>rommon 3 > boot</pre>	

Starting the Router with Boothelper: Example

The following example shows how to start the router with Boothelper:

```
rommon 1 > confreg 0x0
```

```
rommon 2 > reset
```

```
System Bootstrap, Version 12.0(20040624:164256) [assafb-misc1 1.14dev(0.91)] DEE
Copyright (c) 1994-2004 by cisco Systems, Inc.
```

```
DRAM DIMM Slot 1: 512M found, Slot 2: 1024M found
MPC7450 platform with 1572864 Kbytes of main memory
```

```
rommon 1 > unset BOOT
rommon 2 > unset BOOTLDR=
rommon 3 > sync
rommon 4 > boot
```

```
Self decompressing the image :BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB [OK]
```

```
Restricted Rights Legend
```

```
Use, duplication, or disclosure by the Government is
subject to restrictions as set forth in subparagraph
(c) of the Commercial Computer Software - Restricted
Rights clause at FAR sec. 52.227-19 and subparagraph
(c) (1) (ii) of the Rights in Technical Data and Computer
Software clause at DFARS sec. 252.227-7013.
```

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

```
Cisco Internetwork Operating System Software
IOS (tm) GS Software (C12KPRP-BOOT-M), Version 12.0(31)S, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2005 by cisco Systems, Inc.
Compiled Sat 16-Apr-05 22:45 by kellythw
Image text-base: 0x00010000, data-base: 0x0095D000
```

```
cisco 12410/PRP (MPC7450) processor (revision 0x00) with 1572864K bytes of memo.
MPC7450 CPU at 665Mhz, Rev 2.1, 256KB L2, 2048KB L3 Cache
Last reset from sw reset
```

```
3 Route Processor Cards
2 Clock Scheduler Cards
5 Switch Fabric Cards
1 8-port OC3 POS controller (8 POS).
1 four-port OC12 POS controller (4 POS).
1 OC48 POS controller (1 POS).
2 Four Port Gigabit Ethernet/IEEE 802.3z controllers (8 GigabitEthernet).
2 Ethernet/IEEE 802.3 interface(s)
8 GigabitEthernet/IEEE 802.3 interface(s)
13 Packet over SONET network interface(s)
```

```

2043K bytes of non-volatile configuration memory.

1000944K bytes of ATA PCMCIA card at slot 0 (Sector size 512 bytes).
65536K bytes of Flash internal SIMM (Sector size 256K).
.
.
.
Press RETURN to get started!

router(boot)>

```

Configuring the Management Ethernet Interface

To enable network communications when the Cisco IOS XR software is not loaded, you must configure the Management Ethernet interface in Boothelper. The Boothelper configuration is most often used to enable access to TFTP servers when reinstalling software from vm files.

Prerequisites

Before you begin, collect the following information:

- IP address of the Management Ethernet interface for your RP
- Subnet mask of the Management Ethernet interface for your RP
- IP address of the default gateway that serves your RP

SUMMARY STEPS

1. Start the Boothelper software.
2. **enable**
3. Enter the password.
4. **show interface ethernet** *interfaceNumber*
5. **configure terminal**
6. **interface ethernet** *interfaceNumber*
7. **ip address** *ipaddress subnetmask*
8. **mac-address** *macaddress*
9. **no ip directed-broadcast**
10. **no ip route-cache**
11. **no shutdown**
12. **end**
13. **ip default-gateway** *ipAddress*
14. **reload**

DETAILED STEPS

	Command or Action	Purpose
Step 1	Start the Boothelper software.	Starts the Boothelper.

	Command or Action	Purpose
Step 2	enable Example: <pre>router(boot)> enable</pre>	Places the router in privileged EXEC mode.
Step 3	Enter the password. Example: <pre>Password:</pre>	Submits the password for authentication. Note The password is not displayed on the screen.
Step 4	show interface ethernet <i>interfaceNumber</i> Example: <pre>router(boot)# show interface ethernet 0</pre>	Displays the current interface configuration and statistics for the specified interface. • Enter 0 for Ethernet Interface 0 or 1 for Ethernet Interface 1. • If the current configuration is correct, skip to Step 13.
Step 5	configure terminal Example: <pre>router(boot)# configure terminal</pre>	Places the router in configuration mode.
Step 6	interface ethernet <i>interfaceNumber</i> Example: <pre>router(b(config)# interface ethernet 0</pre>	Selects an interface to configure. • Enter 0 for Ethernet interface 0 or 1 for Ethernet interface 1. Note The Ethernet ports correspond to the Management Ethernet interfaces in the Cisco IOS XR software. For example, Ethernet 0 corresponds to MgmtEth0/x/CPU0/0 in the Cisco IOS XR software.
Step 7	ip address <i>ipaddress subnetmask</i> Example: <pre>router(b(config-if)# ip address 10.8.28.103 255.255.0.0</pre>	Configures the IP address and subnet mask for the interface. • Replace <i>ipaddress</i> with the IP address for the interface. • Replace <i>subnetmask</i> with the subnet mask for the interface.
Step 8	mac-address <i>macaddress</i> Example: <pre>router(b(config-if)# mac-address 0007.b39b.a7ff</pre>	Configures the MAC address for the interface. • Replace <i>macaddress</i> with the MAC address for the interface. • This MAC address applies only while the node is running Boothelper.
Step 9	no ip directed-broadcast Example: <pre>router(b(config-if)# no ip directed-broadcast</pre>	Disables the translation of a directed broadcast to physical broadcasts.

	Command or Action	Purpose
Step 10	no ip route-cache Example: router(b(config-if)# no ip route-cache	Disables all switching options supported by the ip route-cache command.
Step 11	no shutdown Example: router(b(config-if)# no shutdown	Brings up the interface.
Step 12	end Example: router(b(config-if)# end	Exits interface configuration mode.
Step 13	ip default-gateway <i>ipAddress</i> Example: router(b(config)# ip default-gateway 10.10.0.1	Defines the IP address for the default gateway.
Step 14	reload Example: router(boot)# reload System configuration has been modified. Save? [yes/no]: y Building configuration... [OK] Proceed with reload? [confirm]	Restarts the RP. • Type y and press Return to save the configuration. • Press Return when asked to confirm that you want to reload the router. • Because the configuration register is still set to 0x0, the router reloads ROM Monitor.

Configuring Management Ethernet Interface: Example

The following example shows how to configure Management Ethernet interface 0 on a PRP in Boothelper:

```

router(boot)> enable

Password:

router(boot)# show interface ethernet 0

Ethernet0 is administratively down, line protocol is down
Hardware is 10/100 Ethernet, address is 0007.b39b.a7ff (bia 0007.b39b.a7ff)
Internet address is 12.8.28.103/16
MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec, rely 255/255, load 1/255
Encapsulation ARPA, loopback not set
Keepalive set (10 sec)
ARP type: ARPA, ARP Timeout 04:00:00
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Queueing strategy: fifo
Output queue 0/40, 0 drops; input queue 0/75, 0 drops
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
  0 packets input, 0 bytes, 0 no buffer
    Received 0 broadcasts, 0 runts, 0 giants, 0 throttles

```

```

0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
0 input packets with dribble condition detected
0 packets output, 0 bytes, 0 underruns
0 output errors, 0 collisions, 1 interface resets
0 babbles, 0 late collision, 0 deferred
1 lost carrier, 0 no carrier
0 output buffer failures, 0 output buffers swapped out

router(boot)# configure terminal

Enter configuration commands, one per line. End with CNTL/Z.
router(b(config)# interface ethernet 0
router(b(config-if)# ip address 10.8.28.103 255.255.0.0
router(b(config-if)# mac-address 0007.b39b.a7ff
router(b(config-if)# no ip directed-broadcast
router(b(config-if)# no ip route-cache
router(b(config-if)# no shutdown
router(b(config-if)# end
router(boot)# reload

System configuration has been modified. Save? [yes/no]: y
Building configuration...
[OK]
Proceed with reload? [confirm]

System Bootstrap, Version 12.0(20040624:164256) [assafb-misc1 1.14dev(0.91)] DEE
Copyright (c) 1994-2004 by cisco Systems, Inc.

DRAM DIMM Slot 1: 512M found, Slot 2: 1024M found
MPC7450 platform with 1572864 Kbytes of main memory
rommon 1 >

```

Exiting Boothelper and Starting ROM Monitor

If an RP is running Boothelper software and you want to return to ROM Monitor mode, use the following procedure.

SUMMARY STEPS

1. **enable** router(boot)> **enable**
2. Enter the password.
3. **configure terminal**
4. **config-register 0x0**
5. **exit**
6. **reload**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable router(boot)> enable	Places the router in privileged EXEC mode.

	Command or Action	Purpose
Step 2	Enter the password. Example: Password:	Submits the password for authentication. The password is not displayed on the screen.
Step 3	configure terminal Example: router (boot) # configure terminal	Places the RP in configuration mode.
Step 4	config-register 0x0 Example: router (b(config) # config-register 0x0	Configures the RP to start in ROM Monitor mode when the next reload occurs.
Step 5	exit Example: router (b(config) # exit	Exits configuration mode.
Step 6	reload Example: router (boot) # reload System configuration has been modified. Save? [yes/no]: y Building configuration... [OK] Proceed with reload? [confirm]	Restarts the RP. • Type y and press Return to save the configuration. • Press Return when asked to confirm that you want to reload the router. • Because the configuration register is set to 0x0, the router reloads ROM Monitor.

Exiting Boothelper and Starting ROM Monitor: Example

The following example shows how to exit Boothelper and start ROM Monitor on an RP:

```

router (boot) > enable

Password:

router (boot) # configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

router (b(config) # config-register 0x0

router (b(config) # exit

router (boot) # reload

System configuration has been modified. Save? [yes/no]: y
Building configuration...
[OK] [OK] [OK]
Proceed with reload? [confirm]

```

```
System Bootstrap, Version 12.0(20040624:164256) [assafb-misc1 1.14dev(0.91)] DEVELOPMENT  
SOFTWARE  
Copyright (c) 1994-2004 by cisco Systems, Inc.  
  
DRAM DIMM Slot 1: 512M found, Slot 2: 1024M found  
MPC7450 platform with 1572864 Kbytes of main memory  
  
rommon 1 >
```

Reinstalling to a Cisco XR 12000 Series Router from a TFTP Server Image

The Cisco IOS XR software can be reinstalled directly from a vm file located on a TFTP server. Complete the instructions in this section exactly as described.

Restrictions for TFTP Services

TFTP services by some vendors (such as Sun Solaris) may not support files larger than 32 MB. Because most Cisco IOS XR vm images are larger than 32 MB, you may need to use one of the following options:

- Use a third-party or freeware TFTP server that supports file sizes larger than 32 MB.
- Download a patch from Sun Microsystems to correct this limitation (<http://www.sun.com>).
- Install the Cisco IOS XR software from a vm image located on the local flash disk.

Prerequisites

The following hardware and software are required:

- ROM Monitor firmware on the Cisco XR 12000 Series Router router is compatible with the Cisco IOS XR software image that you are installing.
- Boothelper c12kprp-boot-mz.120-32.S3 (For Cisco IOS XR software release 4.3.0 and below)
Boothelper c12kprp-boot-mz.120-33.S11 (For Cisco IOS XR software release 4.3.1 and later)
- 256 MB or larger flash disk0:

Before you begin, collect the following information:

- IP address of the TFTP server from which the software will be downloaded
- Filename and directory of the vm installation file that will be installed on the router

Reinstalling to a Cisco XR 12000 Series Router from a TFTP Server Image

SUMMARY STEPS

1. Back up the router configuration while still in EXEC mode.
2. Place both the DSC and standby DSC in ROM Monitor mode.
3. Configure Boothelper for network access.
4. **set**
5. **unset BOOT**
6. **unset TFTP_FILE**
7. **unset CONFIG_FILE**
8. **TURBOBOOT=on**, *boot-device, options*
9. **sync**
10. **boot tftp://server/directory/filename**
11. Boot all non-DSC PRPs with the MBI.

DETAILED STEPS

	Command or Action	Purpose
Step 1	Back up the router configuration while still in EXEC mode.	(Optional) To preserve the current router configuration, copy it to another disk while still in EXEC mode. • For more information, see <i>Managing Configuration History and Rollback</i> section in the <i>Upgrading and Managing Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Management Configuration Guide for the Cisco XR 12000 Series Router</i> .
Step 2	Place both the DSC and standby DSC in ROM Monitor mode.	Places the PRPs in ROM Monitor mode.
Step 3	Configure Boothelper for network access.	Enables network access for the PRP in preparation for downloading the new software.
Step 4	set Example: rommon1> set	Displays the ROM Monitor environment variables.
Step 5	unset BOOT Example: rommon2> unset BOOT	Clears the setting for the BOOT variable. Note This step is not required if the set command display shows that no value is assigned to this variable.
Step 6	unset TFTP_FILE	Clears the setting for the TFTP_FILE variable.

	Command or Action	Purpose
	Example: <code>rommon3> unset TFTP_FILE</code>	Note This step is not required if the set command display shows that no value is assigned to this variable.
Step 7	unset CONFIG_FILE Example: <code>rommon4> unset CONFIG_FILE</code>	Clears the setting for the CONFIG_FILE variable. Note This step is not required if the set command display shows that no value is assigned to this variable.
Step 8	TURBOBOOT=on, boot-device, options Example: <code>rommon5> TURBOBOOT=on, disk0, format</code>	Sets the TURBOBOOT parameters. • Separate each parameter with a comma (,). • To enable the Turboboot process, specify on. • Specify a boot device where all software will be installed on the DSC and all DSDRSCs. We recommend disk0:. • To replace the existing software without formatting the boot device, replace <i>options</i> with clean. • To replace the existing software and format the boot device, replace <i>options</i> with format. • The default option is clean. • Any existing configuration is preserved.
Step 9	sync Example: <code>rommon6> sync</code>	Saves the new ROM Monitor variable settings.
Step 10	boot tftp://server/directory/filename Example: <code>rommon7> boot</code> <code>tftp://223.255.254.254/softdir/c12k-mini.vm-4.3.0</code>	Retrieves the file from the TFTP server and installs it on the boot device. • Execute this command on the active PRP and specify the vm installation file from the TFTP server. • This process removes any existing software packages, resets the configuration register to 0x2, and boots the system. • Allow the system to fully boot. The “Press RETURN to get started” message appears twice. The first occurrence appears when the software is loaded into memory. The second occurrence happens after the software has been installed on the disk. • The system is fully booted when the following message appears: SYSTEM CONFIGURATION COMPLETED • Do not wait for this step to complete before starting the next step.

	Command or Action	Purpose
Step 11	Boot all non-DSC PRPs with the MBI.	Prepares PRPs to communicate with the DSC.

Reinstalling to a Cisco XR 12000 Series Router from a TFTP Server Image: Examples

The following examples are provided:

Setting the TURBOBOOT Variable

The following example shows how to set the TURBOBOOT variable on the DSC and save the change:

```
rommon1> TURBOBOOT=on,disk0,format
rommon2> sync
```

Booting the vm Installation File

The following example shows how to boot the DSC using the specified vm file on the specified TFTP server:

```
rommon 2>
boot tftp://10.10.10.10/software/c12k-mini.vm-4.3.0

.
.
.

bios con0/RP1/CPU0 is now available
Press RETURN to get started.
```

Reinstalling to a Cisco XR 12000 Series Router from an Image on a Local Storage Device

This section describes the tasks required to install the Cisco IOS XR software on the boot device (such as disk0) using a vm image stored on a local flash storage device (such as disk1). Complete the procedures exactly as described in this section.



Note

Before booting begins, a delay of 10 minutes or more may occur while the vm image is read to memory from the removable flash disk1.

Prerequisites

A valid vm image must be located on flash disk (disk1).

If this file is not present on disk1 or a different version is required, use one of the following options:

- While the router is still in EXEC mode, copy the necessary vm image from a TFTP, an FTP, or an rcp server to the local storage device. We recommend flash disk1. This process is described in the the

Upgrading and Managing Cisco IOS XR Software module of *Cisco IOS XR System Management Configuration Guide for the Cisco XR 12000 Series Router*.

- Consult your system administrator for a flash disk containing the bootable vm file.
- Consult your Cisco representative for a flash disk containing the bootable vm file.


Note

We recommend using the removable flash disk disk1 to store archives of vm and PIE files. The disk used to store the installable files cannot be used as a destination for installed software or configurations. Only the boot device can be used to store active software and configurations.

The following hardware and software are required:

- The ROM Monitor firmware on the Cisco XR 12000 Series Router router is compatible with the Cisco IOS XR software image that you are installing.
- Boothelper c12kprp-boot-mz.120-32.S3 (For Cisco IOS XR software release 4.3.0 and below)
- Boothelper c12kprp-boot-mz.120-33.S11 (For Cisco IOS XR software release 4.3.1 and later)
- 256 MB or higher flash disk0.

SUMMARY STEPS

1. Back up the router configuration while still in EXEC mode.
2. Copy the required vm file to the DSC local storage device (such as flash disk1). We recommend the usage of flash disk1. You can also use a flash disk that already has the correct image.
3. Place both the DSC and standby DSC in ROM Monitor mode.
4. **set**
5. **unset BOOT**
6. **unset TFTP_FILE**
7. **unset CONFIG_FILE**
8. **TURBOBOOT=on**, boot-device, options
9. **sync**
10. **boot device:/filename**
11. Boot all non-DSC PRPs with the MBI.

DETAILED STEPS

	Command or Action	Purpose
Step 1	Back up the router configuration while still in EXEC mode.	(Optional) To preserve the current router configuration, copy it to another disk while still in EXEC mode. • See <i>Managing Configuration History and Rollback</i> section in the <i>Upgrading and Managing Cisco IOS XR Software</i> module of <i>Cisco IOS XR</i>

	Command or Action	Purpose
		<i>System Management Configuration Guide for the Cisco XR 12000 Series Router.</i>
Step 2	Copy the required vm file to the DSC local storage device (such as flash disk1). We recommend the usage of flash disk1. You can also use a flash disk that already has the correct image.	Places the software on the router in preparation for installation.
Step 3	Place both the DSC and standby DSC in ROM Monitor mode.	
Step 4	set Example: rommon1> set	Displays the ROM Monitor environment variables.
Step 5	unset BOOT Example: rommon2> unset BOOT	Clears the setting for the BOOT variable. Note This step is not required if the set command display shows that no value is assigned to this variable.
Step 6	unset TFTP_FILE Example: rommon3> unset TFTP_FILE	Clears the setting for the TFTP_FILE variable. Note This step is not required if the set command display shows that no value is assigned to this variable.
Step 7	unset CONFIG_FILE Example: rommon4> unset CONFIG_FILE	Clears the setting for the CONFIG_FILE variable. Note This step is not required if the set command display shows that no value is assigned to this variable.
Step 8	TURBOBOOT=on , boot-device, options Example: rommon5> TURBOBOOT=on, disk0,format	Sets the TURBOBOOT parameters. • Separate each parameter with a comma (,). • To enable the Turboboot process, specify on. • Specify a boot device where all software will be installed on the DSC and all DSDRSCs. We recommend disk0:. • To replace the existing software without formatting the boot device, replace <i>options</i> with clean. • To replace the existing software and format the boot device, replace <i>options</i> with format. • The default option is clean. • Any existing configuration is preserved.

	Command or Action	Purpose
Step 9	sync Example: <pre>rommon6> sync</pre>	Saves the new ROM Monitor variable settings.
Step 10	boot device:/filename Example: <pre>rommon7> boot disk1:/c12k-mini.vm-4.3.0</pre>	Boots the file located on the local storage device and installs it to the boot device. • This process removes any existing software packages, resets the configuration register to 0x2, and boots the system. • Allow the system to fully boot. The “Press RETURN to get started” message appears twice. The first occurrence appears when the software is loaded into memory. The second occurrence happens after the software has been installed on the disk. • The system is fully booted when the following message appears: SYSTEM CONFIGURATION COMPLETED Note A delay of 10 minutes or more occurs while the software is read from the flash disk.
Step 11	Boot all non-DSC PRPs with the MBI.	Prepares PRPs to communicate with the DSC. • For instructions on booting the non-DSC PRPs with the MBI, see the Bringing Up Non-DSC PRPs on Cisco XR 12000 Series Routers. • If the PRP is in a redundancy slot that is paired with an active PRP, the PRP starts as the standby for that PRP. The adjacent redundancy slots are as follows: Slot 0 and Slot 1 Slot 2 and Slot 3 Slot 4 and Slot 5 Slot 6 and Slot 7 Slot 8 and Slot 9 Slot 10 and Slot 11 Slot 12 and Slot 13 Slot 14 and Slot 15 • If the PRP is not in a redundancy slot that is paired with an active PRP, the PRP becomes available for assignment to SDRs. • Redundancy slot pairs are described in Managing the Router Hardware module of <i>Cisco IOS XR System Management Configuration Guide for the Cisco XR 12000 Series Router</i>.

Reinstalling to a Cisco XR 12000 Series Router from an Image on a Local Storage Device: Examples

The following examples are provided:

Setting the TURBOBOOT Variable

The following example shows how to set the TURBOBOOT variable on the DSC and save the change:

```
rommon2> TURBOBOOT=on,disk0,format
rommon3> sync
```

Booting the vm Installation File

The following example shows how to boot the DSC using the specified vm file on flash disk1:

```
rommon4> boot disk1:/c12k-mini.vm-4.3.0
```

What to Do Next

After the system is up, it is in normal EXEC mode, and you can execute the full range of CLI commands.



Note

If there was no previous router configuration, you must enter a root-system username and password when the boot process is complete.

After reinstalling the software, refer to the following additional instructions:

- 1 See *Verifying the System Interfaces* in the *Troubleshooting the Cisco IOS XR Software* module of *Cisco IOS XR Getting Started Guide for the Cisco XR 12000 Series Router* for instructions to verify that the interfaces are up and properly configured.
- 2 Install additional software from the PIE files, as necessary. For more information, see the *Upgrading and Managing Cisco IOS XR Software* module of the *Cisco IOS XR System Management Configuration Guide for the Cisco XR 12000 Series Router*.

Bringing Up Non-DSC PRPs on Cisco XR 12000 Series Routers

If the Cisco IOS XR software has not been previously installed on a PRP and the PRP is installed in a Cisco XR 12000 Series Router, the card state shown by the **show platform** command is Card Present. To bring up the card for use in the router, you must first install the minimum boot image (MBI) software on the card. This section describes how to install the MBI on non-DSC RPs.

Prerequisites

The following hardware and software is required:

- ROM Monitor 1.14 or later version
- Boothelper c12kprp-boot-mz.120-32.S3 (For Cisco IOS XR software release 4.3.0 and below)

Boothelper c12kprp-boot-mz.120-33.S11 (For Cisco IOS XR software release 4.3.1 and later)

- 256 MB or larger flash disk0:

Before you begin, collect the following information:

- IP address of the TFTP server from which the software will be downloaded
- The filename and directory of the MBI file that will be installed on the PRP

SUMMARY STEPS

1. Restart the PRP in ROM Monitor mode.
2. **set**
3. **unset TURBOBOOT**
4. **unset BOOT**
5. **sync**
6. **boot tftp://server/path/mbiprp-rp.vm**

DETAILED STEPS

	Command or Action	Purpose
Step 1	Restart the PRP in ROM Monitor mode.	Restarts the PRP in ROM Monitor mode. • If the ROMMON prompt appears, the PRP is already in ROM Monitor mode. • If the boot prompt appears, the PRP is in Boothelper.
Step 2	set Example: rommon 1 > set	Displays the current setting of the ROM Monitor environment variables.
Step 3	unset TURBOBOOT Example: rommon 2 > unset TURBOBOOT	Clears any value assigned to the TURBOBOOT variable. • If the TURBOBOOT variable displays no value in Step 2, you can skip this step.
Step 4	unset BOOT Example: rommon 3 > unset BOOT	Clears the setting of the BOOT environment variable. • If the BOOT variable displays no value in Step 2, you can skip this step.
Step 5	sync Example: rommon 4 > sync	Saves any configuration changes you have made to the environment variables.

Bringing Up a Non-DSC RP: Example

```
rommon 1 > set
PS1=rommon ! >
IP_SUBNET_MASK=
TFTP_SERVER=
DEFAULT_GATEWAY=
IP_ADDRESS=
RET_2_RUTC=
IOX_ADMIN_CONFIG_FILE=
CONFIG_FILE=
BOOTLDR=
CONFGEN=
CHASSIS_SN=TBA07280054
IOX_CONFIG_FILE=
AUX_AUTHEN_LEVEL=0
TURBOBOOT=on,disk0,format
ReloadReason=79
BSI=0
RET_2_RCALTS=
BOOT=tftp://server1/path/file
```

[illegible]

```

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 8726056 bytes]
Z0#####
System page at phys:00023000 user:00023000 kern:00023000
Starting next program at v0022a188

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                170 West Tasman Drive
                San Jose, California 95134-1706

Cisco IOS XR Software for the Cisco XR c12000-mbiprp,
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```

PRP-3 ROMMON Changes

PRP-3 is the next-generation route processor for the Cisco XR 124xx and 128xx Router chassis running Cisco IOS XR software Release 3.8.0 or a later release. The PRP-3 is available as product number PRP-3 or PRP-3= for a primary route processor and is available as PRP-3/R for a redundant route processor. PRP-3 has significant improvements over PRP-2. These improvements include increased speed, improved scalability, higher system memory, faster packet processing. Because PRP-3 does not support Cisco IOS Software, the bootflash memory no longer exists in PRP-3. PRP-3 ROMMON has software intelligence to download a Cisco IOS XR image without the support of bootflash memory.

The table below differentiates the ROM Monitor behavior for the PRP-2 and PRP-3 cards.

PRP-2 Card	PRP-3 Card
The ROMMON of PRP-2 needs a boothelper image to reach TFTP and further download the Cisco IOS XR software image.	The ROMMON of PRP-3 has more software intelligence. It has inbuilt support to reach the TFTP server without a boothelper image.
Needs valid boothelper image to be present in the bootflash memory to load the Cisco IOS XR software image from the compactflash.	Has inbuilt support to boot from the compactflash memory. That means, PRP-3 doesn't have any boot image requirements.

For more information about PRP-3 ROMMON changes, see the *Performance Route Processor Installation and Configuration Guide*.

PRP-2 ROMMON Changes

ROMMON 2.2 has support for booting non-DSC PRPs from standby RPs and RPs of named SDRs.

A new command, **boot dsc** is added.

**Note**

- ROMMON 2.2 is applicable only for PRP-2s in the Cisco IOS XR software Release 4.1.0.
- The command **boot dsc** is available only on PRP-2.

Additional References

The following sections provide references related to the ROM Monitor.

Related Documents

Related Topic	Document Title
Contact a Cisco representative	<i>Obtaining Additional Publications and Information</i> in <i>What's New in Cisco Product Documentation</i> located at: http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html
Removable flash disk used to store archives of vm and PIE files Save current router configuration Verify that interfaces are up and properly configured Install or upgrade software packages from PIE files	<i>Upgrading and Managing Cisco IOS XR Software</i> chapter in the <i>Cisco IOS XR System Management Configuration Guide for the Cisco XR 12000 Series Router</i>
Redundancy slot pairs	<i>Managing the Router Hardware</i> chapter in the <i>Cisco IOS XR System Management Configuration Guide for the Cisco XR 12000 Series Router</i>
Upgrade a Cisco XR 12000 Series Router that is running Cisco IOS software.	<i>Migrating from Cisco IOS to Cisco IOS XR Software on the Cisco XR 12000 Series Router</i>

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. 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. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/support



Managing Configuration Files in ROM Monitor

This chapter provides information about managing configuration files in the router.

- [Information about Configuration Files, page 47](#)
- [Specifying an Alternative Administration Configuration, page 48](#)
- [Specifying an Alternative SDR Configuration, page 51](#)
- [Specifying an Alternate Storage Location for Configuration Files, page 55](#)
- [Additional References, page 57](#)

Information about Configuration Files

Cisco IOS XR software creates two types of configuration files—the administration configuration file and the default secure domain router (SDR) configuration files. These configuration files are stored in the following locations:

- There is only one administration configuration file, which is stored on the designated shelf controller (DSC) and contains system-wide configurations for items such as SDR name and node inventory.
- In addition, each SDR has its own SDR configuration to specify the parameters for routing, interfaces, SDR usernames, and other SDR-specific configurations. By default, the configuration file for each SDR is stored on the designated secure domain router shelf controller (DSDRSC) for the SDR.

For more information on SDRs, DSDRSCs and admin plane configuration, see the *Configuring Secure Domain Routers on Cisco IOS XR Software* module of the *Cisco IOS XR System Management Configuration Guide for the Cisco XR 12000 Series Router*.

The following sections describe ways to manage the use of configuration files from ROM Monitor:



Caution

The default configuration should be sufficient for most situations. The options described in the following sections are for rare cases in which an alternative configuration is required. Use of these options can result in system errors or downtime. Consult Cisco technical support before using these options.

Specifying an Alternative Administration Configuration

The administration configuration stores system-wide configurations such as the SDR name and node inventory for the entire system. This is separate from the default-SDR configuration that stores routing and interface configurations.



Caution

The default committed administration configuration should be sufficient for most situations. The option described in this section is for rare cases when an alternative admin configuration is required. Use of this method can result in system errors or downtime.

Specifying a Temporary Alternative Administrative Configuration with the -o Boot Option

This mode of administrative configuration with the **-o boot** option is temporary in nature. After this boot option is set, this mode allows the router to boot from this alternative configuration, and the configuration specified in this configuration file becomes part of the running and persistent configuration.



Note

When the router boots with the external configuration specified by the **-o** option, the system loses the default configuration. The default configuration is completely replaced with this alternative configuration.

To specify a temporary administration configuration file with the **-o boot** option, use the following procedure. With this method, the specified configuration file is used for a single router boot. If the DSC is reset again, the permanent configuration file is used.

SUMMARY STEPS

- 1. Place the DSC and the standby DSC in ROM Monitor mode.
- 2. **confreg 0x0**
- 3. **confreg 0x102**
- 4. **set**
- 5. **boot image -o config-file-path**
- 6. **confreg 0x102**
- 7. **reset**

DETAILED STEPS

	Command or Action	Purpose
Step 1	Place the DSC and the standby DSC in ROM Monitor mode.	

	Command or Action	Purpose
Step 2	confreg 0x0 Example: <pre>rommon 1> confreg 0x0</pre>	Sets the configuration register of the standby DSC to 0x0 so that the standby DSC does not take control. Note The configuration register is not an environment variable like TURBOBOOT. Do not enter an equal sign when entering the confreg command.
Step 3	confreg 0x102 Example: <pre>rommon 1 > confreg 0x102</pre>	Sets the active RP configuration register to 0x102.
Step 4	set Example: <pre>rommon 2 > set</pre>	Displays the current environment variable settings. Note The filename is set in the BOOT variable.
Step 5	boot image -o config-file-path Example: <pre>rommon 3> boot tftp://223.255.254.254/images/c12k-mini.vm -o /disk1:/cfgarchives/admingold.conf</pre>	Boots the router. Replace image with the filename listed in the boot variable, and replace <i>config-file-path</i> with the path and filename for the configuration file. Note The pathname should be a valid UNIX pathname (a slash [/] must be included after the device: "disk1:/").
Step 6	confreg 0x102 Example: <pre>rommon 1> confreg 0x102</pre>	Sets the configuration register of the standby DSC to 0x102.
Step 7	reset Example: <pre>rommon 2 > reset</pre>	Resets the standby DSC so that the new setting takes effect and the standby DSC becomes operational.

Specifying a Permanent Alternative Administrative Configuration File with the IOX_ADMIN_CONFIG_FILE= Variable

This mode of alternative administrative configuration with the IOX_ADMIN_CONFIG_FILE= variable is permanent in nature. After this variable is set, this mode allows the router to always boot from this alternative configuration, and the system does not revert to the default committed configuration on the next system reload.

**Note**

When the router boots with the external configuration specified by the `IOX_ADMIN_CONFIG_FILE=` variable, the system loses the default configuration. The default configuration is completely replaced with this alternative configuration.

To permanently change the location of the default administration configuration file, specify the filename and directory path in the `IOX_ADMIN_CONFIG_FILE=` environment variable while in ROM Monitor mode. Specifying the environment variable forces the use of the specified file for all boots while this variable is set.

SUMMARY STEPS

1. Place the DSC and the standby DSC in ROM Monitor mode.
2. **confreg 0x0**
3. **confreg 0x102**
4. **set**
5. **IOX_ADMIN_CONFIG_FILE=drive:path/file**
6. **sync**
7. **boot**
8. **confreg 0x102**
9. **reset**

DETAILED STEPS

	Command or Action	Purpose
Step 1	Place the DSC and the standby DSC in ROM Monitor mode.	
Step 2	confreg 0x0 Example: <pre>rommon 1> confreg 0x0</pre>	Sets the configuration register of the standby DSC to 0x0 so that the standby DSC does not take control. Note The configuration register is not an environment variable like TURBOBOOT. Do not enter an equal sign when entering the confreg command.
Step 3	confreg 0x102 Example: <pre>rommon 1 > confreg 0x102</pre>	Sets the DSC configuration register to 0x102.
Step 4	set Example: <pre>rommon 2 > set</pre>	Displays the current environment variable settings. Note The filename is set in the <code>IOX_ADMIN_CONFIG_FILE</code> variable.

	Command or Action	Purpose
Step 5	IOX_ADMIN_CONFIG_FILE=drive:path/file Example: <pre>rommon B1> IOX_ADMIN_CONFIG_FILE=/disk2:/cfgarchives/ admingold.conf</pre>	Sets the IOX_ADMIN_CONFIG_FILE variable to specify the absolute path of a different administration configuration file. Note The IOX_ADMIN_CONFIG_FILE variable is overridden by the boot command when it is entered with the -o option.
Step 6	sync Example: <pre>rommon B1> sync</pre>	Saves the changes.
Step 7	boot Example: <pre>rommon B1> boot</pre>	Boots the router.
Step 8	confreg 0x102 Example: <pre>rommon 1> confreg 0x102</pre>	Sets the configuration register of the standby DSC to 0x102.
Step 9	reset Example: <pre>rommon 2 > reset</pre>	Resets the standby DSC so that the new setting takes effect and the standby DSC becomes operational.

Specifying an Alternative SDR Configuration

You can specify an alternative configuration for an SDR from ROM Monitor mode, using the methods described in the following sections. These procedures are run from the DSDRSC for the SDR. The DSC is also the DSDRSC of the owner SDR. For all other non-owner SDRs, the DSDRSC is the RP or DRP assigned as the DSDRSC.



Note

For more information on SDRs and DSDRSCs, see the *Configuring Secure Domain Routers on Cisco IOS XR Software* module of *Cisco IOS XR System Management Configuration Guide for the Cisco XR 12000 Series Router*.



Caution

The default committed SDR configuration should be sufficient for most situations. The option described in this section is for rare cases when an alternative SDR configuration is required. Use of this method can result in system errors or downtime.

Specifying a Temporary SDR Configuration File with the -a Boot Option

This mode of SDR configuration with the **-a** boot option is temporary in nature. Once this boot option is set, this mode allows the router to boot from this alternative configuration and the configuration specified in this configuration file becomes part of the running and persistent configuration.



Note

When the router boots with the external configuration specified by the **-a** option, the system loses the default configuration. The default configuration is completely replaced with this alternative configuration.

To specify a temporary SDR configuration file with the **-a** boot option, use the following procedure. With this method, the specified configuration file is used for a single router boot. If the DSC is reset again, the permanent configuration file is used.

SUMMARY STEPS

- 1. Place the DSDRSC and the standby DSDRSC in ROM Monitor mode.
- 2. **confreg 0x0**
- 3. **confreg 0x102**
- 4. **set**
- 5. **boot image -a config-file-path**
- 6. **confreg 0x102**
- 7. **reset**

DETAILED STEPS

	Command or Action	Purpose
Step 1	Place the DSDRSC and the standby DSDRSC in ROM Monitor mode.	
Step 2	confreg 0x0 Example: <pre>rommon 1> confreg 0x0</pre>	Sets the configuration register of the standby DSDRSC to 0x0 so that the standby DSDRSC does not take control. Note The configuration register is not an environment variable like TURBOBOOT. Do not enter an equal sign when entering the confreg command.
Step 3	confreg 0x102 Example: <pre>rommon 1 > confreg 0x102</pre>	Sets the DSDRSC configuration register to 0x102.

	Command or Action	Purpose
Step 4	set Example: <pre>rommon 2 > set</pre>	Displays the current environment variable settings. Note The filename is set in the BOOT variable.
Step 5	boot image -a config-file-path Example: <pre>rommon 3> boot tftp://223.255.254.254/images/c12k-mini.vm -a /disk1:/cfgarchives/SDRgold.conf</pre>	Enter the boot command. Replace <i>image</i> with the filename listed in the boot variable, and replace <i>config-file-path</i> with the path and filename for the configuration file. Note The pathname should be a valid UNIX pathname (a slash [/] must be included after the device: "disk1:/").
Step 6	confreg 0x102 Example: <pre>rommon 1> confreg 0x102</pre>	Sets the configuration register of the standby DSDRSC to 0x102.
Step 7	reset Example: <pre>rommon 2 > reset</pre>	Resets the standby DSDRSC so that the new setting takes effect and the standby DSDRSC becomes operational.

Specifying a Permanent SDR Configuration File with the `IOX_CONFIG_FILE=` Variable

This mode of alternative SDR configuration with the `IOX_CONFIG_FILE=` variable is permanent in nature. Once this variable is set, this mode allows the router to always boot from this alternative configuration. The system does not revert to the default committed configuration on the next system reload.



Note

When the router boots with the external configuration specified by the `IOX_CONFIG_FILE=` variable, the system loses the default configuration. The default configuration is completely replaced with this alternative configuration.

To permanently change the location of the default configuration file for an SDR, specify the filename and directory path in the `IOX_CONFIG_FILE=` environment variable while in ROM Monitor mode. Specifying the environment variable forces the use of the specified file for all boots while this variable is set.

SUMMARY STEPS

1. Place the DSDRSC and the standby DSDRSC in ROM Monitor mode.
2. `confreg 0x0`
3. `confreg 0x102`
4. `set`
5. `IOX_CONFIG_FILE=drive:path/file`
6. `sync`
7. `boot`
8. `confreg 0x102`
9. `reset`

DETAILED STEPS

	Command or Action	Purpose
Step 1	Place the DSDRSC and the standby DSDRSC in ROM Monitor mode.	
Step 2	confreg 0x0 Example: <pre>rommon 1> confreg 0x0</pre>	Sets the configuration register of the standby DSDRSC to 0x0 so that the standby DSDRSC does not take control. Note The configuration register is not an environment variable like TURBOBOOT. Do not enter an equal sign when entering the confreg command.
Step 3	confreg 0x102 Example: <pre>rommon 1 > confreg 0x102</pre>	Sets the DSDRSC configuration register to 0x102.
Step 4	set Example: <pre>rommon 2 > set</pre>	Displays the current environment variable settings. Note The filename is set in the <code>IOX_CONFIG_FILE</code> variable.
Step 5	IOX_CONFIG_FILE=drive:path/file Example: <pre>rommon B1> IOX_CONFIG_FILE=/disk2:/cfgarchives/ admingold.conf</pre>	Sets the <code>IOX_CONFIG_FILE</code> variable to specify the absolute path of a different SDR configuration file. Note The <code>IOX_CONFIG_FILE=</code> variable is overridden by the boot command when it is entered with the -a option.
Step 6	sync Example: <pre>rommon B1> sync</pre>	Saves the changes.

	Command or Action	Purpose
Step 7	boot Example: <pre>rommon B1> boot</pre>	Boots the router.
Step 8	confreg 0x102 Example: <pre>rommon 1> confreg 0x102</pre>	Sets the configuration register of the standby DSDRSC to 0x102.
Step 9	reset Example: <pre>rommon 2 > reset</pre>	Resets the standby DSDRSC so that the new setting takes effect and the standby DSDRSC becomes operational.

Specifying an Alternate Storage Location for Configuration Files

To change the default location where the configuration files for an SDR are saved (committed), specify the location and directory path in the `IOX_CONFIG_MEDIUM=` environment variable while in ROM Monitor mode. Specifying the environment variable forces the use of the specified location while this variable is set.

SUMMARY STEPS

1. Place the DSDRSC and the standby DSDRSC in ROM Monitor mode.
2. **confreg 0x0**
3. **confreg 0x102**
4. **set**
5. **IOX_CONFIG_MEDIUM=/location:/path/**
6. **sync**
7. **boot**
8. **confreg 0x102**
9. **reset**

DETAILED STEPS

	Command or Action	Purpose
Step 1	Place the DSDRSC and the standby DSDRSC in ROM Monitor mode.	

	Command or Action	Purpose
Step 2	confreg 0x0 Example: <pre>rommon 1> confreg 0x0</pre>	Sets the configuration register of the standby DSDRSC to 0x0 so that the standby DSDRSC does not take control. Note The configuration register is not an environment variable like TURBOBOOT. Do not enter an equal sign when entering the confreg command.
Step 3	confreg 0x102 Example: <pre>rommon 1 > confreg 0x102</pre>	Sets the DSDRSC configuration register to 0x102.
Step 4	set Example: <pre>rommon 2 > set</pre>	Displays the current environment variable settings. Note The filename is set in the IOX_CONFIG_MEDIUM variable.
Step 5	IOX_CONFIG_MEDIUM=/location:/path/ Example: <pre>rommon B1> IOX_CONFIG_MEDIUM=/disk1:/cfgarchives/admingold.conf</pre>	Sets the IOX_CONFIG_MEDIUM variable to specify a different location. For the Cisco XR 12000 Series Router, replace location with disk0, disk1, or compactflash. Replace path with the path to the directory in which you want to store the configuration files. Note By default, the directory /disk0:/usr is available for storing alternative configurations and other user files. We recommend that you do not use a directory path starting with /disk0:/config because that path is used to store system files.
Step 6	sync Example: <pre>rommon B1> sync</pre>	Saves the changes.
Step 7	boot Example: <pre>rommon B1> boot</pre>	Boots the router.

	Command or Action	Purpose
Step 8	confreg 0x102 Example: <pre>rommon 1> confreg 0x102</pre>	Sets the configuration register of the standby DSDRSC to 0x102.
Step 9	reset Example: <pre>rommon 2 > reset</pre>	Resets the standby DSDRSC so that the new setting takes effect and the standby DSDRSC becomes operational.

Additional References

The following sections provide references related to the ROM Monitor.

Related Documents

Related Topic	Document Title
SDRs, DSDRSCs, and admin plane configuration	<i>Configuring Secure Domain Routers on Cisco IOS XR Software</i> module of <i>Cisco IOS XR System Management Configuration Guide for the Cisco XR 12000 Series Router</i>

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. 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. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/support



Password Recovery in ROM Monitor Mode

This chapter describes how to recover a password on the router. It also includes instructions to bypass ksh authentication on a node.

- [Information About Password Recovery, page 59](#)
- [Recovering the Root Password on Single-RP Routers, page 59](#)
- [Recovering the Root Password on Redundant-RP Routers, page 61](#)
- [Bypassing ksh Authentication, page 62](#)
- [Additional References, page 62](#)

Information About Password Recovery

If the root password is forgotten, it can be recovered only at the RP card. To recover the password at the Designated Shelf Controller (DSC), set the configuration register to 0x142 on the active RP and reboot the router. When the router boots, a password recovery dialog appears. This dialog prompts you to reset the root-system username and password. After you save the new password, the configuration register automatically resets to the prior value (such as 0x102).

**Note**

The AAA authentication configuration can still prevent access, even after the root password is recovered. In this case, you must bypass the ksh authentication via the auxiliary port.

Recovering the Root Password on Single-RP Routers

Use the following procedure to recover the router password from a router with a single RP:

SUMMARY STEPS

1. Place the router in ROM Monitor (ROMMON) mode.
2. Set the RP configuration register to 0x42 at the ROM Monitor prompt:
3. Reset or power cycle the router so that the new setting takes effect:
4. Press **Return** at the prompt to enter the password recovery dialog, and then enter the new root-system username and password, and save the configuration.

DETAILED STEPS

	Command or Action	Purpose
Step 1	Place the router in ROM Monitor (ROMMON) mode.	
Step 2	Set the RP configuration register to 0x42 at the ROM Monitor prompt: Example: rommon 1> confreg 0x42	Note The configuration register is not an environment variable like TURBOBOOT. Do not enter an equal sign when entering the confreg command.
Step 3	Reset or power cycle the router so that the new setting takes effect:	rommon 2> reset
Step 4	Press Return at the prompt to enter the password recovery dialog, and then enter the new root-system username and password, and save the configuration. Example: router con0/0/CPU0 is now available Press RETURN to get started. --- Administrative User Dialog --- Enter root-system username: user Enter secret: Enter secret again: RP/0/0/CPU0:Jan 10 12:50:53.105 : exec[65652]: %MGBL-CONFIG-6-DB_COMMIT : 'Administration configuration committed by system'. Use 'show configuration commit changes 2000000009' to view the changes. Use the 'admin' mode 'configure' command to modify this configuration. User Access Verification Username: user Password: RP/0/0/CPU0:router#	The router password is recovered successfully.

Recovering the Root Password on Redundant-RP Routers

Use the following procedure to recover the router password from a router with redundant RPs.

SUMMARY STEPS

1. Place both RPs in ROM Monitor mode.
2. Set the configuration register of the standby RP to 0x0 so that the standby RP does not take control during the password recovery.
3. For more information about configuration prompts that are displayed when you enter the **confreg** command. Set the boot type as 0 to enable ROM Monitor mode during the next system boot.
4. Set the active RP configuration register to 0x42:
5. Reset or power cycle the router so that the new setting takes effect.
6. Press **Return** at the prompt to enter the password recovery dialog. Then enter the new root-system username and password and save the configuration, as shown in the following example:
7. Set the configuration register of the standby RP to 0x102:
8. Reset the standby RP so that the new setting takes effect and the standby RP becomes operational.

DETAILED STEPS

	Command or Action	Purpose
Step 1	Place both RPs in ROM Monitor mode.	
Step 2	Set the configuration register of the standby RP to 0x0 so that the standby RP does not take control during the password recovery. Example: <code>rommon 2> confreg 0x0</code>	Note The configuration register is not an environment variable like TURBOBOOT. Do not enter an equal sign “(=)” when entering the confreg command.
Step 3	For more information about configuration prompts that are displayed when you enter the confreg command. Set the boot type as 0 to enable ROM Monitor mode during the next system boot.	
Step 4	Set the active RP configuration register to 0x42:	<code>rommon 1> confreg 0x42</code>
Step 5	Reset or power cycle the router so that the new setting takes effect.	<code>rommon 2> reset</code>
Step 6	Press Return at the prompt to enter the password recovery dialog. Then enter the new root-system username and password and save the configuration, as shown in the following example: Example: <code>router con0/0/CPU0 is now available</code> <code>Press RETURN to get started.</code>	The router password is recovered successfully.

	Command or Action	Purpose
	<pre> --- Administrative User Dialog --- Enter root-system username: user Enter secret: Enter secret again: RP/0/0/CPU0:Jan 10 12:50:53.105 : exec[65652]: %MGBL-CONFIG-6-DB_COMMIT : 'Administration configuration committed by system'. Use 'show configuration commit changes 2000000009' to view the changes. Use the 'admin' mode 'configure' command to modify this configuration. User Access Verification Username: user Password: RP/0/0/CPU0:router# </pre>	
Step 7	Set the configuration register of the standby RP to 0x102:	rommon 3> confreg 0x102
Step 8	Reset the standby RP so that the new setting takes effect and the standby RP becomes operational.	rommon 4> reset

Bypassing ksh Authentication

You can bypass the ksh authentication for the auxiliary port of the route processor (RP), standby RP, and distributed RP cards and for console and auxiliary ports of line cards (LCs) and service processors (SPs). The situations in which ksh authentication may need to be bypassed include the following:

- DSC (active RP) disk0 corruption
- Loss of Qnet connectivity
- Inability to determine the node ID of the DSC(Active RP)

For information and instructions to bypass ksh authentication, see the *Configuring AAA Services on Cisco IOS XR Software* chapter of *Cisco IOS XR System Security Configuration Guide for the Cisco XR 12000 Series Router*.

Additional References

The following sections provide references related to the ROM Monitor.

Related Documents

Related Topic	Document Title
How to bypass ksh authentication	Configuring AAA Services on Cisco IOS XR Software module of <i>Cisco IOS XR System Security Configuration Guide for the Cisco XR 12000 Series Router</i>

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. 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. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/support



Upgrading and Downgrading ROM Monitor and Boothelper

This chapter describes how to upgrade or downgrade the ROM Monitor and Boothelper.

- [Information About ROM Monitor and Boothelper Software, page 65](#)
- [How to Upgrade or Downgrade Boothelper and ROM Monitor, page 66](#)
- [Upgrade Procedures: Examples, page 68](#)
- [Additional References, page 71](#)

Information About ROM Monitor and Boothelper Software

The ROM Monitor, which is also known as ROMMON, is a bootstrap program that initializes the hardware and boots the Cisco IOS XR firmware when you power on or restart a Cisco XR 12000 Series Router. ROM Monitor upgrades can be required to resolve firmware defects or support new features. Typically, ROM Monitor upgrades are infrequent and not required for every Cisco IOS XR software upgrade.

The ROM Monitor firmware on all Route Processors (RP)s must be compatible with the current Cisco IOS XR software release running on the router before it is upgraded to the latest Cisco IOS XR Software Release. For minimum ROM Monitor requirements, see Software/Firmware Compatibility Matrix at the following URL:

http://www.cisco.com/web/Cisco_IOS_XR_Software/index.html

If the router is brought up with an incompatible version of the ROM Monitor software, then the standby RP may fail to boot.



Note

ROMMON versions are backward compatible. You need not downgrade the ROMMON versions if the current version is higher than the listed compatible version.

The upgrade and downgrade procedures for ROM Monitor are the same. During the upgrade or downgrade process, you select the firmware that is used for ROM Monitor. This firmware can represent an upgrade or a downgrade. The firmware must be compatible with the hardware, but it need not be a later version of the

ROM Monitor already installed. During an upgrade or downgrade, the firmware is copied into hardware EEPROMs in the router.

Boothelper software is an additional software that extends the capabilities of ROM Monitor on a Cisco XR 12000 Series Router. Without the Boothelper, ROM Monitor can load images from disk0, disk1, and bootflash. With Boothelper, ROM Monitor can load images from disk0, disk1, bootflash, compact flash, and TFTP servers.

The Boothelper software is also stored in bootflash and can be upgraded or downgraded by replacing the software in the bootflash with a different Boothelper image.

How to Upgrade or Downgrade Boothelper and ROM Monitor

This section contains the following procedures:

Upgrading or Downgrading Boothelper

Perform this task to upgrade or downgrade the Boothelper.



Note

Upgrading or downgrading boothelper is not applicable for PRP-3 cards, as the boothelper software is integrated in ROM Monitor software for PRP-3 cards.

From Cisco IOS XR software release 4.3.1 and later, it is required to have the boothelper, c12kprp-boot-mz.120-33.S11, to ensure the successful installation of Cisco IOS XR Software from a TFTP server.

Prerequisites

Before starting the procedure described in this section, complete the following:

- Determine if there is a Boothelper upgrade file for your version of Cisco IOS XR software.
- To prepare for a Boothelper upgrade, copy the Boothelper upgrade file to the router or to a local workstation from which you can copy files to the router. You can also perform the upgrade with a Boothelper upgrade file located on a TFTP server.
- Establish a connection to the active Route Processor (RP). This allows you to manage the active RP. For more information, see “Connecting and Communicating with the Router” in Cisco IOS XR Getting Started Guide for the Cisco XR 12000 Series Router.

SUMMARY STEPS

1. **dir bootflash:**
2. **format bootflash:**
3. **squeeze bootflash:**
4. **copy upgradeImage bootflash:**

DETAILED STEPS

	Command or Action	Purpose
Step 1	dir bootflash: Example: RP/0/0/CPU0:router# dir bootflash:	Displays the bootflash contents. • Boothelper filename shows the file version number. • If the correct version is in use, there is no need to upgrade.
Step 2	format bootflash: Example: RP/0/0/CPU0:router# format bootflash:	Formats bootflash and erases all contents.
Step 3	squeeze bootflash: Example: RP/0/0/CPU0:router# squeeze bootflash:	Permanently erases the files tagged as “deleted” in the file system.
Step 4	copy upgradeImage bootflash: Example: RP/0/0/CPU0:router# copy disk0:c12kprp-boot-mz.120-32.S3 bootflash: or RP/0/0/CPU0:router# copy disk0:c12kprp-boot-mz.120-33.S11 bootflash:	Copies a file to bootflash. • File system changes you make to the active RP are replicated on the standby RP.

Upgrading or Downgrading ROM Monitor

As IOS XR images are bundled with ROMMON images, you can upgrade or downgrade ROM Monitor using the process below, which does not require copying an external file to the Route Processor’s bootflash. The following procedure upgrades or downgrades the ROM Monitor.

Prerequisites

Before starting the procedure described in this section, complete the following:

- Determine Route Processors that require upgrade or downgrade.
- If you want to upgrade ROM Monitor without interrupting traffic through the router, install a standby RP and verify that the standby RP is operating in standby mode.
- Establish a connection to the active Route Processor. This allows you to manage the active RP. For more information, see “Connecting and Communicating with the Router” in Cisco IOS XR Getting Started Guide for the Cisco XR 12000 Series Router.

**Note**

This procedure requires a reload of the Route Processor for which you are upgrading ROM monitor. This procedure installs the ROMMON release which is bundled with the IOS XR image.

SUMMARY STEPS

1. **admin**
2. **show upgrade rommon location all**
3. **upgrade rommon location <location>**

DETAILED STEPS

	Command or Action	Purpose
Step 1	admin Example: RP/0/0/CPU0:router# admin	Enters administration EXEC mode.
Step 2	show upgrade rommon location all Example: RP/0/0/CPU0:router(admin)# show upgrade rommon location all	Displays a list of RPs, line cards, and other cards that may require either upgrade or downgrade for the ROMMON. To find out such card, you need to view the compatibility of the ROMMON image with the bundled IOS XR image.
Step 3	upgrade rommon location <location> Example: RP/0/0/CPU0:router(admin)# upgrade rommon location 0/0/CPU0	Upgrades the ROMMON and reloads the RP. • Displays a message indicating that RP card rom-monitor has upgraded successfully. • Displays a message indicating that RP is being reloaded. • The upgrade rommon location all upgrades the rommon for all available cards. And the upgrade rommon location all force command forces the rommon ugrade to all RP or line cards even if it is not required.

What to Do Next

The upgrade process continues on the card, even if you press Ctrl-C when the upgrade is in progress.

Upgrade Procedures: Examples

This section provides the following configuration examples:

Upgrading Boothelper: Example

The following example shows how the bootflash is upgraded with a file located on a TFTP server.

```
RP/0/0/CPU0:router# dir bootflash:

Directory of bootflash:

10  -rwx  5192      Thu Apr 28 03:37:53 2005  crashinfo5
381 -rwx  5177      Wed Jun  1 22:12:54 2005  crashinfo4
440 -rwx 1389      Sat Jul 16 14:20:08 2005  snmp/ifindex-table
443 -rwx  3047      Sun Jul 24 06:19:25 2005  crashinfo
444 -rwx  5177      Sun Jul 24 06:30:00 2005  crashinfo3
445 -rwx 3223556    Thu Aug  4 21:55:27 2005  c12kprp-boot-mz.120-29.S

66322432 bytes total (58795492 bytes free)

RP/0/0/CPU0:router# format bootflash:

Format operation may take a while. Continue? [confirm] y
Format will destroy all data on "bootflash:". Continue? [confirm] y

Formatting sector 1
Format of bootflash: complete

RP/0/0/CPU0:router# squeeze bootflash:

All deleted files will be removed. Continue? [confirm] y
Squeeze operation may take a while. Continue? [confirm] y

Squeeze under progress 254
Squeeze of bootflash: complete

RP/0/0/CPU0:router# disk0:c12kprp-boot-mz.120-32.S7
Destination filename [/bootflash:/c12kprp-boot-mz.120-32.S7]? <return>
Accessing disk0:c12kprp-boot-mz.120-32.S7
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
3223556 bytes copied in 23 sec (138000)bytes/sec

RP/0/0/CPU0:router# dir bootflash:

Directory of bootflash:

1  -rwx 3223556    Thu Aug  4 22:09:23 2005  c12kprp-boot-mz.120-32.S7

66322432 bytes total (63098748 bytes free)
```

Upgrading ROM Monitor: Example

The following example shows how the ROM Monitor software is upgraded on a single RP:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show upgrade rommon location all
```

Node	Type	PLIM	Current Rommon Version	Image Rommon Version	Upgrade Required
0/0/CPU0	L3 Service Eng	N/A	1.3	1.3	No
0/1/CPU0	L3 Service Eng	N/A	1.3	1.3	No

0/2/CPU0	L3LC Eng 5+	Jacket Card	17.1	17.1	No
0/3/CPU0	L3LC Eng 5+	Jacket Card	19.1	17.1	No
0/4/CPU0	L3LC Eng 5+	Jacket Card	17.1	17.1	No
0/5/CPU0	PRP(Active)	N/A	1.17	1.23	Yes
0/16/CPU0	CSC6(P)	N/A	N/A	N/A	N/A
0/18/CPU0	SFC6	N/A	N/A	N/A	N/A
0/19/CPU0	SFC6	N/A	N/A	N/A	N/A
0/20/CPU0	SFC6	N/A	N/A	N/A	N/A
0/24/CPU0	ALARM6	N/A	N/A	N/A	N/A
0/25/CPU0	ALARM6	N/A	N/A	N/A	N/A
0/28/CPU0	GSR6-BLOWER	N/A	N/A	N/A	N/A

RP/0/0/CPU0:router(admin)# **upgrade rommon location 0/5/CPU0**

% RELOAD WARNING:

RP ROMMON upgrade starting. If successful, RP will be reloaded.

Continue ? [no]: yes

===== Slot 5 =====

Starting to upgrade rom-monitor

Erasing sectors: eeeeeeee

Programming image: ppp

Verifying image: vvv

Upgraded RP rom-monitor successfully

Reloading RP now

P/0/5/CPU0:Nov 10 21:43:50.626 : redfs_svr[85]: %OS-REDFS-6-MIRROR_REDUNDANT : Mirroring is now fully redundant for devices disk0: and disk1:.

RP/0/5/CPU0:Nov 10 21:43:55.164 : sysmgr[89]: %OS-SYSMGR-5-NOTICE : Card is COLD started
RP/0/5/CPU0:Nov 10 21:43:58.753 : sysmgr[438]: %OS-SYSMGR-6-INFO : Backup system manager is ready

RP/0/5/CPU0:Nov 10 21:44:11.462 : dsc[189]: %PLATFORM-DSC-6-INFO_I_AM_DSC : Setting myself as DSC

RP/0/5/CPU0:Nov 10 21:44:04.450 : dsc[189]: DSC Election entry delay time for this RP is 4 seconds

RP/0/5/CPU0:Nov 10 21:44:18.208 : dumper_config[190]: No HDD Controller found by process dumper

RP/0/5/CPU0:Nov 10 21:44:18.680 : fctl[218]: %PLATFORM-FABRIC_CTRL-2-ERR_REPORT : PCDS: PCDS detected a cold bootn

RP/0/5/CPU0:Nov 10 21:44:18.694 : fctl[218]: PCDS init done with area at 0x601ce040 , size 4032 (n1784 required),

RP/0/5/CPU0:Nov 10 21:44:45.138 : sysldr[436]: %PLATFORM-SYSLDR-6-INFO : Waiting for startup config to be applied before booting LCs

RP/0/5/CPU0:Nov 10 21:44:51.426 : sysldr[436]: %PLATFORM-SYSLDR-5-OIRIN : OIR: Node 0/2/0 inserted

RP/0/5/CPU0:Nov 10 21:44:51.441 : sysldr[436]: %PLATFORM-SYSLDR-5-OIRIN : OIR: Node 0/2/1 inserted

RP/0/5/CPU0:Nov 10 21:44:51.446 : sysldr[436]: %PLATFORM-SYSLDR-5-OIRIN : OIR: Node 0/2/2 inserted

RP/0/5/CPU0:Nov 10 21:44:51.459 : sysldr[436]: %PLATFORM-SYSLDR-5-OIRIN : OIR: Node 0/3/1 inserted

RP/0/5/CPU0:Nov 10 21:44:51.470 : sysldr[436]: %PLATFORM-SYSLDR-5-OIRIN : OIR: Node 0/4/0 inserted

RP/0/5/CPU0:Nov 10 21:44:51.475 : sysldr[436]: %PLATFORM-SYSLDR-5-OIRIN : OIR: Node 0/4/1 inserted

RP/0/5/CPU0:Nov 10 21:44:51.480 : sysldr[436]: %PLATFORM-SYSLDR-5-OIRIN : OIR: Node 0/4/2 inserted

RP/0/5/CPU0:Nov 10 21:44:51.484 : sysldr[436]: %PLATFORM-SYSLDR-5-OIRIN : OIR: Node 0/4/3 inserted

RP/0/5/CPU0:Nov 10 21:45:02.111 : sysldr[436]: %PLATFORM-POWERMGR-6-INFO : PEMs are in Non-Redundancy Mode now

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

--More--

RP/0/5/CPU0:router(admin)#**upgrade rommon location all force**

This may take around 7-10 minutes for a full chassis.

Ensure that GSR is not power cycled during the upgrade.

Premature termination of this command may render the GSR inoperable.

Please consult the documentation for more information.

% UPGRADE ALL WARNING:

ROMMON in RP(s) will not be upgraded by this command. Please upgrade

```

RP's one by one using "upgrade rom location 0/x/CPU0."
Continue ? [no]: yes

Slot 0 is not in IOX Running state

Slot 1 is not in IOX Running state

===== Slot 2 =====
Starting to upgrade rom-monitor
Erasing sectors: eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee
Programming image: pppppppppp
Verifying image: vvvvvvvvvv
Upgraded linecard rom-monitor successfully

===== Slot 3 =====
Starting to upgrade rom-monitor
Erasing sectors: eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee
Programming image: pppppppppp
Verifying image: vvvvvvvvvv
Upgraded linecard rom-monitor successfully

===== Slot 4 =====
Starting to upgrade rom-monitor
Erasing sectors: eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee
Programming image: pppppppppp
Verifying image: vvvvvvvvvv
Upgraded linecard rom-monitor successfully

```

Additional References

Related Documents

Related Topic	Document Title
Hardware component commands	<i>Cisco IOS XR Interface and Hardware Component Command Reference for the Cisco XR 12000 Series Router</i>
System management commands	<i>Cisco IOS XR System Management Command Reference for the Cisco XR 12000 Series Router</i>

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. 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. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/support