Upgrading and Downgrading Boothelper and ROM Monitor on Cisco XR 12000 Series Routers

This appendix describes how to upgrade or downgrade the boothelper and ROM Monitor software on a Cisco XR 12000 Series Router.

Contents

Information About ROM Monitor and Boothelper Software

Before upgrading or downgrading ROM Monitor or boothelper software, you should understand the following concept:

ROM Monitor and Boothelper Upgrade and Downgrade Basics

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

Tip Information on operating the router in ROM Monitor mode is provided in Appendix A, "Router Recovery and Management with ROM Monitor."

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 additional software that extends the capabilities of ROM Monitor on a Cisco XR 12000 Series Router. Without 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.

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

How to Upgrade or Downgrade Boothelper

This section contains the following procedures:

Upgrading or Downgrading Boothelper

The following procedure upgrades or downgrades the boothelper.

Prerequisites

Before starting the procedure described in the next section, do 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.

SUMMARY STEPS

1. Establish a connection to the active RP.
2. **dir bootflash:**
3. **format bootflash:**
4. **copy** *upgradeImage* **bootflash:**

DETAILED STEPS

	Command or Action	Purpose
Step 1	Establish a connection to the active RP.	Allows you to manage the active RP. • For more information, see the "Connecting and Communicating with the Router" section on page 2-2.
Step 2	**dir bootflash:** **Example:** `RP/0/0/CPU0:Router# dir bootflash:`	Displays the bootflash contents. • The boothelper filename shows the file version number. • If the correct version is in use, there is no need to upgrade.
Step 3	**format bootflash:** **Example:** `RP/0/0/CPU0:Router# format bootflash:`	Formats bootflash and erases all contents.
Step 4	**squeeze bootflash:** **Example:** `RP/0/0/CPU0:Router# squeeze bootflash:`	Permanently erases the files tagged as "deleted" in the file system.
Step 5	**copy** *upgradeImage* **bootflash:** **Example:** `RP/0/0/CPU0:Router# copy disk0:c12kprp-boot-mz.120-30.S bootflash:`	Copies a file to bootflash. • The file system changes you make to the active RP are replicated on the standby RP.

Example

In the following example, 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.120-30.S
Destination filename [/bootflash:/c12kprp-boot-mz.120-30.S]? <return>
Accessing disk0:c12kprp-boot-mz.120-30.S
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
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.120-30.S

66322432 bytes total (63098748 bytes free)
RP/0/0/CPU0:router#
```

How to Upgrade or Downgrade ROM Monitor

This section contains the following procedures:

- Upgrading or Downgrading ROM Monitor, page C-4

Upgrading or Downgrading ROM Monitor

The following procedure upgrades or downgrades the ROM Monitor.

Prerequisites

Before starting the procedure described in the next section, do the following:

- Determine if there is an ROM Monitor upgrade file for your version of Cisco IOS XR software.
- To prepare for a ROM Monitor upgrade, copy the ROM Monitor upgrade file to the router or to a local workstation from which you can copy files to the router.
- 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.

SUMMARY STEPS

1. Establish a connection to the active RP.
2. **show version**
3. **copy** *source destination*
4. **dir** *device*

5. **admin**
6. If you are upgrading a standalone RP, go to Step 15.
7. **show redundancy**
8. **config-register 0x0**
9. **redundancy switchover**
10. **confreg 0x2**
11. **boot** *upgradeImage*
12. Establish a connection to the active RP (formerly the standby RP).
13. **admin**
14. **show redundancy**
15. **config-register 0x0**
16. **redundancy switchover** or **reload**
17. **confreg 0x2**
18. **boot** *upgradeImage*

DETAILED STEPS

	Command or Action	Purpose
Step 1	Establish a connection to the active RP.	Allows you to manage the active RP. • For more information, see the "Connecting and Communicating with the Router" section on page 2-2.
Step 2	**show version** **Example:** `RP/0/0/CPU0:Router# show version`	Displays software version information. • The ROM Monitor version appears near the top of the **show version** command display. The line is labeled "ROM:." • Review the command display to determine which version of ROM Monitor is in use on the RP. If the correct version is in use, there is no need to upgrade.
Step 3	**copy** *source destination* **Example:** `RP/0/0/CPU0:Router# copy tftp:software/filename disk0:`	Copies the ROM Monitor upgrade file to the router. • Copy the upgrade file to the root directory of any device on the router. For example, you can copy the file to disk0:.
Step 4	**dir** *device* **Example:** `RP/0/0/CPU0:Router# dir disk0:`	Displays the directory contents for a device root directory. • Verify that the upgrade file appears in the directory.
Step 5	**admin** **Example:** `RP/0/0/CPU0:router# admin`	Enters admin EXEC mode.
Step 6	If you are upgrading a standalone RP, go to Step 15	—

	Command or Action	Purpose
Step 7	**show redundancy** **Example:** `RP/0/0/CPU0:router(admin)# show redundancy`	Displays the status of the standby RP. • Verify that the standby RP is working properly. • If the standby RP is not ready, there is a traffic interruption during the upgrade.
Step 8	**config-register 0x0** **Example:** `RP/0/0/CPU0:router(admin)# config-register 0x0`	Set the configuration register on the active RP to 0x0. • This configures the RP to load ROM Monitor when it restarts.
Step 9	**redundancy switchover** **Example:** `RP/0/0/CPU0:Router# redundancy switchover`	Reloads the active RP in a dual RP router. • The former standby RP becomes the active RP. • The former active RP restarts in ROM Monitor mode due to the configuration register setting defined in Step 8. **Note** The **redundancy switchover** command does not reload the software if the standby RP is not ready to take over.
Step 10	**confreg 0x2** **Example:** `rommon B1> confreg 0x2`	Resets the configuration register to enter EXEC mode when the system is reset.
Step 11	**boot** *upgradeImage* **Example:** `rommon B2> boot upgradeImage`	Boots the RP with the ROM Monitor upgrade image.
Step 12	Establish a connection to the active RP (formerly the standby RP).	Allows you to manage the active RP. • For more information, see the "Connecting and Communicating with the Router" section on page 2-2.
Step 13	**admin** **Example:** `RP/0/1/CPU0:router# admin`	Enters admin EXEC mode.
Step 14	**show redundancy** **Example:** `RP/0/0/CPU0:router(admin)# show redundancy`	Displays the status of the standby RP. • Verify that the standby RP is working properly. • If the standby RP is not ready, there is a traffic interruption during the upgrade.
Step 15	**config-register 0x0** **Example:** `RP/0/1/CPU0:router(admin)# config-register 0x0`	Set the configuration register on the active RP to 0x0.

	Command or Action	Purpose

Step 16	**redundancy switchover** or **reload**
	
	Example:
	`RP/0/1/CPU0:Router# redundancy switchover`
	
	`or`
	
	`RP/0/1/CPU0:Router# reload`
		Reloads the active RP.
		• Use the **redundancy switchover** command in a dual RP router. The former standby RP becomes the active RP, and the former active RP restarts in ROM Monitor mode due to the configuration register setting defined in Step 15.
		Note The **redundancy switchover** command does not reload the software if the standby RP is not ready to take over.
		• Use the **reload** command in a single RP router.
		Note When the **reload** command is entered on a single RP router, all traffic is interrupted.

Step 17	**confreg 0x2** **Example:** `rommon B1> confreg 0x2`	Resets the configuration register to enter EXEC mode when the system is reset.
Step 18	**boot** *upgradeImage* **Example:** `rommon B2> boot upgradeImage`	Boots the RP with the ROM Monitor upgrade image.

Example

In the following example, the ROM Monitor software is upgraded on a single RP:

```
RP/0/0/CPU0:router#show version | include ROM

ROM: System Bootstrap, Version 12.0(20040624:164256) [assafb-misc1 1.14dev(0.91)
] SOFTWARE


RP/0/0/CPU0:router#copy tftp://192.168.1.1/users/bfprp_romupgrade-1.14.0.91 disk0:

Destination filename [/disk0:/bfprp_romupgrade-1.14.0.91]?
Copy : Destination exists, overwrite ?[confirm]
Accessing tftp://192.168.1.1/users/bfprp_romupgrade-1.14.0.91
CCCCCCCCCCC
170268 bytes copied in      0 sec
```

```
RP/0/0/CPU0:router#dir disk0:

Directory of disk0:

2           drwx  4096        Sun Jul 31 02:25:48 2005  LOST.DIR
3           drwx  4096        Sun Jul 31 02:25:52 2005  config
37          drwx  4096        Sun Jul 31 02:27:48 2005  c12k-os-mbi-3.3.80
4040        drwx  4096        Sun Jul 31 02:47:44 2005  instdb
4042        drwx  4096        Sun Jul 31 02:31:14 2005  c12k-base-3.3.80
19570       drwx  4096        Sun Jul 31 02:31:32 2005  c12k-admin-3.3.80
20991       drwx  4096        Sun Jul 31 02:31:58 2005  c12k-fwdg-3.3.80
22567       drwx  4096        Sun Jul 31 02:32:30 2005  c12k-lc-3.3.80
25548       drwx  4096        Sun Jul 31 02:32:54 2005  c12k-rout-3.3.80
29          drwx  4096        Sun Jul 31 02:38:49 2005  shutdown
28460       dr-x  4096        Sun Jul 31 02:40:03 2005  aaa
28468       drwx  4096        Sun Jul 31 02:36:53 2005  usr
28469       drwx  4096        Sun Jul 31 02:36:53 2005  var
66592       -rwx  2765        Sun Jul 31 02:45:50 2005  sam_certdb
28494       drwx  4096        Sun Jul 31 02:45:39 2005  c12k-infra-test-3.3.80
66784       -rwx  126         Sun Jul 31 02:45:50 2005  sam_crldb
66880       -rwx  170268      Thu Aug  4 22:21:21 2005  bfprp_romupgrade-1.14.0.
91

256462848 bytes total (113434624 bytes free)
RP/0/0/CPU0:router#


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

Successfully set config-register to 0x0 on node 0/0/CPU0

RP/0/0/CPU0:router(admin)#exit
RP/0/0/CPU0:router#reload
Updating Commit Database.  Please wait...[OK]
Proceed with reload? [confirm] y


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 2 > confreg 0x2
rommon 3 > boot disk0:bfprp_romupgrade-1.14.0.91


GRP Boot ROM Programming6322432 bytes total (620
Verify the device manufacturing code
RP/0/0/CPU0:i
mft = 0x1, dev = 0x4F tftp://192.168.1.1
Erasing Flashot-users$
Sector address = fff00000
Erasing the Flash...
% Incomplete com
Sector address = fff10000
RP/0/0/CPU0:iox1-shared-
Erasing the Flash...192.168.1.1/auto/t
Sector address = fff20000
Erasing the Flash...
Sector address = fff30000ootflash:/c12kprp-boot-mz
```

```
Erasing the Flash...
Sector address = fff40000
Copy : Destination e
Erasing the Flash...nfirm]
Sector address = fff50000
Accessing tftp://
Erasing the Flash...tftpboot-users/
Sector address = fff60000
Erasing the Flash...
Sector address = fff70000
Erasing the Flash...
Verifying FlashCCCCCCCCCCCCCCC
Verify Boot Sector Complete!
All Programming Complete!
CCCCCC
Verify Boot Sector Complete!
All Programming Complete!
CCCCCC


System Bootstrap, Version 12.0(20040624:164256) [assafb-misc1 1.14dev(0.91)] DEV copied in
22 sec (   144018)bytes/sec
ELOPMENT SOFTWARERP/0/0/CPU0:iox1-
Copyright (c) 1994-2004 by cisco Systems, Inc.
Directory of bootfl


DRAM DIMM Slot 1: 512M found, Slot 2: Empty        Thu Apr 28 03:37:53 2005  crashinfo
MPC7450 platform with 524288 Kbytes of main memory
381  -rwx  5177        Wed Jun  1 22:12:

Jø######################################################################
440  -rwx  1389        Sat Jul 16 14:20:08 2005  snmp/ifindex-tab
System page at phys:00023000 user:00

445  -rwx  322
subject to restrictions as set forth in subparagraph0-30.S
(c) of the Commercial Computer Software - Restricted795492 bytes free)
Rights clause at FAR sec. 52.227-19 and subparagraphash:
(c) (1) (ii) of the Rights in Technical Data and Computer
Form
Software clause at DFARS sec. 252.227-7013.ntinue? [confirm]

           cisco Systems, Inc.
Formatting sector 1
           170 West Tasman Drivelash: complete
           San Jose, California 95134-1706


Cisco IOS-XR  c12000
Fabric Clock is Redundant
Bandwidth Mode : Full Bandwidth

RP/0/0/CPU0:Aug  4 22:32:21.241 : mbi-hello[61]:
%PLATFORM-MBI_HELLO-6-INFO_CREACCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
TE_SUCCESS : MBI-H: Success to create /dev/mbi_lwm. Attempt number
1CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RP/0/0/CPU0:Aug  4 22:32:50.333 : redcon[419]: %HA-REDCON-6-GO_ACTIVE : this
carCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
3223556 byte
d going active 22 sec (   14
RP/0/0/CPU0:Aug  4 22:32:55.330 : dsc[153]: %PLATFORM-DSCMEDIA-6-DSC_ELECTED :
T:router#dir bootflash:
```

```
his node is now dSC (master of chassis)

1    -rwx  3223556     Thu Aug
Squeeze under progress
_LOG : /pkg/bin/sysmgr_debug_script invoked for: (wdsysmon) process did not sign

RP/0/0/CPU0:Aug 4 22:35:05.690 : config_lr[133]: %MGBL-CFGLAUNCH-6-STARTUP_INFO
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RP/0/0/CPU0:Aug  4 22:35:06.062 : cfgmgr-rp[127]: %MGBL-CFGMGR-6-CONFIG_COMPLETE
 : Configuration for node '0/0/CPU0' has been restored.
RP/0/0/CPU0:Aug  4 22:35:06.094 : ifmgr[178]: %PKT_INFRA-LINK-3-UPDOWN : Interfa
ce MgmtEth0/0/CPU0/0, changed state to Down
RP/0/0/CPU0:Aug  4 22:35:06.130 : ifmgr[178]: %PKT_INFRA-LINK-3-UPDOWN : Interfa
ce MgmtEth0/0/CPU0/0, changed state to Up


router con0/0/CPU0 is now available




Press RETURN to get started.



Username: user
Password: secret
RP/0/0/CPU0:router#
```

Additional References

Related Documents

Related Topic	Document Title
Hardware component commands	*Cisco IOS XR Interface and Hardware Component Command Reference*
System management commands	*Cisco IOS XR System Management Command Reference*

Technical Assistance

Description	Link
The Cisco Technical Support website contains thousands of pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/techsupport