



# Router Recovery with ROM Monitor

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

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## 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.



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

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**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 *System Management Configuration Guide for Cisco CRS Routers*.

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## 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=278805180&flowid=1925>

To locate Cisco IOS XR software images:

- Select any entry under Cisco Carrier Routing System .
- 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 1: 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>System Management Configuration Guide for Cisco CRS Routers</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 *System Management Configuration Guide for Cisco CRS Routers* . 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.

## tar Filenames and Version Numbers

The format for a tar filename is:

*platform-bundle\_name-major.minor.maintenance.tar*

**Table 2: tar Filename Components**

Component	Description
platform	<p>Identifies the platform for which the software package is designed.</p> <p>For packages designed for the Cisco CRS Router, the platform designation is “CRS.”</p>
bundle_name	<p>Identifies a specific bundle.</p> <ul style="list-style-type: none"> <li>• <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>System Management Configuration Guide for Cisco CRS Routers</i>.</li> <li>• <i>IOS XR-k9</i> bundle name indicates a file that includes all packages in the <i>iosxr</i> bundle file plus the security package.</li> </ul>
major	<p>Identifies the major release of this package.</p> <ul style="list-style-type: none"> <li>• Major releases occur when there is a major architectural change to the product (for example, a major new capability is introduced).</li> <li>• All packages operating on the router must be at the same major release level.</li> <li>• Major release is the least frequent release and may require a router reboot.</li> </ul>

Component	Description
minor	<p>Identifies the minor release of this package.</p> <ul style="list-style-type: none"> <li>• Minor releases contain one or more of the following: <ul style="list-style-type: none"> <li>• New features</li> <li>• Bug fixes</li> </ul> </li> <li>• 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.</li> <li>• Minor releases may require a router reboot.</li> </ul>
maintenance	<p>Identifies the maintenance release of this package.</p> <ul style="list-style-type: none"> <li>• Maintenance releases contain a collection of bug fixes for a package.</li> <li>• 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.</li> <li>• Maintenance releases usually do not require a router reboot.</li> </ul>

## vm Filenames and Version Numbers

The format for a composite vm filename for Cisco CRS 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 3: vm Filename Components**

Component	Description
platform	<p>Identifies the platform for which the software package is designed.</p> <p>For packages designed for Cisco CRS, the platform designation is “hfr.”</p>

Component	Description
package_name	Identifies a specific package. <ul style="list-style-type: none"> <li>• 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>System Management Configuration Guide for Cisco CRS Routers</i>.</li> </ul>
major	Identifies the major release of this package. <ul style="list-style-type: none"> <li>• A major release occurs when there is a major architectural change to the product (for example, a major new capability is introduced).</li> <li>• All packages operating on the router must be at the same major release level.</li> <li>• A major release is the least frequent release and may require a router reboot.</li> </ul>
minor	Identifies the minor release of this package. <ul style="list-style-type: none"> <li>• A minor release contains one or more of the following:               <ul style="list-style-type: none"> <li>• New features</li> <li>• Bug fixes</li> </ul> </li> <li>• 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.</li> <li>• A minor release may require a router reboot.</li> </ul>
maintenance	Identifies the maintenance release of this package. <ul style="list-style-type: none"> <li>• A maintenance release contains a collection of bug fixes for a package.</li> <li>• 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.</li> <li>• A maintenance release usually does not require a router reboot.</li> </ul>

The following example shows a composite of multiple mini packages:

## 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.

- On the Cisco CRS Router, the supported boot devices are disk0: and disk1:. If a boot-device is not specified, disk0: is used by default. If disk0: is not installed, then disk1: is used. All packages are installed on the flash disk and the MBI resides within the bootflash memory to support split-boot.
- MBI is always installed on the boot device.

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:”.
- 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.



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**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.

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## Reinstalling Cisco IOS XR Software on Cisco CRS Router



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**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 *System Management Configuration Guide for Cisco CRS Routers* .

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This section includes the following topics:

### Cisco CRS 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

When you install Cisco IOS XR software from a TFTP server to the DSC, you must perform the following tasks:

1. Back up the router configuration while still in EXEC mode.
2. Verify the sanity of the configuration file system on each SDR using the **cfs check** command.
3. Place all RPs and DRPs in ROM Monitor mode.
4. From ROM Monitor mode, clear the ROM Monitor environmental variables on all RPs, including the DSC.
5. On the DSC, configure the TURBOBOOT environment variable to either clean or format the boot disk during the installation. The recommended boot device is disk0:.
6. On the DSC, boot the Cisco IOS XR software from a *vm* file on the TFTP server.
7. Reset all other RPs to boot the Cisco IOS XR software.



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**Note** 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.

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**Caution** If the TURBOBOOT variable is set to format the boot device, all SDR configurations are deleted and only the admin configuration is preserved.

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## Installation from a Local Storage Device

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

1. Back up the router configuration while still in EXEC mode.
2. Verify the sanity of the configuration file system on each SDR using the command **cfs check**.
3. Copy the required *vm* file to the DSC flash disk that will hold the installable file. We recommend using disk1. You can also replace the flash disk with a flash disk that already has the correct image.
4. Place all RPs and DRPs in ROM Monitor mode.
5. From ROM Monitor mode, clear the ROM Monitor environmental variables on all RPs, including the DSC.
6. On the DSC, configure the TURBOBOOT environment variable to either clean or format the boot disk during the installation. The recommended boot device is disk0:.
7. Turboboot the DSC with the *vm* image located on the local storage device.
8. Reset all other RPs to boot the Cisco IOS XR software.



**Caution**

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

## Reinstalling to a Cisco CRS Router from a TFTP Server Image

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.

## Reinstalling to a Cisco CRS Router from a TFTP Server Image

### Before you begin

Before reinstalling Cisco IOS XR software from a TFTP server image, verify that the following prerequisites have been met:

- ROM Monitor firmware on the Cisco CRS Router is compatible with the Cisco IOS XR software image that you are installing.
- The following information is available:
  - IP address of the Management Ethernet interface on the DSC
  - Subnet mask of the Management Ethernet interface on the DSC
  - IP address of the default gateway that serves your router
  - IP address of the TFTP server from which the software will be downloaded
  - The filename and directory of the vm installation file that will be installed on the router
  - Boot device for your system.

### SUMMARY STEPS

1. Back up the router configuration while still in EXEC mode.
2. Verify the sanity of the configuration file system. Use **cfs check**
3. **admin**
4. Place all RP cards in ROM Monitor mode. Use **config-register boot-mode rom-monitor location all** and **reload location all** commands.

5. Clear the ROM Monitor environmental variables on all RP cards. Use **unset BOOT** command, **unset TFTP\_FILE** command and **sync** command.
6. On the DSC, set the environment variables that configure the Management Ethernet interface for use in ROM Monitor mode. Use **IP\_ADDRESS=ip\_address** command, **IP\_SUBNET\_MASK=mask** command and **DEFAULT\_GATEWAY=ip\_address** command.
7. On the DSC, set the TFTP environment variables. Use **TFTP\_VERBOSE=print\_setting** command, **TFTP\_RETRY\_COUNT=retry\_count** command, **TFTP\_TIMEOUT=timeout** command, **TFTP\_CHECKSUM=1** command, and **TFTP\_BLKSIZE=transfer\_size** command.
8. On the DSC, set the TURBOBOOT variables. Use **TURBOBOOT=on,boot-device,options** command and **sync** command.
9. On the DSC, boot the vm image located on the tftp server. Use **boot tftp://server/directory/filename**
10. Reset all other RPs to boot the Cisco IOS XR software. Use **confreg 0x2** and **reset** commands.

## DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	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.
<b>Step 2</b>	<p>Verify the sanity of the configuration file system. Use <b>cfs check</b></p> <p><b>Example:</b></p> <pre>RP/0/RP0/CPU0:router# cfs check</pre>	<p>(Optional) Verifies the sanity of the router configuration, and resolves any internal inconsistencies.</p> <p>Repeat the cfs check command on each SDR in the system.</p> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>This step is necessary only to preserve the router configurations (if TURBOBOOT variable is set to <b>clean</b>). If TURBOBOOT variable is set to <b>format</b>, then the disk is erased and the existing configurations are deleted. The default option is <b>clean</b>.</li> </ul>
<b>Step 3</b>	<p><b>admin</b></p> <p><b>Example:</b></p> <pre>RP/0/RP0/CPU0:router# admin</pre>	Enters the admin EXEC mode.
<b>Step 4</b>	<p>Place all RP cards in ROM Monitor mode. Use <b>config-register boot-mode rom-monitor location all</b> and <b>reload location all</b> commands.</p> <p><b>Example:</b></p> <pre>RP/0/RP0/CPU0:router(admin)# config-register boot-mode rom-monitor location all RP/0/RP0/CPU0:router(admin)# reload location all</pre>	
<b>Step 5</b>	<p>Clear the ROM Monitor environmental variables on all RP cards. Use <b>unset BOOT</b> command, <b>unset TFTP_FILE</b> command and <b>sync</b> command.</p> <p><b>Example:</b></p>	<p>Ensures that all RP cards in the system are prepared for installation using the TURBOBOOT variable. Repeat for each RP card in the system (LCC).</p> <p>Enter the settings exactly as shown. You must attach a terminal to each card for this procedure.</p>

	Command or Action	Purpose
	<pre>rommon B1&gt; unset BOOT rommon B2&gt; unset TFTP_FILE rommon B3&gt; sync</pre>	<p>All variable names are case sensitive.</p> <ul style="list-style-type: none"> <li>• Clears the BOOT variable.</li> <li>• Clears the TFTP_FILE variable.</li> <li>• Saves the changes.</li> </ul> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>• If the <b>unset</b> command displays an error message, it is most likely because the variable you are trying to change is not set. If this is the case, ignore the message and continue.</li> </ul>
<b>Step 6</b>	<p>On the DSC, set the environment variables that configure the Management Ethernet interface for use in ROM Monitor mode. Use <b>IP_ADDRESS=ip_address</b> command, <b>IP_SUBNET_MASK=mask</b> command and <b>DEFAULT_GATEWAY=ip_address</b> command.</p> <p><b>Example:</b></p> <pre>rommon B4&gt; IP_ADDRESS=1.1.1.1 rommon B5&gt; IP_SUBNET_MASK=255.255.254.0 rommon B6&gt; DEFAULT_GATEWAY=1.1.0.1</pre>	<p>Enter these settings exactly as shown. All variable names are case sensitive.</p> <ul style="list-style-type: none"> <li>• Sets the IP address for the Management Ethernet interface on the DSC.</li> <li>• Sets the subnet mask for the Management Ethernet interface on the DSC.</li> <li>• Identifies the default gateway that serves the DSC.</li> </ul>
<b>Step 7</b>	<p>On the DSC, set the TFTP environment variables. Use <b>TFTP_VERBOSE=print_setting</b> command, <b>TFTP_RETRY_COUNT=retry_count</b> command, <b>TFTP_TIMEOUT=timeout</b> command, <b>TFTP_CHECKSUM=1</b> command, and <b>TFTP_BLKSIZE=transfer_size</b> command.</p> <p><b>Example:</b></p> <p>Example</p> <pre>rommon B4&gt; TFTP_VERBOSE=0 rommon B5&gt; TFTP_RETRY_COUNT=4 rommon B6&gt; TFTP_TIMEOUT=6000 rommon B7&gt; TFTP_CHECKSUM=1 rommon B8&gt; TFTP_BLKSIZE=1468</pre>	<p>(Optional) Enter these settings exactly as shown. All variable names are case sensitive.</p> <ul style="list-style-type: none"> <li>• <b>TFTP_VERBOSE</b> sets the printer setting: <b>0</b>=quiet, <b>1</b>=progress (default), <b>2</b>=verbose.</li> <li>• <b>TFTP_RETRY_COUNT</b> sets the retry count for ARP and TFTP (default=7).</li> <li>• <b>TFTP_TIMEOUT</b> sets the overall timeout of the operation in seconds (default=7200).</li> <li>• <b>TFTP_CHECKSUM</b> specifies whether or not to perform a checksum test on the image: <ul style="list-style-type: none"> <li><b>1</b>=no, <b>2</b>=yes.</li> </ul> </li> <li>• <b>TFTP_BLKSIZE</b> sets the transfer size per package in bytes (default=1468)</li> </ul>
<b>Step 8</b>	<p>On the DSC, set the TURBOBOOT variables. Use <b>TURBOBOOT=on,boot-device,options</b> command and <b>sync</b> command.</p> <p><b>Example:</b></p> <pre>rommon B9&gt; TURBOBOOT=on,disk0,format rommon B10&gt; sync</pre>	<p>Sets the TURBOBOOT parameters and saves the configuration. Separate each parameter with a comma (.). These parameters are:</p> <ul style="list-style-type: none"> <li>• To enable the installation process using the TURBOBOOT variable, specify on.</li> <li>• Specify a boot device where all software is installed on the DSC. We recommend disk0.</li> </ul>

	Command or Action	Purpose
		<ul style="list-style-type: none"> <li>• To replace the existing software without formatting the boot device, replace options with clean.</li> <li>• To replace the existing software and format the boot device, replace options with format.</li> <li>• Default option is clean.</li> <li>• Any existing configuration is preserved.</li> </ul>
<b>Step 9</b>	<p>On the DSC, boot the vm image located on the tftp server. Use <b>boot tftp://server/directory/filename</b></p> <p><b>Example:</b></p> <pre>rommon B11&gt; boot tftp://223.255.254.254/softdir/hfr-mini-px.vm</pre>	<p>Retrieves the file from the TFTP server and installs it on the boot disk.</p> <ul style="list-style-type: none"> <li>• Run this command on the DSC and specify the vm installation file from the TFTP server.</li> <li>• This process removes any existing software packages, resets the configuration register to 0x2, and boots the DSC.</li> <li>• Allow the system to fully boot. The installation process using the TURBOBOOT variable takes some time. Do not enter any commands until you are prompted to enter a username or until the CLI prompt appears.</li> <li>• “Press RETURN to get started” 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.</li> <li>• DSC is fully booted when the following message appears: SYSTEM CONFIGURATION COMPLETED</li> </ul>
<b>Step 10</b>	<p>Reset all other RPs to boot the Cisco IOS XR software. Use <b>confreg 0x2</b> and <b>reset</b> commands.</p> <p><b>Example:</b></p> <pre>rommon B4&gt; confreg 0x2 rommon B5&gt; reset</pre>	<ul style="list-style-type: none"> <li>• Sets the configuration register to automatically start the boot process instead of staying in ROM Monitor mode.</li> <li>• Resets the RP and starts the boot process.</li> </ul>

### Reinstalling to a Cisco CRS Router from a TFTP Server Image: Example

Verify the sanity of the configuration file system on each SDR in the system:

```
RP/0/RP0/CPU0:router# cfs check
```

Place all RPs in ROM Monitor mode:

```
RP/0/RP0/CPU0:router# admin
```

```
RP/0/RP0/CPU0:router(admin)# config-register
RP/0/RP0/CPU0:router(admin)# location all
RP/0/RP0/CPU0:router(admin)# reload location all
```

Clear the ROM Monitor environmental variables on all RPs, including the DSC:

```
rommon B1> unset BOOT
rommon B2> unset TFTP_FILE
rommon B3> sync
```

```
rommon B4> IP_ADDRESS=10.1.1.1
rommon B5> IP_SUBNET_MASK=255.255.254.0
rommon B6> DEFAULT_GATEWAY=10.1.0.1
```

Enable installation process using the TURBOBOOT variable on the DSC. The following example shows how to boot the router using the specified vm file on the specified TFTP server:

```
rommon B7> TURBOBOOT=on,disk0,format
rommon B8> sync
rommon B9> boot tftp://10.10.10.10/software/
```

Reset all other RPs to boot the Cisco IOS XR software:

```
rommon B8> confreg 0x2
rommon B9> reset
```

## Reinstalling to a Cisco CRS Router from an Image on a Local Storage Device

This section describes the tasks required to install Cisco IOS XR software on the boot device using a vm image stored on a local storage device. The local storage device can be either of the removable flash disks in disk0 or disk1. We recommend using disk1 as the storage device for the vm image, and disk0 as the boot device (destination disk).

Complete the procedures exactly as described in this section.



**Note** Before booting begins on the DSC, a delay of 10 minutes or more may occur while the vm image is read to memory from the removable local storage device.

### Prerequisites

- The ROM Monitor firmware on the Cisco CRS router is compatible with the Cisco IOS XR software image that you are installing.
- A valid vm image must be located on a flash disk installed the RP. Cisco recommends using disk1.

If this file is not present on a local disk 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 disk0 or disk1. This process is described in the Upgrading and Managing Cisco IOS XR Software module of *Cisco IOS XR System Management Configuration Guide for the Cisco CRS 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** The removable flash disk used to store the installation file should be used to store archives only of vm and PIE files. This disk cannot be used as a destination for installed software or configurations. Only the boot device can be used to store active software and configurations.

## SUMMARY STEPS

1. Back up the router configuration while still in EXEC mode.
2. Verify the sanity of the configuration file system. Repeat on each SDR in the system. **cfs check**
3. Copy the required vm file to the DSC flash disk, or replace the flash disk with a flash disk that has the correct image.
4. Place all RPs in ROM Monitor mode: **admin config-register 0x0 location all reload location all**
5. Clear the ROM Monitor environmental variables on all RPs, including the DSC. **unset BOOT unset TFTP\_FILE sync**
6. On the DSC, set the TURBOBOOT variables:
7. **TURBOBOOT=on, boot-device, options sync**
8. On the DSC, boot the vm image located the local storage device:
9. **boot device:/filename**
10. Reset all other RPs to boot the Cisco IOS XR software: **confreg 0x2 reset**

## DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	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.
<b>Step 2</b>	Verify the sanity of the configuration file system. Repeat on each SDR in the system. <b>cfs check</b>  <b>Example:</b> Example:  RP/0/RP0/CPU0:router# <b>cfs check</b>	(Optional) Verifies the sanity of the router configuration, and resolves any internal inconsistencies.  Repeat the <b>cfs check</b> command on each SDR in the system.  <b>Note</b> <ul style="list-style-type: none"> <li>• This step is necessary only to preserve the router configurations (if TURBOBOOT is set to <b>clean</b>). If TURBOBOOT is set to <b>format</b>, then the disk is erased and the existing configurations are deleted. The default option is <b>clean</b>.</li> </ul>
<b>Step 3</b>	Copy the required vm file to the DSC flash disk, or replace the flash disk with a flash disk that has the correct image.	Places the software on the router in preparation for installation.  <b>Note</b> We recommend using flash disk1: to hold the installable file.

	Command or Action	Purpose
<b>Step 4</b>	Place all RPs in ROM Monitor mode: <b>admin</b> <b>config-register 0x0 location all reload location all</b>  <b>Example:</b>  RP/0/RP0/CPU0:router# admin RP/0/RP0/CPU0:router(admin)# config-register 0x0 location all RP/0/RP0/CPU0:router(admin)# reload location all	
<b>Step 5</b>	Clear the ROM Monitor environmental variables on all RPs, including the DSC. <b>unset BOOT unset TFTP_FILE sync</b>  <b>Example:</b>  rommon B1> unset BOOT rommon B2> unset TFTP_FILE rommon B3> sync	Ensures that all RPs in the system are prepared for Turboboot. Repeat for each RP in the system (line card chassis and fabric chassis).  Enter the settings exactly as shown. You must attach a terminal to each card for this procedure.  All variable names are case sensitive.  Clears the BOOT variable.  Clears the TFTP_FILE variable.  Saves the changes.  <b>Note</b> If the <b>unset</b> command displays an error message, it is most likely because the variable you are trying to change is not set. If this is the case, ignore the message and continue.
<b>Step 6</b>	On the DSC, set the TURBOBOOT variables:	
<b>Step 7</b>	<b>TURBOBOOT=on, boot-device, options sync</b>  <b>Example:</b>  rommon B7> TURBOBOOT=on,disk0,format rommon B8> sync	Sets the TURBOBOOT parameters and saves the configuration. Separate each parameter with a comma (.).  <ul style="list-style-type: none"> <li>• To enable the Turboboot process, specify on.</li> <li>• Specify a boot device where all software will be installed on the DSC and all DSDRSCs. We recommend disk0.</li> <li>• To replace the existing software without formatting the boot device, replace options with clean.</li> <li>• To replace the existing software and format the boot device, replace options with format.</li> <li>• The default option is clean.</li> <li>• Any existing configuration is preserved.</li> </ul>
<b>Step 8</b>	On the DSC, boot the vm image located the local storage device:	
<b>Step 9</b>	<b>boot device:/filename</b>  <b>Example:</b>	Boots the file located on the local storage device and installs it to the boot disk.

	Command or Action	Purpose
		<ul style="list-style-type: none"> <li>This process removes any existing software packages, resets the configuration register to 0x2, and boots the system.</li> <li>Allow the RP 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.</li> <li>The system is fully booted when the following message appears: SYSTEM CONFIGURATION COMPLETED</li> </ul> <p><b>Note</b> A delay of 10 minutes or more occurs while the software is read from the flash disk.</p>
<b>Step 10</b>	<p>Reset all other RPs to boot the Cisco IOS XR software: <b>confreg 0x2 reset</b></p> <p><b>Example:</b></p> <pre>rommon B4&gt; confreg 0x2 rommon B5&gt; reset</pre> <ul style="list-style-type: none"> <li>Sets the configuration register to automatically start the boot process instead of staying in ROM Monitor mode.</li> <li>Resets the RP and starts the boot process.</li> </ul>	The RPs synchronize the new Cisco IOS XR software from the DSC.

## Reinstalling to a Cisco CRS Router from an Image on a Local Storage Device: Example

Verify the sanity of the configuration file system on each SDR in the system:

```
RP/0/RP0/CPU0:router# cfs check
```

Place all RPs in ROM Monitor mode:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# config-register 0x0 location all
RP/0/RP0/CPU0:router(admin)# reload location all
```

Clear the ROM Monitor environmental variables on all RPs, including the DSC:

```
rommon B1> unset BOOT
rommon B2> unset TFTP_FILE
rommon B4> sync
```

Turboboot the DSC:



```
rommon B5> TURBOBOOT=on,disk0,format
rommon B6> sync
rommon B7>
```



**Note** A delay of 10 minutes or more occurs while the software is read from the flash disk.

Reset all other RPs to boot the Cisco IOS XR software:

```
rommon B8> confreg 0x2
rommon B9> reset
```

## What to Do Next

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



**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, you might want to verify interfaces, install additional packages or perform other configuration tasks:

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

## 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 in What's New in Cisco Product Documentation</i> located at: <a href="http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html">http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html</a>

Related Topic	Document Title
<p>Removable flash disk used to store archives of vm and PIE files</p> <p>Save current router configuration</p> <p>Verify that interfaces are up and properly configured</p> <p>Install or upgrade software packages from PIE files</p>	<p><i>Upgrading and Managing Cisco IOS XR Software</i> chapter in the <i>System Management Configuration Guide for Cisco CRS Routers</i></p>
<p>Redundancy slot pairs</p>	<p><i>Managing the Router Hardware</i> chapter in the <i>System Management Configuration Guide for Cisco CRS Routers</i></p>

## Technical Assistance

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