Loading and Managing System Images Configuration Guide, Cisco IOS XE 16 (Cisco ASR 920 Series)

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C O N T E N T S

Using FTP to Manage System Images

This module contains information about using FTP to manage Cisco system images.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see Bug Search Tool and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Image Copying from Flash Memory to an FTP Server

The FTP protocol requires a client to send a remote username and password on each FTP request to a server. When you copy a configuration file from the router to a server using FTP, the Cisco IOS software sends the first valid username it encounters in the following list:

1. The username specified in the **copy** privileged EXEC command, if a username is specified.

2. The username set by the **ipftpusername** global configuration command, if the command is configured.

3. Anonymous.

The router sends the first valid password it encounters in the following list:

1. The password specified in the **copy** privileged EXEC command, if a password is specified.

2. The password set by the **ipftppassword** global configuration command, if the command is configured.

The router forms a password *username* @*routername* .*domain* . The variable *username* is the username associated with the current session, *routername* is the configured hostname, and *domain* is the domain of the router.

The username and password must be associated with an account on the FTP server. If you are writing to the server, the FTP server must be properly configured to accept the FTP write request from the user on the router.

If the server has a directory structure, the configuration file or image is written to or copied from the directory associated with the username on the server. For example, if the system image resides in the home directory of a user on the server, specify that user's name as the remote username.

Refer to the documentation for your FTP server for more information.

Use the **ipftpusername** and **ipftppassword** commands to specify a username and password for all copies. Include the username in the **copy** command if you want to specify a username for that copy operation only.

Image Copy from an FTP Server to a Flash Memory File System

You can copy a system image from an FTP server to a flash memory file system.

FTP Username and Password

The FTP protocol requires a client to send a remote username and password on each FTP request to a server. When you copy a configuration file from the router to a server using FTP, the Cisco IOS software sends the first valid username it encounters in the following list:

1. The username specified in the **copy** privileged EXEC command, if a username is specified.

2. The username set by the **ipftpusername** global configuration command, if the command is configured.

3. Anonymous.

The router sends the first valid password it encounters in the following list:

1. The password specified in the **copy** privileged EXEC command, if a password is specified.

2. The password set by the **ip ftp password** command, if the command is configured.

The router forms a password *username* @*routername* .*domain* . The variable *username* is the username associated with the current session, *routername* is the configured host name, and *domain* is the domain of the router.

The username and password must be associated with an account on the FTP server. If you are writing to the server, the FTP server must be properly configured to accept the FTP write request from the user on the router.

If the server has a directory structure, the configuration file or image is written to or copied from the directory associated with the username on the server. For example, if the system image resides in the home directory of a user on the server, specify that user's name as the remote username.

Refer to the documentation for your FTP server for more information.

Use the **ip ftp username** and **ip ftp password** commands to specify a username and password for all copies. Include the username in the **copy** command if you want to specify a username for that copy operation only.

Copying an Image from Flash Memory to an FTP Server

To copy a system image to an FTP network server, complete the tasks in this section:

Procedure

	Command or Action	**Purpose**
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	(Optional) Enters global configuration mode. This step is required only if you override the default remote username or password (see Steps 2 and 3).
Step 3	**ip ftp username** *username* **Example:** `Router(config)# ip ftp username user1`	(Optional) Changes the default remote username.
Step 4	**ip ftp password** *password* **Example:** `Router(config)# ip ftp password guessme`	(Optional) Changes the default password.
Step 5	**end** **Example:** `Router(config)# end`	(Optional) Exits global configuration mode. This step is required only if you override the default remote username or password (see Steps 2 and 3).
Step 6	**show** *flash-filesystem* **:** **Example:** `Router# show flash:`	(Optional) Displays the system image file in the specified flash directory. If you do not already know it, note the exact spelling of the system image filename in flash memory.
Step 7	**copy** *flash-filesystem* **:** *filename* **ftp:** [[[//[*username* [**:***password*]@]*location*]/*directory*]/*filename*]	Copies the image to the FTP server.

Command or Action	Purpose
Example: Router# copy slot0:1:your-ios ftp://myuser:mypass@172.23.1.129/dirt/sysadmin/your-ios	**Note** After you have issued the **copy** privileged EXEC command, you may be prompted for additional information or for confirmation of the action. The prompting will depend on how much information you provide in the **copy** command and the current setting of the **fileprompt** global configuration command.

Examples

The following example uses the **showslot1:privileged**EXEC command to display the name of the system image file in the second PCMCIA slot, and copies the file (test) to an FTP server:

```
Router# show slot1:
-#- ED --type-- --crc--- -seek-- nlen -length- -----date/time------ name
1   .. 1        46A11866 2036C   4    746       May 16 1995 16:24:37 test
Router# copy slot1:test ftp://thisuser:thatpass@172.16.13.110/test
writing test!!!!...
successful ftp write.
```

In this example, the file named your-ios is copied from partition 1 of the flash memory PC card in slot 0 to the TFTP server at 172.23.1.129. The file will be saved with the name your-ios in the dirt/sysadmin directory relative to the directory of the remote username.

```
Router# show slot0: partition 1
PCMCIA Slot0 flash directory, partition 1:
File  Length   Name/status
  1   1711088 your-ios
[1711152 bytes used, 2483152 available, 4194304 total]
Router# copy slot0:1:your-ios ftp://myuser:mypass@172.23.1.129/dirt/sysadmin/your-ios
Verifying checksum for 'your-ios' (file # 1)...  OK
Copy 'your-ios' from Flash to server
  as 'dirt/sysadmin/ios-2'? [yes/no] yes
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Upload to server done
Flash device copy took 00:00:23 [hh:mm:ss]
```

Copying from an FTP Server to Flash Memory

To copy a system image from an FTP server to a flash memory file system, complete the tasks in this section:

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:**	Enables privileged EXEC mode. • Enter your password if prompted.

	Command or Action	**Purpose**
	`Router> enable`	
Step 2	**show** *flash-filesystem* **:** **Example:** `Router# show flash:`	(Optional) Displays the system image filename in Flash memory. Use this command to verify the url-path of the file and the exact spelling of the system image filename for use in the next command.

Step 3	**copy** *flash-url* **tftp** :[[[*//location*]*/directory*]*/filename*]
	
	Example:
	
	`Router# copy slot0:1:your-ios`
	`tftp://172.23.1.129/dirt/sysadmin/your-ios`
		Copies the system image from Flash memory to a TFTP server. Specify the file location and filename as the *flash-url* argument.
		
		Note After you have issued the **copy** privileged EXEC command, you may be prompted for additional information or for confirmation of the action. The prompting will depend on how much information you provide in the **copy** command and the current setting of the **fileprompt** global configuration command.

Step 4	**configure terminal** **Example:** `Router# configure terminal`	(Optional) Enters global configuration mode from the terminal. This step is required only if you want to override the default remote username or password (see Steps 3 and 4).
Step 5	**ip ftp username** *username* **Example:** `Router(config)# ip ftp username netuser1`	(Optional) Changes the default remote username.
Step 6	**ip ftp password** *password* **Example:** `Router(config)# ip ftp password guessme`	(Optional) Changes the default password.
Step 7	**end** **Example:** `Router(config)# end`	(Optional) Exits global configuration mode. This step is required only if you override the default remote username or password (see Steps 3 and 4).
Step 8	**copy ftp:** [[[*//*[*username* [**:***password*]@]*location*] */directory*]*/filename*]*flash-filesystem***:**[*filename*] **Example:**	Copies the configuration file from a network server to running memory or the startup configuration using rcp.

Command or Action	Purpose	
```Router# copy ftp://myuser:mypass@theserver/tftpboot/sub3/c7200-js-mz slot1:c7200-js-mz```	**Note**	After you have issued the **copy** privileged EXEC command, you may be prompted for additional information or for confirmation of the action. The prompting will depend on how much information you provide in the **copy** command and the current setting of the **fileprompt** global configuration command.

Examples

The following example illustrates how to use the **reload** command to reload the software on the router on the current day at 7:30 p.m.:

```
Router# reload at 19:30
Reload scheduled for 19:30:00 UTC Wed Jun 5 1996 (in 2 hours and 25 minutes)
Proceed with reload? [confirm]
```

The following example illustrates how to use the **reload** command to reload the software on the router at a future time:

```
Router# reload at 02:00 jun 20
Reload scheduled for 02:00:00 UTC Thu Jun 20 1996 (in 344 hours and 53 minutes)
Proceed with reload? [confirm]
```

Installing and Upgrading Software

Software Packaging on the Router

Software Package Modes

The router can be booted using any of the following:

- Consolidated—A single software image containing a full collection of software packages. This mode provides a simplified installation and can be stored in the bootflash, a TFTP server, or a network server.

- Sub-package—One or more sub-images extracted from the consolidated image. This mode provides optimized memory usage and requires that you store files in the bootflash directory.

Note The router supports both consolidated and sub-package mode boot.

Understanding Software Packages

Table 1: Individual Sub-Packages

Sub-Package	Purpose
RPBase	Route Switch Processor (RSP) operating system
RPControl	Control plane processes between IOS process and the rest of the platform.
RPAccess	Handles security features including Secure Socket Layer (SSL) and Secure Shell (SSH)
RPIOS	Cisco IOS kernel, which is where IOS features are stored and run. **Note** Each consolidated image has a unique RPIOS package.
FP Pkg	Controls FP daemons.
IO Pkg	Controls input/output driver daemons.
LC Base	Controls basic kernel functions including runtime, initialization scripts, and chassis control daemons.

Provisioning Files

Provisioning files manage the boot process when the router is configured to boot in sub-packages. The provisioning file manages the bootup of each individual sub-package. Provisioning files are extracted automatically when individual sub-package files are extracted from a consolidated package. Provisioning files are not necessary for running the router using the complete consolidated package.

File Systems on the Router

Table 2: File Systems

File System	Description
bootflash:	The boot flash memory file system on the active RSP.
cns:	The Cisco Networking Services file directory.
nvram:	Router NVRAM. You can copy the startup configuration to NVRAM or from NVRAM.
system:	The system memory file system, which includes the running configuration.
tar:	The archive file system.
tmpsys:	The temporary system files file system.
usb0:	The Universal Serial Bus (USB) flash drive file systems on the active RSP. **Note** usb1: is an internal port.

If you see a file system not listed in the above table, enter the **?** help option or see the **copy** command reference for additional information on that file system.

System Requirements

ROMMON Version Requirements

We recommend you to upgrade the ROMMON version to 15.6(33r)S.

For more information on the ROMMON package, see Cisco Software Download.

Determining the Software Version

You can use the **show version installed** command to list the installed sub-packages on the router.

Autogenerated Files and Directories

⚠️

Caution   Any autogenerated file in the bootflash: directory should not be deleted, renamed, moved, or altered in any way unless directed by customer support; altering these files can have unpredictable consequences for system performance.

Table 3: Autogenerated Files

File or Directory	Description
crashinfo files	A crashinfo file may appear in the bootflash: file system. Crashinfo files are useful for tuning and troubleshooting, but are not related to router operations: you can erase them without impacting the router's performance.
core files	The bootflash/core directory is the storage area for .core files. **Warning** Do not erase or move the core directory.
lost+found directory	This directory is created on bootup if a system check is performed. Its appearance is completely normal and does not indicate any issues with the router.
tracelogs files	The storage area for trace files is bootflash/tracelogs. Trace files are useful for troubleshooting; you can access trace files using diagnostic mode to gather information related to the IOS failure. **Warning** Do not erase or move the tracelog directory.

Setting the Router to Boot in Sub-Package Mode

Note   For instructions on how to download an image file, see Downloading an Image, on page 13. In the following example, the image is located in the bootflash: Image/image-name.

Procedure

Step 1   **configure terminal**

Example:

```
Router# configure terminal
```

Enters configuration mode.

Step 2   **config-register**

Example:

```
Router(config)# config-register 0x2
```

Sets the configuration register so that the router boots using a specified image in NVRAM.

Step 3   **exit**

Example:

```
Router(config)#exit
```

Exits configuration mode and returns to the EXEC command interpreter prompt.

Step 4   **configure terminal**

Example:

```
Router# configure terminal
```

Enters configuration mode.

Step 5   **boot system flash** [**flash-fs:**] [*partition-number:*] [*filename*]

Example:

```
Router(config)# boot system bootflash:Image/packages.conf
```

Sets the router to boot using the packages.conf file.

Step 6   **exit**

Example:

```
Router(config)#exit
```

Exits configuration mode and returns to the EXEC command interpreter prompt.

Step 7   **copy running-config startup-config**

Example:

```
Router# copy running-config startup-config
```

Saves the configuration.

Step 8   **reload**

Example:

```
Router#reload
```

Reloads the router.

ISSU Support Matrix

Legend:

NA: Not Applicable

NS: Not Supported

Table 4: ISSU Support Matrix

Supported ISSU Upgrade Or Downgrade Version									
Base IOS Version	16.5.1	16.5.X (X=2-3)	16.6.1	16.6.X (X=2 and later)	16.7.X (X=1 and later)	16.8.X (X=1 and later)	16.9.X (X= 1 and later)	16.11.1 (X= 1 and later)	16.12.1
16.5.1	NA	NS	NS	NS	NS	NS	NS	NS	NS
16.5.X (X=2,3)	NS	NA	NS	Yes	Yes	Yes	Yes	Yes	Yes
16.6.1	NS	NS	NA	NS	NS	NS	NS	NS	Yes
16.6.X (X= 2 and later)	NS	Yes	NS	Yes	Yes[1]	Yes[1]	Yes[1]	Yes[1]	Yes[1]
16.7.X (X=1 and later)	NS	Yes	NS	Yes	Yes	Yes	Yes	Yes	Yes
16.8.X (X=1 and later)	NS	Yes	NS	Yes[2]	Yes	Yes	Yes	Yes	Yes

Supported ISSU Upgrade Or Downgrade Version								
16.9.X (X=1 and later)	NS	Yes	NS	Yes	Yes	Yes	Yes	Yes	Yes
16.11.X (X=1 and later)	NS	Yes	NS	Yes	Yes	Yes	Yes	Yes	Yes
16.12.1	NS	NA	NS	Yes	Yes	Yes	Yes	Yes	NA

[1] With CEM IMs the ISSU **(upgrade)** is not supported directly from Cisco IOS XE Release 16.6.x to 16.7.3 or16.8.x or 16.9.x or 16.11.x, or 16.12.x release. ISSU upgrade should be done in two steps: First, upgrade from Cisco IOS XE Release 16.6.x to Cisco IOS XE Release 16.7.2. Then, upgrade from Cisco IOS XE Release 16.7.2 to the target release.

[2] With CEM IMs, ISSU **(downgrade)** is not supported from 16.8.x to 16.6.x.

Restrictions

- ISSU is supported for all releases for upgrades and downgrades.

  > **Note** ISSU upgrade is not supported on Cisco IOS XE releases 16.5.x and 16.6.x to any later release.

- The ISSU upgrade operation requires that the ROMmon version be 15.6(33r)S or higher for all releases starting from release Cisco IOS XE 16.11.x. For Cisco IOS XE Releases 16.6.x to 16.9.x, the minimum ROMmon version must be 15.6(20r)S.

- You must enable the **port-channel max-memlink-per-pc 8** command when downgrading from Cisco IOS XE Release 16.11.x; else, ISSU may fail. When using CEM IMs in the router, ISSU upgrade is not supported from release Cisco IOS XE 16.6.x to Cisco IOS XE 16.7.3.

- However, the upgrade operation can be performed in two stages:

  - First, upgrade from Cisco IOS XE Release 16.6.x to Cisco IOS XE Release 16.7.2.

  - Then, upgrade from Cisco IOS XE Release 16.7.2 to target release.

- When using CEM IMs in the router, ISSU downgrades are not supported from the Cisco IOS XE 16.8.x to 16.6.x.

- If the router has a higher pseudowire scale configuration, for example, 4K, 8K, or 16K, set the single command ISSU upgrade to a value greater than 1200 seconds. You can do this by using the command **interface-module-delay**.

  - For example, for an 8k scale, the configuration requires approximately 20 minutes to synchronize standby. In this case, the **interface-module-delay** value should be greater than 1200 seconds.

Downloading an Image

Download the image to the same partition of the bootflash where the base image exists. For information on downloading images see, Loading and Managing System Images Configuration Guide, Cisco IOS XE Release 3S.

Note   Ensure that you have chosen an upgrade image that is supported by your current software version.

Performing a Single Command Software Upgrade

A single command upgrade updates the active and standby RSPs with a single IOS command. Follow these steps to complete the one-shot upgrade.

Preparing for Installation

Verify the chassis is booted using sub-package mode and in hot standby state, else set the router to sub-package mode. For more information, see Setting the Router to Boot in Sub-Package Mode, on page 10.

Procedure

Step 1   Download the new image file from Cisco.com on the chassis.

Step 2   Open a console session to the active RSP.

Step 3   Copy the new consolidated image file to the active image bootflash directory such that the new image file is in the same location as the existing image file.

Note   Do not copy the packages.conf file to a new directory after expanding the package. It is required that the packages.conf file and sub package files exist in the same directory.

Note   It is not necessary to copy the new consolidated image file to the standby RSP; the one-shot upgrade process completes this step.

Step 4   **configure terminal**

Example:

```
Router# configure terminal
```

Enters configuration mode.

Step 5   **redundancy**

Example:

```
Router(config)# redundancy
Router(config-red)#
```

Enters redundancy configuration mode.

Step 6　**mode sso**

Example:

```
Router(config-red)# mode sso
```

Sets the router in SSO redundancy mode.

Step 7　**end**

Example:

```
Router(config)# end
```

Exits configuration mode and returns to the EXEC command prompt.

Step 8　Confirm that the router has reached SSO state

Example:

```
*Jan 12 17:52:26.516: %RF-5-RF_TERMINAL_STATE: Terminal state reached for (SSO)
```

Wait for the output before proceeding.

Step 9　**copy running-config startup-config**

Example:

```
Router# copy running-config startup-config
```

Saves the configuration.

Completing the Single Command Upgrade

Note　Do *not* press CTRL+C when the single command upgrade is in process. The system shall reach the command prompt only after successful completion of the upgrade.

Procedure

Step 1　(Optional) **platform issu reload interface-module sequence** *sequence of all IMs*

Reloads the interface modules in a sequence. Separate the IM numbers with a single space. If there are 16 IMs, sequence for all 16 IMs should be given, irrespective of the IMs being physically present or not. If the sequence is not configured using this command, the reload happens sequentially, by default.

Step 2　**request platform software package install node file** *file-URL* [**interface-module-delay** *delay*]

Example:

```
Router# request platform software package install node file
```

bootflash:Image/asr903rsp1-adventerprisek9.upgrade.bin interface-module-delay 150

Initiates the one-shot installation procedure using the consolidated image file.

Note   You can adjust the delay between the OIR of each IM using the **interface-module-delay** keyword. We recommend you set the **interface-module-delay** value to 150 seconds or greater in order to ensure sufficient time for IM software upgrades. Keywords other than **interface-module-delay** are not supported.

Step 3   Wait for the router messages.

The router displays a series of STAGE/SUCCESS messages.

For sample output of a single command upgrade, see Example: Single Command Software Upgrade, on page 17.

Step 4   Wait for original active RSP to reboot.

The active RSP reboots and returns to the console prompt.

Step 5   Switch to the new active console.

Step 6   Wait for new active console to return to SSO state

Example:

`*Jan 12 17:52:26.516: %RF-5-RF_TERMINAL_STATE: Terminal state reached for (SSO)`

Confirms that the router has reached SSO state; wait for this output before proceeding.

Upgrading the ROMMON on the RSP Module

The router has two ROMMON regions (ROM0 and ROM1). We recommend that the upgrade is performed on both the regions.

⚠

Caution   To avoid actions that might make your system unable to boot, read this entire section before starting the upgrade.

Procedure

Step 1   Check the RSP bootup ROMMON region (ROM0 or ROM1). The example, shows the RSP boots up from ROM0 region.

Example:

```
System Bootstrap, Version 15.2(1r)S1, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2011 by cisco Systems, Inc.
Compiled Wed 07-Dec-11 07:33 by tinhuang
Current image running: Boot ROM0
```

Step 2 Copy the ROMMON image to the bootflash on the active and standby RSP.

Example:

```
copy bootflash:asr903-rommon.153-1r.S1.pkg
```

Step 3 Use the **upgrade rom-monitor filename** *bootflash:asr903-rommon.153-1r.S1.pkg* **R0** command to upgrade the version.

> **Note** R0 represents RSP in slot0 of the chassis. Step 3 upgrades the ROMMON region of the RSP that is not used (ROM1 region) as ROM 0 region is used (in this procedure) in Step 1 to boot up the RSP.

Step 4 Upgrade the ROMMON on the Standby RSP (for High Availability) using **upgrade rom-monitor filename** *bootflash:asr903-rommon.153-1r.S1.pkg* **R1** command.

> **Note** R1 represents the RSP in slot1 of the chassis. Step 4 upgrades the ROMMON region of the RSP that is not used (ROM 0 region).

Step 5 Reload the router.

Example:

```
System Bootstrap, Version 15.2(1r)S1, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2011 by cisco Systems, Inc.
Compiled Wed 07-Dec-11 07:33 by tinhuang
Current image running: Boot ROM0
Last reset cause: RSP-Board
UEA platform with 2097152 Kbytes of main memory
Rommon upgrade requested
Flash upgrade reset 1 in progress
.......
System Bootstrap, Version 12.2(20120514:121217) [npenumar-pegasus_rommon_02 183], DEVELOPMENT
 SOFTWARE
Copyright (c) 1994-2008 by cisco Systems, Inc.
Compiled Fri 15-Jun-12 11:45 by ccai
Current image running: *Upgrade in progress* Boot ROM1
Last reset cause: BootRomUpgrade
UEA platform with 2097152 Kbytes of main memory
```

Step 6 Reload the router again to confirm bootup from upgraded ROMMON region ROM1.

Example:

```
System Bootstrap, Version 15.2(1r)S1, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2011 by cisco Systems, Inc.
Compiled Fri 15-Jun-12 11:45 by ccai
Current image running: Boot ROM1
```

Step 7 Repeat Step 3 to Step 6 to update the other region on the RSP (ROM0) region in this procedure.

> **Note** We recommend that both region ROM0 andROM1 are upgraded.

Example: Verifying ROMMON Upgrade

Use the show platform command to verify the ROMMON upgrade.

```
Router# show platform

Chassis type: ASR-903
Slot       Type                State                 Insert time (ago)
---------  ------------------  --------------------  -----------------
 0/0       A900-IMA1X          ok                    04:48:07
 0/1       A900-IMA1X          ok                    04:43:42
 0/4       A900-IMA8T          ok                    05:18:21
 0/5       A900-IMA8T          ok                    05:18:21
R0         A903-RSP1A-55       ok, active            05:23:11
R1         A903-RSP1A-55       ok, standby           05:23:11
F0                                 ok, active             05:23:11
F1                                 ok, standby            05:23:11
P0         A900-PWR550-D       ok                    05:20:02
P1         A900-PWR550-D       ok                    05:19:55
P2         A903-FAN            ok                    05:19:45
Slot       CPLD Version        Firmware Version
---------  ------------------  -------------------------------------
R0         11102133            15.3(1r)S1
R1         11102133            15.3(1r)S1
F0         11102133            15.3(1r)S1
F1         11102133            15.3(1r)S1
```

Verifying the Upgrade

Example: Single Command Software Upgrade

```
Router# request platform software package install node file bootflash:XE371_k9_0810.bin
interface-module-delay 150


NOTE: Currently node has booted from a provisioning file
NOTE: Going to start a dual rp sub-packages node ISSU install
--- Starting initial file path checking ---
Copying bootflash:XE371_k9_0810.bin to stby-bootflash:XE371_k9_0810.bin
Finished initial file path checking
--- Starting config-register verification ---
Finished config-register verfication
--- Starting image file expansion ---
Expanding image file: bootflash:XE371_k9_0810.bin
Image file expanded and copied
Expanding image file: stby-bootflash:XE371_k9_0810.bin
Image file expanded and copied
Finished image file expansion
STAGE 1: Installing software on standby RP
==========================================
--- Starting local lock acquisition on R0 ---
Finished local lock acquisition on R0
--- Starting installation state synchronization ---
Finished installation state synchronization
--- Starting local lock acquisition on R1 ---
Finished local lock acquisition on R1
--- Starting file path checking ---
```

```
Finished file path checking
--- Starting image file verification ---
Checking image file names
Locating image files and validating name syntax
  Found asr903rsp1-espbase.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
  Found asr903rsp1-rpaccess.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
  Found asr903rsp1-rpbase.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
  Found asr903rsp1-rpcontrol.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
  Found asr903rsp1-rpios-universalk9_npe.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg

  Found asr903rsp1-sipbase.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
  Found asr903rsp1-sipspa.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
Verifying image file locations
Inspecting image file types
    WARNING: In-service installation of IOSD package
    WARNING: requires software redundancy on target RP
    WARNING: or on-reboot parameter
    WARNING: Automatically setting the on-reboot flag
    WARNING: In-service installation of RP Base package
    WARNING: requires software reboot of target RP
Processing image file constraints
Creating candidate provisioning file
Finished image file verification
--- Starting candidate package set construction ---
Verifying existing software set
Processing candidate provisioning file
Constructing working set for candidate package set
Constructing working set for running package set
Checking command output
Constructing merge of running and candidate packages
Checking if resulting candidate package set would be complete
Finished candidate package set construction
--- Starting compatibility testing ---
Determining whether candidate package set is compatible
Determining whether installation is valid
Determining whether installation is valid ... skipped
Verifying image type compatibility
Checking IPC compatibility for candidate software
Checking candidate package set infrastructure compatibility
Checking infrastructure compatibility with running software
Checking infrastructure compatibility with running software ... skipped
Checking package specific compatibility
Finished compatibility testing
--- Starting list of software package changes ---
Old files list:
  Removed asr903rsp1-espbase.2012-08-12_15.26_amprajap.pkg
  Removed asr903rsp1-rpaccess.2012-08-12_15.26_amprajap.pkg
  Removed asr903rsp1-rpbase.2012-08-12_15.26_amprajap.pkg
  Removed asr903rsp1-rpcontrol.2012-08-12_15.26_amprajap.pkg
  Removed asr903rsp1-rpios-universalk9_npe.2012-08-12_15.26_amprajap.pkg
  Removed asr903rsp1-sipbase.2012-08-12_15.26_amprajap.pkg
  Removed asr903rsp1-sipspa.2012-08-12_15.26_amprajap.pkg
New files list:
  Added asr903rsp1-espbase.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
  Added asr903rsp1-rpaccess.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
  Added asr903rsp1-rpbase.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
  Added asr903rsp1-rpcontrol.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
  Added asr903rsp1-rpios-universalk9_npe.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg

  Added asr903rsp1-sipbase.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
  Added asr903rsp1-sipspa.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
Finished list of software package changes
--- Starting commit of software changes ---
Updating provisioning rollback files
```

```
Creating pending provisioning file
Committing provisioning file
Finished commit of software changes
SUCCESS: Software provisioned.  New software will load on reboot.
STAGE 2: Restarting standby RP
==============================
--- Starting standby reload ---
Finished standby reload
--- Starting wait for Standby RP to reach terminal redundancy state ---
Finished wait for Standby RP to reach terminal redundancy state
STAGE 3: Installing sipspa package on local RP
==============================================
--- Starting local lock acquisition on R0 ---
Finished local lock acquisition on R0
--- Starting installation state synchronization ---
Finished installation state synchronization
--- Starting file path checking ---
Finished file path checking
--- Starting image file verification ---
Checking image file names
Locating image files and validating name syntax
  Found asr903rsp1-sipspa.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
Verifying image file locations
Inspecting image file types
Processing image file constraints
Creating candidate provisioning file
Finished image file verification
--- Starting candidate package set construction ---
Verifying existing software set
Processing candidate provisioning file
Constructing working set for candidate package set
Constructing working set for running package set
Checking command output
Constructing merge of running and candidate packages
Checking if resulting candidate package set would be complete
Finished candidate package set construction
--- Starting compatibility testing ---
Determining whether candidate package set is compatible
WARNING:
WARNING: Candidate software combination not found in compatibility database
WARNING:
Determining whether installation is valid
WARNING:
WARNING: Candidate software combination not found in compatibility database
WARNING:
WARNING:
WARNING: Candidate software combination not found in compatibility database
WARNING:
Software sets are identified as compatible
Verifying image type compatibility
Checking IPC compatibility with running software
Checking candidate package set infrastructure compatibility
Checking infrastructure compatibility with running software
Checking package specific compatibility
Finished compatibility testing
--- Starting impact testing ---
Checking operational impact of change
Finished impact testing
--- Starting list of software package changes ---
Old files list:
  Removed asr903rsp1-sipspa.2012-08-12_15.26_amprajap.pkg
New files list:
  Added asr903rsp1-sipspa.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
Finished list of software package changes
```

```
               --- Starting commit of software changes ---
         Updating provisioning rollback files
         Creating pending provisioning file
         Committing provisioning file
         Finished commit of software changes
         --- Starting analysis of software changes ---
         Finished analysis of software changes
         --- Starting update running software ---
         Blocking peer synchronization of operating information
         Creating the command set placeholder directory
           Finding latest command set
           Finding latest command shortlist lookup file
           Finding latest command shortlist file
           Assembling CLI output libraries
           Assembling CLI input libraries
           Assembling Dynamic configuration files
           Applying interim IPC and database definitions
           Replacing running software
           Replacing CLI software
           Restarting software
           Restarting IM: 0/0
         Skipping IM reload for Ethernet IM
           Restarting IM: 0/1
         Skipping IM reload for Ethernet IM
           Restarting IM: 0/2
         Skipping IM reload for Ethernet IM
           Restarting IM: 0/3
         Skipping IM reload for Ethernet IM
           Restarting IM: 0/4
         Skipping IM reload for Ethernet IM
           Applying final IPC and database definitions
           Generating software version information
           Notifying running software of updates
           Unblocking peer synchronization of operating information
         Unmounting old packages
         Cleaning temporary installation files
           Finished update running software

         SUCCESS: Finished installing software.
         STAGE 4: Installing software on active RP
         ========================================
         --- Starting local lock acquisition on R0 ---
         Finished local lock acquisition on R0
         --- Starting installation state synchronization ---
         Finished installation state synchronization
         --- Starting file path checking ---
         Finished file path checking
         --- Starting image file verification ---
         Checking image file names
         Locating image files and validating name syntax
           Found asr903rsp1-espbase.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
           Found asr903rsp1-rpaccess.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
           Found asr903rsp1-rpbase.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
           Found asr903rsp1-rpcontrol.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
          Found asr903rsp1-rpios-universalk9_npe.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg

           Found asr903rsp1-sipbase.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
           Found asr903rsp1-sipspa.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
         Verifying image file locations
         Inspecting image file types
             WARNING: In-service installation of IOSD package
             WARNING: requires software redundancy on target RP
             WARNING: or on-reboot parameter
             WARNING: Automatically setting the on-reboot flag
```

```
      WARNING: In-service installation of RP Base package
      WARNING: requires software reboot of target RP
Processing image file constraints
Creating candidate provisioning file
Finished image file verification
--- Starting candidate package set construction ---
Verifying existing software set
Processing candidate provisioning file
Constructing working set for candidate package set
Constructing working set for running package set
Checking command output
Constructing merge of running and candidate packages
Checking if resulting candidate package set would be complete
Finished candidate package set construction
--- Starting compatibility testing ---
Determining whether candidate package set is compatible
Determining whether installation is valid
Determining whether installation is valid ... skipped
Verifying image type compatibility
Checking IPC compatibility for candidate software
Checking candidate package set infrastructure compatibility
Checking infrastructure compatibility with running software
Checking infrastructure compatibility with running software ... skipped
Checking package specific compatibility
Finished compatibility testing
--- Starting list of software package changes ---
Old files list:
  Removed asr903rsp1-espbase.2012-08-12_15.26_amprajap.pkg
  Removed asr903rsp1-rpaccess.2012-08-12_15.26_amprajap.pkg
  Removed asr903rsp1-rpbase.2012-08-12_15.26_amprajap.pkg
  Removed asr903rsp1-rpcontrol.2012-08-12_15.26_amprajap.pkg
  Removed asr903rsp1-rpios-universalk9_npe.2012-08-12_15.26_amprajap.pkg
  Removed asr903rsp1-sipbase.2012-08-12_15.26_amprajap.pkg
New files list:
  Added asr903rsp1-espbase.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
  Added asr903rsp1-rpaccess.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
  Added asr903rsp1-rpbase.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
  Added asr903rsp1-rpcontrol.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
   Added asr903rsp1-rpios-universalk9_npe.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg

  Added asr903rsp1-sipbase.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
Finished list of software package changes
--- Starting commit of software changes ---
Updating provisioning rollback files
Creating pending provisioning file
Committing provisioning file
Finished commit of software changes
SUCCESS: Software provisioned.  New software will load on reboot.
STAGE 5: Restarting active RP (switchover to stdby)
==================================================
--- Starting active reload ---
Finished active reload
SUCCESS: node ISSU finished successfully.
RUDY-1#
RUDY-1#Aug 24 07:54:41.715 R0/0: %PMAN-5-EXITACTION: Process manager is exiting: reload fru
 action requested
System Bootstrap, Version 15.3(1r)S1, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
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Compiled Tue 26-Jun-12 12:42 by ccai
Current image running: Boot ROM0UEA platform with 3670016 Kbytes of main memory
Located packages.conf
Image size 7519 inode num 38, bks cnt 2 blk size 8*512
#
```

```
Located asr903rsp1-rpbase.BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021.pkg
Image size 34216240 inode num 90631, bks cnt 8354 blk size 8*512
##########################################################################
############################################################################
############################################################################
######################################################################
Boot image size = 34216240 (0x20a1930) bytes
Package header rev 0 structure detected
Calculating SHA-1 hash...done
validate_package: SHA-1 hash:
        calculated e7674970:dbc1eb86:325219c7:b3da0e0f:077e5e4d
        expected   e7674970:dbc1eb86:325219c7:b3da0e0f:077e5e4d
Image validated
%IOSXEBOOT-4-BOOT_ACTIVITY_LONG_TIME: (rp/0): load_crash_kernel took: 2 seconds, expected
max time 2 seconds
%IOSXEBOOT-4-DEBUG_CONF: (rp/0): File /bootflash/debug.conf is absent, ignoring
%IOSXEBOOT-4-BOOT_ACTIVITY_LONG_TIME: (rp/0): Chassis initialization took: 26 seconds,
expected max time 10 seconds
%IOSXEBOOT-4-BOOT_ACTIVITY_LONG_TIME: (rp/0): upgrade hw-programmable took: 2 seconds,
expected max time 2 seconds
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           cisco Systems, Inc.
           170 West Tasman Drive
           San Jose, California 95134-1706
Cisco IOS Software, IOS-XE Software (PPC_LINUX_IOSD-UNIVERSALK9_NPE-M),
Experimental Version 15.2(20120810:081250)
[v152_4_s_xe37_throttle-BLD-BLD_V152_4_S_XE37_THROTTLE_LATEST_20120810_070021-ios 131]
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http://www.cisco.com/wwl/export/crypto/tool/stqrg.html
If you require further assistance please contact us by sending email to
export@cisco.com.
cisco ASR-903 (RSP1) processor with 540359K/6147K bytes of memory.
Processor board ID FOX1518P0GP
32768K bytes of non-volatile configuration memory.
3670016K bytes of physical memory.
1328927K bytes of SD flash at bootflash:.
Press RETURN to get started!
```

Additional References

Related Documents

Related Topic	Document Title
Cisco IOS master command list	Cisco IOS Master Command List , All Releases
Cisco IOS High Availability commands	*Cisco IOS High Availability Command Reference*

Standards

Standard	Title
No new or modified standards are supported, and support for existing standards has not been modified.	--

MIBs

MIB	MIBs Link
No new or modified MIBs are supported, and support for existing MIBs has not been modified. Cisco ASR 900 Series Aggregation Services Routers MIB Specifications Guide	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs Cisco ASR 900 Series Aggregation Services Routers MIB Specifications Guide

RFCs

RFC	Title
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Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html