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 that are extracted from the consolidated image. This mode provides optimized memory usage and requires that you store files in the bootflash directory.

Note The Install Workflow based ISSU method is supported on the Cisco RSP3 module from Cisco IOS XE release 17.3.1. Also, the legacy ISSU method of using request platform software method is still supported.

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.
SIPSPA Base	Controls interface module 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.
stby-bootflash:	The boot flash memory file system on the standby RSP.
stby-harddisk:	The hard disk file system on the standby RSP.
stby-usb0:	The Universal Serial Bus (USB) flash drive file systems on the standby RSP. **Note** stby-usb1: is an internal port.
system:	The system memory file system, which includes the running configuration.
tar:	The archive file system.
tmpsys:	The temporary system files file system.

File System	Description
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

RP Memory Recommendations

Table 3: Memory Recommendations for the NCS 4200 RSP3 Module - Consolidated Package Image

Platform	Image Name	Software Image	Individual Sub-package Contents	DRAM Memory
NCS 4200 RSP3 Module	Cisco NCS 4200 Series RSP3 UNIVERSAL W/O CRYPTO	ncs4200rsp3-universal.*version* .bin	ncs4200rsp3-rpbase.*version* .pkg	8 GB (RSP3-400)
			ncs4200rsp3-rpcontrol.*version* .pkg	
			ncs4200rsp3-rpaccess.*version* .pkg	
			ncs4200rsp3-rpios-universal.*version*. pkg	
			ncs4200rsp3-espbase.*version.pkg*	
			ncs4200rsp3-sipbase.*version* .pkg	
			ncs4200rsp3-sipspa.*version* .pkg	
			ncs4200rsp3-packages-universal. version.conf	
			packages.conf	

Platform	Image Name	Software Image	Individual Sub-package Contents	DRAM Memory
NCS 4200 RSP3 Module	Cisco NCS 4200 Series RSP3 UNIVERSAL NPE	ncs4200rsp3-universalk9_npe.*version* .bin	ncs4200-hw-programmables.*version* . pkg	8 GB (RSP3-400)
			ncs4200rsp3-espbase.*version* .pkg	
			ncs4200rsp3-packages-universalk9.*version* .pkg	
			ncs4200rsp3-rpacess.*version* .pkg	
			ncs4200rsp3-rpbase.*version* .pkg	
			ncs4200rsp3-rpcontrol.*version* .pkg	
			ncs4200rsp3-rpios-universalk9_npe.*version* .pkg	
			ncs4200rsp3-sipbase.*version*.pkg	
			ncs4200rsp3-sipspa.*version*.pkg	
			packages.conf	

Determining the Software Version

You can use the **show version installed** command to list the installed sub-packages on 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	17.1.1
16.5.1	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS
16.5.X (X=2,3)	NS	NA	NS	Yes	Yes	Yes	Yes	Yes	Yes	Yes
16.6.1	NS	NS	NA	NS	NS	NS	NS	NS	Yes	NS

Supported ISSU Upgrade Or Downgrade Version										
16.6.X (X=2 and later)	NS	Yes	NS	Yes	Yes[1]	Yes[1]	Yes[1]	Yes[1]	Yes[1]	Yes[12]
16.7.X (X=1 and later)	NS	Yes	NS	Yes	Yes	Yes	Yes	Yes	Yes	Yes[3]
16.8.X (X=1 and later)	NS	Yes	NS	Yes[3]	Yes	Yes	Yes	Yes	Yes	Yes[3]
16.9.X (X=1 and later)	NS	Yes	NS	Yes	Yes	Yes	Yes	Yes	Yes	Yes
16.11.X (X=1 and later)	NS	Yes	NS	Yes	Yes	Yes	Yes	Yes	Yes	Yes
16.12.1	NS	NA	NS	Yes	Yes	Yes	Yes	Yes	NA	Yes
17.1.1	NS	NS	NS	Yes	Yes	Yes	Yes	Yes	NS	NS

[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] Step ISSU (upgrade) to 17.1.1 with any of these images as intermediate image (16.9.3 and higher)

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

Restrictions

- 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 will fail.

- It is recommended to set the value of the interface-module-delay to 1200 seconds or more to ensure sufficient time for IM software upgrades based on the scale configuration on the IM.

  - For example, for a 5K scale, the configuration requires approximately 20 minutes to synchronize standby. In this case, the **interface-module-delay** value should be greater than 1200 seconds.

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 5: 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.

General Prerequisites for Software Upgrade

• The system must be booted in sub-package mode (with packages.conf).

• The packages.conf (base image packages) and the upgrade image should exist in the same location in the bootflash.

Bootflash Space Requirements

The software upgrade process requires a minimum of 2X image size available space in bootflash memory.

General Restrictions for Software Upgrade

• Cisco IOS XE software compatibility is supported only between identical image types. Cross-image-type upgrades or installations (such as from an Universal image to an *Universalk9_npeimage)* are *not* supported in the upgrade process.

- Running two different image types simultaneously is *not* supported.

- Software upgrades from one package mode to another are *not* supported.

- For software upgrade from IOS XE Release 16.x.x to IOS XE Release 16.z.z images, use the interface module delay as 1500, if the node has TDM IMs.

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.

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 15.6(4r)S, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2015 by cisco Systems, Inc.
Compiled Thu 29-Oct-15 23:24 by ccai
Current image running: Boot ROM0
```

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

Example:

```
copy bootflash:ncs4200-rommon.15.6(4r)S.pkg
```

Step 3   Use the **upgrade rom-monitor filename** *bootflash:ncs4200-rommon.15.6(4r)S.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:ncs4200rommon.15.6(4r)S.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 15.6(4r)S, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2015 by cisco Systems, Inc.
Compiled Thu 29-Oct-15 23:24 by ccai
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 15.6(4r)S, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2015 by cisco Systems, Inc.
Compiled Thu 29-Oct-15 23:24 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.

Loading the New Image and Preparing for Upgrade

The following sections describe the steps required to load a new image and prepare for an upgrade.

Creating a Service Upgrade Directory

Before creating a new Service Upgrade directory, verify if that directory already exists in the bootflash of the active and standby RSPs.

```
Router# dir bootflash:
Directory of bootflash:/

    11  drwx         16384  Jan 12 2016 02:05:30 +00:00  lost+found
310689  drwx          4096  May 10 2016 17:14:20 +00:00  .prst_sync
    12  -rwx        145860  Jul 30 2016 00:12:46 +00:00  smartdebug.tcl
523265  drwx         77824  Jul 31 2016 15:52:38 +00:00  tracelogs
    13  -rwx          7074  Jan 12 2016 02:06:34 +00:00  tracelogs.508
179873  drwx          4096  Jul 21 2016 21:59:18 +00:00  core
98113  drwx          4096  Jan 12 2016 02:19:45 +00:00  .rollback_timer
605025  drwx          4096  Jan 12 2016 02:20:40 +00:00  .installer
752193  drwx          4096  Jul 29 2016 23:48:14 +00:00  su
```

If the SU directory exists, skip to Deleting an Existing packages.conf File.

If the directory does not exist in the bootflash, create the directory by running the following command:

```
Router# mkdir su
Create directory filename [su]?
Created dir bootflash:/su
```

Deleting an Existing packages.conf File

Before loading the new image to bootflash:su/, you must delete the existing packages.conf file. This step is required only if the bootflash:su/ directory already existed in the bootflash and contains an expanded image with a packages.conf file.

Note Remove all other unused images (.bin, or expanded image with .conf and .pkg as file extensions) from the existing SU directory.

To delete packages.conf on the active RSP:

```
Router# delete bootflash:su/packages.conf

Delete filename [su/packages.conf]?
Delete bootflash:su/packages.conf? [confirm]
```

Repeat this procedure on the standby RSP by running the command **delete stby-bootflash:su/packages.conf**.

If you created the SU directory in the previous step, skip to Copying the Image to bootflash:su/.

Copying the Image to Bootflash

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

From the privileged EXEC mode:

```
Router# copy usb0:ncs4200rsp3-universalk9_npe.03.18.08v.S.156-2.S8v-std.bin bootflash:su/

Destination filename [su/ncs4200rsp3-universalk9_npe.03.18.08v.S.156-2.S8v-std.bin]?
```

For more information on copying the image from a remote server, seehttp://www.cisco.com/c/en/us/td/docs/routers/ncs4200/configuration/guide/sysmgmt/sysimgmgmt-ncs4200-book.html.

Preparing System for Upgrade

The system is ready for upgrade only if this meets the following conditions:

- The value of the configuration register is set to either 0x2 or 0x2102. These values ensure that the system boots using a specified image in the NVRAM.

```
Router# show bootvar
BOOT variable = bootflash:su/packages.conf,12;
CONFIG_FILE variable =
BOOTLDR variable does not exist
Configuration register is 0x2
```

If the value of the configuration register is not 0x2 or 0x2102, set the correct value by running the following command:

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

- The system boot statement points to the packages.conf. This ensures that the systems boots using the packages.conf file.

```
Router#show running-config | section boot
boot-start-marker
boot system bootflash:su/packages.conf
boot-end-marker
```

If the system boot statement points to a different file, delete that file and point the boot statement to the correct file by running the following commands:

```
Router# configure terminal
Router(config)# no boot system
Router(config)# boot system bootflash:su/packages.conf
Router(config)# do copy running-config startup-config
Router(config)# exit
Router# reload
```

Note A system reload affects all services on the system.

Upgrading the Cisco NCS4200 Series Chassis

The following sections describe:

- Upgrading a single-RSP chassis with boot in sub-package mode

- Upgrading a redundant-RSP chassis with boot in sub-package mode

Upgrading a Single-RSP Chassis With Boot in Sub-package Mode

This section describes the standard procedure for all upgrades in an NCS4200 chassis with a single RSP.

Note Ensure that you have followed all instructions in the previous sections to ensure an efficient upgrade.

Expanding the Consolidated Image and Reloading to the New Image

```
Router# request platform software package expand file
bootflash:su/ncs4200rsp3-universalk9_npe.03.18.07v.S.156-2.S7v-std.bin
Router# reload
```

Caution A system reload affects all services on the system.

Note Connectivity to the system is lost while the RSP reboots. Wait for 15 minutes and then reconnect to the system.

Verifying the New Image

After reloading the new image on the chassis, you must verify that the correct image was reloaded.

```
Router# show version

Cisco IOS XE Software, Version 03.18.08v.S - Standard Support Release
```

Upgrading the Firmware on the CEM Cards

First, verify the firmware version on the CEM cards.

```
Router# show hw-module all fpd
```

```
==== ===================== ====== ==============================================
                                    H/W   Field Programmable
                                                      Current       Min. Required
Slot Card Type              Ver.  Device: "ID-Name"   Version       Version
== ==================== ====== ================== =========== ==============
 0/0 NCS4200-1T8LR-PS      1.0   32-UEA 8x1G 1x10G   69.22         69.22
---- --------------------- ------ ----------------- ----------- --------------
 0/2 NCS4200-1T8LR-PS      1.0   32-UEA 8x1G 1x10G   69.22         69.22
---- --------------------- ------ ----------------- ----------- --------------
 0/3 NCS4200-48T3E3-CE     0.1   44-UEA LOTR DSX FP  1.22          1.22
---- --------------------- ------ ----------------- ----------- --------------
 0/4 NCS4200-48T1E1-CE     0.1   44-UEA LOTR DSX FP  1.22          1.22
---- --------------------- ------ ----------------- ----------- --------------
 0/5 NCS4200-1T8S-10CS     0.2   43-UEA EOWYN OCX F  1.12          1.12
```

To upgrade the firmware version, run the following command to reset and reload the new version.

```
Router# upgrade hw-module subslot 0/4 fpd bundled reload
% Are you sure that you want to perform this operation? [no]: yes
```

⚠

Caution   A module reload affects all services on that module.

Upgrading the Redundant-RSP Chassis With Boot in Sub-package Mode

This section describes the standard procedure for all upgrades in an NCS4200 chassis with a redundant RSP.

✎

Note   Ensure that you have followed all instructions in the previous sections to ensure an efficient upgrade.

Confirming Stateful Switch-Over Configuration

If IGP and MPLS are configured on the chassis, it is recommended that NSR or NSF configuration are enabled for IGP and MPLS. These configuration reduce the loss of traffic during RSP switchover during the upgrade process.

Before upgrading a redundant-RSP chassis, verify if the *redundancy* and *mode sso* are set.

```
Router# show running-config | section redundancy
redundancy
mode sso
```

If the above values are missing, run the following commands to configure the chassis for SSO redundancy:

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

Router# show redundancy states | include peer
peer state = 8 -STANDBY HOT
Router#
```

Note The standby RSP should be in 'STANDBY HOT' state.

Upgrading Using a Single Command

The single-command upgrade initiates the installation procedure using the consolidated image.

You can adjust the delay between the Online Insertion and Removal (OIR) of each Interface Module (IM) using the **interface-module-delay** keyword.

Warning It is recommended to set the value of the **interface-module-delay** to 1200 seconds or more to ensure sufficient time for IM software upgrades.

```
Router# request platform software package install node file bootflash:issu/
ncs4200rsp3-universalk9_npe.03.18.06v.S.156-2.S6v-std.bin interface-module-delay 1200
```

Caution In case of firmware upgrade on an IM, the IM is reset and services on the IM are affected.

Note Connectivity to the system is lost while the active RSP switches over to the standby RSP. Wait for a minute and then reconnect to the system.

Verifying the New Image

After reloading the new image on the chassis, you must verify that the correct image was reloaded.

```
Router# show version
```

```
Cisco IOS XE Software, Version 03.18.08v.S - Standard Support Release
```

Upgrading the Firmware on the CEM Cards

First, verify the firmware version on the CEM cards.

```
Router# show hw-module all fpd
```

```
==== ====================== ====== ===============================================
                              H/W  Field Programmable
                                                      Current      Min. Required
Slot Card Type               Ver.  Device: "ID-Name"  Version      Version
== ====================== ====== ================== =========== ==============
```

```
 0/0 NCS4200-1T8LR-PS        1.0   32-UEA 8x1G 1x10G  69.22       69.22
---- ---------------------- ------ ----------------- ----------- --------------
 0/2 NCS4200-1T8LR-PS        1.0   32-UEA 8x1G 1x10G  69.22       69.22
---- ---------------------- ------ ----------------- ----------- --------------
 0/3 NCS4200-48T3E3-CE       0.1   44-UEA LOTR DSX FP 1.22        1.22
---- ---------------------- ------ ----------------- ----------- --------------
 0/4 NCS4200-48T1E1-CE       0.1   44-UEA LOTR DSX FP 1.22        1.22
---- ---------------------- ------ ----------------- ----------- --------------
 0/5 NCS4200-1T8S-10CS       0.2   43-UEA EOWYN OCX F 1.12        1.12
```

To upgrade the firmware version, run the following command to reset and reload the new version.

```
Router# upgrade hw-module subslot 0/4 fpd bundled reload
% Are you sure that you want to perform this operation? [no]: yes
```

⚠️

Caution   A module reload affects all services on that module.

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 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
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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

Related Topic	Document Title
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

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No new or modified MIBs are supported, and support for existing MIBs has not been modified.	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

RFCs

RFC	Title
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Description	Link
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