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 router supports both consolidated and sub-packages 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.
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

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 2: 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	
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.

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.

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 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.

Expanding the Consolidated Image on the Active and Standby RSPs 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# request platform software package expand file
stby-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
```

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

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