

Cisco NCS5700

IOS-XR7 Release 7.8.1

IOS-XR7 System Upgrade Procedure

Table of Contents

1 Introduction.....	3
1.1 Purpose, Scope and Audience	3
1.2 Upgrade/downgrade Matrix	3
1.3 Summary of Upgrade Steps.....	4
1.4 Mandatory SMUs	4
1.5 Packages for Upgrade	4
1.6 Required Package files	5
2 Pre-Upgrade Task	6
2.1 Configuration Backup	6
2.2 System Stability check	6
2.3 Cost out IGP:	7
2.4 Enable auto-fpd upgrade:	7
2.5 Disk Cleanup:	7
3 Software Upgrade.....	8
3.1 Optional packages installation procedure	9
4 Post Upgrade Tasks.....	10
5 Other Boot Options (GISO/IPXE/USB)	11
6 Downgrade from 7.8.1 IOS XR Release	12
6.2 Post Downgrade Tasks.....	12
7 Caveats.....	13

1 Introduction

1.1 Purpose, Scope and Audience

The purpose of this document is to describe the upgrade and downgrade procedure for the Cisco NCS 5700 Series Network Convergence System Router, Release IOS-XR 7.8.1

Audience: This guide is for Cisco Systems Field Engineers and Network Operators. It is split into four sections.

1.2 Upgrade/downgrade Matrix

Single Step Upgrade/Downgrade is supported for following releases:

Platform	Supported From	To
NCS5700 Fixed	IOS-XR 7.3.2/7.4.x/7.5.x/7.6.x/7.7.x	IOS-XR 7.8.1

Supported variants under NCS5700L:

- NCS-57B1-6D24-SYS/NCS-57B1-5DSE-SYS
- NCS-57C1-48Q6-SYS
- NCS-57D2-18DD-SYS

1.3 Summary of Upgrade Steps

Step 1 Copy the ISO (or GISO) image to the /harddisk: location on the router.

Step 2 Upgrade the system to replace the current software with the .iso image.

Example:

```
Router#install package replace /harddisk:/ncs5700-x64-7.8.1.iso
```

Step 3 Activate the new .iso image on the router by applying the changes.

Example:

```
Router#install apply {reload | restart} [noprompt]
```

Step 4 Verify that the image is activated successfully.

Example:

```
Router#show install request
```

Step 5 Commit the transaction.

Example:

```
Router#install commit
```

1.4 Mandatory SMUs

The following table outlines the SMUs that must be installed for upgrade and downgrade procedure.

Table 1: Needed Mandatory SMUs

Release	Mandatory/Optional SMUs	
	Upgrade SMUs	Downgrade SMUs
R7.3.2	NA	NA
R7.4.x	NA	NA
R7.5.x	NA	NA
R7.6.x	NA	NA
R7.7.x	NA	NA

1.5 Packages for Upgrade

Following files are available to download for various boot options:

Table 2: IOS-XR Software files available for download

#	File	Contents	Comment
1	ncs5700-x64-7.8.1.iso	NCS 5700 IOS XR Software	Contains Boot image
2	ncs5700-k9sec-rpms.7.8.1.tar	NCS 5700 IOS XR Software 3DES	Contains k9sec rpm
3	ncs5700-usb_boot-7.8.1.zip	NCS 5700 IOS XR Software	Contains USB Boot Package
4	ncs5700-optional-rpms.7.8.1.tar	NCS 5700 IOS XR Software	Optional Packages

1.6 Required Package files

Mini ISO Package is mandatory to perform the System Upgrade and upgrade needs to be done from XR VM. Additional XR packages listed below are needed depending on the router configuration and required features:

Description	Package Name
Boot Image	ncs5700-x64-7.8.1.iso

2 Pre-Upgrade Task

Note: Config backup, precheck, Image download, tar file copy to router and install add are hitless operation and can be done outside of MW.

2.1 Configuration Backup

- Copy the running-configuration to a harddisk: on the router.

```
RP/0/RP0/CPU0:57XX# copy running-config harddisk:/running_config
```

- Copy the running-configuration to a remote scp server

```
RP/0/RP0/CPU0:57XX#scp harddisk:/<file name> <user_name>@<server ip>:/<path>
```

2.2 System Stability check

- The following commands should be executed to verify basic system stability before the upgrade. At the XR prompt:

show platform	verify that all nodes are in "IOS XR RUN/OPERATIONAL" state
show ipv4 interface brief <or> show ipv6 interface brief <or> show interface summary	verify that all necessary interfaces are "UP"
show install active	verify that the proper set of packages are active
show install committed	verify that the proper set of committed packages are same as active. If not, execute 'install commit'
cfs check/clear configuration inconsistency	verify/fix configuration file system
show hw-module fpd	Ensure all the FPD versions status are CURRENT Please refer to "Field Programmable Versions Document" for FPD version information.
show alarms	Shows any outstanding alarms in system
show media	Shows the disk usage
show inventory	Shows chassis inventory information
show logging	Capture show logging to check for any errors

2.3 Cost out IGP:

Cost-out IGP: To minimize traffic loss during the upgrade please follow below steps:

For OSPF use “max-metric” command.

```
RP/0/RP0/CPU0:57XX(config-ospf)# max-metric router-lsa
```

For ISIS use “set-overload-bit” command.

```
RP/0/RP0/CPU0:57XX(config-isis)# set-overload-bit
```

2.4 Enable auto-fpd upgrade:

Enable auto FPD auto upgrade from XR.

```
RP/0/RP0/CPU0:57XX(config)#fpd auto-upgrade enable  
RP/0/RP0/CPU0:57XX(config)#commit
```

2.5 Disk Cleanup:

Check available space in install repository. At least 2G of free space is required to perform System upgrade. If copying the packages and SMU's to the harddisk ensure 50% free space on the harddisk. Check in XR plane

XR:

```
RP/0/RP0/CPU0:57XX# show media location 0/RP0/CPU0
```

3 Software Upgrade

Step 1 Download the image from CCO and Copy the ISO (or GISO) image to the `/harddisk:` location on the router.

Step 2 Upgrade the system to replace the current software with the .iso image.

Example:

```
Router#install package replace /harddisk:/ncs5700-x64-7.8.1.iso
```

Step 3 Activate the new .iso image on the router by applying the changes.

Example:

```
Router#install apply {reload | restart} [noprompt]
```

To identify whether a reload is required or only process restart is needed, use either `show install history last transaction verbose` command or `show install request` command.

Include the keyword `noprompt` in the command to enable the system to bypass your permission to reload the router.

Applying the change gives you the flexibility to test the operation of the new software before committing the changes. If you reload the router, the router reverts the software to its previous software state.

All operations that automatically apply the new software are prohibited when an atomic change is already in progress. You must address the current atomic-change before performing this operation. To address the change, apply the current atomic-change, or abort it with the `install package abort all-since-apply` command.

Step 4 Verify that the image is activated successfully.

Example:

```
Router#show install request
```

Step 5 Commit the transaction and execute `show version` to check the details.

Example:

```
Router#install commit
```

```
RP/0/RP0/CPU0:57XX#show version
Cisco IOS XR Software, Version 7.8.1 LNT
Copyright (c) 2013-2022 by Cisco Systems, Inc.
```

Build Information:

```
Built By      : ingunawa
Built On      : Wed Nov 23 00:02:05 UTC 2022
Build Host    : iox-ucs-059
Workspace     : /auto/srcarchive16/prod/7.8.1/ncs5700/ws
Version       : 7.8.1
Label         : 7.8.1
```

```
cisco NCS5700 (D-1633N @ 2.50GHz)
cisco NCS-57D2-18DD-SYS (D-1633N @ 2.50GHz) processor with 32GB of memory
57XX uptime is 2 hours, 19 minutes
NCS 57D2 7.2T Fixed Base Chassis 66 QSFP-DD flexible ports
```


3.1 Optional packages installation procedure

- Copy the required RPMs in a repository and make sure the repository is reachable.
- Repository can be hosted locally on the router or on a remote server which is reachable over http/https/ftp
- Creating a local repository:
 1. Create a directory under the /hddisk:/, say "new_repo"
 2. Copy the rpm .tgz file on the router under this directory
 3. Unzip and untar all the .tgz file: "tar -xzvf <rpm tar ball>" (in this case ncs5700-optional-rpms.7.8.1.tar)
 4. Then configure the repository on XR, as per below example

Sample config of local repository:

```
RP/0/RP0/CPU0:ios#show run install
install
 repository new-repo
  url file:///misc/disk1/new_repo
!
```

- Creating a remote repository:
 1. Identify a remote linux machine is reachable over http/https/ftp
 2. Create a directory, say 'repo' under the http root dir on the machine
 3. Copy the rpm .tgz file on the machine inside the 'repo' directory
 4. Unzip and untar all the .tgz file: "tar -xzvf <rpm tar ball>"
 5. Convert the dir into repository by running 'createrepo /path/to/repo-dir/'
 6. Configure the repository on XR, as per below example.

Sample config of remote repository:

```
RP/0/RP0/CPU0:ios#show run install
install
 repository REPO
  url http://192.168.1.20/sit/REPO
!
```

Make sure the router can reach the repository server over management interface.

- Check 'show install available' to make sure the RPMs are available to install.

Sample output:

```
RP/0/RP0/CPU0:ios#show install available
Trying to access repositories...
```

Package	Version	Repository	Cached	Architecture
xr-cdp	7.8.1v1.0.0-1	local-repo	Y	x86_64
xr-eigrp	7.8.1v1.0.0-1	local-repo	Y	x86_64
xr-ncs5700-core	7.8.1v1.0.1-1		Y	x86_64
xr-telnet	7.8.1v1.0.0-1	local-repo	Y	x86_64

- Add all the packages intended to install, as shown below, with their intended versions.

```
RP/0/RP0/CPU0:ios#install package add xr-telnet-7.8.1v1.0.0-1
```

NOTE: Do not use 'install package upgrade'

- Once this operation completes, execute the below command:

```
RP/0/RP0/CPU0:ios#install apply reload
```

- After reload, once the device is up with 7.8.1 image, perform the install commit:

```
RP/0/RP0/CPU0:ios#install commit.
```

4 Post Upgrade Tasks

- Verify/fix configuration file system (mandatory):

```
RP/0/RP0/CPU0:57XX#cfs check
```

- Verify fpd versions running are current:

```
RP/0/RP0/CPU0:57XX#show hw-module fpd
```

- Restore IGP metric if changed before the upgrade (this is done from xr vm)

OSPF

```
RP/0/RP0/CPU0:57XX# (config-ospf)# no max-metric router-lsa
```

ISIS

```
RP/0/RP0/CPU0:57XX# (config-isis)# no set-overload-bit
```

- Check to see if there were any failed startup configurations.

```
RP/0/RP0/CPU0:57XX#show configuration failed startup
```

- Execute 'install commit' to commit the newly active software (install commit is required after any install activate operation else after router reload, nodes will go back to previously committed software)

```
RP/0/RP0/CPU0:57XX#install commit
```

5 Other Boot Options (GISO/IPXE/USB)

Please refer below for various boot options:

Router Bring up:

<https://www.cisco.com/c/en/us/td/docs/iosxr/ncs5500/system-setup/77x/b-system-setup-cg-ncs5500-77x/m-ncs5700-system-setup.html>

GISO/IPXE and USB Boot option:

<https://www.cisco.com/c/en/us/td/docs/iosxr/ncs5500/system-setup/77x/b-system-setup-cg-ncs5500-77x/m-additional-install-operations.html>

Please find below the link for more information about installation of optional rpms.

<https://www.cisco.com/c/en/us/td/docs/iosxr/ncs5500/system-setup/77x/b-system-setup-cg-ncs5500-77x/m-install-ios-xr-software.html>

6 Downgrade from 7.8.1 IOS XR Release

Downgrade can be performed by following options.

Step 1 Disable fpd auto-upgrade

Copy the ISO (or GISO) image to the /harddisk: location on the router.

Step 2 Upgrade the system to replace the current software with the .iso image.

Example:

```
Router#install package replace /harddisk:/ncs5700-x64-7.3.1.iso
```

Step 3 Activate the new .iso image on the router by applying the changes.

Example:

```
Router#install apply {reload | restart} [noprompt]
```

Step 4 Verify that the image is activated successfully.

Example:

```
Router#show install request
```

Step 5 Commit the transaction.

Example:

```
Router#install commit
```

6.1 Post Downgrade Tasks

- Verify/fix configuration file system (mandatory):

```
RP/0/RP0/CPU0:57XX#cfs check
```

- Verify fpd versions running are current:

```
RP/0/RP0/CPU0:57XX#show hw-module fpd
```

- Restore IGP metric if changed before the upgrade (this is done from xr vm)

OSPF

```
RP/0/RP0/CPU0:57XX(config-ospf)# no max-metric router-lsa
```

ISIS

```
RP/0/RP0/CPU0:57XX(config-isis)# no set-overload-bit
```

7 Caveats

NA