

# **Cisco NCS5700**

## **IOS-XR7 Release 7.7.2**

### **IOS-XR7 System Upgrade Procedure**

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# 1 Introduction

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## 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 7.7.2

**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 7.3.1/7.3.2/7.5.1./7.5.2/7.6.1/7.6.2/7.7.1	IOS-XR 7.7.2

## 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.

**1.3.1.1.1 Example:**

```
Router#install package replace /harddisk:/ncs5700-x64-7.7.2.iso
```

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

**1.3.1.1.2 Example:**

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

**Step 4** Verify that the image is activated successfully.

**1.3.1.1.3 Example:**

```
Router#show install request
```

**Step 5** Commit the transaction.

**1.3.1.1.4 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
R7.3.1	CSCvy66646	NA
R7.3.2	NA	NA
R7.4.x	NA	NA
R7.5.x	NA	NA
R7.6.x	NA	NA

\*Applicable to eXR only.

## 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-x64-7.7.2.iso	NCS 5700 IOS XR Software	Contains Boot image
2	ncs5700-k9sec-rpms.7.7.2.tar	NCS 5700 IOS XR Software 3DES	Contains k9sec rpm
3	ncs5700-usb_boot-7.7.2.zip	NCS 5700 IOS XR Software	Contains USB Boot Package
4	ncs5700-optional-rpms.7.7.2.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-x64-7.7.2.iso

## 2 Pre-Upgrade Task

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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 “spf-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

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Because of FPD and kernel changes in IOS-XR 772 release, NCS5700 platform needs to be upgraded to IOS-XR 751 release first. Once router upgraded to IOS-XR 751 CCO image, please upgrade FPDs in IOS-XR 751 before proceeding to upgrade to IOS-XR 772 release.



**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.

**3.1.1.1.1 Example:**

```
Router#install package replace /harddisk:/ncs5700-x64-7.7.2.iso
```

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

**3.1.1.1.2 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.

**3.1.1.1.3 Example:**

```
Router#show install request
```

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

**3.1.1.1.4 Example:**

```
Router#install commit
```

```
Cisco IOS XR Software, Version 7.7.2 LNT
Copyright (c) 2013-2022 by Cisco Systems, Inc.
```

Build Information:

```
Built By      : ingunawa
Built On      : Wed Oct 26 17:22:02 UTC 2022
Build Host    : iox-ucs-063
Workspace     : /auto/srcarchive14/prod/7.7.2/ncs5700/ws
Version       : 7.7.2
Label         : 7.7.2
```

```
cisco NCS5700 (D-1563N @ 2.00GHz)
cisco NCS-57B1-6D24-SYS (D-1563N @ 2.00GHz) processor with 16GB of
memory
NCS-57B1-ST_PE8 uptime is 36 minutes
NCS55B1 Fixed Base HW Flexible Consumption Need Smart Lic
```

## 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:
  - Create a directory under the /harddisk:/, say "new\_repo"
  - Copy the rpm .tgz file on the router under this directory
  - Unzip and untar all the .tgz file: "tar -xzvf <rpm tar ball>" (in this case ncs5700-optional-rpms.7.7.2.tar)
  - Then configure the repository on XR, as per below example

### Sample config of local repository:

```
RP/0/RP0/CPU0:iso#show run install
install
```

```
repository new-repo
```

```
url file:///misc/disk1/new_repo
```

```
!
```

- Creating a remote repository:

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

### Sample config of remote repository:

```
RP/0/RP0/CPU0:iso#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			Architecture
Version	Repository	Cached	
-----			
xr-cdp			x86_64
7.7.2v1.0.0-1	local-repo	Y	
xr-eigrp			x86_64
7.7.2v1.0.0-1	local-repo	Y	
xr-ncs5700-core			x86_64
7.7.2v1.0.1-1		Y	
xr-telnet			x86_64
7.7.2v1.0.0-1	local-repo	Y	

NOTE: Do not use 'install package upgrade'

- Add all the packages intended to install, as shown below, with their intended versions.  
RP/0/RP0/CPU0:ios#install package add xr-telnet-7.7.2v1.0.0-1
- Once this operation completes, execute the below command:  
RP/0/RP0/CPU0:ios#install apply reload

- o After reload, once the device is up with 7.7.2 image, perform the install commit:  
RP/0/RP0/CPU0:ios#install commit.

## 4 Post Upgrade Tasks

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- 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)

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Please refer below for various boot options:

Router Bring up:

<https://www-author3.cisco.com/content/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-author3.cisco.com/content/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-author3.cisco.com/content/en/us/td/docs/iosxr/ncs5500/system-setup/77x/b-system-setup-cg-ncs5500-77x/m-install-ios-xr-software.html>

## 6 Downgrade from 7.7.2 IOS XR Release

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Downgrade can be performed by following options.

Disable fpd auto-upgrade

**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.

**6.1.1.1.1 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.

**6.1.1.1.2 Example:**

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

**Step 4**

Verify that the image is activated successfully.

**6.1.1.1.3 Example:**

```
Router#show install request
```

**Step 5**

Commit the transaction.

**6.1.1.1.4 Example:**

```
Router#install commit
```

## 6.2 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

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Because of FPD and kernel changes in IOS-XR 772 release, NCS5700 platform needs to be upgraded to IOS-XR 731 release first. Once router upgraded to IOS-XR 731 CCO image, please upgrade FPDs in IOS-XR 731 before proceeding to upgrade to IOS-XR 772 release.