

# **Cisco NCS5700**

## **IOS-XR7 Release 7.6.1**

### **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 7.6.1

**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 | 7.3.1          | 7.6.1 |

## 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-x64-7.6.1.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 Cisco Software Manager

Cisco Software Manager (CSM) can be used to manage SMUs, to create your own SMU tar ball, or find out which SMUs are applicable to your network. More information on CSM: [Download CSM/CSM Documentation](#)

## 1.5 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 |
| R7.0.x  | NA                      | NA             |
| R7.1.x  | NA                      | NA             |
| R7.2.x  | NA                      | NA             |
| R7.3.x  | NA                      | NA             |

\*Applicable to eXR only.

## 1.6 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-x64-7.6.1.iso           | NCS 5700 IOS XR Software      | Contains Boot image       |
| 2 | ncs5700-k9sec-rpms.7.6.1.tar    | NCS 5700 IOS XR Software 3DES | Contains k9sec rpm        |
| 3 | ncs5700-usb_boot-7.6.1.zip      | NCS 5700 IOS XR Software      | Contains USB Boot Package |
| 4 | ncs5700-optional-rpms.7.6.1.tar | NCS 5700 IOS XR Software      | Optional Packages         |

## 1.7 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-x64-7.6.1.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<br><or><br>show ipv6 interface brief<br><or><br>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.<br>If not, execute 'install commit'                                 |
| cfs check/clear<br>configuration<br>inconsistency  | verify/fix configuration file system   |
| show hw-module fpd   | Ensure all the FPD versions status are CURRENT<br>Please refer to "Field Programmable Versions Document" for FPD<br>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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**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-x64-7.6.1.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
```

```
RP/0/RP0/CPU0:57XX#show version
Tue Mar 29 15:54:14.881 UTC
Cisco IOS XR Software, Version 7.6.1 LNT
Copyright (c) 2013-2022 by Cisco Systems, Inc.
```

Build Information:

```
Built By      : ingunawa
Built On      : Sun Mar 27 01:23:01 UTC 2022
Build Host    : iox-ucs-051
Workspace     : /auto/srcarchive17/prod/7.6.1/ncs5700/ws
Version       : 7.6.1
Label        : 7.6.1-iso
```

```
cisco NCS5700 (D-1563N @ 2.00GHz)
cisco NCS-57B1-6D24-SYS (D-1563N @ 2.00GHz) processor with 32GB of
memory
```

```
PE61-ST uptime is 10 hours, 50 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:
  - o Create a directory under the /harddisk:/, say "new\_repo"
  - o Copy the rpm .tgz file on the router under this directory
  - o Unzip and untar all the .tgz file: "tar -xzf <rpm tar ball>" (in this case ncs5700-optional-rpms.7.6.1.tar)
  - o 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
!
```

- o 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 -xzf <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.

- o 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          | 7.6.1v1.0.0-1 | local-repo | Y      | x86_64       |
| xr-eigrp        | 7.6.1v1.0.0-1 | local-repo | Y      | x86_64       |
| xr-ncs5700-core | 7.6.1v1.0.1-1 |            | Y      | x86_64       |
| xr-telnet       | 7.6.1v1.0.0-1 | local-repo | Y      | x86_64       |

NOTE: Do not use 'install package upgrade'

- o Add all the packages intended to install, as shown below, with their intended versions.  
RP/0/RP0/CPU0:ios#install package add xr-telnet-7.6.1v1.0.0-1

- o 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 7.6.1 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)

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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/76x/b-system-setup-cg-ncs5500-76x/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/76x/b-system-setup-cg-ncs5500-76x/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/76x/b-system-setup-cg-ncs5500-76x/m-install-ios-xr-software.html>

## 6 Downgrade from 7.6.1 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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There are no caveats for System Upgrade to 7.6.1