



# **NCS 5500 Series**

## **System Upgrade Procedure**

IOS-XR from 6.1.x /6.2.x/6.3.x/6.5.x/6.6.X to 7.0.1

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# Background

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## Scope of this document

This document provides information on the two methods available for system upgrade for NCS5500 Series platforms from software version 6.1.3/6.1.4/6.2.25/6.3.1/6.3.3/6.2.25/6.5.3/6.6.25 to 7.0.1

Platforms	From	To
NCS 5500 Modular Chassis (NCS 5504,5508, 5516)	6.1.3/6.1.4/6.2.25/6.3.1/6.3.3/6.2.25/6.5.3/ 6.6.25	7.0.1
NCS 5500 Fixed Platforms (5501, 5501-SE,55A1, 5502, 5502-SE)	6.1.3/6.1.4/6.2.25/6.3.1/6.3.3/6.2.25/6.5.3/ 6.6.25	7.0.1

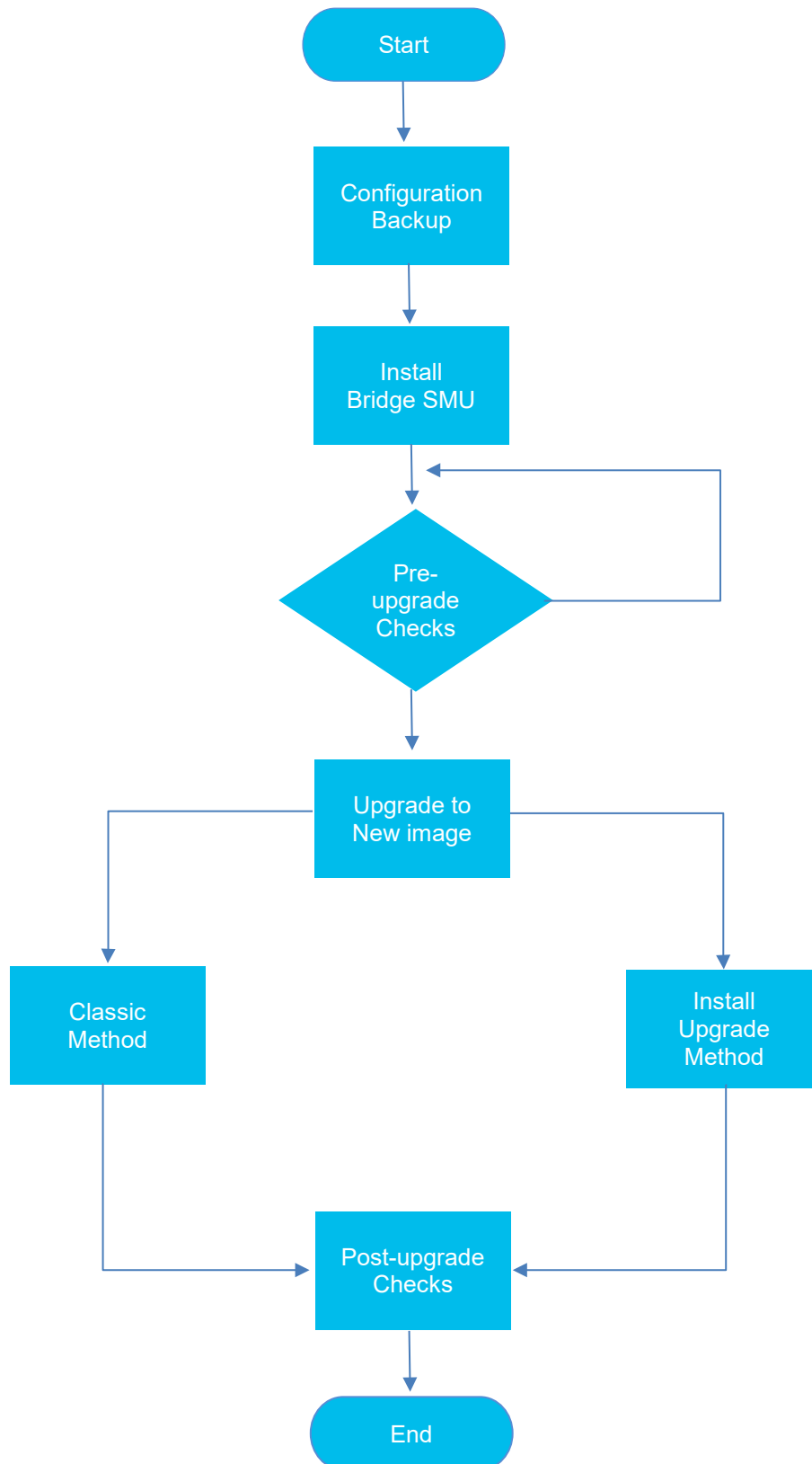
# Obtain Required Package Files

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:

Package Description	Package Filename
<b>Cisco IOS XR IP Unicast Routing Core Bundle</b> Contains the required core packages, including OS, Admin, Base, Forwarding, Modular Services Card, Routing, SNMP Agent, and Alarm Correlation	<a href="#">ncs5500-mini-x-7.0.1.iso</a>
<b>Cisco IOS XR Manageability Package</b> Telemetry, Extensible Markup Language (XML), Parser, and HTTP server packages, NETCONF, YANG Models, gRPC	<a href="#">ncs5500-mgbl-3.0.0.0-r701.x86_64.rpm</a>
<b>Cisco IOS XR MPLS Package</b> Label Distribution Protocol (LDP), MPLS Forwarding, MPLS Operations, Administration, and Maintenance (OAM), Link Manager Protocol (LMP), Optical User Network Interface (OUNI) and Layer-3 VPN	<a href="#">ncs5500-mpls-2.1.0.0-r701.x86_64.rpm</a>
<b>Cisco IOS XR MPLS-TE and RSVP Package</b> MPLS Traffic Engineering (MPLS-TE) and Resource Reservation Protocol (RSVP)	<a href="#">ncs5500-mpls-te-rsvp-3.1.0.0-r701.x86_64.rpm</a>
<b>Cisco IOS XR MCAST Package</b> Contains Automatic Multicast Tunneling (AMT), IGMP Multicast Listener Discovery (MLD), Multicast Source Discovery Protocol (MSDP) and PIM	<a href="#">ncs5500-mcast-2.1.0.0-r701.x86_64.rpm</a>
<b>Cisco IOS XR Security Package</b> Support for Encryption, Decryption, IP Security (IPSec), Secure Shell (SSH), Secure Socket Layer (SSL), and Public-key Infrastructure (PKI)	<a href="#">ncs5500-k9sec-3.1.0.0-r701.x86_64.rpm</a>
<b>Cisco IOS XR OSPF Package</b> Open Shortest Path First (OSPF) version 2 for IPv4 and OSPF version 3 for IPv6	<a href="#">ncs5500-ospf-2.0.0.0-r701.x86_64.rpm</a>
<b>Cisco IOS XR IS-IS Package</b> Intermediate System to Intermediate System (IS-IS)	<a href="#">ncs5500-isis-2.1.0.0-r701.x86_64.rpm</a>
<b>Cisco IOS XR LI Package</b> Lawful Intercept	<a href="#">ncs5500-li-1.0.0.0-r701.x86_64.rpm</a>
<b>Cisco IOS XR USB Boot Package</b>	<a href="#">ncs5500-usb_boot-7.0.1.zip</a>

# Flow Diagram of System Upgrade

---



# Configuration Backup

---

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

```
RP/0/RP0/CPU0:router#copy running-config harddisk:<filename>
```

- 2) Copy the running-configuration to a remote tftp server

```
RP/0/RP0/CPU0:router#copy running-config  
tftp://<tftp_server_IP_Address>/<TFTP Server Location>
```

## Example:

```
RP/0/RP0/CPU0:router#copy running-config  
tftp://223.255.254.254/auto/tftp-gyre/user1/running_cfg
```

## 2. Install Bridge SMUs

---

This section lists the \*Bridge SMUs needed to perform a System Upgrade from 6.1.3/6.1.4/6.2.25/6.3.1/6.3.3/6.2.25/6.5.3/ 6.6.25 to 7.0.1 image. Bridge SMUs will be available for download from CCO. Please refer the below table for bridge SMUs. Please install the bridge SMUs before upgrading to 7.0.1

**Bridge SMU:** Here bridge SMU means all the mandatory SMUs required to upgrade to Target release from Base Release

Base (From) Release	Target (To) Release	Bridge SMU
6.1.3	7.0.1	CSCvf01652, CSCvf46971 (XR and SYSADMIN)
6.1.31	7.0.1	CSCve17920, CSCvf70917, CSCvf01652 (XR and SYSADMIN)
6.1.4	7.0.1	CSCvf01652 (XR and SYSADMIN)
6.2.2	7.0.1	CSCvf01652 (XR and SYSADMIN)
6.2.3	7.0.1	No Bridge SMU required
6.2.25	7.0.1	CSCvf01652 (XR and SYSADMIN)
6.3.1	7.0.1	CSCvf01652 (XR and SYSADMIN)
6.3.3	7.0.1	No Bridge SMU required
6.5.1	7.0.1	No Bridge SMU required
6.5.3	7.0.1	No Bridge SMU required
6.6.25	7.0.1	No Bridge SMU required

Before installing the SMU, run “clear configuration inconsistency” from XR.

```
RP/0/RP0/CPU0:router#clear configuration inconsistency
```

```
Creating any missing directories in Configuration File system...OK
```

```
Initializing Configuration Version Manager...OK
```

```
Syncing commit database with running configuration...OK
```



**Note:** Both “install add source” and “install source” can be used since 6.6.1

# Perform Pre-Upgrade Tasks

---

## 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 "OPERATIONAL" state)

#show platform vm       (verify that all nodes are in "FINAL Band" state)

#show redundancy        (verify that a Standby RP is available and in "ready" state)

#show ipv4 interface brief
#show ipv6 interface brief
#show interface summary (verify that all necessary interfaces are "UP")

#install verify packages (no anomalies should be displayed)

#show install active     (verify that the proper set of packages are active)

#show install commit     (verify that the proper set of committed packages are same as
active. If not, execute 'install commit')

# show health gsp        (verify transport infrastructure is OK)
# admin show controller fabric health (quick fabric health check)

#show hw-module fpd      (Ensure all the FPD versions status are CURRENT)
```

Please refer to section “**Field Programmable Versions**” for FPD version information.  
Power down all unused cards.

### 1) To minimize traffic loss during the upgrade please follow below steps:

- a. Make sure that all the traffic flowing through the router which needs to be upgraded has an alternate path. In this scenario, one can take one of the redundant routers out of service, upgrade it and then bring it back into service without any significant traffic loss (this should work for the core routers, for the edge devices usually the redundant path may not be available)
- b. Set IGP metric to the highest possible value so the IGP will try to route the traffic through the alternate path.

For OSPF use “max-metric” command.

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

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

```
RP/0/RP0/CPU0:router(config-ospf)#set-overload-bit
```

- c. After all the software is upgraded restore the IGP metric by removing the commands:

#### OSPF

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

#### ISIS

```
RP/0/RP0/CPU0:router(config-ospf)#no set-overload-bit
```

## 2) Enable auto FPD auto upgrade from XR and Sysadmin.

```
RP/0/RP0/CPU0:router(config)#fpd auto-upgrade enable
RP/0/RP0/CPU0:router(config)#commit
RP/0/RP0/CPU0:router#show run fpd auto-upgrade
fpd auto-upgrade enable

RP/0/RP0/CPU0:router#admin

admin connected from 127.0.0.1 using console on xr-vm_node0_RP0_CPU0
sysadmin-vm:0_RP0#config
Fri Aug 30 08:24:29.717 UTC+00:00
Entering configuration mode terminal
sysadmin-vm:0_RP0(config)#fpd auto-upgrade enable
sysadmin-vm:0_RP0(config)#commit
sysadmin-vm:0_RP0#show running-config fpd
Tue Aug 07 18:19:40.945 UTC
fpd auto-upgrade enable
```



### Note

For CFP2-MPA, please shutdown laser before upgrading FPD.

CSCvk08049 To support CFP2 DCO optics auto-fpd upgrade without manual laser shut

## 3) Check available space in install repository. At least 2G of free space is required to perform System upgrade.

```
sysadmin-vm:0_RP0# show media
Fri Aug 30 08:25:10.632 UTC+00:00
```

Partition	Size	Used	Percent	Avail
rootfs:	2.4G	1.1G	48%	1.2G
install:	7.4G	1.1G	16%	6.0G
harddisk:/tftpboot	31G	2.1G	8%	28G
harddisk:	38G	6.5G	19%	29G
log:	459M	168M	40%	257M
log:	459M	168M	40%	257M
config:	459M	8.5M	2%	416M
disk0:	2.0G	3.5M	1%	1.9G
rootfs:/mnt/plog	15M	292K	3%	14M
install:/tmp	7.4G	1.1G	16%	6.0G
install:/cache	7.4G	1.1G	16%	6.0G
rootfs:/install/tmp	7.4G	1.1G	16%	6.0G

#### 4) Check health of the system before proceeding to install upgrade operation

```
sysadmin-vm:0_RP0# show install health
Fri Aug 30 08:26:07.910 UTC+00:00
Platform is: ncs5500
Collecting Cards Information
Collecting Sysadmin VMs Information
Collecting XR VMs Information
Verifying all the required VMs are running.
Pass: All required VMs are Running
Collecting sysadmin VMs data
Collecting Host data
Collecting XR VMs data
Collecting Lead VMs data
Verifying Test Plugins
Verifying Plugins results
Verifying Result for:cal_version
Verifying Result for:host_version
Verifying Result for:cal_smus
Verifying Result for:host_smus
Verifying Result for:xr_version
Verifying Result for:cal_local_active_swp
Verifying Result for:xr_smus
Verifying Result for:cal_local_committed_swp
Verifying Result for:xr_disk_space
Verifying Result for:cal_disk_space
Verifying Result for:xr_marker_files
Verifying Result for:cal_marker_files
Verifying Result for:xr_mount_points
Verifying Result for:cal_mount_points
Verifying Result for:xr_stale_symlinks
Verifying Result for:cal_stale_symlinks
Verifying Result for:xr_prepared_packages
Verifying Result for:cal_prepared_packages
Verifying Result for:cal_master_active_swp
Verifying Result for:cal_master_committed_swp
Verifying Result for:xr_master_active_swp
Verifying Result for:xr_master_committed_swp
Verifying Result for:xr_local_active_swp
Verifying Result for:xr_local_committed_swp
Verifying Result for:cal_tftp_boot_image_version
Verifying Result for:cal_image
Verifying Result for:system_image_version
Verifying Result for:system_image_stale_symlink
Verifying Result for:system_image_file
*****
System is in Consistent State. You can go ahead with next operation.
*****
Total time taken: 12.4909930229 seconds.
```

**5) Check inactive packages and remove them before upgrading.**

XR:

```
RP/0/RP0/CPU0:router# show install active summary
Active Packages: 9
  ncs5500-xr-6.6.25 version=6.6.25 [Boot image]
  ncs5500-mgbl-3.0.0.0-r6625
  ncs5500-li-1.0.0.0-r6625
  ncs5500-mpls-te-rsvp-3.1.0.0-r6625
  ncs5500-isis-2.1.0.0-r6625
  ncs5500-mcast-2.1.0.0-r6625
  ncs5500-ospf-2.0.0.0-r6625
  ncs5500-mpls-2.1.0.0-r6625
  ncs5500-k9sec-3.1.0.0-r6625
RP/0/RP0/CPU0:router#install remove inactive all

RP/0/RP0/CPU0:router#sh install inactive
Fri Aug 30 08:27:06.887
No inactive package(s) in software repository
```

Sysadmin:

```
sysadmin-vm:0_RP0#show install inactive
Fri Aug 30 08:31:17.221 UTC+00:00
Active Packages: 1
  ncs5500-sysadmin-6.6.25 version=6.6.25 [Boot image]

sysadmin-vm:0_RP0#install remove inactive

sysadmin-vm:0_RP0#show install inactive
Fri Aug 30 08:31:18.160 UTC
Node 0/RP0 [RP]
Inactive Packages:
sysadmin-vm:0_RP0#
```

# Upgrade

---

## Classic Method

All System Upgrade related install operations should be done in the XR VM plane.

SKIP THIS SECTION IF 'install source' CLI IS THE PREFERRED METHOD TO PERFORM A SYSTEM UPGRADE AND CONTINUE TO NEXT SECTION (Upgrade – 'install source' CLI Method)



**Note:** "install upgrade" method has been deprecated since 6.6.1

- 1) Download 7.0.1 mini ISO and packages tar and SMUs from CCO.  
Copy tar file to tftp/scp/ftp server. Verify the contents of the tar file"

```
-bash-4.2$ tar tvf NCS5500-iosxr-k9-7.0.1.tar
-rw-r--r-- vram/eng      3212142 2019-08-29 16:22 ncs5500-isis-2.1.0.0-r701.x86_64.rpm
-rwxr-x--- vram/crypto  1485130 2019-08-29 16:28 ncs5500-k9sec-3.1.0.0-r701.x86_64.rpm
-rw-r--r-- vram/eng      345295 2019-08-29 16:22 ncs5500-li-1.0.0.0-r701.x86_64.rpm
-rw-r--r-- vram/eng     12635107 2019-08-29 16:23 ncs5500-mcast-3.0.0.0-r701.x86_64.rpm
-rw-r--r-- vram/eng     1949377 2019-08-29 16:22 ncs5500-mgbl-3.0.0.0-r701.x86_64.rpm
-rw-r--r-- vram/eng    1714661376 2019-08-29 16:34 ncs5500-mini-x-7.0.1.iso
-rw-r--r-- vram/eng     2437290 2019-08-29 16:22 ncs5500-mpls-2.1.0.0-r701.x86_64.rpm
-rw-r--r-- vram/eng     8378918 2019-08-29 16:22 ncs5500-mpls-te-rsvp-3.1.0.0-
r701.x86_64.rpm
-rw-r--r-- vram/eng      3671819 2019-08-29 16:22 ncs5500-ospf-2.0.0.0-r701.x86_64.rpm
-rw-r--r-- vram/eng        742 2019-08-29 18:43 README-NCS5500-iosxr-k9-7.0.1.txt
```

- 2) Copy the 7.0.1 tar file to the router harddisk and verify that file is copied successfully

```
RP/0/RP0/CPU0:router# scp root@1.75.55.1:/auto/tftpboot-
projects/yatgandh/701_Renum2/NCS5500-iosxr-k9-7.0.1.tar harddisk:/
Connecting to 1.75.55.1...
Password:
Transferred 1748787200 Bytes
1748787200 bytes copied in 82 sec (21169707)bytes/sec
```

- 3) Verify the md5 checksum of the tar/individual rpms with the original MD5 values posted on CCO

```
RP/0/RP0/CPU0:NCS_5504_02#run
[xr-vm_node0_RP0_CPU0:~]$cd /misc/disk1/
[xr-vm_node0_RP0_CPU0:/misc/disk1]$md5sum
md5sum                               md5sum.coreutils
[xr-vm_node0_RP0_CPU0:/misc/disk1]$md5sum NCS5500-iosxr-k9-7.0.1.tar
ee3215de8b8779d5fcd3530386fc145c  NCS5500-iosxr-k9-7.0.1.tar
```

- 4) Perform 'install add source' of 7.0.1 tar file (7.0.1 SMUs can be included in the tarball) :

```
RP/0/RP0/CPU0:NCS55xx# install ?
activate  Activate software package(s) (cisco-support)
add       Add package file(s) to software repository(cisco-support)
commit    Commit changes to the active software(cisco-support)
deactivate Deactivate software package(s) (cisco-support)
extract   Extract mini image to be activated via ISSU(cisco-support)
prepare   Prepare software package(s) to be activated(cisco-support)
remove    Remove package file(s) from software repository(cisco-support)
replace   Add & Activate packages in given GISO
          (cisco-support)
source    Add & Activate packages
```

```
(cisco-support)
verify          verifies packages present on the router(cisco-support)
```

#### Option 1: Manual procedure - Move to the 'step 5)'

```
RP/0/RP0/CPU0:router# install add source harddisk: NCS5500-iosxr-k9-7.0.1.tar
Aug 30 01:55:46 Install operation 53 started by root:
install add source harddisk: NCS5500-iosxr-k9-7.0.1.tar
Aug 30 01:55:48 Install operation will continue in the background
```

#### Option 2: Automatic procedure - Move to the 'step 12)'

```
RP/0/RP0/CPU0:5501#install source tftp://<IP address>/auto/tftp-sjc-users1/user/
NCS5500-iosxr-k9-7.0.1.tar noprompt
Fri Aug 30 02:24:11.493 PDT
+++++
Install operation 75 started by root:
exec-timeout is suspended.
No install operation in progress at this moment
Update in progress...
Scheme : tftp
Hostname : 223.255.254.254
Username : None
SourceDir : auto/tftpboot-projects/yatgandh/701_Renum2/
Collecting software state..
Getting platform
Getting supported architecture
Getting active packages from XR
Getting inactive packages from XR
Getting list of RPMs in local repo
Getting list of provides of all active packages
Getting provides of each rpm in repo
Getting requires of each rpm in repo

Auto dependency management is not possible with TFTP repository.
Given set of packages will be downloaded and installed if
dependencies are met. Only full rpm names should be used with TFTP.
```

```
Adding packages
NCS5500-iosxr-k9-7.0.1.tar
Install add operation successful
Activating id 76
Aug 30 02:44:07 Install operation 77 started by root:
install activate id 76 noprompt
Aug 30 02:44:07 Package list:
Aug 30 02:44:07 ncs5500-mgbl-3.0.0.0-r701.x86_64
Aug 30 02:44:07 ncs5500-mcast-3.0.0.0-r701.x86_64
Aug 30 02:44:08 ncs5500-ospf-2.0.0.0-r701.x86_64
Aug 30 02:44:08 ncs5500-k9sec-3.1.0.0-r701.x86_64
Aug 30 02:44:08 ncs5500-mpls-te-rsvp-3.1.0.0-r701.x86_64
Aug 30 02:44:08 ncs5500-li-1.0.0.0-r701.x86_64
Aug 30 02:44:08 ncs5500-mini-x-7.0.1
Aug 30 02:44:08 ncs5500-mpls-2.1.0.0-r701.x86_64
Aug 30 02:44:08 ncs5500-isis-2.1.0.0-r701.x86_64
Aug 30 02:45:34 Install operation will continue in the background
exec-timeout is resumed.
```

**\*\* Router will be automatically reloaded**

#### 5) Take a note of the install operation id generated by the add operation in step 4)

```
Aug 30 02:11:37 Install operation 53 finished successfully
```

#### 6) Prepare the packages added in step 4)

```
RP/0/RP0/CPU0:router# install prepare id 53
Aug 30 02:14:44 Install operation 54 started by root:
install prepare id 53
Aug 30 02:14:44 Package list:
Aug 30 02:14:44 ncs5500-mpls-2.1.0.0-r701.x86_64
Aug 30 02:14:44 ncs5500-k9sec-3.1.0.0-r701.x86_64
Aug 30 02:14:44 ncs5500-isis-2.1.0.0-r701.x86_64
```

```

Aug 30 02:14:44      ncs5500-mgbl-3.0.0.0-r701.x86_64
Aug 30 02:14:44      ncs5500-mini-x-7.0.1
Aug 30 02:14:44      ncs5500-mpls-te-rsvp-3.1.0.0-r701.x86_64
Aug 30 02:14:44      ncs5500-mcast-3.0.0.0-r701.x86_64
Aug 30 02:14:44      ncs5500-ospf-2.0.0.0-r701.x86_64
Aug 30 02:14:44      ncs5500-li-1.0.0.0-r701.x86_64
Aug 30 02:14:50 Install operation will continue in the background

```

## 7) Check if install prepare is successful

```

RP/0/RP0/CPU0:router# show install prepare
Prepared Boot Image:  ncs5500-mini-x-7.0.1
Prepared Boot Partition:  /dev/panini_vol_grp/xr_lv54
Restart Type: Reboot
Prepared Packages:
  ncs5500-mini-x-7.0.1
  ncs5500-mpls-2.1.0.0-r701
  ncs5500-k9sec-3.1.0.0-r701
  ncs5500-isis-2.1.0.0-r701
  ncs5500-mgbl-3.0.0.0-r701
  ncs5500-mpls-te-rsvp-3.1.0.0-r701
  ncs5500-mcast-3.0.0.0-r701
  ncs5500-ospf-2.0.0.0-r701
  ncs5500-li-1.0.0.0-r701

```

Use the "install activate" command to activate the prepared packages.  
Use the "install prepare clean" command to undo the install prepare operation.

## 8) Check 'show install log' is successful and for any errors

```

RP/0/RP0/CPU0:ROUTER#show install log 54
Aug 30 02:14:44 Install operation 54 started by root:
  install prepare id 53
Aug 30 02:14:44 Package list:
Aug 30 02:14:44      ncs5500-mpls-2.1.0.0-r701.x86_64
Aug 30 02:14:44      ncs5500-k9sec-3.1.0.0-r701.x86_64
Aug 30 02:14:44      ncs5500-isis-2.1.0.0-r701.x86_64
Aug 30 02:14:44      ncs5500-mgbl-3.0.0.0-r701.x86_64
Aug 30 02:14:44      ncs5500-mini-x-7.0.1
Aug 30 02:14:44      ncs5500-mpls-te-rsvp-3.1.0.0-r701.x86_64
Aug 30 02:14:44      ncs5500-mcast-3.0.0.0-r701.x86_64
Aug 30 02:14:44      ncs5500-ospf-2.0.0.0-r701.x86_64
Aug 30 02:14:44      ncs5500-li-1.0.0.0-r701.x86_64
Aug 30 02:14:50 Action 1: install prepare action started
Aug 30 02:14:50 Install operation will continue in the background
Aug 30 02:15:57 The prepared software is set to be activated with reload
upgrade
Aug 30 02:15:58 Start preparing new VM for reload upgrade
Aug 30 02:37:45 All the above nodes completed System Upgrade prepare.
Aug 30 02:37:45 Action 1: install prepare action completed successfully
Aug 30 02:37:50 Install operation 54 finished successfully
Aug 30 02:37:50 Ending operation 54

```

## 9) Activate all the packages prepared in step 5)

```

RP/0/RP0/CPU0:router# install activate noprompt
Aug 30 02:46:07 Install operation 55 started by root:
  install activate noprompt

```

## 10) Router will reload at the end of activation to start using the new packages.



**Note:** Under ideal conditions, this operation may take up to 30 minutes to complete

- 11) Verify that all the packages are installed correctly in XR and SysAdmin

#### XR

```
RP/0/RP0/CPU0:router# show install active summary
Active Packages: 9
  ncs5500-xr-7.0.1 version=7.0.1 [Boot image]
  ncs5500-isis-2.1.0.0-r701
  ncs5500-mpls-2.1.0.0-r701
  ncs5500-mpls-te-rsvp-3.1.0.0-r701
  ncs5500-ospf-2.0.0.0-r701
  ncs5500-li-1.0.0.0-r701
  ncs5500-mgbl-3.0.0.0-r701
  ncs5500-mcast-3.0.0.0-r701
  ncs5500-k9sec-3.1.0.0-r701
```

#### Sysadmin

```
sysadmin-vm:0_RP0# show install active summary
Fri Aug 30 09:48:46.390 UTC+00:00
Active Packages: 1
  ncs5500-sysadmin-7.0.1 version=7.0.1 [Boot image]
```

- 12) 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:router#install commit
```

- 13) Verify system stability through commands described under "**System Stability Check**" section after router comes up with new software

- 14) Verify show version to check router is upgraded to 701.

```
RP/0/RP0/CPU0:router# show version
Cisco IOS XR Software, Version 7.0.1
Copyright (c) 2013-2019 by Cisco Systems, Inc.

Build Information:
  Built By      : ahoang
  Built On      : Thu Aug 29 16:30:00 PDT 2019
  Built Host    : iox-ucs-027
  Workspace     : /auto/srcarchive15/prod/7.0.1/ncs5500/ws
  Version       : 7.0.1
  Location      : /opt/cisco/XR/packages/

cisco NCS-5500 () processor
System uptime is 39 minutes
```

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

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

- 16) Optional: If not installed together with the main tar ball SMUs can be added as following:

```
RP/0/RP0/CPU0:router#install add source harddisk: <SMU tar file for 701>
```

17) Activate the SMUs

```
RP/0/RP0/CPU0:router#install activate id <add id of step 17>
```

18) Enter 'yes' to reload prompt. This is only required if reload SMUs are contained.

19) After system comes up from reload, execute 'install commit'

# Install Source Method

All System Upgrade related install operations should be done in the XR VM plane.  
Skip this section if section '[Upgrade – Classic Method](#)' has been performed



**Note:** "install upgrade" method has been deprecated since 6.6.1

- 1) Download 7.0.1 mini ISO and packages tar (NCS5500-iosxr-k9-6.6.1.tar) and SMUs from CCO. Copy tar file to tftp / scp / ftp server directory.
- 2) Extract tar file to the directory. Also, extract any mandatory SMUs and copy to the same directory.

```
fretta-sit-auto:185>tar -xvf NCS5500-iosxr-k9-7.0.1.tar
```

- 3) Verify the md5 checksum of the tar/individual rpms with the original MD5 values posted on CCO

```
RP/0/RP0/CPU0:NCS_5504_02#run
[xr-vm_node0_RP0_CPU0:~]$cd /misc/disk1/
[xr-vm_node0_RP0_CPU0:/misc/disk1]$md5sum
md5sum          md5sum.coreutils
[xr-vm_node0_RP0_CPU0:/misc/disk1]$md5sum NCS5500-iosxr-k9-7.0.1.tar
ee3215de8b8779d5fcd3530386fc145c  NCS5500-iosxr-k9-7.0.1.tar
```

- 4) Perform System Upgrade using 'install source' CLI.

```
RP/0/RP0/CPU0:router# install source tftp://223.255.254.254//auto/tftpboot-
projects/yatgandh/701_Renum2/ NCS5500-iosxr-k9-7.0.1.tar noprompt
Fri Aug 30 02:24:11.493 PDT
++++
++++
Install operation 75 started by root:
exec-timeout is suspended.
No install operation in progress at this moment
Update in progress...
Scheme : tftp
Hostname : 223.255.254.254
Username : None
SourceDir : auto/tftpboot-projects/yatgandh/701_Renum2/
Collecting software state..
Getting platform
Getting supported architecture
Getting active packages from XR
Getting inactive packages from XR
Getting list of RPMs in local repo
Getting list of provides of all active packages
Getting provides of each rpm in repo
Getting requires of each rpm in repo

Auto dependency management is not possible with TFTP repository.
Given set of packages will be downloaded and installed if
dependencies are met. Only full rpm names should be used with
TFTP.
```

```

Adding packages
  NCS5500-iosxr-k9-7.0.1.tar
Install add operation successful
Activating id 76
Aug 30 02:44:07 Install operation 77 started by root:
  install activate id 76 noprompt
Aug 30 02:44:07 Package list:
Aug 30 02:44:07      ncs5500-mgbl-3.0.0.0-r701.x86_64
Aug 30 02:44:07      ncs5500-mcast-3.0.0.0-r701.x86_64
Aug 30 02:44:08      ncs5500-ospf-2.0.0.0-r701.x86_64
Aug 30 02:44:08      ncs5500-k9sec-3.1.0.0-r701.x86_64
Aug 30 02:44:08      ncs5500-mpls-te-rsvp-3.1.0.0-r701.x86_64
Aug 30 02:44:08      ncs5500-li-1.0.0.0-r701.x86_64
Aug 30 02:44:08      ncs5500-mini-x-7.0.1
Aug 30 02:44:08      ncs5500-mpls-2.1.0.0-r701.x86_64
Aug 30 02:44:08      ncs5500-isis-2.1.0.0-r701.x86_64
Aug 30 02:45:34 Install operation will continue in the background
exec-timeout is resumed.

```

- 5) Respond 'yes' to the reload prompt (sample output above). This step can be skipped if no prompt option was used in step 3.



**Note:** This operation may take up to 30 minutes to get the reload prompt.

- 6) After user enter 'yes' to the reload prompt router will reload at the end of activation to start using the new packages. [ This step can be skipped if no prompt option was used in step 4.]



**Note:** Under ideal conditions, this operation may take up to 30 minutes to complete.

- 7) Verify that all the packages are installed correctly in XR and sysadmin

XR

```
RP/0/RP0/CPU0:router#show install active
```

Sysadmin

```
sysadmin-vm:0_RP0#show install active
```

- 8) Verify show version to check router is upgraded to 701.

```

RP/0/RP0/CPU0:router#show version
Cisco IOS XR Software, Version 7.0.1
Copyright (c) 2013-2019 by Cisco Systems, Inc.

Build Information:
  Built By      : ahoang
  Built On      : Thu Aug 29 16:30:00 PDT 2019
  Built Host    : iox-ucs-027
  Workspace     : /auto/srcarchive15/prod/7.0.1/ncs5500/ws
  Version       : 7.0.1
  Location      : /opt/cisco/XR/packages/

cisco NCS-5500 () processor
System uptime is 47 minutes

```

- 9) 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:router#install commit
```

- 10) Verify system stability through commands described under “**System Stability Check**” section after router comes up with new software

- 11) Check to see if there were any failed startup config.

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

# Post-Upgrade Procedure

---

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

### OSPF

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

### ISIS

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

## 2) Disk cleanup

Once software upgrade has been completed, disk space can be recovered by removing any inactive packages that are no longer needed (if the packages are required at a later time, they can be re-added):

```
RP/0/RP0/CPU0:router#install remove inactive all
```

## 3) Verify/fix configuration file system (mandatory):

```
RP/0/RP0/CPU0:router#clear configuration inconsistency
Creating any missing directories in Configuration File system...OK
Initializing Configuration Version Manager...OK
Syncing commit database with running configuration...OK
```

## 4) Verify fpd versions running are current:

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

Please refer to “Determine Firmware Support” section in Release Notes for Cisco NCS 5500 Series Routers for FPD version information.

# Caveats

---

Please make sure that laser is shutdown before upgrading CFP2 DCO optics

- CSCvk08049 To support CFP2 DCO optics auto-fpd upgrade without manual laser shut

There are no other caveats for System Upgrade.

We need to install bridge SMU on bases release to upgrade to 661.

# Field Programmable Versions

NCS55xx Field Programmable Versions.

PID	FPD Devices	FPD Versions	FPD Versions	FPD Versions	FPD Versions	FPD Versions	FPD Versions	FPD Versions	FPD Versions
		Release 6.1.3	Release 6.1.4	Release 6.2.25	Release 6.3.1	Release 6.3.3	Release 6.5.3	Release 6.6.25	Release 7.0.1
NC55-RP	Bootloader	9.23	9.23	9.23	9.23	9.25	9.28	9.29	9.30
	IOFPGA	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.39
NC55-SC	Bootloader	1.7	1.7	1.7	1.74	1.74	1.74	1.74	1.74
	IOFPGA	0.08	0.08	0.08	0.08	0.1	0.1	0.1	0.1
NC55-5508-FC	Bootloader	1.7	1.7	1.7	1.74	1.74	1.74	1.74	1.74
	IOFPGA	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
NC55-36X100G	Bootloader	1.17	1.17	1.17	1.17	1.18	1.18	1.19	1.19
	IOFPGA	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
	MIFPGA	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
	SATA	N/A	N/A	N/A	N/A	5.00	5.00	5.00	5.00
NC55-24X100G-SE	Bootloader	1.11	1.11	1.11	1.11	1.13	1.13	1.14	1.14
	IOFPGA	0.12	0.12	0.12	0.13	0.13	0.13	0.13	0.13
	MIFPGA	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
	SATA	N/A	N/A	N/A	N/A	5.00	5.00	5.00	5.00
NC55-18H18F	Bootloader	1.11	1.11	1.11	1.11	1.11	1.13	1.13	1.14
	IOFPGA	0.2	0.2	0.22	0.22	0.22	0.22	0.22	0.22
	MIFPGA	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
	SATA	N/A	N/A	N/A	N/A	N/A	N/A	5.0.0	5.00
NC55-36X100G-S	Bootloader	1.11	1.11	1.11	1.11	1.13	1.13	1.14	1.14
	IOFPGA	0.09	0.09	0.09	0.1	0.11	0.11	0.11	0.11
	MIFPGA	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07
	SATA	N/A	N/A	N/A	N/A	5.00	5.00	5.00	5.00
NC55-24H12F-SE	Bootloader	1.11	1.11	1.11	1.11	1.13	1.13	1.14	1.14
	IOFPGA	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0/09
	MIFPGA	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03
	SATA	N/A	N/A	N/A	N/A	5.00	5.00	5.00	5.00
NCS-5501	Bootloader	1.05	1.11	1.13	1.11	1.16	1.18	1.19	1.21
	CPU-IOFPGA	1.12	1.14	1.14	1.14	1.14	1.14	1.19	1.19
	MB-IOFPGA	1.04	1.04	1.04	1.04	1.05	1.05	1.05	1.11
	MB-MIFPGA	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.02

<b>NCS-5501</b>	SATA	N/A	N/A	N/A	N/A	N/A	N/A	5.00	5.00
<b>NCS-5501-SE</b>	Bootloader	1.11	1.13	1.15	1.15	1.16	1.18	1.19	1.21
	CPU-IOFPGA	1.12	1.14	1.14	1.14	1.14	1.14	1.14	1.14
	MB-IOFPGA	1.07	1.07	1.07	1.08	1.11	1.11	1.11	1.11
	MB-MIFPGA	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
	SATA	N/A	N/A	N/A	N/A	5.00	5.00	5.00	NA
<b>NCS-5502</b>	Bootloader	1.11	1.13	1.15	1.13	1.16	1.18	1.19	1.21
	CPU-IOFPGA	1.12	1.14	1.14	1.14	1.14	1.14	1.14	1.19
	DC-IOFPGA	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
	DC-MIFPGA	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
	MB-IOFPGA	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
	MB-MIFPGA	1.02	1.05	1.02	1.02	1.02	1.02	1.02	1.02
	SATA	N/A	N/A	N/A	N/A	5.00	5.00	5.00	5.00
<b>NCS-5502-SE</b>	Bootloader	1.11	1.13	1.15	1.15	1.16	1.18	1.19	1.21
	CPU-IOFPGA	1.12	1.14	1.14	1.14	1.14	1.14	1.19	1.14
	DC-IOFPGA	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
	DC-MIFPGA	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
	MB-IOFPGA	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
	MB-MIFPGA	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
	SATA	N/A	N/A	N/A	N/A	5.00	5.00	5.00	5.00
<b>NC55-5516-FC</b>	Bootloader	1.73	1.73	1.73	1.75	1.75	1.75	1.75	1.75
	IOFPGA	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.24
<b>NCS-55A1-36H-S</b>	Bootloader	N/A	N/A	1.05	1.05	1.07	1.10	1.11	1.12
	CPU-IOFPGA			1.14	1.14	1.14	1.14	1.19	1.19
	MB-IOFPGA			1	1	1.01	1.01	1.01	1.02
	MB-MIFPGA			1	1	1.02	1.03	1.03	1.03
<b>NC55-6X200-DWDM-S</b>	Bootloader	N/A	N/A	1.11	1.11	1.13	1.13	1.14	1.14
	IOFPGA			0.1	0.11	0.11	0.11	0.11	0.11
	DENALI			13.48	13.48	13.48	13.48	13.48	13.48
	MORGOTH			5.13	5.2	5.17	5.25	5.25	5.26
	MSFPGA			2.21	2.22	2.22	2.22	2.22	2.22
	CFP2_PORT			5.23	5.23	5.23	5.23	5.23	5.23
	SATA			N/A	N/A	N/A	5.00	5.00	5.00
<b>NC55-36X100G-A-SE</b>	MIFPGA	N/A	N/A	N/A	0.03	0.03	0.03	0.03	0.03
	Bootloader				0.13	0.13	0.13	0.14	0.14
	DBFPGA				0.14	0.14	0.14	0.14	0.14
	IOFPGA				0.21	0.21	0.21	0.21	0.21
	SATA				N/A	N/A	5.00	5.00	5.00

<b>NC55-5504-FC</b>	Bootloader	N/A	N/A	N/A	1.75	1.75	1.75	1.75	1.75
	IOFPGA	N/A	N/A	N/A	0.07	0.07	0.07	0.07	0.07
<b>NC55-RP-E</b>	Bootloader	N/A	N/A	N/A	1.1	1.14	1.18	1.20	1.21
	IOFPGA				0.18	0.21	0.23	0.23	0.23
	OMGFPGA				0.4	0.48	0.48	0.48	0.48
<b>NCS-55A1-24H</b>	Bootloader	N/A	N/A	N/A	1.05	1.07	1.10	1.11	1.12
	CPU-IOFPGA				1.14	1.14	1.14	1.14	1.14
	MB-IOFPGA				1.00	1.00	1.00	1.02	1.02
	MB-MIFPGA				1.00	1.00	1.00	1.00	1.00
<b>NCS-55A1-36H-SE-S</b>	Bootloader	N/A	N/A	N/A	1.05	1.07	1.10	1.11	1.12
	CPU-IOFPGA				1.14	1.14	1.14	1.19	1.19
	MB-IOFPGA				1	1	1.01	1.02	1.02
	MB-MIFPGA				1	1	1.03	1.03	1.03
<b>NCS-55A2-MOD-S</b>	Bootloader	N/A	N/A	N/A	1.05	1.07	1.10	1.11	1.12
	CPU-IOFPGA				N/A	N/A	1.18	1.18	1.18
	MB-IOFPGA				1.14	1.14	0.15	0.18	0.18
	MB-MIFPGA				1	1	0.16	0.19	0.19

\*\* FPD versions on the boards shipped by manufacturing may have higher versions than the fpd package integrated in XR



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