

NCS5500

IOS-XR Release 25.4.1

System Upgrade Procedure

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Purpose, Scope and Audience

This document outlines the available methods for upgrading the Cisco NCS5500 Series Router to Release 25.4.1. The table below presents the supported compatibility matrix for this release.

Table 1. Compatibility Matrix

Platform	From	To
NCS5500	IOS-XR 7.10.2	IOS-XR 25.4.1
NCS5500	IOS-XR 7.11.2	IOS-XR 25.4.1
NCS5500	IOS-XR 7.11.21	IOS-XR 25.4.1
NCS5500	IOS-XR 24.1.1	IOS-XR 25.4.1
NCS5500	IOS-XR 24.1.2	IOS-XR 25.4.1
NCS5500	IOS-XR 24.2.1	IOS-XR 25.4.1
NCS5500	IOS-XR 24.2.2	IOS-XR 25.4.1
NCS5500	IOS-XR 24.2.21	IOS-XR 25.4.1
NCS5500	IOS-XR 24.3.1	IOS-XR 25.4.1
NCS5500	IOS-XR 24.3.2	IOS-XR 25.4.1
NCS5500	IOS-XR 24.4.1	IOS-XR 25.4.1
NCS5500	IOS-XR 24.4.2	IOS-XR 25.4.1
NCS5500	IOS-XR 25.1.1	IOS-XR 25.4.1
NCS5500	IOS-XR 25.1.2	IOS-XR 25.4.1
NCS5500	IOS-XR 25.2.1	IOS-XR 25.4.1
NCS5500	IOS-XR 25.2.2	IOS-XR 25.4.1
NCS5500	IOS-XR 25.3.1	IOS-XR 25.4.1

Note:

- A direct, single-step upgrade from any release prior to 7.10.2 to 25.4.1 is not supported. You must first upgrade to the intermediate release 7.10.2 before proceeding with the upgrade to 25.4.1
- USB/PXE boot is an option for single-step install directly to 25.4.1
- For downgrades, please check show install upgrade-matrix running for all supported downgrades from IOS-XR 25.4.1 release. To downgrade to an unsupported version Eg: 7.5.2, please do USB/PXE boot.

Audience: This guide is for Cisco Systems Field Engineers and Network Operators.

Bridge SMU / Mandatory RPMs

A bridge SMU is an SMU that is a prerequisite to an upgrade or downgrade to another Cisco IOS XR software release. Bridge SMUs are also referred to as mandatory upgrade or downgrade SMUs because they must be installed before an upgrade or downgrade.

Refer to [Cisco IOS XR General Information](#) for procedures for each upgrade or downgrade and for details of any mandatory bridge SMUs.

Table 2. Bridge SMU / Mandatory RPMs

From Release	To Release	Bridge SMU / Mandatory RPMs
IOS-XR 7.10.2	IOS-XR 25.4.1	*CSCwn05862
IOS-XR 7.11.2	IOS-XR 25.4.1	*CSCwr10451
IOS-XR 7.11.21	IOS-XR 25.4.1	*CSCwr10451
IOS-XR 24.1.2	IOS-XR 25.4.1	*CSCwn05862
IOS-XR 24.2.2	IOS-XR 25.4.1	*CSCwn05862
IOS-XR 24.2.21	IOS-XR 25.4.1	*CSCwn05862
IOS-XR 24.3.1	IOS-XR 25.4.1	*CSCwn05862
IOS-XR 25.2.1	IOS-XR 25.4.1	*CSCwn05862

Note: Above table has those releases mentioned which require Bridge SMU / Mandatory RPMs. Other Supported Releases that are not included doesn't require any Bridge SMU.

*** This SMU is applicable only when system contains a disk boot card with ARM architecture(PIDS: NC55-5508-FC2, NC55-5516-FC2)**

Required Package Files

Table 3. Package Files

Description	Package Name	Details
Bootable ISO Image	NCS5500-mini-x64-25.4.1.iso	Contains all mandatory packages. Download from Cisco Software Download portal.
Optional RPMs	NCS5500-iosxr-25.4.1.tar	Contains Optional RPMs.Download from Cisco Software Download portal.
Optional RPMs with K9sec	NCS5500-iosxr-k9-25.4.1.tar	Contains Optional RPMs with K9sec package. Download from Cisco Software Download portal.

Description	Package Name	Details
USB Boot image	NCS5500-usb_boot-25.4.1.zip	Contains USB Bootable packages. Download from Cisco Software Download portal.
Golden ISO Image	Golden ISO (GISO) is a customized ISO	Refer Configuration Guide - System Setup and Software Installation Guide for Cisco NCS 5500 Series Routers, IOS XR Release 25.4.x Chapter: Customize Installation using Golden ISO

Pre-upgrade Tasks

This includes tasks and health checks that can be performed outside of the standard upgrade MOP to verify abnormal hardware behavior and validate system parameters relevant to upgrade success.

Configuration Backup

Copy the running-configuration to a harddisk: on the router and to a remote scp server.

```
RP/0/RP0/CPU0# copy running-config harddisk:/running_config-<mmddyyyy>
RP/0/RP0/CPU0:ios#scp harddisk:/ running_config-<mmddyyyy> user@<ip-address>:<location>
```

Check for config inconsistency

Check for any inconsistencies in the configuration before upgrade using '*show configuration failed startup*'. If there are any errors, clear them using '*clear configuration inconsistency*'

Check for available disk space

Check the space available in the install repository; at least 5GB of free space in /harddisk: is required to perform system upgrade. Use "*show media*" to check the space availability.

TIP: Remove old or large size files to free disk space:

- delete harddisk:*core*
- delete harddisk:/showtech/*
- delete harddisk:<old iso files if any>
- remove inactive packages using "install remove inactive" from XR and Admin plane.

Check FPD auto-upgrade

Enable auto FPD auto upgrade from XR and Sysadmin.

```
RP/0/RP0/CPU0:NCS5500(config)#fpd auto-upgrade enable
RP/0/RP0/CPU0:NCS5500(config)#commit
```

```
sysadmin-vm:0_RP0(config)# fpd auto-upgrade enable
sysadmin-vm:0_RP0(config)# commit
```

Please make sure it is NOT disabled by applying the configuration 'fpd auto-upgrade disable'.

Note: Due to CSCws23426, an additional manual reload is required after upgrading to version 25.4.1 with "fpd auto-upgrade."

System stability check

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

CLI	Description
show platform	Verify that all nodes are in "IOS XR RUN/OPERATIONAL" state
show platform vm	Verify that all nodes are in "FINAL Band" state
show redundancy	Verify that a Standby RP is available, and the system is in "NSR-ready" 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
admin show install active	Verify on sysadmin plane
show install committed	Verify that the proper set of committed packages are same as active. If not, execute 'install commit'
show hw-module fpd	Ensure all the FPD versions status are CURRENT
show pfm location all	Shows any outstanding alarms in system
show alarms brief system active	Shows any outstanding active alarms in system
admin show environment all	Shows temperature, Fan, Voltage, Power status
admin show led	Shows LED status
show media (both XR and Admin mode) location all	Shows the disk usage in XR and admin state
show inventory	Shows chassis inventory information

CLI	Description
<code>show logging</code>	Capture show logging to check for any errors
<code>show watchdog memory-state location all</code>	Monitors watchdog memory status
<code>show health gsp</code>	GSP health check
<code>show health sysdb</code>	Sysdb health check
<code>admin show install health</code>	Verifies the current state of the system
<code>admin show smart-monitor location all</code>	Smart SSD Disk Health Status http://www.win-metrics.com/cgi-bin/ddtsdisp.cgi?id=CSCwg38396

Node Isolation

Once the sanity check is done, it's recommended to drain/isolate the router. This can be achieved using regular routing techniques (ISIS overload bit, OSPF max metric, MPLS traffic engineering, BGP attributes, etc.).

Software Upgrade

Available Boot Methods for Install/Upgrade:

1. Install Replace with Golden ISO (Recommended)
Use a pre-built Golden ISO image to perform a fresh installation or replacement of the existing system. Recommended method if the router with a running pre-25.4.1 image is in a stable state, and the intention is to upgrade without losing the existing configuration
2. Install add/activate using mini ISO + Optional RPMs
Start with a standard mini ISO image for installation, with the option to include additional RPM packages as needed.
3. Network Boot using USB (ISO or Golden ISO)
Initiate a network boot from a USB device containing either a standard ISO or a Golden ISO image.
4. Network Boot using iPXE (ISO or Golden ISO)
Leverage iPXE to perform a network boot with either a standard ISO or a Golden ISO image.

Method 1: Upgrade using the Golden ISO (GISO)

Users have the option to create a custom Golden ISO (GISO) by utilizing the gisobuild.py script perform the upgrade with the single command 'install replace <giso>'. For detailed instructions, please refer to the "Customize Installation using Golden ISO" chapter in the **System Setup and Software Installation Guide for Cisco NCS 5500 Series Routers, IOS XR Release 25.4.x**.

Alternatively, you may contact the Cisco Technical Assistance Centre (TAC) to request a Golden ISO (GISO) that includes the specific optional RPMs you require.

GISO on External Server (Recommended)

Upgrade the system to replace the current software with the GISO image available on external server.

Pre-requisite: Refer Appendix section for Managing External server/repo reachability.

```
RP/0/RP0/CPU0:ios#install replace sftp://user:*****@172.24.77.24/auto/tftp-rtplib/NCS5500/ncs5500-goldenk9-x64-25.4.1.iso commit noprompt
```

Enter absolute path of GISO which is intended to be installed

Example:

```
sftp://user[:password]@server/directory/GISO
scp://user[:password]@server/directory/GISO
ftp://user[:password]@server/directory/GISO
tftp://server/directory/GISO
http://server/directory/GISO
```


GISO on Router harddisk

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

Upgrade the system to replace the current software with the GISO image available on the /harddisk: of the router

```
Step1: RP/0/RP0/CPU0:ios#scp <user>@<ip-address>:<directory>/NCS5500-goldenk9-x64-25.4.1.iso harddisk:
```

```
Step2: RP/0/RP0/CPU0:ios#install replace harddisk:/ncs5500-goldenk9-x64-25.4.1.iso commit noprompt
```

Enter local path to the GISO relative to the default path: /harddisk:/mirror/

Example:

```
    /directory/GISO
    GISO
    directory/GISO  (path relative to /harddisk:/mirror)
    ./directory/GISO (path relative to /harddisk:/mirror)
```

Method 2: Upgrade using the mini ISO and optional RPMs

This method requires user to perform 2 step process of install add and install activate operation to complete the upgrade.

Packages on External Server (Recommended)

Untar the RPMs and create a single tar that includes the mini.iso and all optional RPMs on external server.

Pre-requisite: Refer Appendix section for Managing External server/repo reachability.

1. Perform 'install add' of the tar file.

```
RP/0/RP0/CPU0:ios#install add source sftp://user:*****@172.24.77.24/auto/tftp-rtp-sit/NCS5500/ncs5500-goldenk9-x64-25.4.1.tar
```

Example:

```
    sftp://user[:password]@server:/directory/
    ftp://user[:password]@server:/directory/
    http://[user:password@]server/directory/
    https://[user:password@]server/directory/
    ftp://user[:password]@server;VRF/directory/
```

2. Take a note of the install operation id generated by the add operation in previous step.

Note: Install operation **id#** finished successfully

3. Prepare the packages added in the previous step:

```
RP/0/RP0/CPU0:ios#install prepare id id#
```

Or, if multiple add operations occurred:

```
RP/0/RP0/CPU0:ios#install prepare id id1 id2
```

4. Activate all the packages:

```
RP/0/RP0/CPU0:ios#install activate
```

5. Router will reload at the end of activation to start using the new packages.

Note: This operation may take up some time to complete as the router goes for reboot with new image.

6. After performing Post Upgrade Checks and 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:ios#install commit
```

Packages on Router harddisk

Download/Copy the single tar created to the harddisk: location on the router.

```
Step1: RP/0/RP0/CPU0:ios#scp <user>@<ip-address>:<directory>/NCS5500-goldenk9-x64-25.4.1.tar harddisk:
```

```
Step2: RP/0/RP0/CPU0:ios#install add source harddisk:/ncs5500-goldenk9-x64-25.4.1.tar
```

Example:

```
harddisk:/directory
```

Perform steps 2–6 as described in the "Packages on External Server (Recommended)" section.

Method 3: Upgrading the router using USB or PXE

For USB and iPXE, please refer to the chapter "Bring-up the Router" in "[System Setup and Software Installation Guide for Cisco NCS5500 Series Routers](#)", IOS XR Release 25.4.x

Note: iPXE/USB will wipe out all the data/config from the router. Please backup any required configuration or files before proceeding with the upgrade. Refer to section 'Pre-Upgrade Task à Configuration backup' for steps to perform this.

Post-Upgrade Tasks

Health Check

Execute and verify the health check commands mentioned in “System stability check” section of **Pre-upgrade Tasks**

Check for config inconsistency

Check for any inconsistencies in the configuration before upgrade using *‘show configuration failed startup’*. If there are any errors, clear them using *‘clear configuration inconsistency’*

Check/fix the configuration file system

```
RP/0/RP0/CPU0:ios#cfs check
```

Check the FPD versions

```
RP/0/RP0/CPU0:ios#show hw-module location all fpd
```

Note: IOS-XR 25.4.1 supports auto-fpd upgrade. All FPDs should show the status as "CURRENT" in "show hw-module location all fpd" after upgrade.

If *‘show hw-module fpd’* shows FPD status as ‘CURRENT’ state, please skip the manual FPD upgrade procedure.

Manual FPD Upgrade:

If ‘fpd auto-upgrade’ was disabled before upgrade and ‘show hw-module fpd’ shows any FPDs in ‘NEED UPGD’ state, then the following procedure can be used to manually upgrade all the FPDs.

```
RP/0/RP0/CPU0:ios#upgrade hw-module location all fpd all
```

Note: Some of the FPDs like Timing, Power modules do not participate in upgrade all fpd command, they need to be upgraded separately using explicit command.

```
RP/0/RP0/CPU0:ios# upgrade hw-module location pm-all fpd all
```

Once all FPDs have been upgraded, check the output of “*show hw-module fpd*”. If any FPD status is listed as RLOAD_REQ, reload the router:

```
RP/0/RP0/CPU0:ios#reload location all
```

```
Proceed with reload? [confirm]
```

After router reload, all the FPDs should be up-to-date and FPD 'Status' should display 'CURRENT'

Downgrade/Rollback to previous IOS-XR version

There are few options to choose from to downgrade IOS XR version.

Note: If FPD upgrade was done as part of 25.4.1 installation, FPDs do not need to be updated again once the previously published image is activated.

Option 1: If install commit was not done after upgrade to 25.4.1, a router reload will bring it back to previous install committed image.

Option 2: Install remove the inactive packages and re-add the previous IOS-XR version iso image+rpm via install add, prepare, activate to downgrade/rollback

Option 3: For USB and iPXE, please refer to the chapter "Bring-up the Router" in "[System Setup and Software Installation Guide for Cisco NCS5500 Series Routers](#)", IOS XR Release 25.4.x.

Note: iPXE/USB will wipe out all the data/config from the router. Please backup any required configuration or files before proceeding with the upgrade. Refer to section 'Pre-Upgrade Task à Configuration backup' for steps to perform this.

Caveats

The caveats listed below may be summaries only. Please review release note enclosure (RNE) , R-comments for each DDTS for complete details (Including known workarounds and/or actions to take).

DDTS	Description
CSCws23426	Exr auto-fpd upgrade is not working during SU from XR version lower than 25.2.1 to 25.2.1 onwards
CSCwm14431	Upgrade from 7.10.2 to 24.3.1 with base and VRF config makes the SDR console inaccessible. Issue will be seen during below upgrades: <ul style="list-style-type: none">•7.10.x -> 7.11.2•7.10.x -> 25.x.y•7.11.1 -> 7.11.2•7.11.1 -> 25.x.y

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