



Cisco XRV9000

IOS-XR Release 7.7.1

IOS-XR System Upgrade/Downgrade Procedure



Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883

Asia Pacific Headquarters
Cisco Systems, Inc.
168 Robinson Road
#28-01 Capital Tower
Singapore 068912
www.cisco.com
Tel: +65 6317 7777
Fax: +65 6317 7799

Europe Headquarters
Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: +31 0 800 020 0791
Fax: +31 0 20 357 1100

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.

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Purpose, Scope and Audience

This document provides information on the two methods Classic and GISO methods available for system upgrade and downgrade for XRV9000 Series platforms from software version 7.X.X to 7.7.1 and vice versa.



Note

This document covers NGXR to NGXR upgrade procedure only.

Platform	From	To
XRV9000	7.X.X	7.7.1
XRV9000	7.7.1	7.X.X

Cisco Software Manager (CSM) can be used to manage Image, SMUs and SPs. It can help create your own SMU tar ball or find out which SMUs/SPs are applicable to your network. More information on CSM:

[CSM Download page](#)

[User Documentation](#)

It's highly recommended that CSM be used to come up with a list of optimized set of SMUs or Service Packs that should be installed on the release that is going to be deployed. SMUs/SPs + Major release can be installed together in one install operation to save time and avoid multiple reloads.

However, in the absence of CSM, the MOP (Method of Procedure) described in this document can be followed for software upgrade of XRV9000 series routers.

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:

Description	Package Name
Boot Image	xrv9k-fullk9-x-7.7.1.iso
mpls	xrv9k-mpls-2.1.0.0-r771.x86_64.rpm
mpls-rsvp-te	xrv9k-mpls-te-rsvp-3.1.0.0-r771.x86_64.rpm
multicast	xrv9k-mcast-3.0.0.0-r771.x86_64.rpm
ospf	xrv9k-ospf-2.0.0.0-r771.x86_64.rpm
isis	xrv9k-isis-2.1.0.0-r771.x86_64.rpm
li	xrv9k-li-x-1.1.0.0-r771.x86_64.rpm
eigrp	xrv9k-eigrp-1.0.0.0-r771.x86_64.rpm
k9sec	xrv9k-k9sec-3.1.0.0-r771.x86_64.rpm
mgbl	xrv9k-mgbl-3.0.0.0-r771.x86_64.rpm

Configuration Backup

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

```
RP/0/RP0/CPU0:XRV9000# copy running-config harddisk:/running_config
```

- Copy the running-configuration to a remote scp server

Pre-Upgrade Tasks

- System Stability Check: The following commands should be executed to verify basic system stability before the upgrade. At the XR prompt:
 - RP/0/RP0/CPU0:R1#admin show install health
INFO Platform is: xrv9k
INFO Collecting Cards Information
INFO Collecting Sysadmin VMs Information
INFO Collecting XR VMs Information
INFO Verifying all the required VMs are running.
INFO Pass: All required VMs are Running
INFO Collecting sysadmin VMs data
INFO Collecting Host data
INFO Collecting XR VMs data
INFO Collecting Lead VMs data
INFO Verifying Test Plugins
INFO Verifying Plugins results
INFO Verifying Result for:cal_version
INFO Verifying Result for:cal_smus
INFO Verifying Result for:cal_local_active_swp
INFO Verifying Result for:cal_local_committed_swp
INFO Verifying Result for:cal_disk_space
INFO Verifying Result for:cal_marker_files
INFO Verifying Result for:cal_mount_points
INFO Verifying Result for:cal_stale_symlinks
INFO Verifying Result for:cal_prepared_packages
INFO Verifying Result for:cal_master_active_swp
INFO Verifying Result for:cal_master_committed_swp
INFO Verifying Result for:xr_master_active_swp
INFO Verifying Result for:xr_master_committed_swp
INFO Verifying Result for:xr_local_active_swp
INFO Verifying Result for:xr_local_committed_swp
INFO Verifying Result for:cal_image
INFO Verifying Result for:cal_tmp_staging_dir
INFO Verifying Result for:cal_install_tmp_staging_dir
INFO Verifying Result for:cal_repo_file_permission
INFO Verifying Result for:host_version
INFO Verifying Result for:xr_version
INFO Verifying Result for:host_smus
INFO Verifying Result for:xr_smus
INFO Verifying Result for:xr_disk_space
INFO Verifying Result for:xr_marker_files
INFO Verifying Result for:xr_mount_points
INFO Verifying Result for:xr_stale_symlinks
INFO Verifying Result for:xr_prepared_packages
INFO Verifying Result for:xr_tmp_staging_dir
INFO *****
INFO System is in Consistent State. **You can go ahead with next operation.**
INFO *****

INFO Total time taken: 3.96575188637 seconds.

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

For OSPF use “max-metric” command.

```
RP/0/RP0/CPU0:XR9000(config-ospf)# max-metric router-lsa
```

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

```
RP/0/RP0/CPU0:XR9000(config-isis)# set-overload-bit
```

- Check available space in install repository and delete unnecessary files/folder if needed to make sure that sufficient memory is available

```
sysadmin-vm:0_RP0# show media
```

- Check inactive packages and remove them before upgrading.

```
XR: RP/0/RP0/CPU0:XR9000#install remove inactive all  
Sysadmin: sysadmin-vm:0_RP0# show install inactive
```

- Check and delete core files and any other files which are not required in harddisk

```
RP/0/RP0/CPU0:XR9000#run  
[xr-vm_node0_RP0_CPU0:~]$cd /misc/disk1  
[xr-vm_node0_RP0_CPU0:/misc/disk1]$rm *core*
```

Software Upgrade

Classic Method

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

- Download 7.7.1 image from CCO.
- Copy the 7.7.1 iso image / tar file to the router harddisk and verify that file is copied successfully

```
RP/0/RP0/CPU0:XR9000#scp root@1.2.3.4://auto/<image file> /misc/disk1/.
```

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

```
[xr-vm_node0_RP0_CPU0:/misc/disk1]$md5sum fullk9-R-XR9000-771.tar
```

- Perform ‘install add’ of 771 tar file / iso image:

```
RP/0/RP0/CPU0:XR9000#install add source harddisk:/ fullk9-R-XR9000-771.tar
```

OR

```
RP/0/RP0/CPU0:XR9000#install add source tftp://auto/... xrv9k-fullk9-x-7.7.1.iso
```

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

```
Install operation 1 finished successfully
```

- Activate all the packages

```
RP/0/RP0/CPU0:XRv9000#install activate id 1 noprompt synchronous
```

- Router will reload at the end of activation operation for new packages to take effect.
- Verify that all the packages are installed correctly in XR and SysAdmin

```
RP/0/RP0/CPU0:XRv9000#show install active
sysadmin-vm:0_RP0# show install active
```

- 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:XRv9000#install commit
```

- Verify system stability through commands described under Check System Stability section (3.1) after router comes up with new software
- Verify show version to check router is upgraded to desired image.

```
RP/0/RP0/CPU0:XRv9000#show version
```

```
RP/0/RP0/CPU0:R1#show version
Cisco IOS XR Software, Version 7.7.1
Copyright (c) 2013-2022 by Cisco Systems, Inc.
```

Build Information:

```
Built By   : ingunawa
Built On   : Mon Jul 11 02:54:43 PDT 2022
Built Host : iox-ucs-067
Workspace  : /auto/iox-ucs-067-san2/prod/7.7.1/xrv9k/ws
Version    : 7.7.1
Location   : /opt/cisco/XR/packages/
Label      : 7.7.1-0
```

```
cisco IOS-XRv 9000 () processor
System uptime is 1 hour 50 minutes
```

- Check to see if there were any failed startup configurations and use CLI "clear configuration inconsistency" to clear failed configuration to proceed.

```
RP/0/RP0/CPU0:XRv9000#show configuration failed startup
```

- Add recommended SMUs for 7.7.1 if not already in initial tarball (optional)

```
RP/0/RP0/CPU0:XRv9000#install add source harddisk: <mandatory SMU tar file
for 7.7.1>
```

- Activate the recommended SMUs (if recommended smu's were added)

```
RP/0/RP0/CPU0:XRv9000#install activate id <add id of previous step>
noprompt synchronous
```

- After system comes up from reload, execute 'install commit'
- Please check "show install committed summary" to make sure your system is upgraded and committed with your desired version/7.7.1

Post-Upgrade Tasks

- 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:XRv9000#install remove inactive all
```

- Verify/fix configuration file system (mandatory):

```
RP/0/RP0/CPU0:XRv9000#cfs check
```

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

OSPF

```
RP/0/RP0/CPU0:XRv9000# (config-ospf)# no max-metric router-lsa
```

ISIS

```
RP/0/RP0/CPU0:XRv9000# (config-isis)# no set-overload-bit
```

Caveats

Following error is expected in Step-by-Step upgrade method, it was failing while moving from versions (721,722,731,732, 733, 742 and 751) to 771 version where CSCwa37195, CSCvz88591 are not fixed. Issue not seen while booting with GISO image.

July 17 04:54:41 Error! The following package(s) is/are required to be activated as part of this operation:

xrv9k-li-x

xrv9k-k9sec

July 17 04:54:41 Action 1: install prepare action aborted

Software Downgrade:

Classic Method

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

- Download 7.2.1 mini-ISO and packages tar and SMUs from CCO.
Copy iso image to tftp / scp / ftp server. Verify the contents of the tar file/iso image"
- Copy the 7.2.1 iso image/tar file to the router harddisk and verify that file is copied successfully

```
RP/0/RP0/CPU0:XR9000#scp root@1.2.3.4://image/CCO/fullk9-R-XRV9000-721.tar
```

- Verify the md5 checksum of the tar/individual rpms with the original MD5 values on CCO
bash-4.2\$ md5sum fullk9-R-XRV9000-721.tar

- [xr-vm_node0_RP0_CPU0:/misc/disk1]\$md5sum fullk9-R-XRV9000-721.tar
[xr-vm_node0_RP0_CPU0:/misc/disk1]\$

- Perform 'install add' of 721 iso image / tar file:

```
RP/0/RP0/CPU0:XR9000#install add source harddisk:/ fullk9-R-XRV9000-721.tar
```

OR

```
RP/0/RP0/CPU0:XR9000#install add source tftp://auto../ xrv9k-fullk9-x-7.2.1.iso
```

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

```
Install operation 9 finished successfully
```

- Activate all the packages

```
RP/0/RP0/CPU0:XR9000#install activate id 9 noprompt synchronous
```

- Router will reload at the end of activation operation for new packages to take effect.
- Verify that all the packages are installed correctly in XR and SysAdmin

```
RP/0/RP0/CPU0:XR9000#show install active  
sysadmin-vm:0_RP0# show install active
```

- 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:XR9000#install commit
```

- Verify system stability through commands described under Check System Stability section (3.1) after router comes up with new software
- Verify show version to check router is upgraded to desired image.

```
RP/0/RP0/CPU0:XR9000#show version
```

- Check to see if there were any failed startup configurations and use CLI "clear configuration inconsistency" to clear failed configuration to proceed.

```
RP/0/RP0/CPU0:XR9000#show configuration failed startup
```


- Add recommended SMUs for 7.2.1 if not already in initial tarball (optional)

```
RP/0/RP0/CPU0:XR9000#install add source harddisk: <mandatory SMU tar file for 7.2.1>
```

- Activate the recommended SMUs (if recommended smu's were added)

```
RP/0/RP0/CPU0:XR9000#install activate id <add id of previous step> noprompt synchronous
```

- After system comes up from reload, execute 'install commit'
- Please check "show install committed summary" to make sure your system is downgraded and committed with your desired version/7.2.1

Post-Downgrade Tasks

- 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:XR9000#install remove inactive all
```

- Verify/fix configuration file system (mandatory):

```
RP/0/RP0/CPU0:XR9000#cfs check
```

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

OSPF

```
RP/0/RP0/CPU0:XR9000# (config-ospf)# no max-metric router-lsa
```

ISIS

```
RP/0/RP0/CPU0:XR9000# (config-isis)# no set-overload-bit
```

Caveats

Aborts due to missing xrv9k-li-x in 722 while downgrading from 771 to 722-renumber, 733-renumber & 742 images. It is expected behaviour as per CSCwa37195, CSCvz88591 as the fix is not available in 722 & 733.

Other Boot Options (GISO)

GISO:

- Create GISO with necessary rpms/pkg/SMU
- Copy the GISO on to the harddisk
- Use the following command to active GISO from harddisk in one single shot with zero touch

```
RP/0/RP0/CPU0:XR9000#install replace harddisk: /<GISO_image> commit force noprompt
```