



Cisco XRV9000

IOS-XR Release 7.10.1

IOS-XR System Upgrade/Downgrade Procedure



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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 7.10.1 and vice versa.



Note

This document covers NGXR to NGXR upgrade procedure only.

Platform	From	To
XRV9000	7.X.X	7.10.1
XRV9000	7.10.1	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-7.10.1.iso
mpls	xrv9k-mpls-1.0.0.0-r7101.x86_64.rpm
mpls-rsvp-te	xrv9k-mpls-te-rsvp-1.0.0.0-r7101.x86_64.rpm
multicast	xrv9k-mcast-1.0.0.0-r7101.x86_64.rpm
ospf	xrv9k-ospf-1.0.0.0-r7101.x86_64.rpm
isis	xrv9k-isis-1.0.0.0-r7101.x86_64.rpm
li	xrv9k-li-x-1.0.0.0-r7101.x86_64.rpm
eigrp	xrv9k-eigrp-1.0.0.0-r7101.x86_64.rpm
k9sec	xrv9k-k9sec-1.0.0.0-r7101.x86_64.rpm
mgbl	xrv9k-mgbl-1.0.0.0-r7101.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

```
RP/0/RP0/CPU0:XRV9000#scp harddisk:/<file name> root@1.2.3.4:/auto/config/.
```

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 Verifying SCP file transfer on VMs
 - INFO Pass: scp file transfer succeed on all xr vms
 - INFO Pass: scp file transfer succeed on all cal vms
 - INFO Collecting HDPARM values of harddisk
 - INFO hdparm value on card 0/RP0 is 114.04 MB/sec
 - 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:host_version
 - INFO Verifying Result for:host_smus
 - INFO Verifying Result for:smartctl
 - 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:xr_version
 - 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: 21.9608619213 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 7.10.1 image from CCO.
- Copy the 7.10.1 iso image / tar file along with the rpm packages to the router harddisk and verify that files are 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-XR9000-7101.tar
```

- Perform ‘install add’ of 7101 tar file / iso image and rpm packages:

```
RP/0/RP0/CPU0:XR9000#install add source harddisk:/ fullk9-R-XR9000-7101.tar
```

OR

```
RP/0/RP0/CPU0:XR9000#install add source tftp://auto/.../ xr9k-fullk9-x-7.10.1.iso + required rpm pkgs
```

- 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 7.10.1  
Copyright (c) 2013-2023 by Cisco Systems, Inc.
```

Build Information:

```
Built By   : deenayak  
Built On   : Tue Jun 27 05:01:58 PDT 2023  
Built Host  : aacac540638b  
Workspace  : /auto/srcarchive16/prod/7.10.1/xrv9k/ws  
Version    : 7.10.1  
Location   : /opt/cisco/XR/packages/  
Label      : 7.10.1
```

```
cisco IOS-XRv 9000 () processor  
System uptime is 15 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 7.10.1 if not already in initial tarball (optional)

```
RP/0/RP0/CPU0:XRv9000#install add source harddisk: <mandatory SMU tar file  
for 7.10.1>
```

- 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/7.10.1

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

No Caveats found.

Software Downgrade:

Classic Method

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

- Download 7.2.2 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 7.2.2 iso image/tar file to the router harddisk and verify that file is copied successfully

```
RP/0/RP0/CPU0:XRv9000#scp root@1.2.3.4://image/CCO/ fullk9-R-XRv9000-722.tar
```

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

```
bash-4.2$ md5sum fullk9-R-XRV9000-722.tar
```

- [xr-vm_node0_RP0_CPU0:/misc/disk1]\$md5sum fullk9-R-XRV9000-722.tar
[xr-vm_node0_RP0_CPU0:/misc/disk1]\$

- Perform 'install add' of 722 iso image / tar file:

```
RP/0/RP0/CPU0:XRV9000#install add source harddisk:/ fullk9-R-XRV9000-722.tar
```

OR

```
RP/0/RP0/CPU0:XRV9000#install add source tftp://auto/.../ xrv9k-fullk9-x-7.2.2.iso + required rpm pkgs
```

- 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:XRV9000#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: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
```

- 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 7.2.2 if not already in initial tarball (optional)

```
RP/0/RP0/CPU0:XRV9000#install add source harddisk: <mandatory SMU tar file for 7.2.2>
```


- 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 downgraded and committed with your desired version/7.2.2

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: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

Observed DDTs#CSCwe12104

Problem Description:

we are hitting an exception error as mentioned in DDTs# CSCwe12104 while downgrading from 7101 to 722/733/742/752/762/772 releases, during admin VM reload the router is going unresponsive. We are observing this issue on XRv9K launched on ESXi hypervisor.

NOTE: Issue not seen in XRv9K launched on KVM based hypervisor.

Other Boot Options (GISO)

GISO:

- Create GISO with necessary rpms/pkgs/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:XRv9000#install replace harddisk:/<GISO_image> commit force noprompt
```