



# Cisco XRV9000

## IOS-XR Release 24.2.1

### 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 24.2.1 and vice versa.



**Note**

This document covers NGXR to NGXR upgrade procedure only.

Upgrade		
V1	V2	Bridge SMU
75x	2421	CSCwj08501
76x	2421	CSCwj08501
77x	2421	CSCwj08501
78x	2421	CSCwj08501
79x	2421	
710x	2421	
711x	2421	
241x	2421	

**Note:** CSCwj08501 need it on V1 image and is applicable for vRR ESXi and Appliance setup

Downgrade		
V1	V2	Bridge SMU
2421	75x	**
2421	76x	**
2421	77x	**
2421	78x	**
2421	79x	
2421	710x	
2421	711x	
2421	241x	

**\*\* Please refer the caveat Section.**

## 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-mini-x-24.2.1.iso
mpls	xrv9k-mpls-1.0.0.0-r2421.x86_64.rpm
mpls-rsvp-te	xrv9k-mpls-te-rsvp-1.0.0.0-r2421.x86_64.rpm
multicast	xrv9k-mcast-1.0.0.0-r2421.x86_64.rpm
ospf	xrv9k-ospf-1.0.0.0-r2421.x86_64.rpm
isis	xrv9k-isis-1.0.0.0-r2421.x86_64.rpm
Li	xrv9k-li-x-1.0.0.0-r2421.x86_64.rpm

Eigrp	xrv9k-eigrp-1.0.0.0-r2421.x86_64.rpm
k9sec	xrv9k-k9sec-1.0.0.0-r2421.x86_64.rpm
Mgbl	xrv9k-mgbl-1.0.0.0-r2421.x86_64.rpm

## Configuration Backup

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

```
RP/0/RP0/CPU0:XR9000# copy running-config harddisk:/running_config
```

- Verify/fix configuration file system (mandatory):

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

- Copy the running-configuration to a remote scp server

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

- sysadmin-vm:0\_RP0# show install health
- Mon Mar 11 15:34:37.297 UTC+00:00
- 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 355.24 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:xr\_version
- INFO Verifying Result for:cal\_smus
- INFO Verifying Result for:smartctl
- INFO Verifying Result for:xr\_smus
- INFO Verifying Result for:cal\_local\_active\_swp
- INFO Verifying Result for:cal\_local\_committed\_swp
- INFO Verifying Result for:xr\_disk\_space
- INFO Verifying Result for:cal\_disk\_space
- INFO Verifying Result for:xr\_marker\_files
- INFO Verifying Result for:cal\_marker\_files

- INFO Verifying Result for:xr\_mount\_points
  - INFO Verifying Result for:cal\_mount\_points
  - INFO Verifying Result for:xr\_stale\_symlinks
  - INFO Verifying Result for:cal\_stale\_symlinks
  - INFO Verifying Result for:xr\_prepared\_packages
  - INFO Verifying Result for:cal\_prepared\_packages
  - INFO Verifying Result for:xr\_tmp\_staging\_dir
  - 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 \*\*\*\*\*
  - INFO System is in Consistent State. You can go ahead with next operation.
  - INFO \*\*\*\*\*
  - INFO Total time taken: 20.4302339554 seconds.
- sysadmin-vm:0\_RP0#

- **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
```

Example : Harddisk required minimum 2GB during image staging.

- 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 24.2.1 image from CCO.
- Copy the 24.2.1 iso image / tar file along with the rpm packages to the router harddisk and verify that files are copied successfully

```
RP/0/RP0/CPU0:XRv9000#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 xrv9k-mini-x-24.2.1.iso
```

- Perform 'install add' of 2421 tar file / iso image and rpm packages:

```
RP/0/RP0/CPU0:XRv9000#install add source harddisk:/ xrv9k-mini-x-24.2.1.iso  
+ Required rpms
```

OR

```
RP/0/RP0/CPU0:XRv9000#install add source tftp://auto/.../ xrv9k-mini-x-24.2.1.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:RR3-XRv-M5#show ver  
Wed Jun 12 13:16:20.328 UTC
```

Build Information:

Built By : swtools

Built On : Tue Jun 11 08:30:31 PDT 2024

Built Host : iox-ucs-004

Workspace : /auto/srcarchive11/prod/24.2.1/xrv9k/ws

Version : 24.2.1

Location : /opt/cisco/XR/packages/

Label : 24.2.1

cisco IOS-XRv 9000 () processor

System uptime is 38 minutes

RP/0/RP0/CPU0:RR3-XRv-M5#

- 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 24.2.1 if not already in initial tarball (optional)

```
RP/0/RP0/CPU0:XRv9000#install add source harddisk: <mandatory SMU tar file for 24.2.1>
```

- 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/24.2.1

## **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:XR9000# (config-ospf)# no max-metric router-lsa
```

#### ISIS

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

## Software Downgrade:

### **Classic Method**

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

- Download 7.9.2 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 7.9.2 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/ xrv9k-mini-x-7.9.2.iso
```

```
RP/0/RP0/CPU0:XR9000#scp root@1.2.3.4://image/CCO/ rpm.tar
```

- Verify the md5 checksum of the tar/individual rpms with the original MD5 values on CCO  
bash-4.2\$ md5sum fullk9-R-XRV9000-792.tar
- [xr-vm\_node0\_RP0\_CPU0:/misc/disk1]\$md5sum xrv9k-mini-x-7.9.2.iso  
[xr-vm\_node0\_RP0\_CPU0:/misc/disk1]\$
- Perform ‘install add’ of 792 iso image / tar file:

```
RP/0/RP0/CPU0:XR9000#install add source harddisk:/ xrv9k-mini-x-7.9.2.iso  
+ Required Rpm tar
```

OR

```
RP/0/RP0/CPU0:XR9000#install add source tftp://auto/.../ xrv9k-mini-x-  
7.9.2.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: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 7.9.2 if not already in initial tarball (optional)

```
RP/0/RP0/CPU0:XR9000#install add source harddisk: <mandatory SMU tar file for 7.9.2>
```

- 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/7.9.2

## **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: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:XRv9000# (config-ospf)# no max-metric router-lsa
ISIS
RP/0/RP0/CPU0:XRv9000# (config-isis)# no set-overload-bit
```

## **Caveats**

### **Observed DDTS#CSCwe12104 - Xrv9k-Unable to upgrade/downgrade image from 772.10i to 781.33i.**

#### **Problem Description:**

we are hitting an exception error as mentioned in DDTS# CSCwe12104 while downgrading from 2421 to 75x/76x/77x/78x releases, during admin VM reload the router is going unresponsive. We are observing this issue on XRv9K launched on ESXi hypervisor and Appliance mode. This issue is not SMuable, So Downgrade was blocked.

#### **Recovering options:**

1. Fresh installation in ESXI hypervisor mode.
2. USB boot and CIMC boot are workaround for Appliance mode.

### **Observed DDTS#CSCwj08501 - Increase the sysadmin ram allocation from 3GB to 4GB for install upgrade/downgrade failures.**

#### **Problem Description :**

we are hitting an exception error as mentioned in DDTS# CSCwj08501 while upgrading from 76x/77x/78x releases to 2421, during admin VM reload the router is going unresponsive. This issue is specific to vRR ESXI and Appliance mode. SMU required for V1 image.