



Cisco XRV9000

IOS-XR Release 24.1.1

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.

Cisco Systems, Inc. All rights reserved. CCVP, the Cisco logo, and the Cisco Square Bridge logo are trademarks of Cisco Systems, Inc.; Changing the Way We Work, Live, Play, and Learn is a service mark of Cisco Systems, Inc.; and Access Registrar, Aironet, BFX, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, CCSP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Enterprise/Solver, EtherChannel, EtherFast, EtherSwitch, Fast Step, Follow Me Browsing, FormShare, GigaDrive, GigaStack, HomeLink, Internet Quotient, IOS, IP/TV, IQ Expertise, the IQ logo, iQ Net Readiness Scorecard, iQuick Study, LightStream, Linksys, MeetingPlace, MGX, Networking Academy, Network Registrar, Packet, PIX, ProConnect, RateMUX, ScriptShare, SlideCast, SMARTnet, StackWise, The Fastest Way to Increase Your Internet Quotient, and TransPath are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or Website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0609R)

Contents

Purpose, Scope and Audience	3
Obtain Required Package Files	3
Configuration Backup	4
Pre-Upgrade Tasks	4
Software Upgrade	5
Classic Method	6
Post-Upgrade Tasks	7
Caveats	Error! Bookmark not defined.
Classic Method	8
Post-Downgrade Tasks	9
Caveats	Error! Bookmark not defined.

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 24.1.1 and vice versa.



This document covers NGX to NGX upgrade procedure only.

Upgrade		
V1	V2	Bridge SMU
75x	2411	
76x	2411	CSCwj08501
77x	2411	CSCwj08501
78x	2411	CSCwj08501
79x	2411	CSCwj08501
710x	2411	CSCwj08501
711x	2411	CSCwj08501

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

Downgrade		
V1	V2	Bridge SMU
2411	75x	**
2411	76x	**
2411	77x	**
2411	78x	**
2411	79x	CSCwh82660
2411	710x	CSCwh82660
2411	711x	CSCwh82660

Note: CSCwh82660 need it on V2 image and is applicable for vRR ESXi and Appliance setup

**** 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-24.1.1.iso
mpls	xrv9k-mpls-1.0.0.0-r2411.x86_64.rpm
mpls-rsvp-te	xrv9k-mpls-te-rsvp-1.0.0.0-r2411.x86_64.rpm
multicast	xrv9k-mcast-1.0.0.0-r2411.x86_64.rpm
ospf	xrv9k-ospf-1.0.0.0-r2411.x86_64.rpm
isis	xrv9k-isis-1.0.0.0-r2411.x86_64.rpm
Li	xrv9k-li-x-1.0.0.0-r2411.x86_64.rpm

Eigrp	xrv9k-eigrp-1.0.0.0-r2411.x86_64.rpm
k9sec	xrv9k-k9sec-1.0.0.0-r2411.x86_64.rpm
Mgbl	xrv9k-mgbl-1.0.0.0-r2411.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 24.1.1 image from CCO.
- Copy the 24.1.1 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-24.1.1.iso
```

- Perform 'install add' of 2411 tar file / iso image and rpm packages:

```
RP/0/RP0/CPU0:XRv9000#install add source harddisk:/ xrv9k-mini-x-24.1.1.iso  
+ Required rpms
```

OR

```
RP/0/RP0/CPU0:XRv9000#install add source tftp://auto/./ xrv9k-mini-x-24.1.1.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#sh version  
Tue Mar 12 14:32:11.191 UTC  
Cisco IOS XR Software, Version 24.1.1
```

Build Information:

```
Built By      : swtools
Built On      : Mon Mar 11 19:41:26 PDT 2024
Built Host    : iox-ucs-066
Workspace     : /auto/srcarchive15/prod/24.1.1/xrv9k/ws
Version       : 24.1.1
Location      : /opt/cisco/XR/packages/
Label        : 24.1.1
```

```
cisco IOS-XRv 9000 () processor
System uptime is 40 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 24.1.1 if not already in initial tarball (optional)

```
RP/0/RP0/CPU0:XRv9000#install add source harddisk: <mandatory SMU tar file
for 24.1.1>
```

- 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/24.1.1

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: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 7.9.2 if not already in initial tarball (optional)

```
RP/0/RP0/CPU0:XRv9000#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: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/7.9.2

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: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 - 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 2411 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/79x/710x/711x releases to 2411, during admin VM reload the router is going unresponsive. This issue is specific to vRR ESXi and Appliance mode. SMU required for V1 image.

Observed DDTS#CSCwh82660 – Downgrade failed from 2411 to 711x/710x/79x

Problem Description :

we are hitting an exception error as mentioned in DDTS# CSCwh82660 while downgrading from 2411 to 79x/710x/711x releases, during admin VM reload the router is going unresponsive. This issue is specific to vRR ESXi and Appliance mode. SMU required for V2 image.