



**GSR IOS XR Release 4.0.0**  
**Upgrade / Downgrade Procedure**  
**3.7.x – 3.9.x to 4.0.0**

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**For the latest upgrade documents please refer to the following page:**

[http://www.cisco.com/web/Cisco\\_IOS\\_XR\\_Software/index.html](http://www.cisco.com/web/Cisco_IOS_XR_Software/index.html)

## 1. Obtain Required PIE Files

C12K Mini & Upgrade packages are mandatory. Perform all the upgrade operations in **admin mode** only. **The Upgrade package c12k-upgrade-4.0.0 is used ONLY during upgrade and once upgrade is completed (router boots with newer version), the upgrade pie must be deactivated and removed.** Additional packages listed below are also needed depending on the router configuration and required features.

PIE File Description	Sample PIE Filename	Default Package Name
Composite Mini Package (OS-MBI, Base, Admin, Fwdg, Ic Rout)	c12k-mini.pie-4.0.0	disk0:c12k-mini-4.0.0
Multicast Package	c12k-mcast.pie-4.0.0	disk0:c12k-mcast-4.0.0
Manageability Package	c12k-mgbl.pie-4.0.0	disk0:c12k-mgbl-4.0.0
MPLS Package	c12k-mpls.pie-4.0.0	disk0:c12k-mpls-4.0.0
Security Package	c12k-k9sec.pie-4.0.0	disk0:c12k-k9sec-4.0.0
Diagnostic package	c12k-diags.pie-4.0.0	disk0:c12k-diags-4.0.0
Field Programmable Device package	c12k-fpd.pie-4.0.0	disk0:c12k-fpd-4.0.0
Upgrade pie	c12k-upgrade.pie-4.0.0	c12k-upgrade.pie-4.0.0

## 2. Install Mandatory SMUs

N/A

## 3. Check System Stability

The following commands should be executed to verify basic system stability before the upgrade/downgrade:

<code>(admin)# show platform</code>	[verify that all Nodes are in "IOS XR RUN" state, SPAs in "OK" state, Fan Tray and Power Modules are in "READY"]
<code>show redundancy</code>	[verify that Active & Standby RSP available and in Active & "ready" states]
<code>show interface summary</code>	[verify that all interfaces are "UP"]
<code>show install active</code>	[verify that the proper set of packages are active]

`cfs check/clear configuration inconsistency` [verify/fix configuration file system in exec and admin mode]

**Note 1:** before upgrade/downgrade, check for the tftp reachability

## 4. Perform Pre-Upgrade Tasks

- 1) Sufficient disk space is required to perform the upgrade.
- 2) Due to increasing size of the images sufficient disk space is required to perform the upgrade. 2Gig flash disk option was first introduced in release 3.7.0, optional 4Gig one is available starting 3.8.x release.

**When upgrading to release 4.0.0, a PCMCIA flash disk of 2Gig or larger has to be installed in the system BEFORE the software upgrade is performed.**

Use "show filesystem" command to check the actual disk0 size:

```
RP/0/RP0/CPU0:Router#sho filesystem
Wed July 30 15:28:57.401 PST PST
File Systems:
```

Size (b)	Free (b)	Type	Flags	Prefixes
-	-	network	rw	qsm/dev/fs/tftp:
-	-	network	rw	qsm/dev/fs/rcp:
-	-	network	rw	qsm/dev/fs/ftp:
1043456	1005568	dumper-lnk	rw	qsm/dumper_nvram:
39929724928	39605428224	dumper-lnk	rw	qsm/dumper_harddisk:
1004994560	114500224	dumper-lnk	rw	qsm/dumper_disk1:
1024606208	423608320	dumper-lnk	rw	qsm/dumper_disk0:
62390272	49101348	dumper-lnk	rw	qsm/dumper_bootflash:
39929724928	39605428224	harddisk	rw	harddisk:
1024606208	423608320	flash-disk	rw	disk0: ←-----
1004994560	114500224	flash-disk	rw	disk1:
1043456	1005568	nvram	rw	nvram:
62390272	49101348	flash	rw	bootflash:

If the disk size is smaller than 2Gig please follow "Cisco XR 12000 and CRS-1 Flash Disk Upgrade Tasks" document which can be found at:

[http://www.cisco.com/web/Cisco\\_IOS\\_XR\\_Software/index.html](http://www.cisco.com/web/Cisco_IOS_XR_Software/index.html)

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*Note1: if you have already loaded the installation files for the new operating system version onto the router, the 'install remove inactive' will delete these files! Therefore, only load the new packages (via 'install add') after removing the inactive packages.*

Note2: In order to provide as much room as possible on the disk, one can remove old files from the disk. This may include files which the operator has placed on the disk device such as .pie files or temporary directory that have been created.

When preparing for the upgrade to the next version of the operating system, the old, non-operational version should be removed.

To remove old SMU files and old versions of the operating system use the admin-commands

*install commit*

to ensure all active packages are 'committed', then issue the command

*install remove inactive*

The 'install remove inactive test sync' commands can be used first to show which packages will be removed from the disk.

*Note3: In addition to checking the installation disk device, the bootflash device on the MSCs should also be checked. Extraneous files such as crashinfo files can be removed. To check the free space of the bootflash use the following command:*

*dir bootflash: location 0/1/CPU0*

3) Copy the running-configuration and admin-configuration to a temporary storage location. This could be on a remote TFTP server or a device such as the harddisk: or compactflash: present on the RSP.

*RP/0/2/CPU0:PE1-E3E5:router#copy running-config tftp://...running\_config.txt*

*RP/0/2/CPU0:PE1-E3E5:router#admin*

*RP/0/2/CPU0:PE1-E3E5:router(admin)#copy running-config tftp://...admin-running\_config.txt*

*RP/0/2/CPU0:PE1-E3E5:router(admin)#exit*

4) Verify Mgmt LAN access to the router

*RP/0/2/CPU0:PE1-E3E5:router# ping <tftp\_server\_address>*

**Note 5:** If unable to reach the Mgmt LAN or TFTP\_SERVER, please check the Mgmt Port states and route configuration for Mgmt LAN.

5) Disable disk mirroring, if in use

Disable disk mirroring feature, if enabled on the router, before going to next step. Disk mirroring can increase the upgrade time.

**Note 6:** Enable Disk Mirroring again, once IOS XR upgrade procedure is complete.

## 5. Upgrade to IOS XR Release 4.0.0

**Note 1:** All install operations should be done in admin mode.

**Note 2:** Check System Stability [See **Section 3** for details].

1) Add the required pies to disk:

```
RP/0/2/CPU0:PE1-E3E5:router(admin)#install add <source>/<path>/<pie-1>  
<source>/<path>/<pie-2> ... <source>/<path>/<pie-n> sync
```

**Note 3:** The <source> can be one of disk0:, disk1:, tftp:, ftp: or rcpx:

**Note 4:** C12K Mini and Upgrade Packages are Mandatory, use of any of the optional packages [listed in section 1] will vary as per customer's requirements. For example, c12k-mcast.pie-4.0.0 is needed for Multicast features.

**Note 5:** The above step must be repeated for each pie file, or all required pies can be added together in a single 'install add ..' command. To add all pies using a single command, list all of the pies (including their source) within the 'install add ..' command in the following manner:

```
RP/0/2/CPU0:PE1-E3E5:router(admin)# install add <source-path>/c12k-mini.pie-4.0.0  
<source-path>/c12k-upgrade.pie-4.0.0 <source-path>/c12k-mcast.pie-4.0.0 <source-  
path>/c12k-mgbl.pie-4.0.0 <source-path>/c12k-mpls.pie-4.0.0 <source-path>/c12k-  
k9sec.pie-4.0.0 <source-path>/c12k-video.pie-4.0.0 <source-path>/c12k-doc.pie-4.0.0 sync
```

Below is an example of add packages to disk command:

```
RP/0/2/CPU0:PE1-E3E5:router(admin)# install add  
tftp://223.255.254.245/tftpserver/images/c12k-mini.pie-4.0.0  
tftp://223.255.254.245/tftpserver/images/c12k-upgrade.pie-4.0.0  
tftp://223.255.254.245/tftpserver/images/c12k-mcast.pie-4.0.0  
tftp://223.255.254.245/tftpserver/images/c12k-mgbl.pie-4.0.0  
tftp://223.255.254.245/tftpserver/images/c12k-mpls.pie-4.0.0  
tftp://223.255.254.245/tftpserver/images/c12k-k9sec.pie-4.0.0  
tftp://223.255.254.245/tftpserver/images/c12k-doc.pie-4.0.0 -----
```

Install operation 14 completed successfully

**Note 6:** The use of 'sync' option will prevent the user from executing any other command during the install operation, and is recommended.

**Note 7:** Source Path of packages can be specified just once rather than for each package, using 'source' keyword. This simplifies the command:

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```
RP/0/2/CPU0:PE1-E3E5:router(admin)# install add source <source-path> c12k-mini.pie-4.0.0  
c12k-upgrade.pie-4.0.0 c12k-mcast.pie-4.0.0 c12k-mgbl.pie-4.0.0 c12k-mpls.pie-4.0.0 c12k-  
k9sec.pie-4.0.0 sync
```

**Note 8:** Under idle conditions, this command may take at least 35 minutes to complete, during which the router will be fully functional.

**Note 9:** tar file can also be used to add the packages to the local disk of router

```
RP/0/2/CPU0:PE1-E3E5:router (admin)# install add tar <source-path>/<tar-file>
```

- 2) List the inactive packages list using 'show install inactive summary' command

Example :

```
RP/0/RSP0/CPU0:router(admin)# sh install inactive summary  
Default Profile:  
SDRs:  
Owner  
Inactive Packages:  
disk0:c12k-mini-4.0.0  
disk0:c12k-upgrade-4.0.0  
disk0:c12k-mcast-4.0.0  
disk0:c12k-mgbl-4.0.0  
disk0:c12k-mpls-4.0.0  
disk0:c12k-k9sec-4.0.0  
disk0:c12k-doc-4.0.0
```

- 3) Using the list of inactive packages from previous step, select and test the activation using the CLI:

```
RP/0/2/CPU0:PE1-E3E5:router(admin)# install activate <source> :<pie-1> <source> :<pie-  
2> ... <source> :<pie-n> test sync
```

Example:

```
RP/0/2/CPU0:PE1-E3E5:router(admin)# install activate disk0:c12k-mini-4.0.0 disk0 :c12k-  
upgrade-4.0.0 disk0:c12k-doc-4.0.0 disk0:c12k-mcast-4.0.0 disk0:c12k-mgbl-4.0.0  
disk0:c12k-k9sec-4.0.0 disk0:c12k-mpls-4.0.0 sync test
```

**Note 11:** Testing the activation will give you a preview of the activation. No actual changes will be made when 'test' option is used.

**Note 12:** Any config that is incompatible with the new version being activated will be identified. The 'show configuration removed' command can be used to view what will be removed as result of the software upgrade.

**Note 13:** Such removed config can be reapplied using the 'load config removed <config>.cfg' command from config mode after the upgrade has been completed.

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- 4) Activate inactive packages added in step 1 using command:

```
RP/0/2/CPU0:PE1-E3E5:router(admin)# install activate <source> :<pie-1> <source> :<pie-2> ... <source> :<pie-n> sync
```

Example :

```
RP/0/2/CPU0:PE1-E3E5:router (admin)# install activate disk0:c12k-mini-4.0.0 disk0:c12k-upgrade-4.0.0 disk0:c12k-doc-4.0.0 disk0:c12k-mcast-4.0.0 disk0:c12k-mgbl-4.0.0 disk0:c12k-k9sec-4.0.0 disk0:c12k-mpls-4.0.0 sync
```

**Note 14:** The output of 'install add' command executed in step 1 OR output of 'show install inactive summary' in step2, provides the list of names of packages to be used in 'install activate <package>..' command.

**Note 15:** The use of 'sync' option will prevent the user from executing any other command during the install operation.

**Note 16:** From release 3.7.x, pies can subsequently be activated using single command based on the install operation id generated after each install command:

```
RP/0/2/CPU0:PE1-E3E5:router (admin)# install activate id <install_operation_id> sync
```

Install operation id is printed after finishing each install command or can be obtained using "show install log" command.

Below is an example of activating packages using Install operation id from the above Note 3 install add operation example:

```
RP/0/2/CPU0:PE1-E3E5:router (admin)# install activate id 14 sync
```

**Note 17:** The Router will reload at the end of activation to start using the new packages. This reload operation will impact traffic for small duration.

**Note 18:** Under idle conditions, this operation may take at least 20 minutes to complete.

**Note 19:** A wild card option is available and can also be used during packages activation.

```
RP/0/2/CPU0:PE1-E3E5:router (admin)# install activate disk0 :*4.0.0* sync
```

*\*Warning message: The following packages are specified multiple times could be observed.*

- 5) Check to see if there were any failed startup config.

```
RP/0/2/CPU0:PE1-E3E5:router# show configuration failed startup
```

- 6) Verify system stability through commands described under **Check System Stability** [See **Section 3** for details]. If system issues are detected or if the upgrade needs to be backed out for



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any reason, please follow the steps described in **Downgrade** [See **Section 8** for details] to rollback the software to the starting point.

- 7) Perform install deactivate the upgrade package (c12k-upgrade-4.0.0) and install remove the upgrade package.

```
RP/0/2/CPU0:PE1-E3E5:router (admin)# install deactivate disk0:c12k-upgrade.pie-4.0.0
```

```
RP/0/2/CPU0:PE1-E3E5:router (admin)# install remove disk0:c12k-upgrade.pie-4.0.0
```

- 8) Commit the newly activated software and verify:

```
RP/0/2/CPU0:PE1-E3E5:router (admin)# install commit
```

```
RP/0/2/CPU0:PE1-E3E5:router (admin)# show install committed summary
```

- 9) Clear configuration inconsistencies from admin and exec mode

```
RP/0/RSP0/CPU0:router(admin)#clear configuration inconsistency
```

```
RP/0/RSP0/CPU0:router#clear configuration inconsistency
```

**Note 20:** After software upgrade to 4.0.0 on wards, user might see licensing related error message; please refer to the 4.0.0 Release Notes for information.

## 6. Mandatory 4.0.0 FPD Upgrade

After running the install commit command on upgrade to 4.0.0 software, run the "show hw-module fpd location all" command to check which firmware files need to be upgraded, by inspecting the Upg/Dng column. If there is any 'Yes' marked, upgrade is required.

### Steps to Upgrade FPD firmware [R4.0.0]:

- 1) While running 4.0.0 Software Version on C12K router, Run the "show hw-module fpd location all" command to check which firmware files need to be upgraded.

```
RP/0/7/CPU0:CE1-E3E5(admin)#sho hw-module fpd location all
Fri Sep  3 14:30:21.960 UTC
```

```
===== Existing Field Programmable Devices =====
=====
Location      Card Type      HW      Type Subtype Inst  Current SW Upg/
=====      =====      =====
0/0/0          SPA-5X1GE-V2    1.2     spa  fpga1  0      1.10      No
-----
0/0/1          SPA-4XCT3/DS0   1.1     spa  fpga1  1      2.08      No
                        spa  rommon 1      2.12      No
```

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			spa	fpga2	1	1.04	No
0/1/0	SPA-OC192POS-XFP	2.1	spa	fpga1	0	1.02	No
0/1/1	SPA-1XCHOC12/DS0	1.0	spa	rommon	1	2.02	No
			spa	fpga1	1	1.36	No
			spa	fpga2	1	1.00	No
0/1/2	SPA-2CHT3-CE-ATM	1.0	spa	fpga1	2	2.22	No
			spa	rommon	2	1.04	No
			spa	fpga2	2	1.10	No
0/2/0	SPA-8X1GE-V2	1.1	spa	fpga1	0	1.10	No
0/3/CPU0	E3-OC12-ATM-4	N/A	lc	fpga1	0	40977.00	No
			lc	fpga2	0	40971.00	No
			lc	fpga3	0	41091.00	No
			lc	fpga4	0	45586.00	No
0/8/0	SPA-8XCHT1/E1	1.5	spa	fpga1	0	2.08	No
			spa	rommon	0	2.12	No
0/8/1	SPA-8X1FE-V2	1.0	spa	fpga1	1	1.01	No
0/8/2	SPA-1XCHSTM1/OC3	2.0	spa	fpga1	2	1.08	No
			spa	rommon	2	2.12	No
			spa	fpga2	2	1.04	No
0/13/CPU0	E3-OC12-ATM-4	N/A	lc	fpga1	0	40977.00	No
			lc	fpga2	0	40971.00	No
			lc	fpga3	0	41091.00	No
			lc	fpga4	0	45586.00	No

... Snipped ...

**Note 1:** In the output above, the column 'Upg Dng?' points to the down-rev firmware software versions, which need to be upgraded.

- 2) Issue the following command to check the latest version of all FPGA/ROMMON/CPLDs:

```
RP/0/RSP0/CPU0:router(admin)#show fpd package
```

For "show fpd package" example output to display latest FPD version, please refer to **Section 12 [Appendix A]**

- 3) Issue the following command to upgrade fpd:

```
RP/0/RSP0/CPU0:router(admin)#upgrade hw-module fpd all location all
```

**Note 2:** Except CBC update, router reload is required after running the "upgrade hw-module fpd all location all" command, to make the changes in effect.

## 7. Downgrade

**Note 1:** All install operations should be done in admin mode.

**Note 2:** Check System Stability [See Section 3 for details].

**Note 3:** As `fpd.pie` is part of mini package in 3.9.1 release onwards (prior or 3.9.1 release, it was a separate package), when downgrading from 4.0.0/3.9.1 to any previous release, `fpd.pie` need to be activated along with down-version (3.7.x and 3.9.0) packages.

**Note 4:** Downgrade requires at least equal number of matching packages. For example, if an upgraded release had Mini Package and Mcast Package activated, software downgrade path will require same number of packages (Mini and Mcast Package). In addition, FPD package is required to be part of downgrade command (as per Note2).

**Note 5:** Download the mandatory SMU needed to downgrade from 4.0.0 to 3.7.x. The mandatory SMU must be installed and activated along with the 3.7.x packages (install add/install activate). Please do not use install rollback.

**Note 6:** Before downgrade to 3.7.x or 3.9.x, the Mandatory upgrade package (`c12k-upgrade.pie-4.0.0`) needs to be deactivated and removed.

**Note 7:** Before downgrade to 3.7.x or 3.9.x, we recommend to backup any installed 4.0.0 Software licenses.

**Note 8:** Before downgrade to 3.7.x, 3.8.x or 3.9.x, any installed newly supported 4.0.0 line card/SPAs need to be removed.

1) List the available package to downgrade:

```
RP/0/RSP0/CPU0:router(admin)#install activate ?
```

2) If you previously executed "install remove" command to permanently remove any packages after upgraded in 4.0.0 release, please run the following command to re-add the relevant packages to disk0 :

```
RP/0/RSP0/CPU0:router (admin)# install add <device or tftp>/<path> /<3.7.x.pie> sync
```

OR

```
RP/0/RSP0/CPU0:router (admin)# install add <device or tftp>/<path> /<3.9.x.pie> sync
```

3) Activate to the downgrade revision package:

Activate all of the packages you need to downgrade to, which also available listed in step 1:

Or

Activate all of the packages added in step 2:

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```
RP/0/RSP0/CPU0:router(admin)# install activate disk0:comp-c12k-mini-3.7.x disk0:c12k-mcast-3.7.x disk0:c12k-mgbl-3.7.x disk0:c12k-k9sec-3.7.x disk0:c12k-mpls-3.7.x disk0:c12k-fpd-3.7.x sync
```

Or

```
RP/0/RSP0/CPU0:router(admin)# install activate disk0:comp-c12k-mini-3.9.x disk0:c12k-mcast-3.9.x disk0:c12k-mgbl-3.9.x disk0:c12k-k9sec-3.9.x disk0:c12k-mpls-3.9.x disk0:c12k-fpd-3.9.x sync
```

**Note 12:** The output of 'install add' command executed in step 2 provides the list of names of packages to be used in "install activate .." command.

**Note 13:** The use of "sync" option will prevent the user from executing any other command during the install operation.

**Note 14:** The router will reload at the end of activation to start using the new packages.

**Note 15:** Under idle conditions, this operation may take at least 20 minutes to complete.

**Note 16:** A wild card option is available during packages activation.

```
RP/0/RSP0/CPU0:router(admin)# install activate disk0:*3.7.x*
```

OR

```
RP/0/RSP0/CPU0:router(admin)# install activate disk0:*3.9.x*
```

*\*Warning message: The following packages are specified multiple times: may be observed.*

- 4) Check to see if there were any failed startup config.

```
RP/0/2/CPU0:PE1-E3E5:router# show configuration failed startup
```

- 5) Verify system stability through commands described under **Check System Stability** [See **Section 3** for details]. If system issues are detected or if the upgrade needs to be backed out for any reason, please follow the steps described in **Downgrade** [See **Section 8** for details] to rollback the software to the starting point.

- 6) After router downgraded to 3.7.x, commit the newly activated software, and verify

```
RP/0/RSP0/CPU0:router(admin)#install commit
```

```
RP/0/2/CPU0:PE1-E3E5:router (admin)# show install committed summary
```

## 8. Downgrade Using Install Rollback Option

- 1) List the available rollback points:

```
RP/0/RSP0/CPU0:router(admin)# show install rollback ?
```

- 2) Identify the rollback point by executing the following show command and analyzing the software configuration at the rollback point:

```
RP/0/RSP0/CPU0:router(admin)# show install rollback <rollback point>
```

**Note 1:** A valid rollback point number must be specified. The output will show list of active packages for that rollback point.

- 3) Test the rollback operation using the 'test' option. Testing the rollback operation can give you a preview of the rollback.

```
RP/0/RSP0/CPU0:router (admin)# install rollback to <rollback point> sync test
```

**Note 3:** The output will detect if any incompatible config exist. In such cases, 'show configuration removed' command can be used to view what will be removed as result of the software downgrade.

**Note 4:** Removed command can be reapplied at a later time using the 'load config removed <config>.cfg' command from config mode.

The following is a sample output:

```
Warning: SDR Owner: No incompatible configuration will be removed due to the
Warning: 'test' option
```

```
Info: SDR Owner: Detected incompatibility between the activated software
Info: and router running configuration.
Info: SDR Owner: Removing the incompatible configuration from the running
Info: configuration.
Info: SDR Owner: Saving removed configuration in file '20060316131636.cfg'
Info: on node 'RSP/0/0/CPU0:'
Info: Use the "show configuration removed 20060316131636.cfg" command to
Info: view the removed config.
Info: NOTE: You must address the incompatibility issues with the
Info: removed configuration above and re-apply it to the running
Info: configuration as required. To address these issues use the
Info: "load configuration removed 20060316131636.cfg" and "commit"
Info: commands.
```

Use the command suggested in the above example to display the config that will potentially be removed after the downgrade.

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- 4) Perform the rollback operation using command:

```
RP/0/RSP0/CPU0:router(admin)# install rollback to <rollback point> sync
```

**Note 5:** Based on the set of packages being activated and deactivated as part of the rollback operation, one or more nodes may be reloaded. Please be patient as this operation could take some time.

**Note 6:** If you previously executed 'install remove' command to permanently remove any packages in the rollback configuration then the rollback operation will not proceed. To resolve this issue, please run the following command to re-add the relevant packages to disk :

```
RP/0/RSP0/CPU0:router(admin)# install add <device or tftp>/<path>/<pie> sync
```

**Note 7:** The use of 'sync' option will prevent the user from executing any other command during the install operation.

- 5) Restore the original configuration that was backed up in **Special Upgrade Instructions** section.

```
RP/0/RSP0/CPU0:router #config
RP/0/RSP0/CPU0:router (config)#load <source/filename>
RP/0/RSP0/CPU0:router (config)#commit replace
RP/0/RSP0/CPU0:router (config)#show configuration failed
Verify any rejected configuration
RP/0/RSP0/CPU0:router (config)#exit
Restore the admin-running-configuration as follows
RP/0/RSP0/CPU0:router#admin
RP/0/RSP0/CPU0:router (admin)#config
RP/0/RSP0/CPU0:router (admin-config)#load <source/filename>
RP/0/RSP0/CPU0:router (admin-config)#commit replace
RP/0/RSP0/CPU0:router (admin-config)#show configuration failed
Verify any rejected configuration
RP/0/RSP0/CPU0:router (admin-config)#exit
RP/0/RSP0/CPU0:router (admin)#exit
```

- 6) Verify system stability through commands described in **Check System Stability** [See **Section 3** for details].

- 7) Install commit the newly activated software, and verify.

```
RP/0/RSP0/CPU0:router (admin)# install commit
```

```
RP/0/2/CPU0:PE1-E3E5:router (admin)# show install committed summary
```

- 8) Force downgrade fpd (detailed in next section)

## 10. Release 4.0.0, 3.9.x, and 3.7.x FPD Force Downgrade

After running the install commit command on downgrade to 3.9.x or 3.7.x software version, run the "show hw-module fpd location all" command to check for firmware files. To downgrade fpd firmware to meet 3.7.x or 3.9.x needs, downgrade fpd command with force option is requested for the downgrade process.

To downgrade FPD firmware:

- 1) Run the "show hw-module fpd location all" command to check current firmware files.

**Note 1:** fpd.pie should be already active on the system if downgrade steps are followed. Step 2 to step 4 becomes optional if 3.9.0 / 3.7.x fpd.pie is active on the system.

**Note 2:** To downgrade FPD firmware rel 3.9.1 onwards skip to step 5.

- 2) Add package "c12k-fpd.pie-3.7.x" or "c12k-fpd.pie-3.9.0" (if you have not added in **Section 8**, step 2) :

```
RP/0/RSP0/CPU0:router(admin)#install add <device or tftp>/<path>/c12k-fpd.pie-3.7.x sync
```

OR

```
RP/0/RSP0/CPU0:router(admin)#install add <device or tftp>/<path>/c12k-fpd.pie-3.9.0 sync
```

- 3) Activate package added in step 2:

```
RP/0/RSP0/CPU0:router(admin)#install activate disk0:c12k-fpd.pie-3.7.x sync
```

OR

```
RP/0/RSP0/CPU0:router(admin)#install activate disk0:c12k-fpd.pie-3.9.0 sync
```

- 4) **Check System Stability** [See **Section 3** for details].

- 5) Commit the newly activated software, and verify

```
RP/0/RSP0/CPU0:router(admin)#install commit
```

```
RP/0/2/CPU0:PE1-E3E5:router (admin)# show install committed summary
```

- 6) Issue the following command to downgrade fpd:

```
RP/0/RSP0/CPU0:router(admin)#upgrade hw-module fpd all force location all
```

**Note 2:** Except CBC, router reload is requested after running the "upgrade hw-module fpd all force location all" command.

# 11. Post-Upgrade / Post-Downgrade Procedure

- 1) Verify the active package list after upgrade, using command:

```
RP/0/RSP0/CPU0:router(admin)# show install active summary
Default Profile:
SDRs:
  Owner
Active Packages:
  disk0:c12k-mini-4.0.0
  disk0:c12k-doc-4.0.0
  disk0:c12k-k9sec-4.0.0
  disk0:c12k-mgbl-4.0.0
  disk0:c12k-mcast-4.0.0
  disk0:c12k-mpls-4.0.0
```

- 2) Disk cleanup (optional)

Once software upgrade or downgrade 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):

- Obtain the list of inactive packages and note the names of packages that are not needed:

```
RP/0/RSP0/CPU0:router(admin)#show install inactive summary
```

- Remove the unnecessary inactive packages:

```
RP/0/RSP0/CPU0:router(admin)# install remove disk0:<package_name1>
disk0:<package_name2> .. disk0:<pkg_nameN> sync
```

or

```
RP/0/RSP0/CPU0:router(admin)#install remove inactive sync
```

**Note 1:** The use of 'sync' option will prevent the user from executing any other command during the install operation.

- 2) Verify/fix configuration file system (mandatory)

```
RP/0/RSP0/CPU0:router(admin)#cfs check
```

If "max-metric" or "set overload bit" is set during pre-upgrade task restore the metric using commands specified in section 4.



## 4.0.0 GSR-XR Upgrade/Downgrade Procedure [EDCS-905559]

### 3) Upgrade firmware (mandatory)

ROMMON, CBC, HSBI, CPLD, and FPGA firmware needs to be upgraded after the 4.0.0 image installation on the system. For detailed upgrade procedure please refer "*IOS XR Firmware Upgrade Guide*" document which can be accessed at:

[http://www.cisco.com/web/Cisco\\_IOS\\_XR\\_Software/index.html](http://www.cisco.com/web/Cisco_IOS_XR_Software/index.html)

## 12. Appendix

[Will update with 4.0.0 release image "show version" output]

### Reference #1 – 4.0.0 software "show version" output:

```
xr-fwding, V 4.0.0[Default], Cisco Systems, at disk0:iosxr-fwding-4.0.0
  Built on Tue Sep  7 00:48:55 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

iosxr-diags, V 4.0.0[Default], Cisco Systems, at disk0:iosxr-diags-4.0.0
  Built on Tue Sep  7 00:50:20 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-fpd-supply, V 4.0.0[00], Cisco Systems, at disk0:c12k-fpd-supply-4.0.0
  Built on Tue Sep  7 01:23:50 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-diags, V 4.0.0[00], Cisco Systems, at disk0:c12k-diags-4.0.0
  Built on Tue Sep  7 01:06:33 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-k9sec-supply, V 4.0.0[00], Cisco Systems, at disk0:c12k-k9sec-supply-4.0.0
  Built on Tue Sep  7 00:47:37 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-mcast-supply, V 4.0.0[00], Cisco Systems, at disk0:c12k-mcast-supply-4.0.0
  Built on Tue Sep  7 00:47:21 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-base, V 4.0.0[00], Cisco Systems, at disk0:c12k-base-4.0.0
  Built on Tue Sep  7 00:53:35 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-os-mpi, V 4.0.0[00], Cisco Systems, at disk0:c12k-os-mpi-4.0.0
  Built on Tue Sep  7 00:53:28 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

Boot device on node 0/10/CPU0 is mem:
Package active on node 0/10/CPU0:
c12k-fwding, V 4.0.0[00], Cisco Systems, at disk0:c12k-fwding-4.0.0
  Built on Tue Sep  7 00:53:46 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

iosxr-security, V 4.0.0[Default], Cisco Systems, at disk0:iosxr-security-4.0.0
  Built on Tue Sep  7 00:47:31 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie
```

## 4.0.0 GSR-XR Upgrade/Downgrade Procedure [EDCS-905559]

```
iosxr-mpls, V 4.0.0[Default], Cisco Systems, at disk0:iosxr-mpls-4.0.0
  Built on Tue Sep  7 00:47:04 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

iosxr-mcast, V 4.0.0[Default], Cisco Systems, at disk0:iosxr-mcast-4.0.0
  Built on Tue Sep  7 00:47:11 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

iosxr-routing, V 4.0.0[Default], Cisco Systems, at disk0:iosxr-routing-4.0.0
  Built on Tue Sep  7 00:50:09 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

iosxr-infra, V 4.0.0[Default], Cisco Systems, at disk0:iosxr-infra-4.0.0
  Built on Tue Sep  7 00:47:39 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

iosxr-fwding, V 4.0.0[Default], Cisco Systems, at disk0:iosxr-fwding-4.0.0
  Built on Tue Sep  7 00:48:55 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

iosxr-diags, V 4.0.0[Default], Cisco Systems, at disk0:iosxr-diags-4.0.0
  Built on Tue Sep  7 00:50:20 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-fpd-suppl, V 4.0.0[00], Cisco Systems, at disk0:c12k-fpd-suppl-4.0.0
  Built on Tue Sep  7 01:23:50 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-diags, V 4.0.0[00], Cisco Systems, at disk0:c12k-diags-4.0.0
  Built on Tue Sep  7 01:06:33 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-k9sec-suppl, V 4.0.0[00], Cisco Systems, at disk0:c12k-k9sec-suppl-4.0.0
  Built on Tue Sep  7 00:47:37 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-mcast-suppl, V 4.0.0[00], Cisco Systems, at disk0:c12k-mcast-suppl-4.0.0
  Built on Tue Sep  7 00:47:21 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-base, V 4.0.0[00], Cisco Systems, at disk0:c12k-base-4.0.0
  Built on Tue Sep  7 00:53:35 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-os-mpi, V 4.0.0[00], Cisco Systems, at disk0:c12k-os-mpi-4.0.0
  Built on Tue Sep  7 00:53:28 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

Boot device on node 0/12/CPU0 is mem:
Package active on node 0/12/CPU0:
c12k-fwding, V 4.0.0[00], Cisco Systems, at disk0:c12k-fwding-4.0.0
  Built on Tue Sep  7 00:53:46 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

iosxr-security, V 4.0.0[Default], Cisco Systems, at disk0:iosxr-security-4.0.0
  Built on Tue Sep  7 00:47:31 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

iosxr-mpls, V 4.0.0[Default], Cisco Systems, at disk0:iosxr-mpls-4.0.0
  Built on Tue Sep  7 00:47:04 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

iosxr-mcast, V 4.0.0[Default], Cisco Systems, at disk0:iosxr-mcast-4.0.0
```

## 4.0.0 GSR-XR Upgrade/Downgrade Procedure [EDCS-905559]

```
Built on Tue Sep  7 00:47:11 UTC 2010
By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

iosxr-routing, V 4.0.0[Default], Cisco Systems, at disk0:iosxr-routing-4.0.0
  Built on Tue Sep  7 00:50:09 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

iosxr-infra, V 4.0.0[Default], Cisco Systems, at disk0:iosxr-infra-4.0.0
  Built on Tue Sep  7 00:47:39 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

iosxr-fwding, V 4.0.0[Default], Cisco Systems, at disk0:iosxr-fwding-4.0.0
  Built on Tue Sep  7 00:48:55 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

iosxr-diags, V 4.0.0[Default], Cisco Systems, at disk0:iosxr-diags-4.0.0
  Built on Tue Sep  7 00:50:20 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-fpd-suppl, V 4.0.0[00], Cisco Systems, at disk0:c12k-fpd-suppl-4.0.0
  Built on Tue Sep  7 01:23:50 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-diags, V 4.0.0[00], Cisco Systems, at disk0:c12k-diags-4.0.0
  Built on Tue Sep  7 01:06:33 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-k9sec-suppl, V 4.0.0[00], Cisco Systems, at disk0:c12k-k9sec-suppl-4.0.0
  Built on Tue Sep  7 00:47:37 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-mcast-suppl, V 4.0.0[00], Cisco Systems, at disk0:c12k-mcast-suppl-4.0.0
  Built on Tue Sep  7 00:47:21 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-base, V 4.0.0[00], Cisco Systems, at disk0:c12k-base-4.0.0
  Built on Tue Sep  7 00:53:35 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-os-mpi, V 4.0.0[00], Cisco Systems, at disk0:c12k-os-mpi-4.0.0
  Built on Tue Sep  7 00:53:28 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

Configuration register on node 0/13/CPU0 is 0x102
Boot device on node 0/13/CPU0 is disk0:
Package active on node 0/13/CPU0:
c12k-fwding, V 4.0.0[00], Cisco Systems, at disk0:c12k-fwding-4.0.0
  Built on Tue Sep  7 00:53:46 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

iosxr-security, V 4.0.0[Default], Cisco Systems, at disk0:iosxr-security-4.0.0
  Built on Tue Sep  7 00:47:31 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

iosxr-mpi, V 4.0.0[Default], Cisco Systems, at disk0:iosxr-mpi-4.0.0
  Built on Tue Sep  7 00:47:04 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

iosxr-mpi, V 4.0.0[Default], Cisco Systems, at disk0:iosxr-mpi-4.0.0
  Built on Tue Sep  7 00:47:24 UTC 2010
  By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

iosxr-mcast, V 4.0.0[Default], Cisco Systems, at disk0:iosxr-mcast-4.0.0
```

## 4.0.0 GSR-XR Upgrade/Downgrade Procedure [EDCS-905559]

```
Built on Tue Sep  7 00:47:11 UTC 2010
By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-doc-supply, V 4.0.0[00], Cisco Systems, at disk0:c12k-doc-supply-4.0.0
Built on Tue Sep  7 01:23:44 UTC 2010
By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

iosxr-routing, V 4.0.0[Default], Cisco Systems, at disk0:iosxr-routing-4.0.0
Built on Tue Sep  7 00:50:09 UTC 2010
By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

iosxr-infra, V 4.0.0[Default], Cisco Systems, at disk0:iosxr-infra-4.0.0
Built on Tue Sep  7 00:47:39 UTC 2010
By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

iosxr-fwding, V 4.0.0[Default], Cisco Systems, at disk0:iosxr-fwding-4.0.0
Built on Tue Sep  7 00:48:55 UTC 2010
By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

iosxr-diags, V 4.0.0[Default], Cisco Systems, at disk0:iosxr-diags-4.0.0
Built on Tue Sep  7 00:50:20 UTC 2010
By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-fpd-supply, V 4.0.0[00], Cisco Systems, at disk0:c12k-fpd-supply-4.0.0
Built on Tue Sep  7 01:23:50 UTC 2010
By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-diags, V 4.0.0[00], Cisco Systems, at disk0:c12k-diags-4.0.0
Built on Tue Sep  7 01:06:33 UTC 2010
By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-k9sec-supply, V 4.0.0[00], Cisco Systems, at disk0:c12k-k9sec-supply-4.0.0
Built on Tue Sep  7 00:47:37 UTC 2010
By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-mgbl-supply, V 4.0.0[00], Cisco Systems, at disk0:c12k-mgbl-supply-4.0.0
Built on Tue Sep  7 00:47:28 UTC 2010
By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-mcast-supply, V 4.0.0[00], Cisco Systems, at disk0:c12k-mcast-supply-4.0.0
Built on Tue Sep  7 00:47:21 UTC 2010
By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-base, V 4.0.0[00], Cisco Systems, at disk0:c12k-base-4.0.0
Built on Tue Sep  7 00:53:35 UTC 2010
By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie

c12k-os-mpi, V 4.0.0[00], Cisco Systems, at disk0:c12k-os-mpi-4.0.0
Built on Tue Sep  7 00:53:28 UTC 2010
By sjc-lds-511 in /auto/srcarchive5/production/4.0.0/c12k/workspace for pie
```

### Reference #2 – 4.0.0 “show fpd package” example output:

```
RP/0/2/CPU0:PE1-E3E5(admin)#sho hw-module fpd location all
```

```
=====
Existing Field Programmable Devices
=====
HW                               Current SW Upg/
Location   Card Type             Version Type Subtype Inst  Version  Dng?
-----

```

## 4.0.0 GSR-XR Upgrade/Downgrade Procedure [EDCS-905559]

0/0/0	SPA-5X1GE-V2	1.2	spa	fpga1	0	1.10	No
0/0/2	SPA-1XCHSTM1/OC3	2.0	spa	fpga1	2	1.08	No
			spa	rommon	2	2.12	No
			spa	fpga2	2	1.04	No
0/1/0	SPA-1XCHOC12/DS0	1.0	spa	rommon	0	2.02	No
			spa	fpga1	0	1.36	No
			spa	fpga2	0	1.00	No
0/1/3	SPA-1XOC12-ATM-V2	1.80	spa	fpga1	3	?????.????	Yes
0/3/CPU0	E3-OC12-ATM-4	N/A	lc	fpga1	0	40977.00	No
			lc	fpga2	0	40971.00	No
			lc	fpga3	0	41091.00	No
			lc	fpga4	0	45586.00	No
0/4/0	SPA-5X1GE-V2	1.0	spa	fpga1	0	1.10	No
0/4/1	SPA-1X10GE-L-V2	1.1	spa	fpga1	1	1.11	No
0/5/0	SPA-2XOC48POS/RPR	1.0	spa	fpga1	0	1.00	No
0/5/1	SPA-1XCHOC48/DS3	1.0	spa	rommon	1	2.02	No
			spa	fpga1	1	1.36	No
			spa	fpga2	1	1.00	No
			spa	fpga3	1	1.00	No
0/8/1	SPA-8X1FE	1.2	spa	fpga1	1	1.01	No
0/8/2	SPA-2CHT3-CE-ATM	1.0	spa	fpga1	2	2.22	No
			spa	rommon	2	1.04	No
			spa	fpga2	2	1.10	No
0/8/3	SPA-4XCT3/DS0	0.253	spa	fpga1	3	2.08	No
			spa	rommon	3	2.12	No
			spa	fpga2	3	1.04	No
0/10/0	SPA-OC192POS-XFP	2.0	spa	fpga1	0	1.02	No
0/10/1	SPA-8XCHT1/E1	1.5	spa	fpga1	1	2.08	No
			spa	rommon	1	2.12	No
0/10/2	SPA-8X1FE	1.3	spa	fpga1	2	1.01	No

## 4.0.0 GSR-XR Upgrade/Downgrade Procedure [EDCS-905559]

0/12/CPU0	E3-OC12-ATM-4	N/A	1c	fpga1	0	40977.00	No
			1c	fpga2	0	40971.00	No
			1c	fpga3	0	41091.00	No
			1c	fpga4	0	45586.00	No

---