



Cisco ASR 9000

Release 6.3.3

System Upgrade Procedure

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Purpose, Scope and Audience

The purpose of this document is to describe the manual upgrade procedure for the Cisco ASR 9000 Series Aggregation Services Router, Release 6.3.3. This guide is for Cisco Systems Field Engineers and Network Operators.

Platform	From	To
ASR 9000 (ASR 900x, 990x Chassis)	5.3.4/6.0.x/6.1.x/6.2.x	6.3.3

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/SP + Major release can be installed together in one install operation to save time and avoid multiple reloads. For more information on Service packs, see the following link, when possible it's always preferred to deploy Service Packs <http://www.cisco.com/c/en/us/support/docs/ios-nx-os-software/ios-xr-software/117550-technote-product-00.pdf>

However, in the absence of CSM, the MOP (Method of Procedure) described in this document can be followed for software upgrade of Cisco ASR 9000 series routers.



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Obtain Required Package Files

The following package options are available for download in Cisco Software Center (replace 6.3.3 below with the version of the intended release).

Package Filename	Package Description	Comments
ASR9k-iosxr-px-6.3.3-bridge_smus.tar	(Optional) Contains all bridge SMUs + other miscellaneous SMUs	Important – If applicable, Bridge SMUs are loaded onto your existing XR version before upgrading to R6.3.3
ASR9K-iosxr-px-6.3.3-turboboot.tar	Contains mini-vm file	Once installed, you will need to load the optional packages in Row 3 or Row 4 to complete the installation
ASR9K-iosxr-px-6.3.3.tar	The mini.pie + optional packages (e.g., mcast, mpls, etc.). No mini-vm file.	The mini.pie constitute the base package. Optional packages add features as needed. No Mini.vm and no k9-sec pie.
ASR9k-iosxr-px-6.3.3-k9.tar	Same as Row 3 + K9sec pie	Contains Line item-3 + K9sec pie.
Asr9k-ncs500x-nV-p-6.3.3.tar	Only ncs500x pie	Just the NCS5000 Skywarp
ASR9K-px-docs-6.3.3.tar	Documentation	No software packages, only documentation.



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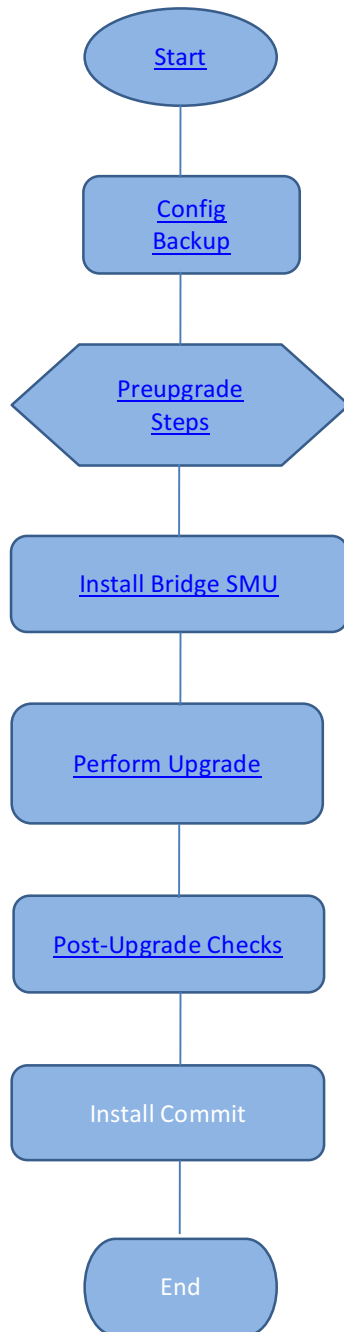
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Flow Chart for Upgrade Steps



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Configuration Backup

Save the XR and Admin running-configuration in local harddisk. It's also recommended to copy the configuration off the device to some external TFTP/SCP host.

- Save XR Config in local disk:

```
RP/0/RSP0/CPU0:ASR9006-FF1803#copy running-config harddisk:ASR9006-
FF1803-cfg.08122018
Destination file name (control-c to abort): [/ASR9006-FF1803-
cfg.08122018]?
Building configuration.
531 lines built in 1 second
[OK]
RP/0/RSP0/CPU0:ASR9006-FF1803#dir harddisk:ASR9006-FF1803-cfg.12
Sun Aug 12 14:43:38.010 UTC

Directory of harddisk:

24620      -rwx  8899      Sun Aug 12 14:43:13 2018  ASR9006-FF1803-
cfg.08122018

6412025856 bytes total (6395097088 bytes free)
RP/0/RSP0/CPU0:ASR9006-FF1803#
```

- Save XR Config in TFTP:

```
RP/0/RSP0/CPU0:ASR9006-FF1803#copy running-config
tftp://10.8.24.240/ASR9006-FF1803-cfg.08122018
Host name or IP address (control-c to abort): [10.8.24.240;default]?
Destination file name (control-c to abort): [/ASR9006-FF1803-
cfg.08122018]?
Building configuration.
531 lines built in 1 second
[OK]
RP/0/RSP0/CPU0:ASR9006-FF1803#

[tacharya@sste-auto-tftp ~]$ ls -l /auto/sste-sp-tftpboot/ASR9006-
FF1803-cfg.08122018
-rw-rw-rw- 1 nobody nobody 8899 Aug 12 09:44 /auto/sste-sp-
tftpboot/ASR9006-FF1803-cfg.08122018
[tacharya@sste-auto-tftp ~]$
```

- Save Admin Config in local disk:



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```

RP/0/RSP0/CPU0:ASR9006-FF1803#admin copy running-config
harddisk:ASR9006-FF1803-admin-cfg.08122018
Destination file name (control-c to abort): [/ASR9006-FF1803-admin-
cfg.08122018]?
Building configuration...
[OK]
RP/0/RSP0/CPU0:ASR9006-FF1803#dir harddisk:ASR9006-FF1803-admin-
cfg.08122018

Directory of harddisk:

24620      -rwx  208          Sun Aug 12 14:47:10 2018  ASR9006-FF1803-
admin-cfg.08122018

6412025856 bytes total (6395105792 bytes free)
RP/0/RSP0/CPU0:ASR9006-FF1803#

```

- Save Admin Config on a TFTP server:

```

RP/0/RSP0/CPU0:ASR9006-FF1803#admin copy running-config
tftp://10.8.24.240/ASR9006-FF1803-admin-cfg.08122018
Host name or IP address (control-c to abort): [10.8.24.240;default]?
Destination file name (control-c to abort): [/ASR9006-FF1803-admin-
cfg.08122018]?
Building configuration...
[OK]
RP/0/RSP0/CPU0:ASR9006-FF1803#

[tacharya@sste-auto-tftp ~]$ ls -l /auto/sste-sp-tftpboot/ASR9006-
FF1803-admin-cfg.08122018
-rw-rw-rw- 1 nobody nobody 208 Aug 12 09:48 /auto/sste-sp-
tftpboot/ASR9006-FF1803-admin-cfg.08122018
[tacharya@sste-auto-tftp ~]$

```



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Perform Pre-Upgrade Tasks

- **Check System Stability:** The following commands may be executed to verify basic system stability before the upgrade.

```
#admin show platform (verify that all nodes are in Operational [IOS XRRUN/READY/OK] state)
```

```
#show redundancy (verify Ready/NSR-Ready state)
```

```
#show ipv4 interface brief <or> show ipv6 interface brief <or>  
show interface summary (verify that all necessary interfaces are "UP")
```

```
#show install active (verify that the proper set of packages are active)
```

```
#show install commit (verify that the proper set of committed packages are same as active. If not, execute 'install commit')
```

```
#cfs check/clear configuration inconsistency (verify/fix configuration file system)
```

```
#sh pfm location all (verify open alarms)
```

```
Verify atleast 50% of available harddisk space. shud have atleast 50% available disk space (Harddisk space can be cleared by removing core files from harddisk:/dumper and older showtech files from harddisk:/showtech)
```

```
RP/0/RSP0/CPU0:ASR9006-FF1803#cfs check  
Sun Aug 12 18:28:05.541 UTC  
  
Creating any missing directories in Configuration File system...OK  
Initializing Configuration Version Manager...OK  
Syncing commit database with running configuration...OK  
RP/0/RSP0/CPU0:ASR9006-FF1803#  
RP/0/RSP0/CPU0:ASR9006-FF1803#clear configuration inconsistency  
Sun Aug 12 15:26:52.964 UTC  
  
Creating any missing directories in Configuration File system...OK  
Initializing Configuration Version Manager...OK  
Syncing commit database with running configuration...OK  
RP/0/RSP0/CPU0:ASR9006-FF1803#
```



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```
RP/0/RSP0/CPU0:ASR9006-FF1803#admin clear configuration
inconsistency
Sun Aug 12 15:27:01.828 UTC

Creating any missing directories in ADMIN Configuration File
system...OK
Initializing ADMIN Configuration Version Manager...OK
Syncing ADMIN commit database with running configuration...OK
```

`#admin show hw-module fpd location all` (Ensure all the FPD versions status are CURRENT)

`#"show proc cpu" and "show memory summary"` (verify CPU and Memory utilizations are in the expected range)

- **Cost-out IGP:** To minimize traffic loss during the upgrade please follow below steps:
 - Make sure that all the traffic flowing through the router which needs to be upgraded has an alternate path. In this scenario one can take one of the redundant routers out of service, upgrade it and then bring it back into service without any significant traffic loss (this should work for the core routers, for the edge devices usually the redundant path may not be available)
 - Set IGP metric to the highest possible value so the IGP will try to route the traffic through the alternate path.

For OSPF use "max-metric" command.

```
router(config-ospf)# max-metric router-lsa
```

For ISIS use "spf-overload-bit" command.

```
router(config-isis)# set-overload-bit
```

- Enable auto FPD upgrade in admin plane config mode (please see FPD Upgrade section for more details).

```
router(admin-config)#fpd auto-upgrade
router(admin-config)#commit

router#admin show run | i fpd
Building configuration...
fpd auto-upgrade
```



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- Check available disk space to make sure there is enough space to hold all the packages.(
CHK harddisk also)

```
RP/0/RSP0/CPU0:ASR9006-FF1803#dir disk0:
Sun Aug 12 15:03:31.568 UTC

Directory of disk0:
<snip>

12810436608 bytes total (7176310272 bytes free)
RP/0/RSP0/CPU0:ASR9006-FF1803#
```

- Check for any inactive packages.

```
RP/0/RSP0/CPU0:ASR9006-FF1803#show install inactive
Sun Aug 12 15:08:58.133 UTC
Secure Domain Router: Owner
```

```
Node 0/RSP0/CPU0 [RP] [SDR: Owner]
Boot Device: disk0:
Inactive Packages:
disk0:asr9k-services-infra-6.3.3.20I
disk0:asr9k-services-infra-6.3.3.20I
disk0:asr9k-fpd-px-6.3.3.20I
disk0:asr9k-k9sec-px-6.3.3.20I
disk0:asr9k-mcast-px-6.3.3.20I
disk0:asr9k-mgbl-px-6.3.3.20I
disk0:asr9k-mini-px-6.3.3.20I
disk0:asr9k-mpls-px-6.3.3.20I
disk0:asr9k-services-px-6.3.3.20I
disk0:asr9k-fpd-px-6.3.3.20I
disk0:asr9k-mini-px-6.3.3.20I
disk0:asr9k-k9sec-px-6.3.3.20I
disk0:asr9k-mcast-px-6.3.3.20I
disk0:asr9k-mgbl-px-6.3.3.20I
disk0:asr9k-mpls-px-6.3.3.20I
disk0:asr9k-services-px-6.3.3.20I
```

```
Node 0/RSP1/CPU0 [RP] [SDR: Owner]
Boot Device: disk0:
Inactive Packages:
disk0:asr9k-services-infra-6.3.3.20I
disk0:asr9k-services-infra-6.3.3.20I
disk0:asr9k-fpd-px-6.3.3.20I
disk0:asr9k-k9sec-px-6.3.3.20I
disk0:asr9k-mcast-px-6.3.3.20I
disk0:asr9k-mgbl-px-6.3.3.20I
disk0:asr9k-mini-px-6.3.3.20I
disk0:asr9k-mpls-px-6.3.3.20I
disk0:asr9k-services-px-6.3.3.20I
disk0:asr9k-fpd-px-6.3.3.20I
```



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```
disk0:asr9k-mini-px-6.3.3.20I
disk0:asr9k-k9sec-px-6.3.3.20I
disk0:asr9k-mcast-px-6.3.3.20I
disk0:asr9k-mgbl-px-6.3.3.20I
disk0:asr9k-mpls-px-6.3.3.20I
disk0:asr9k-services-px-6.3.3.20I

Node 0/0/CPU0 [LC] [SDR: Owner]
Boot Device: mem:
Inactive Packages:
  disk0:asr9k-services-infra-6.3.3.20I
  disk0:asr9k-services-infra-6.3.3.20I
  disk0:asr9k-k9sec-px-6.3.3.20I
  disk0:asr9k-mcast-px-6.3.3.20I
  disk0:asr9k-mini-px-6.3.3.20I
  disk0:asr9k-mpls-px-6.3.3.20I
  disk0:asr9k-services-px-6.3.3.20I
  disk0:asr9k-mini-px-6.3.3.20I
  disk0:asr9k-k9sec-px-6.3.3.20I
  disk0:asr9k-mcast-px-6.3.3.20I
  disk0:asr9k-mpls-px-6.3.3.20I
  disk0:asr9k-services-px-6.3.3.20I

Node 0/1/CPU0 [LC] [SDR: Owner]
Boot Device: mem:
Inactive Packages:
  disk0:asr9k-services-infra-6.3.3.20I
  disk0:asr9k-services-infra-6.3.3.20I
  disk0:asr9k-k9sec-px-6.3.3.20I
  disk0:asr9k-mcast-px-6.3.3.20I
  disk0:asr9k-mini-px-6.3.3.20I
  disk0:asr9k-mpls-px-6.3.3.20I
  disk0:asr9k-services-px-6.3.3.20I
  disk0:asr9k-mini-px-6.3.3.20I
  disk0:asr9k-k9sec-px-6.3.3.20I
  disk0:asr9k-mcast-px-6.3.3.20I
  disk0:asr9k-mpls-px-6.3.3.20I
  disk0:asr9k-services-px-6.3.3.20I

RP/0/RSP0/CPU0:ASR9006-FF1803#
```

- Remove inactive packages before upgrading to reclaim disk space, if needed. Confirm when prompted.

```
RP/0/RSP0/CPU0:ASR9006-FF1803#admin install remove inactive
Sun Aug 12 15:11:21.158 UTC
Install operation 22 '(admin) install remove inactive' started by
user 'root' via CLI at 15:11:21 UTC Sun Aug 12 2018.
Info:      This operation will remove the following packages:
Info:      disk0:asr9k-services-px-6.3.3.19I
Info:      disk0:asr9k-mpls-px-6.3.3.19I
Info:      disk0:asr9k-mgbl-px-6.3.3.19I
```



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```

Info:          disk0:asr9k-mcast-px-6.3.3.19I
Info:          disk0:asr9k-k9sec-px-6.3.3.19I
Info:          disk0:asr9k-mini-px-6.3.3.19I
Info:          disk0:asr9k-fpd-px-6.3.3.19I
Info:          disk0:asr9k-services-px-6.3.3.19I
Info:          disk0:asr9k-mpls-px-6.3.3.19I
Info:          disk0:asr9k-mini-px-6.3.3.19I
Info:          disk0:asr9k-mgbl-px-6.3.3.19I
Info:          disk0:asr9k-mcast-px-6.3.3.19I
Info:          disk0:asr9k-k9sec-px-6.3.3.19I
Info:          disk0:asr9k-fpd-px-6.3.3.19I
Info:          disk0:asr9k-services-infra-6.3.3.19I
Info:          disk0:asr9k-services-infra-6.3.3.19I
Info:          After this install remove the following install
rollback points will no longer be reachable, as the required packages
will not be present:
Info:          8, 11, 15
Proceed with removing these packages? [confirm]
The install operation will continue asynchronously.
RP/0/RSP0/CPU0:ASR9006-FF1803#
RP/0/RSP0/CPU0:ASR9006-FF1803#Install operation 22 completed
successfully at 15:13:46 UTC Sun Aug 12 2018.

RP/0/RSP0/CPU0:ASR9006-FF1803#

```

- On rare occasions, some packages may not get removed. Doublecheck, therefore, to make sure the packages have actually been deleted.

```

RP/0/RSP0/CPU0:ASR9006-FF1803#show install inactive
Sun Aug 12 15:16:04.712 UTC
Secure Domain Router: Owner

There are no inactive packages on the SDR.

RP/0/RSP0/CPU0:ASR9006-FF1803#

```

- Perform install commit after inactive packages are removed.

```

RP/0/RSP0/CPU0:ASR9006-FF1803#admin install commit
Sun Aug 12 15:16:24.555 UTC
Install operation 23 '(admin) install commit' started by user
'root' via CLI at 15:16:24 UTC Sun Aug 12 2018.
Install operation 23 completed successfully at 15:16:30 UTC Sun
Aug 12 2018.
RP/0/RSP0/CPU0:ASR9006-FF1803#

```

- It's better to remove/replace all incompatible hardware and upgrade ROMMON to the required version. Please refer to the "Determine Firmware Support" section in Release Notes



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for Cisco for FPD version information or check this link: http://www.cisco.com/web/Cisco_IOS_XR_Software/index.html.



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Install Bridge SMUs

Before an upgrade, Bridge SMU's may need to be installed on the current release to ensure that installation of new software succeeds. Download the ASR9k-iosxr-px-6.3.3-bridge_smus.tar file if required. Extract only the packages that are applicable to your currently running release. Install activates these prior to upgrading the router to the new release.



Note: Bridge SMU installation may cause router reload.

Here is an example to download and install mandatory/bridge SMUs.

- Before installing the SMU, run “clear configuration inconsistency from both XR and Admin prompt.

```
RP/0/RSP0/CPU0:ASR9006-FF1803#clear configuration inconsistency
Sun Aug 12 15:26:52.964 UTC

Creating any missing directories in Configuration File system...OK
Initializing Configuration Version Manager...OK
Syncing commit database with running configuration...OK
RP/0/RSP0/CPU0:ASR9006-FF1803#
RP/0/RSP0/CPU0:ASR9006-FF1803#admin clear configuration inconsistency
Sun Aug 12 15:27:01.828 UTC

Creating any missing directories in ADMIN Configuration File
system...OK
Initializing ADMIN Configuration Version Manager...OK
Syncing ADMIN commit database with running configuration...OK
RP/0/RSP0/CPU0:ASR9006-FF1803#
```

- Download Mandatory SMU tar from CCO and copy tar file to tftp / scp / ftp server. Verify the contents of the tar file.

```
[root@TFTP-SERVER]# tar -tvf ASR9k-iosxr-px-6.3.3-bridge_smus.tar
```

- Copy the tar file to the router harddisk (e.g. via TFTP or SCP):

```
router# copy tftp://<tftp-ip-address>/<bridge_smus> harddisk:
or
```



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```
router#scp root@<server-ip-address>:<bridge-smus-location-full-path>
harddisk:
```

- Verify that bridge_smus tar file is copied to the harddisk correctly.

```
router#dir harddisk: | inc <tarfile-name>
```

Now that you've copied the all mandatory SMUs to the correct location on the router, we can proceed with installing mandatory SMUs as detailed below.

- Add the bridge SMUs:

```
router#admin install add source harddisk: <bridge-smu-tar-file>
```

- Perform install activation operation. When prompted for confirmation say "YES"

```
router#admin install activate <id>
```

- Once router is up after reload, verify SMUs are installed successfully

```
router#show install active summary
```

- Commit the active SMUs

```
router#admin install commit
```



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Perform Software Upgrade

All install operations must be performed in “admin” mode. The optional packages (mpls, mcast, mgbl etc.) that are being installed/upgraded must match the active packages, else the install will fail.

It is recommended to enable FPD auto upgrade (“fpd auto-upgrade” in admin config mode). This way, FPD will be upgraded automatically during the image upgrade and an extra reload step will be avoided. However, if there are any issues with auto upgrade, FPD can be manually upgraded after the image upgrade is done. Reload is required after the manual FPD upgrade in order for the new FPD to take effect. For more information on FPD upgrade, please check out the section “FPD Upgrade”.

- Download the packages tar and SMUs from CCO. Copy tar file to tftp / scp / ftp server. Verify the contents of the tar file”

```
server> tar tvf <tarball>
```

- Two install options are covered; single-command and two-command install upgrade.
 - **Single-Command Upgrade: “admin install add <pkgs+smus or SP> activate”**

IOS XR install upgrades can be performed with a single command, in the format of “**admin install add <pkgs+smus or SP or TAR> activate**” and “**admin install commit**” after the operation is completed. Examples of popular single command install:

Example 1) Standard install

```
router(admin)#install add source tftp://10.10.10.1/ asr9k-px-6.3.3.CSCcd54321.pie asr9k-px-6.3.3.CSCab12345.pie asr9k-px-6.3.3.CSCef12345.pie activate
```

Example 2) This is an example of a create your own TAR install:

```
router(admin)#install add tar tftp://10.10.10.1/ Rel6_3_3.tar activate
```

Example 3) If the file server is reachable through a vrf, in the example here the vrf name is “**management**”:

```
router(admin)#install add source ftp://root:root@1.1.1.1;management/ asr9k-px-6.3.3.CSCcd54321.pie asr9k-px-6.3.3.CSCab12345.pie asr9k-px-6.3.3.CSCef12345.pie activate
```



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Example 4) If the file server has sftp capabilities, then use (test is username: test123 is password)

```
router(admin)#install add tar
sftp://test:test123@1.1.1.1:/tftpboot/633.tar activate
```

Sample One-command Upgrade Output:

```
RP/0/RSP0/CPU0:ASR9006-FF1803#admin install add source
tftp://10.8.24.240/images/633_cco/asr9k ASR9K-iosxr-px-k9-
6.3.3.tar activate sync prompt-level none
Sun Aug 12 17:20:31.979 UTC
Install operation 28 '(admin) install add source
/tftp://10.8.24.240/images/633_cco/asr9k/ ASR9K-iosxr-px-k9-
6.3.3.tar activate prompt-level none synchronous' started by user
'root' via CLI at 17:20:32 UTC Sun Aug 12 2018.
Warning: The following file has the suffix '.tar' and will be
treated as a tar file:
Warning: /tftp://10.8.24.240/images/633_cco/asr9k/ASR9K-
iosxr-px-k9-6.3.3.tar
Warning: If a file should not be treated as tar file:
Warning: - change the file extension.
Warning: To stop this message being displayed:
Warning: - use the tar keyword to explicitly specify a tar file.
Info: The following files were extracted from the tar file
'/tftp://10.8.24.240/images/633_cco/asr9k/ASR9K-iosxr-px-k9-
6.3.3.tar' and will be added to the entire router:
Info:
Info: asr9k-asr9000v-nV-px.pie-6.3.3
Info: asr9k-bng-px.pie-6.3.3
Info: asr9k-doc-px.pie-6.3.3
Info: asr9k-fpd-px.pie-6.3.3
Info: asr9k-k9sec-px.pie-6.3.3
Info: asr9k-li-px.pie-6.3.3
Info: asr9k-mcast-px.pie-6.3.3
Info: asr9k-mgbl-px.pie-6.3.3
Info: asr9k-mini-px.pie-6.3.3
Info: asr9k-mpls-px.pie-6.3.3
Info: asr9k-optic-px.pie-6.3.3
Info: asr9k-services-infra-px.pie-6.3.3
Info: asr9k-services-px.pie-6.3.3
Info: asr9k-video-px.pie-6.3.3
Info: README-ASR9K-iosxr-px-k9-6.3.3.txt (skipped - not a
pie)
Info:
Part 1 of 2 (add software): Started
Warning: Skipped adding the following packages as they were
already present:
Warning: disk0:asr9k-9000v-nV-px-6.3.3
```



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```

Warning:      disk0:asr9k-bng-px-6.3.3
Warning:      disk0:asr9k-doc-px-6.3.3
Warning:      disk0:asr9k-fpd-px-6.3.3
Warning:      disk0:asr9k-k9sec-px-6.3.3
Warning:      disk0:asr9k-li-px-6.3.3
Warning:      disk0:asr9k-mcast-px-6.3.3
Warning:      disk0:asr9k-mgbl-px-6.3.3
Warning:      disk0:asr9k-mini-px-6.3.3
Warning:      disk0:asr9k-mpls-px-6.3.3
Warning:      disk0:asr9k-optic-px-6.3.3
Warning:      disk0:asr9k-services-infra-6.3.3
Warning:      disk0:asr9k-services-px-6.3.3
Warning:      disk0:asr9k-video-px-6.3.3
Warning:      Please check:
Warning:      - the set of active packages using '(admin) show
install active'.
Warning:      - the set of inactive packages using '(admin) show
install inactive'.
Info:         The following packages are now available to be
activated:
Info:
Info:         disk0:asr9k-9000v-nV-px-6.3.3
Info:         disk0:asr9k-bng-px-6.3.3
Info:         disk0:asr9k-doc-px-6.3.3
Info:         disk0:asr9k-fpd-px-6.3.3
Info:         disk0:asr9k-k9sec-px-6.3.3
Info:         disk0:asr9k-li-px-6.3.3
Info:         disk0:asr9k-mcast-px-6.3.3
Info:         disk0:asr9k-mgbl-px-6.3.3
Info:         disk0:asr9k-mini-px-6.3.3
Info:         disk0:asr9k-mpls-px-6.3.3
Info:         disk0:asr9k-optic-px-6.3.3
Info:         disk0:asr9k-services-infra-6.3.3
Info:         disk0:asr9k-services-px-6.3.3
Info:         disk0:asr9k-video-px-6.3.3
Info:
Info:         The packages can be activated across the entire router.
Info:
Part 1 of 2 (add software): Completed successfully (skipped adding
one or more packages because they were already present on the boot
device)
Part 2 of 2 (activate software): Started
Warning:      There is no valid license for the following package:
Warning:
Warning:      disk0:asr9k-li-6.3.3
Warning:
'prompt-level none' specified. Proceeding with operation.
Info:         This operation will reload the following nodes in
parallel:
Info:         0/RSP0/CPU0 (RP) (SDR: Owner)
Info:         0/RSP1/CPU0 (RP) (SDR: Owner)

```



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```

Info:          0/0/CPU0 (LC) (SDR: Owner)
Info:          0/1/CPU0 (LC) (SDR: Owner)
Info:          Install Method: Parallel Reload
Install operation 28: load phase started at 17:50:18 UTC Sun Aug
12 2018.
Info:          FPD Upgrade: No fpd on location 0/RSP0/CPU0 need upgrade
at this time.
Info:          FPD Upgrade: No fpd on location 0/RSP1/CPU0 need upgrade
at this time.
Info:          FPD Upgrade: No fpd on location 0/0/CPU0 need upgrade at
this time.
Info:          FPD Upgrade: No fpd on location 0/1/CPU0 need upgrade at
this time.
Info:          The changes made to software configurations will not be
persistent across system reloads. Use the command '(admin) install
commit' to make changes persistent.
Info:          Please verify that the system is consistent following
the software change using the following commands:
Info:          show system verify
Info:          install verify packages
Part 2 of 2 (activate software): Completed successfully
Part 1 of 2 (add software): Completed successfully (skipped adding
one or more packages because they were already present on the boot
device)
Part 2 of 2 (activate software): Completed successfully
Install operation 28 completed successfully at 17:50:49 UTC Sun
Aug 12 2018.
RP/0/RSP0/CPU0:ASR9006-FF1803#

```

- Two-Command Upgrade:

The above can be broken down into two operations if needed. Perform **“admin install add <pkgs+smu’s or SP>”** to copy the software from TFTP/SFTP/SCP/FTP server to the router. *This is a hitless operation and can be formed outside a maintenance window.*

Example:

```

router(admin)#install add source tftp://10.10.10.1/
asr9k-mini-px.pie-6.3.3 asr9k-mpls-px.pie-6.3.3 asr9k-
mcast-px.pie-6.3.3 asr9k-px-6.3.3.CSCab12345-0.0.0.pie
synchronous

```

Or a TAR



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```
router(admin)#install add tar tftp://10.10.10.1/
Rel6_3_3.tar synchronous
```

Here is a full sample output:

```
RP/0/RSP0/CPU0:ASR9006-FF1803#admin install add source
tftp://10.8.24.240/images/633_cco/asr9k ASR9K-iosxr-px-k9-
6.3.3.tar
Sun Aug 12 15:35:49.726 UTC
Install operation 24 '(admin) install add source
/tftp://10.8.24.240/images/623_cco/asr9k/ ASR9K-iosxr-px-
k9-6.3.3.tar' started by user 'root' via CLI at 15:35:49
UTC Sun Aug 12 2018.
Warning: The following file has the suffix '.tar' and will
be treated as a tar file:
Warning:
/tftp://10.8.24.240/images/633_cco/asr9k/ASR9K-iosxr-px-
k9-6.3.3.tar
Warning: If a file should not be treated as tar file:
Warning: - change the file extension.
Warning: To stop this message being displayed:
Warning: - use the tar keyword to explicitly specify a
tar file.
Info: The following files were extracted from the tar
file '/tftp://10.8.24.240/images/633_cco/asr9k/ASR9K-
iosxr-px-k9-6.3.3.tar' and will be added to the entire
router:
Info:
Info: asr9k-asr9000v-nV-px.pie-6.3.3
Info: asr9k-bng-px.pie-6.3.3
Info: asr9k-doc-px.pie-6.3.3
Info: asr9k-fpd-px.pie-6.3.3
Info: asr9k-k9sec-px.pie-6.3.3
Info: asr9k-li-px.pie-6.3.3
Info: asr9k-mcast-px.pie-6.3.3
Info: asr9k-mgbl-px.pie-6.3.3
Info: asr9k-mini-px.pie-6.3.3
Info: asr9k-mppls-px.pie-6.3.3
Info: asr9k-optic-px.pie-6.3.3
Info: asr9k-services-infra-px.pie-6.3.3
Info: asr9k-services-px.pie-6.3.3
Info: asr9k-video-px.pie-6.3.3
Info: README-ASR9K-iosxr-px-k9-6.3.3.txt (skipped -
not a pie)
Info:
The install operation will continue asynchronously.
```



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```

RP/0/RSP0/CPU0:ASR9006-FF1803#Info:           The following
packages are now available to be activated:
Info:
Info:          disk0:asr9k-9000v-nV-px-6.3.3
Info:          disk0:asr9k-bng-px-6.3.3
Info:          disk0:asr9k-doc-px-6.3.3
Info:          disk0:asr9k-fpd-px-6.3.3
Info:          disk0:asr9k-k9sec-px-6.3.3
Info:          disk0:asr9k-li-px-6.3.3
Info:          disk0:asr9k-mcast-px-6.3.3
Info:          disk0:asr9k-mgbl-px-6.3.3
Info:          disk0:asr9k-mini-px-6.3.3
Info:          disk0:asr9k-mpls-px-6.3.3
Info:          disk0:asr9k-optic-px-6.3.3
Info:          disk0:asr9k-services-infra-6.3.3
Info:          disk0:asr9k-services-px-6.3.3
Info:          disk0:asr9k-video-px-6.3.3
Info:
Info:          The packages can be activated across the entire
router.
Info:
Install operation 24 completed successfully at 16:11:03 UTC
Sun Aug 12 2018.

RP/0/RSP0/CPU0:ASR9006-FF1803#

```

After the add is successful, perform **“admin install activate <pkgs+smus or SP>”** on packages, SMU’s or SP to activated, at this point the router will reboot. After the router has reloaded and sufficient checks have been done, then perform the following steps. **“admin install commit”** this will make the software (packages and smu’s) persistent across reloads.

```

router(admin)# install activate disk0:asr9k-mini-px-6.3.3
disk0:asr9k-mpls-px-6.3.3 disk0:asr9k-mcast-px-6.3.3 asr9k-px-
6.3.3.CSCab12345-0.0.0 synchronous

```

```

Another shortcut is to activate the install add operation id
router(admin)# install activate id <install add operation id>

```

```

Another shortcut is to activate with a wildcard:
router(admin)# install activate disk0:*6.3.3*

```



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Here is a full sample output:

```
RP/0/RSP0/CPU0:ASR9006-FF1803#admin install activate id 24
prompt-level none synchronous
Sun Aug 12 16:17:44.222 UTC
Install operation 25 '(admin) install activate id 24 prompt-
level none synchronous' started by user 'root' via CLI at 16:17:44
UTC Sun Aug 12 2018.
Info:      This operation will activate the following packages:
Info:      disk0:asr9k-video-px-6.3.3
Info:      disk0:asr9k-services-px-6.3.3
Info:      disk0:asr9k-services-infra-6.3.3
Info:      disk0:asr9k-optic-px-6.3.3
Info:      disk0:asr9k-mpls-px-6.3.3
Info:      disk0:asr9k-mini-px-6.3.3
Info:      disk0:asr9k-mgbl-px-6.3.3
Info:      disk0:asr9k-mcast-px-6.3.3
Info:      disk0:asr9k-li-px-6.3.3
Info:      disk0:asr9k-k9sec-px-6.3.3
Info:      disk0:asr9k-fpd-px-6.3.3
Info:      disk0:asr9k-doc-px-6.3.3
Info:      disk0:asr9k-bng-px-6.3.3
Info:      disk0:asr9k-9000v-nV-px-6.3.3
Warning:   There is no valid license for the following package:
Warning:
Warning:   disk0:asr9k-li-6.3.3
Warning:
'prompt-level none' specified. Proceeding with operation.
Info:      This operation will reload the following nodes in
parallel:
Info:      0/RSP0/CPU0 (RP) (SDR: Owner)
Info:      0/RSP1/CPU0 (RP) (SDR: Owner)
Info:      0/0/CPU0 (LC) (SDR: Owner)
Info:      0/1/CPU0 (LC) (SDR: Owner)
Info:      Install Method: Parallel Reload
Install operation 25: load phase started at 16:18:30 UTC Sun
Aug 12 2018.
Info:      FPD Upgrade: No fpd on location 0/RSP0/CPU0 need
upgrade at this time.
Info:      FPD Upgrade: No fpd on location 0/RSP1/CPU0 need
upgrade at this time.
Info:      FPD Upgrade: No fpd on location 0/0/CPU0 need upgrade
at this time.
Info:      FPD Upgrade: No fpd on location 0/1/CPU0 need upgrade
at this time.
Info:      The changes made to software configurations will not
be persistent across system reloads. Use the command '(admin) install
commit' to make changes
Info:      persistent.
Info:      Please verify that the system is consistent following
the software change using the following commands:
Info:      show system verify
Info:      install verify packages
Install operation 25 completed successfully at 16:19:00 UTC Sun
Aug 12 2018.
RP/0/RSP0/CPU0:ASR9006-FF1803#
```



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- NOTE:
 - use **ignore-pkg-presence-check** keyword if an upgrade is attempted without installing all the optional pies. This can be useful when offloading some unused pies. “*admin#install activate ignore-pkg-presence-check <operation id or package list>*”
 - If the install operation fails collect the relevant show tech install output.
- Router will reload at the end of activation to start using the new packages.
- Verify “show version” and “show install active” output to make sure the intended packages are reflected in the output.

```
router#show version
router#show install active
```

```
RP/0/RSP0/CPU0:ASR9006-FF1803#show version
Sun Aug 12 16:32:53.930 UTC

Cisco IOS XR Software, Version 6.3.3[Default]
Copyright (c) 2017 by Cisco Systems, Inc.

ROM: System Bootstrap, Version 0.76(c) 1994-2012 by Cisco
Systems, Inc.

ASR9006-FF1803 uptime is 12 minutes
System image file is "disk0:asr9k-os-mpi-
6.3.3/0x100305/mbiasr9k-rsp3.vm"

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```
6114M bytes of hard disk.
12510192k bytes of disk0: (Sector size 512 bytes).
12510192k bytes of disk1: (Sector size 512 bytes).

Configuration register on node 0/RSP0/CPU0 is 0x2102
Boot device on node 0/RSP0/CPU0 is disk0:
Package active on node 0/RSP0/CPU0:
iosxr-adv-video, V 6.3.3[Default], Cisco Systems, at
disk0:iosxr-adv-video-6.3.3
    Built on Fri Dec 22 05:19:46 UTC 2017
    By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-adv-video-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-adv-video-supp-6.3.3
    Built on Fri Dec 22 05:19:46 UTC 2017
    By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-video-px, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-video-px-6.3.3
    Built on Fri Dec 22 05:19:48 UTC 2017
    By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-service, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
service-6.3.3
    Built on Fri Dec 22 05:19:50 UTC 2017
    By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-service-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-service-supp-6.3.3
    Built on Fri Dec 22 05:19:50 UTC 2017
    By iox-lnx-051 in
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asr9k-services-px, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-services-px-6.3.3
    Built on Fri Dec 22 05:19:53 UTC 2017
    By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-optics-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-optics-supp-6.3.3
```



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Built on Fri Dec 22 05:19:44 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
asr9k-optic-px, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-optic-px-6.3.3
Built on Fri Dec 22 05:19:45 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
iosxr-mpls, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
mpls-6.3.3
Built on Fri Dec 22 05:03:02 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
asr9k-mpls-px, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
mpls-px-6.3.3
Built on Fri Dec 22 05:03:13 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
iosxr-infra, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
infra-6.3.3
Built on Fri Dec 22 04:57:47 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
iosxr-fwding, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
fwding-6.3.3
Built on Fri Dec 22 04:57:49 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
iosxr-routing, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
routing-6.3.3
Built on Fri Dec 22 04:57:49 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
iosxr-diags, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
diags-6.3.3
Built on Fri Dec 22 04:57:49 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
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iosxr-ce, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-ce-6.3.3
    Built on Fri Dec 22 04:57:49 UTC 2017
    By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-gcp-fwding, V 6.3.3[Default], Cisco Systems, at
disk0:iosxr-gcp-fwding-6.3.3
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    By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-comSun-pd-fib, V 6.3.3[Default], Cisco Systems, at
disk0:iosxr-comSun-pd-fib-6.3.3
    Built on Fri Dec 22 04:57:49 UTC 2017
    By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-os-mpi, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
os-mpi-6.3.3
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asr9k-base, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
base-6.3.3
    Built on Fri Dec 22 04:57:53 UTC 2017
    By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-fwding, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
fwding-6.3.3
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/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-diags-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-diags-supp-6.3.3
    Built on Fri Dec 22 04:57:59 UTC 2017
    By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-scfclient, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-scfclient-6.3.3
```



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Built on Fri Dec 22 04:58:00 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
asr9k-cpp, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-cpp-
6.3.3
Built on Fri Dec 22 04:57:50 UTC 2017
By iox-lnx-051 in
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asr9k-ce, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-ce-
6.3.3
Built on Fri Dec 22 04:57:59 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
asr9k-mini-px, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
mini-px-6.3.3
Built on Fri Dec 22 05:02:55 UTC 2017
By iox-lnx-051 in
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iosxr-mgbl, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
mgbl-6.3.3
Built on Fri Dec 22 05:03:25 UTC 2017
By iox-lnx-051 in
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asr9k-mgbl-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-mgbl-supp-6.3.3
Built on Fri Dec 22 05:03:25 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
asr9k-mgbl-px, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
mgbl-px-6.3.3
Built on Fri Dec 22 05:03:40 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
iosxr-mcast, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
mcast-6.3.3
Built on Fri Dec 22 05:03:15 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
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asr9k-mcast-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-mcast-supp-6.3.3
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    By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

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disk0:asr9k-mcast-px-6.3.3
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iosxr-li, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-li-
6.3.3
    Built on Fri Dec 22 05:54:29 UTC 2017
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6.3.3
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asr9k-li-px, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
li-px-6.3.3
    Built on Fri Dec 22 05:54:31 UTC 2017
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iosxr-security, V 6.3.3[Default], Cisco Systems, at
disk0:iosxr-security-6.3.3
    Built on Fri Dec 22 09:05:49 UTC 2017
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for pie

asr9k-k9sec-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-k9sec-supp-6.3.3
    Built on Fri Dec 22 09:05:49 UTC 2017
    By iox-lnx-051 in /san1/production/6.3.3/asr9k-px/workspace
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asr9k-k9sec-px, V 6.3.3[Default], Cisco Systems, at
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Built on Fri Dec 22 09:05:56 UTC 2017
By iox-lnx-051 in /san1/production/6.3.3/asr9k-px/workspace
for pie

asr9k-fpd, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-fpd-
6.3.3
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/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-fpd-px, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
fpd-px-6.3.3
  Built on Fri Dec 22 05:19:40 UTC 2017
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/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9K-doc-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9K-doc-supp-6.3.3
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/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-doc-px, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
doc-px-6.3.3
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/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-bng, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-bng-
6.3.3
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  By iox-lnx-051 in
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asr9k-bng, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-bng-
6.3.3
  Built on Fri Dec 22 05:19:01 UTC 2017
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asr9k-bng-px, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
bng-px-6.3.3
  Built on Fri Dec 22 05:19:08 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
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asr9k-9000v-nV-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-9000v-nV-supp-6.3.3
  Built on Fri Dec 22 05:19:54 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-9000v-nV-px, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-9000v-nV-px-6.3.3
  Built on Fri Dec 22 05:19:58 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-services-infra, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-services-infra-6.3.3
  Built on Fri Dec 22 06:24:15 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

Configuration register on node 0/RSP1/CPU0 is 0x2102
Boot device on node 0/RSP1/CPU0 is disk0:
Package active on node 0/RSP1/CPU0:
iosxr-adv-video, V 6.3.3[Default], Cisco Systems, at
disk0:iosxr-adv-video-6.3.3
  Built on Fri Dec 22 05:19:46 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-adv-video-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-adv-video-supp-6.3.3
  Built on Fri Dec 22 05:19:46 UTC 2017
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asr9k-video-px, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-video-px-6.3.3
  Built on Fri Dec 22 05:19:48 UTC 2017
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/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-service, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
service-6.3.3
  Built on Fri Dec 22 05:19:50 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
```



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asr9k-service-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-service-supp-6.3.3
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asr9k-services-px, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-services-px-6.3.3
    Built on Fri Dec 22 05:19:53 UTC 2017
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/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-optics-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-optics-supp-6.3.3
    Built on Fri Dec 22 05:19:44 UTC 2017
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/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

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disk0:asr9k-optic-px-6.3.3
    Built on Fri Dec 22 05:19:45 UTC 2017
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iosxr-mpls, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
mpls-6.3.3
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asr9k-mpls-px, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
mpls-px-6.3.3
    Built on Fri Dec 22 05:03:13 UTC 2017
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iosxr-infra, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
infra-6.3.3
    Built on Fri Dec 22 04:57:47 UTC 2017
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/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-fwding, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
fwding-6.3.3
```



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Built on Fri Dec 22 04:57:49 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
iosxr-routing, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
routing-6.3.3
Built on Fri Dec 22 04:57:49 UTC 2017
By iox-lnx-051 in
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iosxr-diags, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
diags-6.3.3
Built on Fri Dec 22 04:57:49 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
iosxr-ce, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-ce-
6.3.3
Built on Fri Dec 22 04:57:49 UTC 2017
By iox-lnx-051 in
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iosxr-gcp-fwding, V 6.3.3[Default], Cisco Systems, at
disk0:iosxr-gcp-fwding-6.3.3
Built on Fri Dec 22 04:57:52 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
iosxr-comSun-pd-fib, V 6.3.3[Default], Cisco Systems, at
disk0:iosxr-comSun-pd-fib-6.3.3
Built on Fri Dec 22 04:57:49 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
asr9k-os-mpi, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
os-mpi-6.3.3
Built on Fri Dec 22 04:58:55 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
asr9k-base, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
base-6.3.3
Built on Fri Dec 22 04:57:53 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
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asr9k-fwding, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
fwding-6.3.3
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/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-diags-supp, V 6.3.3[Default], Cisco Systems, at
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asr9k-scfclient, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-scfclient-6.3.3
    Built on Fri Dec 22 04:58:00 UTC 2017
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asr9k-cpp, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-cpp-
6.3.3
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asr9k-ce, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-ce-
6.3.3
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asr9k-mini-px, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
mini-px-6.3.3
    Built on Fri Dec 22 05:02:55 UTC 2017
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/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-mgbl, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
mgbl-6.3.3
    Built on Fri Dec 22 05:03:25 UTC 2017
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/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-mgbl-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-mgbl-supp-6.3.3
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Built on Fri Dec 22 05:03:25 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
asr9k-mgbl-px, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
mgbl-px-6.3.3
Built on Fri Dec 22 05:03:40 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
iosxr-mcast, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
mcast-6.3.3
Built on Fri Dec 22 05:03:15 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
asr9k-mcast-suppl, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-mcast-suppl-6.3.3
Built on Fri Dec 22 05:03:15 UTC 2017
By iox-lnx-051 in
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asr9k-mcast-px, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-mcast-px-6.3.3
Built on Fri Dec 22 05:03:23 UTC 2017
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iosxr-li, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-li-
6.3.3
Built on Fri Dec 22 05:54:29 UTC 2017
By iox-lnx-051 in
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asr9k-li, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-li-
6.3.3
Built on Fri Dec 22 05:54:29 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
asr9k-li-px, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
li-px-6.3.3
Built on Fri Dec 22 05:54:31 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
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iosxr-security, V 6.3.3[Default], Cisco Systems, at
disk0:iosxr-security-6.3.3
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for pie

asr9k-k9sec-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-k9sec-supp-6.3.3
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for pie

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asr9k-fpd, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-fpd-
6.3.3
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asr9K-doc-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9K-doc-supp-6.3.3
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asr9k-doc-px, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
doc-px-6.3.3
    Built on Fri Dec 22 05:19:13 UTC 2017
    By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-bng, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-bng-
6.3.3
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By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
asr9k-bng, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-bng-
6.3.3
Built on Fri Dec 22 05:19:01 UTC 2017
By iox-lnx-051 in
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bng-px-6.3.3
Built on Fri Dec 22 05:19:08 UTC 2017
By iox-lnx-051 in
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asr9k-9000v-nV-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-9000v-nV-supp-6.3.3
Built on Fri Dec 22 05:19:54 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
asr9k-9000v-nV-px, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-9000v-nV-px-6.3.3
Built on Fri Dec 22 05:19:58 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
asr9k-services-infra, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-services-infra-6.3.3
Built on Fri Dec 22 06:24:15 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

Boot device on node 0/0/CPU0 is mem:
Package active on node 0/0/CPU0:
iosxr-adv-video, V 6.3.3[Default], Cisco Systems, at
disk0:iosxr-adv-video-6.3.3
Built on Fri Dec 22 05:19:46 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
asr9k-adv-video-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-adv-video-supp-6.3.3
Built on Fri Dec 22 05:19:46 UTC 2017

```



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```
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-video-px, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-video-px-6.3.3
  Built on Fri Dec 22 05:19:48 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-service, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
service-6.3.3
  Built on Fri Dec 22 05:19:50 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-service-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-service-supp-6.3.3
  Built on Fri Dec 22 05:19:50 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-services-px, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-services-px-6.3.3
  Built on Fri Dec 22 05:19:53 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-optics-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-optics-supp-6.3.3
  Built on Fri Dec 22 05:19:44 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-optic-px, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-optic-px-6.3.3
  Built on Fri Dec 22 05:19:45 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-mpls, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
mpls-6.3.3
  Built on Fri Dec 22 05:03:02 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
```



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asr9k-mpls-px, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
mpls-px-6.3.3
    Built on Fri Dec 22 05:03:13 UTC 2017
    By iox-lnx-051 in
    /auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-infra, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
infra-6.3.3
    Built on Fri Dec 22 04:57:47 UTC 2017
    By iox-lnx-051 in
    /auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-fwding, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
fwding-6.3.3
    Built on Fri Dec 22 04:57:49 UTC 2017
    By iox-lnx-051 in
    /auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-routing, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
routing-6.3.3
    Built on Fri Dec 22 04:57:49 UTC 2017
    By iox-lnx-051 in
    /auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-diags, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
diags-6.3.3
    Built on Fri Dec 22 04:57:49 UTC 2017
    By iox-lnx-051 in
    /auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-ce, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-ce-
6.3.3
    Built on Fri Dec 22 04:57:49 UTC 2017
    By iox-lnx-051 in
    /auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-gcp-fwding, V 6.3.3[Default], Cisco Systems, at
disk0:iosxr-gcp-fwding-6.3.3
    Built on Fri Dec 22 04:57:52 UTC 2017
    By iox-lnx-051 in
    /auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-comSun-pd-fib, V 6.3.3[Default], Cisco Systems, at
disk0:iosxr-comSun-pd-fib-6.3.3
    Built on Fri Dec 22 04:57:49 UTC 2017
```



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```
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-os-mbi, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
os-mbi-6.3.3
Built on Fri Dec 22 04:58:55 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-base, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
base-6.3.3
Built on Fri Dec 22 04:57:53 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-fwding, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
fwding-6.3.3
Built on Fri Dec 22 04:57:56 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-diags-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-diags-supp-6.3.3
Built on Fri Dec 22 04:57:59 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-scfclient, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-scfclient-6.3.3
Built on Fri Dec 22 04:58:00 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-cpp, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-cpp-
6.3.3
Built on Fri Dec 22 04:57:50 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-ce, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-ce-
6.3.3
Built on Fri Dec 22 04:57:59 UTC 2017
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
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```
asr9k-mini-px, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
mini-px-6.3.3
    Built on Fri Dec 22 05:02:55 UTC 2017
    By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-mcast, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
mcast-6.3.3
    Built on Fri Dec 22 05:03:15 UTC 2017
    By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-mcast-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-mcast-supp-6.3.3
    Built on Fri Dec 22 05:03:15 UTC 2017
    By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-mcast-px, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-mcast-px-6.3.3
    Built on Fri Dec 22 05:03:23 UTC 2017
    By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-li, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-li-
6.3.3
    Built on Fri Dec 22 05:54:29 UTC 2017
    By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-li, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-li-
6.3.3
    Built on Fri Dec 22 05:54:29 UTC 2017
    By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-li-px, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
li-px-6.3.3
    Built on Fri Dec 22 05:54:31 UTC 2017
    By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-security, V 6.3.3[Default], Cisco Systems, at
disk0:iosxr-security-6.3.3
    Built on Fri Dec 22 09:05:49 UTC 2017
```



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```

By iox-lnx-051 in /san1/production/6.3.3/asr9k-px/workspace
for pie

asr9k-k9sec-suppl, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-k9sec-suppl-6.3.3
  Built on Fri Dec 22 09:05:49 UTC 2017
  By iox-lnx-051 in /san1/production/6.3.3/asr9k-px/workspace
for pie

asr9k-k9sec-px, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-k9sec-px-6.3.3
  Built on Fri Dec 22 09:05:56 UTC 2017
  By iox-lnx-051 in /san1/production/6.3.3/asr9k-px/workspace
for pie

iosxr-bng, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-bng-
6.3.3
  Built on Fri Dec 22 05:19:01 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-bng, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-bng-
6.3.3
  Built on Fri Dec 22 05:19:01 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-bng-px, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
bng-px-6.3.3
  Built on Fri Dec 22 05:19:08 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-services-infra, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-services-infra-6.3.3
  Built on Fri Dec 22 06:24:15 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

Boot device on node 0/1/CPU0 is mem:
Package active on node 0/1/CPU0:
iosxr-adv-video, V 6.3.3[Default], Cisco Systems, at
disk0:iosxr-adv-video-6.3.3
  Built on Fri Dec 22 05:19:46 UTC 2017

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```
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-adv-video-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-adv-video-supp-6.3.3
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  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-video-px, V 6.3.3[Default], Cisco Systems, at
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  Built on Fri Dec 22 05:19:48 UTC 2017
  By iox-lnx-051 in
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iosxr-service, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
service-6.3.3
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  By iox-lnx-051 in
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asr9k-service-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-service-supp-6.3.3
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/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-services-px, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-services-px-6.3.3
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asr9k-optics-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-optics-supp-6.3.3
  Built on Fri Dec 22 05:19:44 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-optic-px, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-optic-px-6.3.3
  Built on Fri Dec 22 05:19:45 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
```



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```
iosxr-mpls, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
mpls-6.3.3
    Built on Fri Dec 22 05:03:02 UTC 2017
    By iox-lnx-051 in
    /auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-mpls-px, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
mpls-px-6.3.3
    Built on Fri Dec 22 05:03:13 UTC 2017
    By iox-lnx-051 in
    /auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-infra, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
infra-6.3.3
    Built on Fri Dec 22 04:57:47 UTC 2017
    By iox-lnx-051 in
    /auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-fwding, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
fwding-6.3.3
    Built on Fri Dec 22 04:57:49 UTC 2017
    By iox-lnx-051 in
    /auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-routing, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
routing-6.3.3
    Built on Fri Dec 22 04:57:49 UTC 2017
    By iox-lnx-051 in
    /auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-diags, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-
diags-6.3.3
    Built on Fri Dec 22 04:57:49 UTC 2017
    By iox-lnx-051 in
    /auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-ce, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-ce-
6.3.3
    Built on Fri Dec 22 04:57:49 UTC 2017
    By iox-lnx-051 in
    /auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-gcp-fwding, V 6.3.3[Default], Cisco Systems, at
disk0:iosxr-gcp-fwding-6.3.3
    Built on Fri Dec 22 04:57:52 UTC 2017
```



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```
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-comSun-pd-fib, V 6.3.3[Default], Cisco Systems, at
disk0:iosxr-comSun-pd-fib-6.3.3
  Built on Fri Dec 22 04:57:49 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-os-mpi, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
os-mpi-6.3.3
  Built on Fri Dec 22 04:58:55 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-base, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
base-6.3.3
  Built on Fri Dec 22 04:57:53 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-fwding, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
fwding-6.3.3
  Built on Fri Dec 22 04:57:56 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-diags-supp, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-diags-supp-6.3.3
  Built on Fri Dec 22 04:57:59 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-scfclient, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-scfclient-6.3.3
  Built on Fri Dec 22 04:58:00 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-cpp, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-cpp-
6.3.3
  Built on Fri Dec 22 04:57:50 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
```



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```
asr9k-ce, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-ce-6.3.3
    Built on Fri Dec 22 04:57:59 UTC 2017
    By iox-lnx-051 in
    /auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-mini-px, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-mini-px-6.3.3
    Built on Fri Dec 22 05:02:55 UTC 2017
    By iox-lnx-051 in
    /auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-mcast, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-mcast-6.3.3
    Built on Fri Dec 22 05:03:15 UTC 2017
    By iox-lnx-051 in
    /auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-mcast-suppl, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-mcast-suppl-6.3.3
    Built on Fri Dec 22 05:03:15 UTC 2017
    By iox-lnx-051 in
    /auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-mcast-px, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-mcast-px-6.3.3
    Built on Fri Dec 22 05:03:23 UTC 2017
    By iox-lnx-051 in
    /auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-li, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-li-6.3.3
    Built on Fri Dec 22 05:54:29 UTC 2017
    By iox-lnx-051 in
    /auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-li, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-li-6.3.3
    Built on Fri Dec 22 05:54:29 UTC 2017
    By iox-lnx-051 in
    /auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-li-px, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-li-px-6.3.3
    Built on Fri Dec 22 05:54:31 UTC 2017
```



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```
By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

iosxr-security, V 6.3.3[Default], Cisco Systems, at
disk0:iosxr-security-6.3.3
  Built on Fri Dec 22 09:05:49 UTC 2017
  By iox-lnx-051 in /san1/production/6.3.3/asr9k-px/workspace
for pie

asr9k-k9sec-suppl, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-k9sec-suppl-6.3.3
  Built on Fri Dec 22 09:05:49 UTC 2017
  By iox-lnx-051 in /san1/production/6.3.3/asr9k-px/workspace
for pie

asr9k-k9sec-px, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-k9sec-px-6.3.3
  Built on Fri Dec 22 09:05:56 UTC 2017
  By iox-lnx-051 in /san1/production/6.3.3/asr9k-px/workspace
for pie

iosxr-bng, V 6.3.3[Default], Cisco Systems, at disk0:iosxr-bng-
6.3.3
  Built on Fri Dec 22 05:19:01 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-bng, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-bng-
6.3.3
  Built on Fri Dec 22 05:19:01 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-bng-px, V 6.3.3[Default], Cisco Systems, at disk0:asr9k-
bng-px-6.3.3
  Built on Fri Dec 22 05:19:08 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie

asr9k-services-infra, V 6.3.3[Default], Cisco Systems, at
disk0:asr9k-services-infra-6.3.3
  Built on Fri Dec 22 06:24:15 UTC 2017
  By iox-lnx-051 in
/auto/srcarchive11/production/6.3.3/asr9k-px/workspace for pie
```



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RP/0/RSP0/CPU0:ASR9006-FF1803#

```
RP/0/RSP0/CPU0:ASR9006-FF1803#show install active
Sun Aug 12 16:33:18.001 UTC
Secure Domain Router: Owner
```

```
Node 0/RSP0/CPU0 [RP] [SDR: Owner]
  Boot Device: disk0:
  Boot Image: /disk0/asr9k-os-mpi-6.3.3/0x100305/mbiasr9k-
rsp3.vm
```

Active Packages:

```
disk0:asr9k-services-infra-6.3.3
disk0:asr9k-9000v-nV-px-6.3.3
disk0:asr9k-bng-px-6.3.3
disk0:asr9k-doc-px-6.3.3
disk0:asr9k-fpd-px-6.3.3
disk0:asr9k-k9sec-px-6.3.3
disk0:asr9k-li-px-6.3.3
disk0:asr9k-mcast-px-6.3.3
disk0:asr9k-mgbl-px-6.3.3
disk0:asr9k-mini-px-6.3.3
disk0:asr9k-mpls-px-6.3.3
disk0:asr9k-optic-px-6.3.3
disk0:asr9k-services-px-6.3.3
disk0:asr9k-video-px-6.3.3
```

```
Node 0/RSP1/CPU0 [RP] [SDR: Owner]
  Boot Device: disk0:
  Boot Image: /disk0/asr9k-os-mpi-6.3.3/0x100305/mbiasr9k-
rsp3.vm
```

Active Packages:

```
disk0:asr9k-services-infra-6.3.3
disk0:asr9k-9000v-nV-px-6.3.3
disk0:asr9k-bng-px-6.3.3
disk0:asr9k-doc-px-6.3.3
disk0:asr9k-fpd-px-6.3.3
disk0:asr9k-k9sec-px-6.3.3
disk0:asr9k-li-px-6.3.3
disk0:asr9k-mcast-px-6.3.3
disk0:asr9k-mgbl-px-6.3.3
disk0:asr9k-mini-px-6.3.3
disk0:asr9k-mpls-px-6.3.3
disk0:asr9k-optic-px-6.3.3
disk0:asr9k-services-px-6.3.3
```



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```

disk0:asr9k-video-px-6.3.3

Node 0/0/CPU0 [LC] [SDR: Owner]
Boot Device: mem:
Boot Image: /disk0/asr9k-os-mbi-6.3.3/lc/mbiasr9k-lc.vm
Active Packages:
disk0:asr9k-services-infra-6.3.3
disk0:asr9k-bng-px-6.3.3
disk0:asr9k-k9sec-px-6.3.3
disk0:asr9k-li-px-6.3.3
disk0:asr9k-mcast-px-6.3.3
disk0:asr9k-mini-px-6.3.3
disk0:asr9k-mpls-px-6.3.3
disk0:asr9k-optic-px-6.3.3
disk0:asr9k-services-px-6.3.3
disk0:asr9k-video-px-6.3.3

Node 0/1/CPU0 [LC] [SDR: Owner]
Boot Device: mem:
Boot Image: /disk0/asr9k-os-mbi-6.3.3/lc/mbiasr9k-lc.vm
Active Packages:
disk0:asr9k-services-infra-6.3.3
disk0:asr9k-bng-px-6.3.3
disk0:asr9k-k9sec-px-6.3.3
disk0:asr9k-li-px-6.3.3
disk0:asr9k-mcast-px-6.3.3
disk0:asr9k-mini-px-6.3.3
disk0:asr9k-mpls-px-6.3.3
disk0:asr9k-optic-px-6.3.3
disk0:asr9k-services-px-6.3.3
disk0:asr9k-video-px-6.3.3

RP/0/RSP0/CPU0:ASR9006-FF1803#

```

- Check to see if there were any failed startup configurations.

```

RP/0/RSP0/CPU0:ASR9006-FF1803#show configuration failed startup
Sun Aug 12 16:35:55.487 UTC
!!16:22:47 UTC Sun Aug 12 2018

RP/0/RSP0/CPU0:ASR9006-FF1803#

```

- Verify that all the packages are installed correctly and repair if needed.



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```
router#admin install verify packages [repair]
```

```
RP/0/RSP0/CPU0:ASR9006-FF1803#admin install verify packages
Sun Aug 12 16:38:30.537 UTC
Install operation 26 '(admin) install verify packages' started
by user 'root' via CLI at 16:38:30 UTC Sun Aug 12 2018.
The install operation will continue asynchronously.
RP/0/RSP0/CPU0:ASR9006-FF1803#Info:      This operation can take
up to 2 minutes per package being verified. Please be patient.
Info:      0/1/CPU0 [LC] [SDR: Owner]
Info:      meta-data: [SUCCESS] Verification Successful.
Info:      /install/iosxr-gcp-fwding-6.3.3: [SUCCESS]
Verification Successful.
Info:      /install/iosxr-comSun-pd-fib-6.3.3: [SUCCESS]
Verification Successful.
Info:      /install/iosxr-adv-video-6.3.3: [SUCCESS]
Verification Successful.
Info:      /install/asr9k-services-infra-6.3.3: [SUCCESS]
Verification Successful.
Info:      /install/asr9k-scfclient-6.3.3: [SUCCESS]
Verification Successful.
Info:      /install/asr9k-optics-supp-6.3.3: [SUCCESS]
Verification Successful.
Info:      /install/asr9k-adv-video-supp-6.3.3: [SUCCESS]
Verification Successful.
Info:      /install/asr9k-li-6.3.3: [SUCCESS] Verification
Successful.
Info:      /install/iosxr-li-6.3.3: [SUCCESS] Verification
Successful.
Info:      /install/asr9k-bng-6.3.3: [SUCCESS] Verification
Successful.
Info:      /install/iosxr-bng-6.3.3: [SUCCESS] Verification
Successful.
Info:      /install/asr9k-service-supp-6.3.3: [SUCCESS]
Verification Successful.
Info:      /install/iosxr-service-6.3.3: [SUCCESS]
Verification Successful.
Info:      /install/iosxr-security-6.3.3: [SUCCESS]
Verification Successful.
Info:      /install/asr9k-cpp-6.3.3: [SUCCESS] Verification
Successful.
Info:      /install/asr9k-ce-6.3.3: [SUCCESS] Verification
Successful.
```



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```

Info:          /install/iosxr-ce-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/asr9k-diags-supp-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-diags-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-mcast-supp-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-mcast-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-mps-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/asr9k-k9sec-supp-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-fwding-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-fwding-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-routing-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-infra-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-base-6.3.3: [SUCCESS] Verification
Successful.
Info:          0/0/CPU0 [LC] [SDR: Owner]
Info:          meta-data: [SUCCESS] Verification Successful.
Info:          /install/iosxr-gcp-fwding-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-comSun-pd-fib-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-adv-video-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-services-infra-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-scfclient-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-optics-supp-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-adv-video-supp-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-li-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/iosxr-li-6.3.3: [SUCCESS] Verification
Successful.

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```

Info:          /install/asr9k-bng-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/iosxr-bng-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/asr9k-service-supp-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-service-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-security-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-cpp-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/asr9k-ce-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/iosxr-ce-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/asr9k-diags-supp-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-diags-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-mcast-supp-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-mcast-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-mps-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/asr9k-k9sec-supp-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-fwding-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-fwding-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-routing-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-infra-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-base-6.3.3: [SUCCESS] Verification
Successful.
Info:          0/RSP1/CPU0 [RP] [SDR: Owner]
Info:          meta-data: [SUCCESS] Verification Successful.
Info:          /install/asr9k-adv-video-supp-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-adv-video-6.3.3: [SUCCESS]
Verification Successful.

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```

Info:          /install/asr9k-service-sup-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-service-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-optics-sup-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-mp-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/asr9k-ce-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/asr9k-cpp-6.3.3: [SUCCESS] Verification
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Info:          /install/asr9k-scfclient-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-diags-sup-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-fw-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-base-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/iosxr-comSun-pd-fib-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-gcp-fw-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-ce-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/iosxr-diags-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-routing-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-fw-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-infra-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-mgbl-sup-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-mgbl-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/asr9k-mcast-sup-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-mcast-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-li-6.3.3: [SUCCESS] Verification
Successful.

```



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```

Info:          /install/iosxr-li-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/asr9k-k9sec-supp-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-security-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-fpd-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/asr9K-doc-supp-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-bng-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/iosxr-bng-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/asr9k-9000v-nV-supp-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-service-supp-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-service-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-mps-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-ce-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-cpp-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-scfclient-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-diags-supp-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-fwding-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-base-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-comSun-pd-fib-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-gcp-fwding-6.4.1.30I: [SUCCESS]
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Info:          /install/iosxr-ce-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-diags-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-routing-6.4.1.30I: [SUCCESS]
Verification Successful.

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```

Info:          /install/iosxr-fwding-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-infra-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-mgbl-supp-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-mgbl-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-mcast-supp-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-mcast-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-k9sec-supp-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-security-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-fpd-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-services-infra-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-services-infra-6.4.1.30I:
[SUCCESS] Verification Successful.
Info:          0/RSP0/CPU0 [RP] [SDR: Owner]
Info:          meta-data: [SUCCESS] Verification Successful.
Info:          /install/asr9k-adv-video-supp-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-adv-video-6.3.3: [SUCCESS]
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Info:          /install/asr9k-service-supp-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-service-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-optics-supp-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-mps-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/asr9k-ce-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/asr9k-cpp-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/asr9k-scfclient-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-diags-supp-6.3.3: [SUCCESS]
Verification Successful.

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```

Info:          /install/asr9k-fwding-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-base-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/iosxr-comSun-pd-fib-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-gcp-fwding-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-ce-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/iosxr-diags-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-routing-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-fwding-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-infra-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-mgbl-supp-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-mgbl-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/asr9k-mcast-supp-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-mcast-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-li-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/iosxr-li-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/asr9k-k9sec-supp-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-security-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-fpd-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/asr9K-doc-supp-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-bng-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/iosxr-bng-6.3.3: [SUCCESS] Verification
Successful.
Info:          /install/asr9k-9000v-nV-supp-6.3.3: [SUCCESS]
Verification Successful.

```



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```

Info:          /install/asr9k-service-supply-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-service-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-mpis-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-ce-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-cpp-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-scfclient-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-diags-supply-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-fwding-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-base-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-comSun-pd-fib-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-gcp-fwding-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-ce-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-diags-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-routing-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-fwding-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-infra-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-mgbl-supply-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-mgbl-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-mcast-supply-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-mcast-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-k9sec-supply-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/iosxr-security-6.4.1.30I: [SUCCESS]
Verification Successful.

```



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```

Info:          /install/asr9k-fpd-6.4.1.30I: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-services-infra-6.3.3: [SUCCESS]
Verification Successful.
Info:          /install/asr9k-services-infra-6.4.1.30I:
[SUCCESS] Verification Successful.
Info:          Verification Summary:
Info:          0/1/CPU0: SUCCESSFUL. No anomalies found.
Info:          0/0/CPU0: SUCCESSFUL. No anomalies found.
Info:          0/RSP1/CPU0: SUCCESSFUL. No anomalies found.
Info:          0/RSP0/CPU0: SUCCESSFUL. No anomalies found.
Info:          The system needs no repair.
Install operation 26 completed successfully at 16:42:38 UTC Sun
Aug 12 2018.

RP/0/RSP0/CPU0:ASR9006-FF1803#

```

- **Check System Stability:**

[Check system stability](#) (post-upgrade) by following the same steps listed previously in the Pre-Upgrade Check section.

- 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)

```
router#admin install commit
```

- Add mandatory SMUs if not already in initial tarball (follow the same install add/activate steps again as described above).



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FPD Upgrade

For the releases with FPD support, we recommend that auto-fpd upgrade be enabled so that the FPD gets upgraded during image upgrade itself. With this, another reload will not be required to upgrade FPD. FPD auto-upgrade feature (supported from R4.2.3 onwards) is not recommended for XR602, “fpd auto-upgrade” should be disabled when upgrading to any release (including 6.0.1/6.1.4/6.3.3) from 5.3.x Release.

In summary, it is recommended to configure “auto fpd-upgrade disabled” for 4.3.4 - 6.0.2 and manual fpd upgrade needs to be performed. For upgrading from 6.1.x to 6.1.x or higher, auto fpd-upgrade must be enabled.

The feature can be disabled from the admin-config mode as follows:

```
RP/O/RSP0/CPU0:router(admin-config)# no fpd auto-upgrade
```

Manual fpd upgrade can be performed after R6.3.3 upgrade is install committed. 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, manual upgrade is required. After Manual upgrade a reload is required for the fpd to take effect. Issue the following command to upgrade FPD:

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

Note: Except CBC update, router reload is required after running the “upgrade hw-module fpd all location all” command, to make the changes in effect. No reload is required after running the upgrade hw-module fpd cbc location all command. The new CBC firmware will be active. The software automatically resets the local CAN Bus. FPD pie is mandatory for the above steps.

Auto-FPD requirements:

- **CSCUj69940:** Auto-FPD upgrade will not work if the source release does not have FPD Package installed and the user has configured auto-fpd prior to upgrade.
- **CSCuI00317:** Auto-FPD upgrade will not work if FPD being upgraded is 2 releases old or if no new FPD changes are available. Workaround is to perform a manual FPD upgrade.
- **CSCuT97560:** FPD upgrade (both auto and manual) fails if there is not enough space on harddisk: Workaround is to clear some unwanted files in the harddisk before doing the fpd upgrade.



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Post-Upgrade Procedure

- **Restore IGP metric if changed before the upgrade**

OSPF

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

ISIS

```
router# (config-isis)# no set-overload-bit
```

- **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):

```
router#admin install remove inactive all
router#admin install commit
```

- **Verify fpd versions running are current:**

```
router#admin show hw-module fpd location all
```

Please refer to the “Determine Firmware Support” section in Release Notes for Cisco for FPD version information or check this link: http://www.cisco.com/web/Cisco_IOS_XR_Software/index.



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Caveats and Restrictions

- **Pre-4.2.1:** IOS-XR upgrade from pre-4.2.1 is not supported and has not been covered in testing, the upgrade from pre-4.2.1 can be attempted through a standard Turboboot method or install upgrade, and caveats may apply. Please review the install cheat sheet for short cuts: <https://supportforums.cisco.com/document/12440491/ios-xr-install-upgrade-cheat-sheet>.
- **Post-Expiry-Cert Expiration Mandatory SAM SMU:** For upgrading from Pre - 5.3.1 images to 6.3.3 you must install a post-expiry SMU along with the new root certificate. You can install additional SMUs or pie files after activating the post-expiry SMU. Refer below link for details: <http://www.cisco.com/c/en/us/td/docs/routers/technotes/MOP-CSS-to-Abraxas.html>

**** ADD IN BRDGE SMU section****

- **ISSU:** In-Service Software Upgrade (ISSU) is not supported in 32-bit QNX based ASR 9000 classic IOS-XR routers.
- **Turboboot:** Turboboot should not be necessary for an upgrade to the latest release if the upgrade procedure is followed properly. However, should there be a need to perform Turboboot to recover/re-image the router, Turboboot Instructions are well documented in this location: <https://supportforums.cisco.com/document/123576/asr9000xr-understanding-turboboot-and-initial-system-bring>.



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