Software Upgrade Qualification

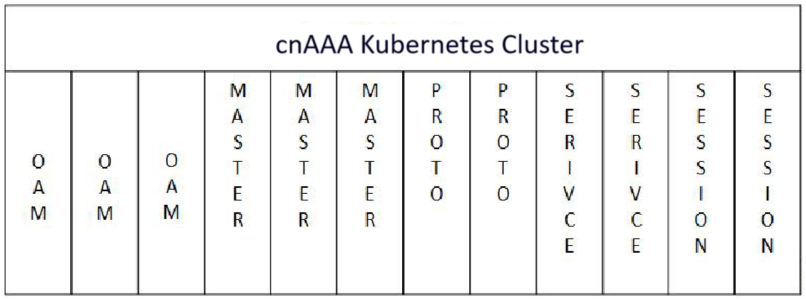
Introduction

Cisco cnAAA has a three-tier architecture which consists of Protocol, Service, and Session tiers. Each tier includes a set of microservices (pods) for a specific functionality. Within these tiers, there exists a Kubernetes Cluster comprising of Kubernetes (K8s) master, and worker nodes (including Operation and Management nodes).

For high availability and fault tolerance, a minimum of two K8s worker nodes are required for each tier. You can have multiple replicas for each worker node. Kubernetes orchestrates the pods using the StatefulSets controller. The pods require a minimum of two replicas for fault tolerance.

The following figure depicts a cnAAA K8s Cluster – Master nodes, Operations, and Management (OAM) worker nodes, Protocol worker nodes, Service worker nodes, Session (data store) worker nodes.

Figure 1: cnAAA Kubernetes Cluster



Note

- OAM worker nodes - These nodes host the Ops Center pods for configuration management and metrics pods for statistics and Key Performance Indicators (KPIs).
- Protocol worker nodes - These nodes host the cnAAA protocol-related pods for RADIUS Endpoint.
- Service worker nodes - These nodes host the cnAAA application-related pods that perform session management processing.
- Session worker nodes - These nodes host the database-related pods that store subscriber session data.

Deploy and validate cnAAA software

This section describe different stages in deploying the cnAAA Software.

- Run the SMI Cluster Manager
- Deploy the cnAAA Software
- Validate the Deployment

Run the SMI cluster manager

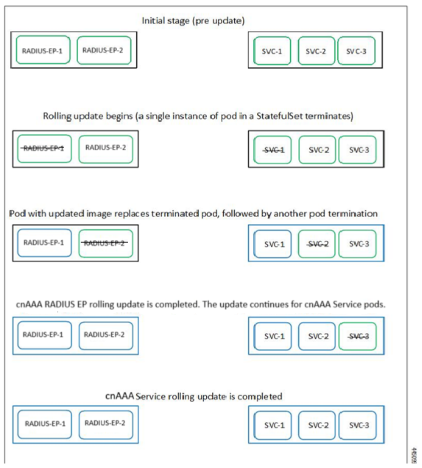
The cnAAA software deploy or in-service procedure utilizes the K8s rolling strategy to update the pod images. In K8s rolling update strategy, the pods of a StatefulSet updates sequentially to ensure that the ongoing process remains unaffected. Initially, a rolling update on a StatefulSet causes a single pod instance to terminate. This process continues until all the replicas of the StatefulSet are updated. The terminating pods exit gracefully after completing all the ongoing processes.

Note

Run the SMI sync operation for the cnAAA Ops Center and Cloud Native Common Execution Environment (CN-CEE).

For more information, see the SMI Cluster Manager - Deployment guide.

The following figure illustrates a cnAAA rolling update for cnAAA RADIUS endpoint pods (two replicas) on Protocol worker nodes along with cnAAA Service pods (three replicas) on Service worker nodes.


Initial stage (pre update)
RADIUS-EP-1
RADIUS-EP-2
SVC-1
SVC-2
SVC-3
Rolling update begins (a single instance of pod in a StatefulSet terminates)
~~RADIUS-EP-1~~
RADIUS-EP-2
~~SVC-1~~
SVC-2
SVC-3
Pod with updated image replaces terminated pod, followed by another pod termination
RADIUS-EP-1
~~RADIUS-EP-2~~
SVC-1
~~SVC-2~~
SVC-3
cnAAA RADIUS EP rolling update is completed. The update continues for cnAAA Service pods.
RADIUS-EP-1
RADIUS-EP-2
SVC-1
SVC-2
~~SVC-3~~
cnAAA Service rolling update is completed
RADIUS-EP-1
RADIUS-EP-2
SVC-1
SVC-2
SVC-3

Prerequisites

The prerequisites for upgrading cnAAA are:

- All the nodes – including all the pods in the node – are up and running.
- A patch version of the cnAAA software.

Note Currently, major versions do not support the rolling upgrade. The major version represents the release year, release number, and maintenance number. Cisco follows the versioning format as YYYY.RN.MN such as 2025.02.0.

Important Trigger rolling upgrade only when the CPU usage of the nodes is less than 50%.

cnAAA Health Check

Perform a health check to ensure that all the services are running and nodes are in ready state. To perform a health check:

1. Log in to master node.
2. Use these commands to view pod and node configurations:
   - View pods in the SMI namespace:
     ```
     kubectl get pods -n smi
     ```
   - View Kubernetes nodes:
     ```
     kubectl get nodes
     ```
   - View pods in all namespaces with wide output:
     ```
     kubectl get pod --all-namespaces -o wide
     ```

- View pods in the CPC namespace with wide output:

  ```
  kubectl get pods -n <cpc namespace> -o wide
  ```

- View pods in the CEE namespace with wide output:

  ```
  kubectl get pods -n <cpc namespace> -o wide
  ```

- List helm releases:

  ```
  helm list
  ```

- Count all pods across all namespaces:

  ```
  kubectl get pods -A | wc -l
  ```

Note

- If any pod is not in a running state, verify the status of the nodes using this command:

  ```
  kubectl get nodes --show-labels
  ```

- Start the cnAAA Ops-Center with 100% functionality before starting traffic on it.

Important Ensure that all the nodes are in the ready state before you proceed further. Use the kubectl get nodes command to display the node states.

Check cnAAA Ops-Center Status

Use this command to view the status of the cnAAA Ops-Center:

- Use this command to view the system status:

  ```
  [m13-cnaaa/m13] cpc# show system
  ```

Sample output:

```
Tue Apr  15 13:13:03.130 UTC+00:00
system uuid 6301d096-a1d7-442d-8b6b-9577143dd47f
system status deployed true
system status percent-ready 100.0
system ops-center repository https://charts.<Master_VIP>.nip.io/cpc.2025.02.0.i64
system ops-center-debug status true
system synch running true
system synch pending false
```

Verify non-running Pods

Use this command to list all pods and filter for those not in a running status.

```
kubectl get pods -A | grep -iv running
```

Sample output:

```
NAMESPACE          NAME                                                              READY
  STATUS              RESTARTS          AGE
```

```
<namespace>           crd-api-<namespace>-engine-app-production-rjio-7689c94786-kvd26   1/2
     CrashLoopBackOff   17 (4m28s ago)   76m
```

Prepare for upgrade

This section describes the procedure involved creating a backup configuration, logs, and deployment files. To back up the files:

Table 1: Mandatory options for backup configuration

Option	Description
`backup-type`	Specifies the type of backup to perform (all, PB, CRD, Ops-center).
`password`	Password for authentication of PB or CRD.
`scp-server-dest-backup-path`	Destination path for backup files on the SCP server.
`scp-server-user-ip`	Host IP address of the SCP server.
`scp-server-user-name`	Username for the SCP server.
`scp-server-user-password`	Password for the SCP server user.
`svn-url`	SVN URL for Policy Builder export (e.g., `http://svn/repos//configuration`).
`username`	Username for authentication of PB or CRD.
`schedule-backup-daily`	Specifies the hour of the day when the backup operation should be executed (Values range from 00 to 23).
`schedule-backup-weekly`	Indicates the day of the week when the backup should occur (Values range from 1-7 and start with 1-Monday).

1. Log in to the SMI Cluster Manager Node as an **ubuntu** user.
2. Create a new directory for deployment.

   Example:

   ```
   test@smicpc-cm01:~$ mkdir -p "temp_$(date +'%m%d%Y_T%H%M')" && cd "$_"
   ```

3. Move all the *cnAAA* deployment file into the newly created deployment directory.
4. Untar the *cnAAA* deployment file.

   Example:

   ```
   test@smi1cpc01-cm01:~/temp_08072019_T1651$ tar -xzvf cpc.2025.01.SPA.tgZ
   ./
   ./cpc_REL_KEY-CCO_RELEASE.cer
   ./cisco_x509_verify_release.py
   ./cpc.2020.01.0-1.tar
   ```

```
./cpc.2020.01.0-1.tar.signature.SPA
./cpc.2020.01.0-1.tar.SPA.README
```

5. Verify the downloaded image.

   Example:

   ```
   test@smi1cnAAA01-cm01:~/temp_08072019_T1651$ cat cpc.2025.01.SPA.tgZ
   ```

Important Follow the procedure mentioned in the *SPA.README* file to verify the build before proceeding to the next step.

Backup SVN, Policy, and CRD data

This section describes the procedure involved in creating a backup of SVN, Policy, and CRD data. To perform a backup of SVN and Policy files:

1. Log in to the master node as an **ubuntu** user.

2. Use the following command to retrieve the Policy Builder URL.

   ```
   kubectl get ing -n $( kubectl get namespaces | grep -oP
   'cnAAA-(\d+|\w+)' | cut -d\  -f1) | grep policy-builder | awk '{ print
    $2 }'
   pb.cnAAA-02-cnAAA-engine-app-blv02.ipv4address.nip.io
   ```

   Example:

   ```
   cloud-user@m13-cnaaa-master-2:~$ kubectl get ing -n $( kubectl get namespaces | grep -oP
    'pcf-(\d+|\w+)') |grep policy-builder | awk '{ print $3 }'
   pb.pcf-m13-pcf-engine-app-production-rjio.10.84.16.218.nip.io
   cloud-user@m13-cnaaa-master-2:~$
   ```

   Sample output:

   ```
   pb.cnAAA-02-cnAAA-engine-app-blv02.ipv4address.nip.io
   ```

3. Navigate to the Policy Builder home page.

4. Click **Import/Export**.

5. Click **All Data**.

   - **Export URL**—Specify the export URL.
   - **Export File Prefix**—Specify an appropriate name for the export file.

6. Click **Export**.

Important You can find the exported file in your local **Downloads** directory.

To perform a backup of CRD data:

1. Navigate to the Policy Builder Home page.

2. Click **Custom Reference Data.**
3. Click **Import/Export CRD data.**
4. Click **Export**.

Important You can find the CRD data in your Web browser's **Downloads** directory.

Auto-backup of PB,CRD and Ops Center configurations

Feature History

Feature Name	Release Information	Description
Auto-backup of PB,CRD and Ops Center configurations	2025.03.0	This feature allows for automated backups of PB, CRD, and Ops-center configurations through customizable schedules and on-demand triggers. It consolidates backup processes, replacing manual tasks with automation, thereby enhancing operational efficiency.

Overview

A new Ops Center command-line utility simplifies the backup of critical configurations within the CPC system. This utility provides single-command backups by consolidating Ops Center, Policy Builder, and Customer Reference Data backups, which previously required separate API commands to trigger the backup for individual configurations. It also supports remote storage through Secure Copy Protocol (SCP) and allows scheduling of automated backups for better management and avoiding data loss. The utility improves backup management, helps prevent data loss, and enables restoring critical configuration.

Auto-backup procedure

Follow these steps to configure the backup settings from Ops Center:

Procedure

Step 1 Enter to `config` mode and configure parameters under `debug backup-config`.

This table lists the mandatory options for backup-config:

Option	Description
`backup-type`	Specifies the type of backup to perform (all, PB, CRD, Ops-center).

Option	Description
`password`	Password for authentication of PB or CRD.
`scp-server-dest-backup-path`	Destination path for backup files on the SCP server.
`scp-server-user-ip`	Host IP address of the SCP server.
`scp-server-user-name`	Username for the SCP server.
`scp-server-user-password`	Password for the SCP server user.
`svn-url`	SVN URL for Policy Builder export (e.g., `http://svn/repos//configuration`).
`username`	Username for authentication of PB or CRD.
`schedule-backup-daily`	Specifies the hour of the day when the backup operation should be executed (Values range from 00 to 23).
`schedule-backup-weekly`	Indicates the day of the week when the backup should occur (Values range from 1-7 and start with 1-Monday).

Step 2 Verify the configuration by using the **show running-config debug backup-config** command.

Example:

This sample configuration shows backup settings for the Ops Center:

```
[unknown] pcf# show running-config debug backup-config
debug backup-config backup-type all
debug backup-config username admin
debug backup-config password $8$pjU5UYsnL9kn5Lg5A1ckCB0fZx6qL5/fLWxNSMCk4/4=
debug backup-config svn-url http://svn/repos//configuration
debug backup-config scp-server-user-name cloud-user
debug backup-config scp-server-user-ip 10.84.117.99
debug backup-config scp-server-dest-backup-path /home/cloud-user/aellendu
debug backup-config scp-server-user-password $8$mEE8Kc5kW+5bIf4vYK1zpTaHYqUhYCUT05snEYl8c4Y=
```

Example

Note To trigger a backup manually, execute this command from Ops Center CLI:

pcf# `pcf-system periodic-backup backup-type all http://svn/repos/new_import123456`

- **backup-type all**: Initiates a backup of PB, CRD and Ops Center configurations.

Manual backup CEE and cnAAA Ops-Center configuration

This section describes the procedure involved in creating a backup of CEE and Ops Center configuration from the master node.

Procedure

Step 1 Log in to the master node as an **ubuntu** user.

Step 2 Create a directory to backup the configuration files.

```
mkdir backups_$(date +'%m%d%Y_T%H%M') && cd "$_"
```

Step 3 Back up the cnAAA Ops-Center configuration and verify the line count of the backup files.

```
ssh -p <port_number> admin@$(kubectl get svc -n $(kubectl get namespaces|
 grep -oP 'cnAAA-(\d+|\w+)') | grep <port_number> | awk '{ print $3 }') "show run |
nomore" > cnAAAops.backup_$(date +'%m%d%Y_T%H%M') && wc-l cnAAAops.backup_$(date +'%m%d%Y_T%H%M')
```

Example:

```
ssh -p 2024 admin@$(kubectl get svc -n $(kubectl get namespaces| grep -oP 'pcf-(\d+|\w+)')
| grep 2024 | awk '{ print $3}') "show run | nomore" > cnAAAops.backup_$(date
+'%m%d%Y_T%H%M') && wc -l cnAAAops.backup_$(date +'%m%d%Y_T%H%M')
```

Step 4 Back up the CEE Ops Center configuration and verify the line count of the backup files.

```
ssh -p <port_number> admin@$(kubectl get svc -n $(kubectl get namespaces
| grep -oP 'cee-(\d+|\w+)') | grep <port_number> | awk '{ print $3 }') "show run | nomore" >
ceeops.backup_$(date +'%m%d%Y_T%H%M') && wc
-l ceeops.backup_$(date +'%m%d%Y_T%H%M')
```

Example:

```
ubuntu@pocnAAA-mas01:~/backups_09182019_T2141$ ssh -p <port_number>
admin@$(kubectl get svc -n $(kubectl get namespaces | grep -oP 'cee-(\d+|\w+)') |
grep <port_number> | awk'{ print $3 }') "show run | nomore" > ceeops.backup_$
(date +'%m%d%Y_T%H%M') && wc -l ceeops.backup_$(date +'%m%d%Y_T%H%M')
admin@<admin_ip_address> password: CEE-OPS-PASSWORD 233 ceeops.backup
```

Step 5 Move the SMI Ops Center backup file (from the SMI Cluster Manager) to the backup directory.

```
scp $(grep cm01 /etc/hosts | awk '{ print $1
}'):/home/ubuntu/smiops.backup_$(date +'%m%d%Y_T%H%M')
```

Example:

```
ubuntu@pocnAAA-mas01:~/backups_09182019_T2141$ scp $(grep cm01 /etc/hosts | awk '{ print
$1 }'):/home/ubuntu/smiops.backup_$(date +'%m%d%Y_T%H%M'). ubuntu@<admin_ip_address>
password: SMI-CM-PASSWORD smiops.backup 100% 9346 22.3MB/s 00:00
```

Step 6 Verify the line count of the backup files.

Example:

```
ubuntu@pocnAAA-mas01:~/backups_09182019_T2141$ wc -l *
233 ceeops.backup
334 cnAAAops.backup
361 smiops.backup
928 total
```

Upgrade the cnAAA

This section describes the procedures involved in upgrading cnAAA.

- Staging a new cnAAA Image
- Triggering the Rolling Software Upgrade
- Monitoring the Upgrade

Stage a new cnAAA image

This section describes the procedure involved in staging a new cnAAA image before initiating the upgrade.

To stage the new cnAAA image:

1. Download and verify the new cnAAA image.

   ```
   url: http://<Repo_Server_IP>/releases/cpc/cpc.2026.01.0.x<Repo_Server_IP>.tar sha256:
   6817692f1703a657a1867b0ccaf4483fadd7a908d68094a7deb5d16ce234c0e7
   ```

2. Log in to the SMI Cluster Manager node as an **ubuntu** user.
3. Copy the images to **Uploads** directory.

   ```
   sudo mv <cnAAA_new_image.tar> /data/software/uploads
   ```

Note The SMI uses the new image present in the **Uploads** directory to upgrade.

4. Verify whether the image is picked up by the SMI for processing from the **Uploads** directory.

   ```
   sleep 30; ls /data/software/uploads
   ```

   Example:

   ```
   ubuntu@pocnAAA-cm01:~/temp_08072019_T1651$ sleep 30; ls /data/software/uploads
   ubuntu@pocnAAA-cm01:~/temp_08072019_T1651$
   ```

5. Verify whether the images were successfully picked up and processed.

   Example:

   ```
   auser@unknown:$ sudo du -sh /data/software/packages/*
   1.6G /data/software/packages/cee.2019.07
   5.3G /data/software/packages/cnAAA.2019.08-04
   16K /data/software/packages/sample
   ```

   The SMI unpacks the images into the **packages** directory successfully to complete the staging.

   For more information, refer the SMI Cluster Manager - Deployment

Note The SMI must unpack the images into the **packages** directory successfully to complete the staging.

Trigger the rolling software upgrade

The cnAAA is triggered using the SMI cluster manager. To trigger cnAAA using SMI cluster manager, follow these configurations:

1. Log in to the SMI cluster manager console.

2. Run the following command to log in to the SMI Ops Center.

   `ssh -p <port_number> admin@$(kubectl get svc -n smi | grep '.*netconf.*<port_number>' | awk '{ print $4 }')`

   Example:

```
cloud-user@m13-cm:~$ ssh -p 2024 admin@$(kubectl get svc -n smi-cm | grep '2024' | awk
'{ print $3 }')
admin@10.101.154.93's password:

      Welcome to the Cisco SMI Cluster Deployer on m13-cm
      Copyright © 2016-2020, Cisco Systems, Inc.
      All rights reserved.

admin connected from 10.192.1.11 using ssh on
ops-center-smi-cluster-deployer-6685dd9dd9-52wk2
[m13-cm] SMI Cluster Deployer#
```

3. Download the latest .tar from the URL.

   `software-packages download` *`URL`*

   Example:

```
[m13-cm] SMI Cluster Deployer(config)# software cnf cpc.2025.02.0.i64
[m13-cm] SMI Cluster Deployer(config-cnf-cpc.2025.02.0.i64)#  url
http://10.84.16.209/releases/cpc/cpc.2025.02.0.i64.tar
```

   NOTES:

   - **software-packages download** *url*—Specify the software packages to be downloaded through HTTP/HTTPS.

4. Verify whether the TAR balls are loaded.

   `software-packages list`

   Example:

```
[m13-cm] SMI Cluster Deployer# show running-config software cnf cpc.2025.02.0.i64
```

   NOTES:

   - **software-packages list** —Specify the list of available software packages.

5. Update the product repository URL with the latest version of the product chart.

```
config
  cluster cluster_name
   ops-centers app_name cnAAA_instance_name
        repository-local local repository name
         exit
       exit
```

   Example:

```
SMI Cluster Manager# config
SMI Cluster Manager(config)# clusters m13-cnaaa
SMI Cluster Manager(config-clusters-test2)# ops-centers pcf m13
SMI Cluster Manager(config-ops-centers-cnAAA/data)# repository-local cpc.2025.02.0.i64
SMI Cluster Manager(config-ops-centers-cnAAA/data)# exit
SMI Cluster Manager(config-clusters-test2)# exit
```

NOTES:

- **cluster** —Specify the K8s cluster.
- *cluster_name* —Specify the name of the cluster.
- **ops-centers** *app_name instance_name* —Specify the product Ops Center and instance. *app_name* is the application name. *instance_name* is the name of the instance.
- **repository** *url*—Specify the local registry URL for downloading the charts.

6. Run the **cluster sync** command to update to the latest version of the product chart. For more information on **cluster sync** command, see the section.

   clusters *cluster_name* **actions sync run**

   Example:

```
clusters m13-cnaaa actions sync run sync-phase opscenter debug true   <<<<<<<<<<<<<< (For
 Cluster Sync)
This will run sync.  Are you sure? [no,yes] yes
message accepted
warning "k8s node-type master" for node master-1 is deprecated. Use "k8s node-type
control-plane" instead
warning "k8s node-type master" for node master-2 is deprecated. Use "k8s node-type
control-plane" instead
warning "k8s node-type master" for node master-3 is deprecated. Use "k8s node-type
control-plane" instead
[m13-cm] SMI Cluster Deployer# monitor sync-logs m13-cnaaa     <<<<<<<<<<<<<< (To monitor
 the sync logs)
```

Important The cluster synchronization configure the cnAAA Ops Center, which in turn upgrade the application pods (through **helm sync** command) one at a time automatically.

NOTES:

- **cluster** —Specify the K8s cluster.
- *cluster_name* —Specify the name of the cluster.
- **actions** —Specify the actions performed on the cluster.
- **sync run** —Triggers the cluster synchronization.

Monitor the cnAAA Upgrade

Monitor the status of the upgrade through SMI Cluster Manager Ops-Center configurations:

```
config
  clusters cluster_name actions sync run upgrade-strategy concurrent debug
true
  clusters cluster_name actions sync logs
  monitor sync-logs cluster_name
   clusters cluster_name actions sync status
   end
```

Example:

```
SMI Cluster Manager# clusters test1 actions sync run
SMI Cluster Manager# clusters test1 actions sync run upgrade-strategy concurrent debug true
SMI Cluster Manager# clusters test1 actions sync logs
SMI Cluster Manager# monitor sync-logs test1
SMI Cluster Manager# clusters test1 actions sync status
```

Once cluster sync is successful, verify the cluster sync log.

Sample output:

```
Monday 27 October 2025 10:20:53 +0000 (0:00:01.467) 0:24:13.515 ********

2025-10-27 10:20:53.862 DEBUG cluster_sync.m13-cnaaa: Cluster sync successful
2025-10-27 10:20:53.864 DEBUG cluster_sync.m13-cnaaa: Ansible sync done
2025-10-27 10:20:53.864 INFO cluster_sync.m13-cnaaa: _sync finished. Opening lock
2025-10-27 10:20:53.864 INFO cluster_sync.m13-cnaaa: Aggregated sync time: 00:24:25.265
```

NOTES:

- **clusters** *cluster_name*—Specify the information about the nodes to be deployed. *cluster_name* is the name of the cluster.
- **actions**—Configures the actions performed on the cluster.
- **sync run**—Triggers the cluster synchronization.
- **sync logs**—Displays the current cluster synchronization logs.
- **sync status**—Displays the current status of the cluster synchronization.
- **debug true**—Enters the debug mode.
- **monitor sync logs** – Monitors the cluster synchronization process.

Important You can view the pod details after the upgrade through CEE Ops Center. For more information on pod details, see Viewing the Pod Details section.

Verify the Helm Status

This section describes the procedure involved in verifying the helm status. You need to determine whether the deployed helm chart is listed in the helm list successfully.

To determine the helm status:

1. Run the following on the master node to view the list of deployed helm charts.

   `helm list -A`

   Sample output:

   ```
   cloud-user@m13-cnaaa-master-3:~$ helm ls -A| grep cpc
   cpc-m13-cnat-cps-infrastructure         cpc-m13         1               2025-10-29
   06:24:22.68282772 +0000 UTC  deployed
   cnat-cps-infrastructure-0.6.10-dev-cpc-2025-03-0051-250811004416-4daacd0
   BUILD_2025.03.1.i54
   cpc-m13-cps-radius-ep                   cpc-m13         1               2025-10-29
   06:24:22.681193924 +0000 UTC deployed
   cps-radius-ep-0.6.43-dev-cpc-2025-03-0317-250812071800-2db928a
   BUILD_2025.03.1.i54
   ```

```
cpc-m13-network-query                  cpc-m13        1               2025-10-29
06:24:22.681469304 +0000 UTC deployed
network-query-0.5.4-dev-cpc-2025-03-0095-250716052025-833caab
BUILD_2025.03.1.i54
cpc-m13-ops-center                     cpc-m13        10              2025-10-29
06:18:10.184343814 +0000 UTC deployed
cpc-ops-center-0.6.32-dev-cpc-2025-03-0558-250716054741-99e44f1
BUILD_2025.03.1.i54
cpc-m13-cpc-config                     cpc-m13        1               2025-10-29
06:24:22.68490608 +0000 UTC  deployed
cpc-config-0.6.3-dev-cpc-2025-03-0030-250716051310-045be1e
BUILD_2025.03.1.i54
cpc-m13-cpc-dashboard                  cpc-m13        1               2025-10-29
06:24:22.686188032 +0000 UTC deployed
cpc-dashboard-0.2.17-dev-cpc-2025-03-0196-250716051353-871e51f
BUILD_2025.03.1.i54
cpc-m13-cpc-engine-app-production-rjio  cpc-m13        1               2025-10-29
06:24:22.681441532 +0000 UTC deployed
cpc-engine-app-0.9.2-dev-cpc-2025-03-0788-250811003555-7830316
BUILD_2025.03.1.i54
cpc-m13-cpc-oam-app                    cpc-m13        1               2025-10-29
06:24:22.681257099 +0000 UTC deployed
cpc-oam-app-0.6.2-dev-cpc-2025-03-0022-250716051638-582c2b0
BUILD_2025.03.1.i54
cpc-m13-cpc-services                   cpc-m13        1               2025-10-29
06:24:22.681354868 +0000 UTC deployed
cpc-services-0.6.17-dev-cpc-2025-03-0089-250716051336-a203202
BUILD_2025.03.1.i54
cloud-user@m13-cnaaa-master-3:~$
```

2. If the helm chart is not found, run the following in the operational mode to view the charts irrespective of their deployment status.

   `show helm charts`

   Sample output:

```
[m13-cnaaa/m13] cpc# show running-config helm
Wed Oct  29 06:37:41.475 UTC+00:00
helm default-repository base-repos
helm repository base-repos
 url https://charts.2002-10-192-1--21.sslip.io/cpc.2025.03.1.i54
exit
[m13-cnaaa/m13] cpc#


[m13-cnaaa/m13] cpc# show helm charts version
Wed Oct  29 06:36:48.650 UTC+00:00
CHART                    INSTANCE                                VERSION
-------------------------------------------------------------------------------------
cpc-ops-center           cpc-m13-ops-center                      BUILD_2025.03.1.i54
cnat-cps-infrastructure  cpc-m13-cnat-cps-infrastructure         BUILD_2025.03.1.i54
cps-radius-ep            cpc-m13-cps-radius-ep                   BUILD_2025.03.1.i54
etcd-cluster             cpc-m13-etcd-cluster                    BUILD_2025.03.1.i54
network-query            cpc-m13-network-query                   BUILD_2025.03.1.i54
ngn-datastore            cpc-m13-ngn-datastore                   BUILD_2025.03.1.i54
cpc-config               cpc-m13-cpc-config                      BUILD_2025.03.1.i54
cpc-dashboard            cpc-m13-cpc-dashboard                   BUILD_2025.03.1.i54
cpc-engine-app           cpc-m13-cpc-engine-app-production-rjio  BUILD_2025.03.1.i54
cpc-oam-app              cpc-m13-cpc-oam-app                     BUILD_2025.03.1.i54
cpc-services             cpc-m13-cpc-services                    BUILD_2025.03.1.i54

[m13-cnaaa/m13] cpc# show helm charts status
Wed Oct  29 06:36:54.252 UTC+00:00
CHART                    INSTANCE                                STATUS
```

```
---------------------------------------------------------------------------
cpc-ops-center           cpc-m13-ops-center                      deployed
cnat-cps-infrastructure  cpc-m13-cnat-cps-infrastructure         deployed
cps-radius-ep            cpc-m13-cps-radius-ep                   deployed
etcd-cluster             cpc-m13-etcd-cluster                    deployed
network-query            cpc-m13-network-query                   deployed
ngn-datastore            cpc-m13-ngn-datastore                   deployed
cpc-config               cpc-m13-cpc-config                      deployed
cpc-dashboard            cpc-m13-cpc-dashboard                   deployed
cpc-engine-app           cpc-m13-cpc-engine-app-production-rjio  deployed
cpc-oam-app              cpc-m13-cpc-oam-app                     deployed
cpc-services             cpc-m13-cpc-services                    deployed
[m13-cnaaa/m13] cpc#
```

Verify the Pods

Follow these steps to determine the pod and container status after upgrading cnAAA. Ensure that all pods and containers are up and running.

- Use this command to view the cnAAA pod logs:

  `kubectl describe pod` *`pod_name`* **`-n`** *`namespace`*

- Use this command to list all pods and filter for those not in a `Running` status.

  ```
  kubectl get pods -A | grep -v Running
  ```

Note If the **Status** column displays the state as *Running*, and the **Ready** column has the same number of containers on both sides of the forward-slash (/), then the pod is healthy and operational.

Rollback the upgrade

The upgrade can be rolled back if issues are encountered during the upgrade process. This section describes the procedure for rolling back the upgrade..

Reload cnAAA Ops Center configuration

To reload the cnAAA Ops Center configuration from the backup file, follow these steps:

1. Log in to the SMI console as an **ubuntu** user.
2. Untar the backup file created on SMI and move it into a directory.

   Example:

   ```
   cd ~/backups && tar -zxf popcf-cfg-backup_110219-053530.tar.gz
   ```

3. Move the backup configuration file into the newly created **backups** directory.

   Example:

   ```
   cd popcf-cfg-backup_110219-053530
   ```

4. Convert the exported cnAAA Ops Center configuration into a clean file, which is ready for import.

   Example:

```
cat pcfops*.cfg | perl -pe 's/vendor.*\[(.*)\]/vendor $1/g' | perl -pe
's/(^\s+ips).*\[(.*)\]/$1$2/g' | perl -pe 's/(\w)\s+(\w)/$1 $2/g' | perl -pe 's/^\s+//g'
 | grep -v "system mode run" > cpcops.txt
```

Update cnAAA Ops Center configuration

This section describes the procedure involved in updating the cnAAA Ops Center configuration after restoring it. To update the cnAAA Ops Center configuration:

1. Log in to the master node as an **ubuntu** user.
2. Run the following command to log in to the cnAAA Ops Center CLI.

   Example:

   ```
   ssh -p <port_number> admin@$(kubectl get svc -n $(kubectl get namespaces | grep -oP
   'cnAAA-(\d+|\w+)') | grep <port_number> | awk '{ print $3 }')
   ```

3. Paste the contents of the exported cnAAA configuration file (the **cnAAAops.txt** file mentioned in the cnAAA Ops Center.

   Example:

   ```
   product cnAAA# config
   Entering configuration mode terminal
   product cnAAA(config)# <PASTE CONTENTS OF cnAAAops.txt AND RETURN TO 'config' mode. Don't
    Paste Default Configuration>
   product cnAAA(config)#
   ```

Important Fix any sections in the configuration file that did not import properly.

4. Ensure that the helm URLs are inline with the updated cnAAA image.

   Example:

   ```
   product cnAAA(config)# helm repository base-repos
   product cnAAA(config-repository-base-repos)# url <url>
   product cnAAA(config-repository-base-repos)# exit
   product cnAAA(config)# k8s registry <registry_url>
   product cnAAA(config)# commit
   Commit complete.
   product cnAAA(config)#
   ```

Restore the configuration from backup

This section describes the procedure involved in restoring all the Policy Builder and CRD configuration files from the backup.

Restore policy builder configuration

1. Log in to the master node as an **ubuntu** user.
2. Retrieve the Cisco Policy Suite Central URL.

Example:

```
kubectl get ing -n $(kubectl get namespaces | grep -oP 'pcf-(\d+|\w+)') | cut -d\ -f1
 | grep policy-builder | awk '{ print $2 }'
```

```
pb.pcf-02-pcf-engine-app-blv02.<ipv4address>.nip.io
```

3. Navigate to the Cisco Policy Suite Central URL and log in with user credentials.
4. Click **Import/Export** and select the **Import** tab.
5. Select the exported policy backed up in the Back Up SVN, Policy, and CRD Data section.
6. In **Import URL**, specify the following URL:

   `http://svn/repos/configuration`
7. Enter a brief description in **Commit Message** and click **Import**to commit the changes in Policy Suit Central.
8. Log in to the master node again as an **ubuntu** user.
9. Run the following command to retrieve the Cisco Policy Builder URL.

   Example:

```
kubectl get ing -n $(kubectl get namespaces | grep -oP 'cnAAA-(\d+|\w+)' | cut -d\
-f1) | grep policy-builder | awk '{ print "https://"$2"/pb" }'
https://pb.cnAAA-02-cnAAA-engine-app-blv02.<ipv4address>.nip.io/pb
ubuntu@pocnAAA-mas01:~/backups_09182019_T2141$
```

10. Navigate to the Cisco Policy Builder URL and click **Build Policies using version controlled data** .
11. Choose **Repository** from the drop-down list and click **OK**.
12. Click **Publish to Runtime Environment** and enter a brief description in **Commit Message**.
13. Click **OK.**

Restoring CRD Data

1. In CPS Central home page, click **Custom Reference Data**.
2. Check the **Export CRD to Golden Repository** check-box.
3. Specify the SVN host name in **Please enter valid server Hostname or IP** text-box.

Note For cnAAA the SVN host name value is *svn*.

4. Click +.
5. Click **Export**.

Note You receive a success message when the data is exported successfully.