Oracle® Communications
Cloud Native Environment (OC-CNE)
Upgrade Guide

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What's New in This Guide

New and Updates Features in Release 1.5.0

The procedure to backup of the dashboard is added in Upgrade Procedure.

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1 Introduction

This document details the procedure for upgrading Oracle Communications Cloud Native Environment, referred to in these procedures simply as OCCNE. The intended audiences for this document are Oracle engineers who work with customers to maintain a Cloud Native Environment (CNE) on-site at customer facilities.

Acronyms

Table 1-1 Acronyms

Term	Definition
CD	Continuous Delivery
OCCNE	Oracle Communications Cloud Native Environment

2
Upgrading OCCNE

The upgrade procedures in this document explain how to setup and perform an upgrade on the Oracle Communications Signaling, Network Function Cloud Native Environment (OCCNE) environment. The upgrade includes the OL7 base image, kubernetes, and the common services.

Prerequisites

The customer central repository should be updated with the current OCCNE Images for 1.5.0 and any RPMs and binaries should be updated to the latest versions.

Ensure that cluster is in healthy state by checking that all the pods are ready and running. Execute the following command and verify that all pods are in completed/ running status. The pods from the list should have status as **Running** and **READY** value set to **x/x** (or) as **Completed** and **READY** value set to **0/x**.

```
kubectl get pods --all-namespaces
```

Example:

```
NAMESPACE      NAME                                       READY
STATUS    RESTARTS   AGE
cert-manager   cert-manager-77fb98dc45-7ch6b              1/1
Running     0        8d
kube-system    calico-kube-controllers-7df59b474d-r4f7z 1/1
Running     0        8d
kube-system    calico-node-6cvhp                          1/1
Running     1        8d
...
...
...
occne-infra    occne-elastic-elasticsearch-client-0     1/1
Running     0        6d8h
occne-infra    occne-elastic-elasticsearch-client-1     1/1
Running     0        6d8h
occne-infra    occne-elastic-elasticsearch-client-2     1/1
Running     0        6d8h

...
...
...
```

Pre-upgrade Procedures

Following is the pre-upgrade procedure for OCCNE:

1. All NFs must be upgraded before OCCNE upgrade. Execute Installing Network Functions procedure for all NFs that have upgrades available. This procedure includes steps to update NF-specific alerts.
2. The below procedure needs to be executed to track and save the changes which can be reapplied after upgrade to keep the SNMP running after upgrade:
   a. If trap receiver (snmp.destination) for occne-snmp-notifier is modified after installation then the IP details must be saved so that after upgrade it can be reassigned.

      ```
      $ kubectl get  deployment occne-snmp-notifier -n occne-infra -o
      yaml
      ```

      Search for `- --snmp.destination=<trap receiver ip address>:162`. Copy the IP and save it for future reference.
   b. Execute the following command to determine whether multiple SNMP notifiers are configured or not:

      ```
      $ kubectl get pods --all-namespaces | grep snmp
      occne-infra occne-snmp-notifier-1-f4d4876c7-hxnkb  1/1  Running
      0   44h
      occne-infra occne-snmp-notifier-6b99997bfd-r59t7   1/1  Running
      0   43h
      ```

   c. If multiple SNMP notifiers are created then alert manager configmap must be saved before upgrade, so that the config can be reapplied after upgrade by following the post upgrade steps:

      ```
      $ kubectl get configmap occne-prometheus-alertmanager -n occne-
      infra -o yaml
      apiVersion: v1
      data:
        alertmanager.yml: |
          global: {}
          receivers:
          - name: default-receiver
            webhook_configs:
            - url: http://occne-snmp-notifier:9464/alerts
          - name: test-receiver-1
            webhook_configs:
            - url: http://occne-snmp-notifier-1:9465/alerts
          route:
            group_interval: 5m
            group_wait: 10s
            receiver: default-receiver
            repeat_interval: 3h
            routes:
            - receiver: default-receiver
              group_interval: 1m
              group_wait: 10s
              repeat_interval: 9y
              group_by: [instance, alertname, severity]
              continue: true
      ```

```
      - receiver: test-receiver-1
        group_interval: 1m
        group_wait: 10s
        repeat_interval: 9y
        group_by: [instance, alertname, severity]
        continue: true
kind: ConfigMap
```

3. Go to Grafana GUI to backup dashboard:
   a. Select **Shared Dashboard** option on the top-right side of the dashboard that needs to be saved.
   b. Click **Export**. Click **Save to file** to save the file in the local repository.
   c. Save all the dashboards as json files before upgrading OCCNE.
4. Get the administrator password from the Jenkins container to log into the Jenkins user interface running on the Bastion Host.
   a. SSH to the Bastion host and run following command to get the Jenkins docker container ID:

      ```
      $ docker ps | grep 'jenkins' | awk '{print $1}'

      Example output-
      19f6e8d5639d
      ```

   b. Get the admin password from the Jenkins container running as bash. Execute the following command to run the container in bash mode:

      ```
      $ docker exec -it <container id from above command> bash
      ```

   c. Run the following command from the Jenkins container while in bash mode. Once complete, capture the password for later use with user-name: admin to log in to the Jenkins GUI.

      ```
      $ cat /var/jenkins_home/secrets/initialAdminPassword

      Example output -
      e1b3bd78a88946f9a0a4c5bfb0e74015
      ```

   d. Execute the following ssh command from the Jenkins container in bash mode after getting the bastion host ip address:
      Note: The Bare Metal user is admusr and the vCNE user is cloud-user.

      ```
      ssh -t -t -i /var/occne/cluster/<cluster_name>/.ssh/occne_id_rsa
      <user>@<bastion_host_ip_address>
      ```

   e. After executing the SSH command the following prompt appears:

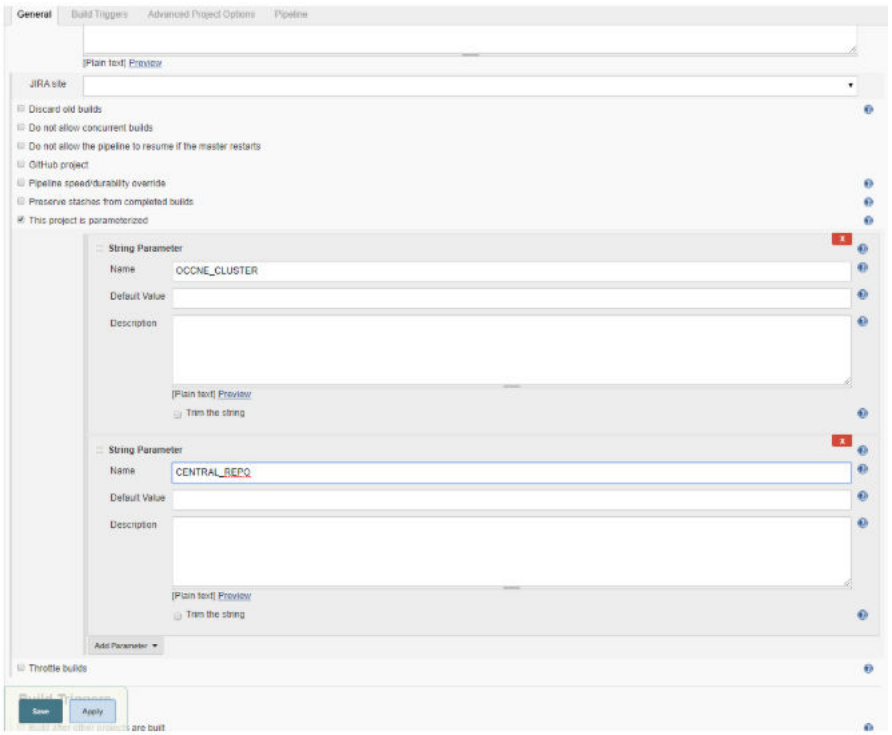
      ```
      The authenticity of host can't be established. Are you sure you
      want to continue connecting (yes/no)
      ```

      Enter yes.

f. Exit from bash mode of the Jenkins container (that is, enter exit at the command line).

5. Open the Jenkins GUI in a browser window using url, <bastion-host-ip>:8080. Login using the password from step 2c with admin user.
6. Click **New Item** to create a job with an appropriate name. Follow the steps below:
   a. Click **New Item** on the Jenkins home page.
   b. Add a name and select the **Pipeline** option for creating the job.
   c. Once the job is created and visible on the Jenkins home page, select **Job**. Select **Configure**.
   d. Add parameters **OCCNE_CLUSTER** and **CENTRAL_REPO** from configure screen. Two **String Parameter** dialogs will appear, one for **OCCNE_CLUSTER** and one for **CENTRAL_REPO**. Enter values for the **Default Value** fields in the **OCCNE_CLUSTER** dialog and **CENTRAL_REPO** dialog.

Figure 2-1 Jenkins UI



For openstack environment with certificate authentication only.

Add parameter ENCODED_CACERT as String Parameter and set default value for the Default Value field as base64 encoded string of the openstack certificate, use the link Base encode to generate base64 encoded string of openstack certificate.

e. Copy the following configuration to the pipeline script section in the Configure page of the Jenkins job with substituting values for upgrade-image-version, OCCNE_CLUSTER, CENTRAL_REPO, and

CENTRAL_REPO_DOCKER_PORT. All of these values should be known to the user.

i. **For both bare metal and vCNE without openstack certificate authentication**

```
node ('master') {
    sh "docker run -i --rm
-v /var/occne/cluster/${OCCNE_CLUSTER}:/host -e
ANSIBLE_NOCOLOR=1 ${CENTRAL_REPO}:<central_repo_docker_port>/
occne/provision:<upgrade_image_version> cp deploy_upgrade/
JenkinsFile /host/artifacts"
    load '/var/occne/cluster/<cluster-name>/artifacts/
JenkinsFile'}
```

Example:

```
node ('master') {
    sh "docker run -i --rm -v /var/occne/
cluster/${OCCNE_CLUSTER}:/host -e ANSIBLE_NOCOLOR=1 $
{CENTRAL_REPO}:5000/occne/provision:1.5.0 cp deploy_upgrade/
JenkinsFile /host/artifacts"
    load '/var/occne/cluster/delta/artifacts/JenkinsFile'}
```

ii. **For vCNE with openstack certificate authentication**

```
node ('master') {    sh "docker run -i --rm -v /var/occne/
cluster/${OCCNE_CLUSTER}:/host -e ANSIBLE_NOCOLOR=1
        ${CENTRAL_REPO}:<central_repo_docker_port>/occne/
provision:<upgrade_image_version> cp
        deploy_upgrade/JenkinsFile /host/artifacts"    sh
"docker run -i --rm -v /var/occne/cluster/${OCCNE_CLUSTER}:/
host -e ANSIBLE_NOCOLOR=1
        ${CENTRAL_REPO}:<central_repo_docker_port>/occne/
provision:<upgrade_image_version> sed -i
        's/\${env.openstack_domain_name}
\\\\\\\\\\\\"}/\${env.openstack_domain_name}\\\\\\\\\\\\",\
\\\\\\\\\\\\"openstack_cacert\\\\\\\\\\\\":\\\\\\\\\\\\"$
{ENCODED_CACERT}\\\\\\\\\\\\"}/g'
        /host/artifacts/JenkinsFile"    load '/var/occne/
cluster/<cluster-name>/artifacts/JenkinsFile'}
```

Example:

```
node ('master') {    sh "docker run -i --rm -v /var/occne/
cluster/${OCCNE_CLUSTER}:/host -e ANSIBLE_NOCOLOR=1
        ${CENTRAL_REPO}:5000/occne/provision:1.5.0 cp
deploy_upgrade/JenkinsFile
        /host/artifacts"    sh "docker run -i --rm -v /var/
occne/cluster/${OCCNE_CLUSTER}:/host -e ANSIBLE_NOCOLOR=1
        ${CENTRAL_REPO}:5000/occne/provision:1.5.0 sed -i
        's/\${env.openstack_domain_name}
\\\\\\\\\\\\"}/\${env.openstack_domain_name}\\\\\\\\\\\\",\
\\\\\\\\\\\\"openstack_cacert\\\\\\\\\\\\":\\\\\\\\\\\\"$
```

```
{ENCODED_CACERT}\\\\\\\\\\\\\\"}/g'
        /host/artifacts/JenkinsFile"    load '/var/occne/
cluster/delta/artifacts/JenkinsFile'}
```

f. Select **Apply** and **Save**.

> **Note:**
>
> Skip next step g for 1.5.0 tagged image upgrade. This should only be executed for rc builds (For example- upgrading from 1.4.0 to 1.5.0-rc.3 and not for upgrade from **1.4.0 to 1.5.0**)

g. Execute following commands on Bastion host:

```
docker run -i --rm -v /var/occne/cluster/${OCCNE_CLUSTER}:/host
-e ANSIBLE_NOCOLOR=1 ${CENTRAL_REPO}:<central_repo_docker_port>/
occne/provision:<upgrade_image_version> cp deploy_upgrade/
JenkinsFile /host/artifacts
sed -i 's/1.5.0/1.5.0-<rc_version>/g' /var/occne/cluster/
<cluster_name>/artifacts/JenkinsFile
```

Example-

```
sed -i 's/1.5.0/1.5.0-rc.3/g' /var/occne/cluster/<cluster_name>/
artifacts/JenkinsFile
```

Remove this line from jenkins pipeline configuration block that was added in step e in jenkins pipeline configuration, click **Apply** and **Save**:

```
sh "docker run -i --rm
-v /var/occne/cluster/${OCCNE_CLUSTER}:/host -e
ANSIBLE_NOCOLOR=1 ${CENTRAL_REPO}:<central_repo_docker_port>/
occne/provision:<upgrade_image_version> cp deploy_upgrade/
JenkinsFile /host/artifacts"
```

h. Go back to the **Job** page and select **Build with Parameters** and then Build button for the new pipeline script to be enabled for the job, this job will be aborted.

i. Select **Build with Parameters** option to see latest Jenkins file parameters in the .GUI.

Upgrade Procedure

Following is the procedure to upgrade OCCNE:

1. Click the job name created in the previous step. Select the **Build with Parameters** option on the left top corner panel in the Jenkins GUI.
2. On selecting the **Build with Parameters** option, there will be a list of parameters with a description describing which values need to be used for the Bare-Metal upgrade vs the vCNE upgrade.

> **Note:**
>
> If the default values are not displayed, enter the values manually.

a. The openstack specific values can be obtained by using the openstack configuration show command on a shell that supports the openstack client (cli).

b. The correct value for the OCCNE_CLUSTER (the cluster name) can be obtained by entering the following command on the Bastion Host: echo $OCCNE_CLUSTER.
Note: This value must be the exact cluster name used when the system was originally deployed.

c. **USER** should be set to *admusr* for upgrading a bare-metal cluster and **cloud-user** for upgrading a vCNE cluster.

d. **HOSTIP** should be the internal IP address of the Bastion Host.

3. After entering correct values for parameters, select **Build** to start upgrade.
4. Once the build has started, go to the job home page to see the live console for upgrade. This can be done in two ways: Either select **console output** or **Open Blue Ocean** (Recommended is blue ocean as it will show each stage of upgrade).
5. Re-trigger the Jenkins build by repeating procedure from step 2, if build gets aborted with the below message (applicable only for bare metal upgrade).

```
Reboot is required to ensure that your system benefits from these
updates.
+ echo 'Node being restarted due to updates, returns 255'
Node being restarted due to updates, returns 255
+ nohup sudo -b bash -c 'sleep 2; reboot'
+ echo 'restart queued'
restart queued
+ exit 255
```

6. Check the job progress from **Blue Ocean** link in the job to see each stage being executed, once upgrade is complete all the stages will be in **Green**.
7. Before upgrading the Dbtier you need to execute below SQL commands on any one of the sql nodes:

```
#Login to any one of the sql node
#Then login to the mysql prompt and execute below queries

mysql> CREATE DATABASE replication_info;

mysql> CREATE TABLE replication_info.DBTIER_MATE_SITE_INFO
( ParamKey VARCHAR(100), ParamValue VARCHAR(100) NOT NULL,
CONSTRAINT DBTIER_MATE_SITE_INFO_pk PRIMARY KEY (ParamKey) );

mysql> CREATE TABLE
replication_info.DBTIER_REPLICATION_CHANNEL_INFO ( channel_id INT
NOT NULL, remote_signaling_ip VARCHAR(100) NOT NULL, role
VARCHAR(100) NOT NULL, start_epoch BIGINT(20) DEFAULT
```

```
NULL, CONSTRAINT DBTIER_REPLICATION_CHANNEL_INFO PRIMARY KEY
(remote_signaling_ip));
```

8. Login to any one of the DB Tier management node and in the mcm prompt and execute below commands:

```
set binlog-format:mysqld=row occnendbclustera;
 set log_bin:mysqld=/var/occnedb/binlogs occnendbclustera;
 set relay_log:mysqld=/var/occnedb/mysql/mysql-relay-bin
occnendbclustera;
 set relay_log_index:mysqld=/var/occnedb/mysql/mysql-relay-
bin.index occnendbclustera;
 set expire_logs_days:mysqld=10 occnendbclustera;
 set max_binlog_size:mysqld=1073741824 occnendbclustera;
 set auto-increment-increment:mysqld=2 occnendbclustera;
 set auto-increment-offset:mysqld=2 occnendbclustera;
 set ndb-log-update-as-write:mysqld=0 occnendbclustera;
 set skip-slave-start:mysqld=TRUE occnendbclustera;
 set ndb-log-apply-status:mysqld=TRUE occnendbclustera;
```

9. Retrieve the password for DB Tier SQL users "occneuser" and "occnerepluser". Execute below command on bastion host to get the password for "occneuser":

```
$ kubectl -n occne-infra exec -it $( kubectl -n occne-infra get
pods | grep occne-db-monitor-svc | grep Running |  awk -F "
" '{print $1}') -- printenv | grep MYSQL_PASSWORD | awk -F "="
'{print $2}'XH5G99BAuRLb
```

If the password field received as blank then execute below commands on all DB Tier SQL nodes to reset the password for "occneuser".

```
# Login to both Sql node and execute below commands (In the below
example we have set the password for occneuser as NextGenCne)
mysql> CREATE USER IF NOT EXISTS 'occneuser'@'%' IDENTIFIED BY
'<OCCNEUSER_PASSWORD>';
mysql> ALTER USER 'occneuser'@'%' IDENTIFIED BY
'<OCCNEUSER_PASSWORD>';
mysql> GRANT ALL PRIVILEGES ON *.* TO 'occneuser'@'%';
mysql> FLUSH PRIVILEGES;
```

Execute below commands on bastion host to retrieve password for "occnerepluser".

```
$ kubectl -n occne-infra exec -it $( kubectl -n occne-infra get
pods | grep occne-db-replication-svc | grep Running |  awk -F "
" '{print $1}') -- printenv | grep MYSQL_REPLICATION_PASSWORD | awk
-F "=" '{print $2}'RZjcwNem8PgS
```

If password field received as empty or "db-replication-svc" deployment is not there in the system then execute below commands on all DB Tier SQL nodes to reset password for "occnerepluser".

```
# Login to both Sql node and execute below commands (In the below
example we have set the password as NextGenCne).
mysql> DROP USER 'occnerepluser'@'%';
mysql> GRANT REPLICATION SLAVE ON *.* TO 'occnerepluser'@'%'
IDENTIFIED BY 'NextGenCne';
mysql> FLUSH PRIVILEGES;
```

10. Execute below commands on bastion host to upgrade dbtier services. First remove the dbtier secrets and services by running below commands on bastion host.

```
helm delete --purge occne-db-replication-svc
helm delete --purge occne-replication-secret
helm delete --purge occne-secret
helm delete --purge occne-db-monitor-svc
```

Install the dbtier services by running below command:

```
CENTRAL_REPO=${CENTRAL_REPO} CENTRAL_REPO_IP=${CENTRAL_REPO_IP}
PROV_SKIP_DEPLOY=1 OCCNE_SKIP_K8S=1 OCCNE_SKIP_CFG=1
OCCNE_SKIP_TEST=1 DB_SKIP_TEST=1 OCCNE_VERSION=1.5.0 DB_ARGS='--
tags=createsecrets,install-dbtiersvc --skip-tags=db-connectivity-
svc --extra-
vars={"mysql_username_for_metrics":"occneuser","mysql_password_for_m
etrics":"<OCCNEUSER_PASSWORD>","mysql_username_for_replication":"occ
nerepluser","mysql_password_for_replication":"<OCCNEREPLUSER_PASSWOR
D>","mate_site_db_replication_ip":"<MATE_SITE_REPLICATION_SVC_IP>","
occne_mysqlndb_cluster_id":<DB_TIER_CLUSTER_ID>}' /var/occne/
cluster/${OCCNE_CLUSTER}/artifacts/pipeline.sh
  CENTRAL_REPO=${CENTRAL_REPO} CENTRAL_REPO_IP=${CENTRAL_REPO_IP}
PROV_SKIP_DEPLOY=1 OCCNE_SKIP_K8S=1 OCCNE_SKIP_CFG=1
OCCNE_SKIP_TEST=1 DB_SKIP_TEST=1 OCCNE_VERSION=1.5.0 DB_ARGS='--
tags=upgrade --extra-
vars={"mysql_username_for_metrics":"occneuser","mysql_password_for_m
etrics":"<OCCNEUSER_PASSWORD>","mysql_username_for_replication":"occ
nerepluser","mysql_password_for_replication":"<OCCNEREPLUSER_PASSWOR
D>","mate_site_db_replication_ip":"<MATE_SITE_REPLICATION_SVC_IP>","
occne_mysqlndb_cluster_id":<DB_TIER_CLUSTER_ID>}' /var/occne/
cluster/${OCCNE_CLUSTER}/artifacts/pipeline.sh
```

> **Note:**
>
> While upgrading Site 1 please give empty string as value of "mate_site_db_replication_ip". "occne_mysqlndb_cluster_id" is the cluster_id given to the ndb cluster during installation time.

Post-Upgrade Procedures

This section describes the post-upgrade procedure.

1. The below procedure needs to be executed to revert back the changes so that SNMP runs smoothly:

   a. Edit SNMP notifier to add (snmp.destination) IP back:

   ```
   $ kubectl edit deployment occne-snmp-notifier -n occne-infra
    Move cursor to the line:
           - --snmp.destination=127.0.0.1:162
   Modify to the first trap receiver ip:
           - --snmp.destination=<trap receiver ip address>:162
     The editor is vi, use the vi command :x or :wq to same the
   change and exit.
   ```

   b. If multiple SNMP notifiers were created before upgrade then alert manager configmap needs to be reloaded with previous configuration:

   ```
   $ kubectl edit configmap occne-prometheus-alertmanager -n occne-
   infra

   apiVersion: v1
   data:
     alertmanager.yml: |
       global: {}
       receivers:
       - name: default-receiver
         webhook_configs:
         - url: http://occne-snmp-notifier:9464/alerts
       - name: test-receiver-1
         webhook_configs:
         - url: http://occne-snmp-notifier-1:9465/alerts
       route:
         group_interval: 5m
         group_wait: 10s
         receiver: default-receiver
         repeat_interval: 3h
         routes:
         - receiver: default-receiver
           group_interval: 1m
           group_wait: 10s
           repeat_interval: 9y
           group_by: [instance, alertname, severity]
           continue: true
         - receiver: test-receiver-1
           group_interval: 1m
           group_wait: 10s
           repeat_interval: 9y
           group_by: [instance, alertname, severity]
           continue: true
   ```

   c. Restart Alert Manager pods for the configmap changes to take effect:

i. Execute the below command to make sure both the Alert Manager pods are running:

```
$kubectl get pods -n occne-infra | grep alert
occne-prometheus-alertmanager-0    2/2     Running
0          5h
occne-prometheus-alertmanager-1    2/2     Running
0          5h
```

ii. Execute the below command to delete the first Alert manager Pod. The pod will be recreated automatically after delete:

```
$kubectl delete pod occne-prometheus-alertmanager-0 -n occne-
infra
pod "occne-prometheus-alertmanager-0" deleted
```

iii. Execute the below command to make sure the new Alert manager pod is up and running:

```
$ kubectl get pods -n occne-infra | grep alert
occne-prometheus-alertmanager-0  2/2     Running
0          5h
occne-prometheus-alertmanager-1  2/2     Running
0          50s
```

iv. Execute the below command to delete the second Alert manager Pod. The pod will be recreated automatically after delete.

```
$kubectl delete pod occne-prometheus-alertmanager-1 -n occne-
infra
pod "occne-prometheus-alertmanager-1" deleted
```

v. Execute the below command to make sure the new Alert manager pod is up and running:

```
$ kubectl get pods -n occne-infra | grep alert
occne-prometheus-alertmanager-0  2/2     Running
0          5h
occne-prometheus-alertmanager-1  2/2     Running
0          50s
```

2. Run command below and verify all the pods in namespace **occne-infra** are in running status. All the pods from the list should have status as **Running** and **READY** value set to **1/1.**

```
kubectl get pods -n occne-infra
 Example:
NAME                                READY   STATUS    RESTARTS   AGE
occne-elastic-elasticsearch-data-0  1/1     Running   0
2d1h
```

3. Load old Grafana dashboard.

   a. Click **+** icon on the left panel, click **Import**.

b. Once in new panel, click upload.json file. Choose the dashboard file saved locally.

c. Repeat same for all dashboards saved from old version.