

# Oracle® Communications

## Service Communication Proxy (SCP) Cloud Native Installation Guide



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The Oracle logo, consisting of a solid red square with the word "ORACLE" in white, uppercase, sans-serif font centered within it.

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# What's New in This Guide

This section introduces the documentation updates for Release 1.8.x in Oracle Communications Cloud Native Service Communication Proxy (SCP) Installation Guide.

## **New and Updated Features in Release 1.8.0**

For Release 1.8.0, the following changes are performed in the document:

- Updated the [Installation Tasks](#) section to include Aspen Service Mesh (ASM) steps.

# 1

## Overview

This section provides a brief overview of the recommended methods to install Service Communication Proxy (SCP).

SCP is a decentralized solution and composed of Service Proxy Controllers and Service Proxy Workers and is deployed along side of 5G network functions and provides routing control, resiliency, and observability to the core network. Refer to *SCP User's Guide* for more information on architecture and features.

Oracle SCP leverages the Istio or Envoy service mesh for all internal and external communication. The service mesh integration provides inter-NF communication and allows API gateway co-working with service mesh. The service mesh integration supports the services by deploying a special sidecar proxy in the environment to intercept all network communication between microservices. Refer to [Predeployment Configurations to Install SCP with ASM](#) section to learn how to configure the Service Mesh.

The service mesh integration also supports pod level routing and visibility into the pods for other network functions (NF) in the cluster. It provides optional ClusterRole and ClusterRoleBinding for SCP deployment.

## References

1. Cloud Native Environment (CNE) 1.4, 1.5 and 1.6 Installation Guide
2. Service Communication Proxy (SCP) Cloud Native User's Guide
3. Network Repository Function (NRF) Cloud Native Installation Guide

## Acronyms

**Table 1-1 Acronyms**

Acronym	Meaning
ASM	Aspen Service Mesh
CNE	Cloud Native Environment
DNS	Domain Name System
FQDN	Fully Qualified Domain Name
NRF	Network Repository Function
OHC	Oracle Help Center
OSDC	Oracle Software Delivery Cloud
SCP	Service Communication Proxy
SVC	Services

# 2

## SCP Installation

This chapter explains the installation procedure of SCP.

### Prerequisites

Following are the prerequisites to install and configure the SCP:

#### SCP Software

Following minimum software versions must be installed before deploying the SCP:

**Table 2-1 Pre-installed Software**

Software	Version
Kubernetes	v1.15.3 and v1.18.4
HELM	v2.14.3 and v3.1.2

 **Note:**

If case any of the above software is not installed in CNE, then install the specified software items before proceeding.

Following are the common services that needs to be deployed as per the requirement:

**Table 2-2 Common Services**

Software	Chart Version	Required For
elasticsearch	7.6.1	Logging Area
elastic-curator	5.5.4	Logging Area
elastic-exporter	1.1.0	Logging Area
elastic-master	7.6.1	Logging Area
logs	3.0.0	Logging Area
kibana	7.6.1	Logging Area
grafana	7.0.4	Metrics Area
prometheus	2.16.0	Metrics Area
prometheus-kube-state-metrics	1.9.5	Metrics Area
prometheus-node-exporter	0.18.1	Metrics Area
metallb	0.9.3	External IP
metrics-server	2.10.0	Metric Server
tracer	1.14.0	Tracing Area

## Network access

The Kubernetes cluster hosts must have network access to:

- Local docker image repository where SCP images are available
- Local helm repository where SCP helm charts are available
- Service FQDN of SCP must be discoverable from outside the cluster (that is, publicly exposed so that ingress messages to SCP can come from outside of Kubernetes).

### Note:

All the kubectl and helm related commands used in this guide need to be executed on a system or the bastion depending on the infrastructure/ deployment. It could be a client machine such as a VM, server, local desktop, and so on.

## Client machine requirements

There are some requirements for the laptop/desktop from where the deployment commands need to be executed:

- It should have network access to the helm repository and docker image repository.
- Helm repository must be configured on the client.
- It should have network access to the Kubernetes cluster.
- It should have necessary environment settings to run the kubectl commands. The environment should have privileges to create a namespace in the Kubernetes cluster.
- It should have the helm client installed with the **push** plugin. The environment should be configured so that the `helm install` command deploys the software in the Kubernetes cluster.

## SCP Images

Following are the SCP images:

**Table 2-3 SCP Images**

Microservices	Image
SCP-Worker	scp-worker
SCPC-Pilot	scpc-pilot
SCPC-Soothsayer	soothsayer-configuration
SCPC-Soothsayer	soothsayer-notification
SCPC-Soothsayer	soothsayer-subscription
SCPC-Soothsayer	soothsayer-audit
SCP-SDS	scp-sds



## Installation Sequence

This section provides information on prerequisites and installation procedure of SCP.

Refer to the following chapters in the *OCCNE 1.4 Installation Guide* for more information on how to configure docker registry and NFs on OCCNE:

- For docker registry, refer to Docker Image Registry Configuration chapter
- For executing the below commands on Bastion Host, refer to Bastion Host Installation chapter

## Installation Tasks

This section describes how to install SCP on a cloud native environment.

Follow the below mentioned sequence to install SCP:

1. [Downloading SCP package](#)
2. [Predeployment Configurations to Install SCP with ASM](#)
3. [Installing SCP](#)
4. [Configure NRF Details](#)
5. [Configure SCP as HTTP Proxy](#)

## Downloading SCP package

Following is the procedure to download the release package from [MOS](#):

1. Login to MOS using the appropriate login credentials.
2. Select **Patches & Updates** tab.
3. In **Patch Search** console, select **Product or Family (Advanced)** tab.
4. Enter *Oracle Communications Cloud Native Core - 5G* in **Product** field and select the product from the Product drop-down.
5. Select *Oracle Communications Cloud Native Core Service Communication Proxy <release\_number>* in **Release** field.
6. Click **Search**. The **Patch Advanced Search Results** list appears.
7. Select the required patch from the list. The Patch Details window appears.
8. Click on **Download**. File Download window appears.
9. Click on the **<p\*\*\*\*\*\_<release\_number>\_Tekelec>.zip** file.
10. Extract the zip file to download the network function patch to the system where network function must be installed.

## Predeployment Configurations to Install SCP with ASM

To install SCP with Aspen Service Mesh (ASM), perform the following configurations before initiating installation:

 **Note:**

Refer to [ASM Resource](#) for ASM related parameter information. You need to login using ASPEN credentials.

1. Create a namespace for SCP deployment if not already created:

```
kubectl create ns <scp-namespace-name>
```

2. Follow the below steps to set the connectivity to database (DB) service:

- a. For VM based DB:

- i. Create a Headless service for DB connectivity in SCP namespace:

```
kubectl apply -f db-connectivity.yaml
```

Sample *db-connectivity.yaml* file:

```
# db_service_external.yaml
apiVersion: v1
kind: Endpoints
metadata:
  name: scp-db-connectivity-service-headless
  namespace: <db-namespace>
subsets:
- addresses:
  - ip: <10.75.203.49> # IP Endpoint of DB service.
  ports:
  - port: 3306
    protocol: TCP
---
apiVersion: v1
kind: Service
metadata:
  name: scp-db-connectivity-service-headless
  namespace: <db-namespace>
spec:
  clusterIP: None
  ports:
  - port: 3306
    protocol: TCP
    targetPort: 3306
  sessionAffinity: None
  type: ClusterIP
---
apiVersion: v1
kind: Service
metadata:
  name: scp-db-connectivity-service
  namespace: <scp-namespace>
spec:
  externalName: scp-db-connectivity-service-headless.<db-
```

```
namespace>.svc.<domain>
  sessionAffinity: None
  type: ExternalName
```

ii. Create **ServiceEntry** and **DestinationRule** for DB connectivity service:

```
kubectl apply -f db-se-dr.yaml
```

Sample *db-se-dr.yaml* file:

```
apiVersion: networking.istio.io/v1alpha3
kind: ServiceEntry
metadata:
  name: scp-db-external-se
  namespace: <scp-namespace>
spec:
  exportTo:
  - "."
  hosts:
  - scp-db-connectivity-service-headless.<db-
namespace>.svc.<domain>
  ports:
  - number: 3306
    name: mysql
    protocol: MySQL
  location: MESH_EXTERNAL
  resolution: NONE
---
apiVersion: networking.istio.io/v1alpha3
kind: DestinationRule
metadata:
  name: scp-db-external-dr
  namespace: <scp-namespace>
spec:
  exportTo:
  - "."
  host: scp-db-connectivity-service-headless.<db-
namespace>.svc.<domain>
  trafficPolicy:
    tls:
      mode: DISABLE
```

b. For KubeVirt based DB:

- i. DB connectivity headless service is not required for KubeVirt based deployment as DB service may be exposed as K8S service. SCP can use Kubernetes service FQDN to connect to DB service. Create a DestinationRule with DB FQDN to disable mTLS.

```
kubectl apply -f db-dr.yaml
```

Sample *db-dr.yaml* file:

```
apiVersion: networking.istio.io/v1alpha3
kind: DestinationRule
metadata:
  name: scp-db-service-dr
  namespace: <scp-namespace>
spec:
  exportTo:
  - "."
  host: <db-service-fqdn>.<db-namespace>.svc.<domain>
  trafficPolicy:
    tls:
      mode: DISABLE
```

3. Configure access to Kubernetes API Service:
  - a. Create a service entry in pod networking so that pods can access kubernetes api-server:

```
kubectl apply -f kube-api-se.yaml
```

Sample *kube-api-se.yaml* file:

```
# service_entry_kubernetes.yaml
apiVersion: networking.istio.io/v1alpha3
kind: ServiceEntry
metadata:
  name: kube-api-server
  namespace: <scp-namespace>
spec:
  hosts:
  - kubernetes.default.svc.<domain>
  exportTo:
  - "."
  addresses:
  - <10.96.0.1> # cluster IP of kubernetes api server
  location: MESH_INTERNAL
  ports:
  - number: 443
    name: https
    protocol: HTTPS
  resolution: NONE
```

4. Set NRF connectivity by creating **ServiceEntry** and **DestinationRule** to access external or public NRF service (not part of Service Mesh Registry):

```
kubectl apply -f nrf-se-dr.yaml
```

Sample *nrf-se-dr.yaml* file:

```
apiVersion: networking.istio.io/v1alpha3
kind: DestinationRule
metadata:
```

```

    name: nrf-dr
    namespace: <scp-namespace>
spec:
  exportTo:
  - .
  host: ocnrf.3gpp.oracle.com
  trafficPolicy:
    tls:
      mode: MUTUAL
      clientCertificate: /etc/certs/cert-chain.pem
      privateKey: /etc/certs/key.pem
      caCertificates: /etc/certs/root-cert.pem
---
apiVersion: networking.istio.io/v1alpha3
kind: ServiceEntry
metadata:
  name: nrf-se
  namespace: <scp-namespace>
spec:
  exportTo:
  - .
  hosts:
  - "ocnrf.3gpp.oracle.com"
  ports:
  - number: 80
    name: http2
    protocol: HTTP2
  location: MESH_EXTERNAL
  resolution: NONE

```

##### 5. Enable Inter-NF communication:

If Consumer and Producer NFs are not part of Service Mesh Registry, create **Destination Rules** and **Service Entries** in SCP namespace for all known call-flows to enable inter NF communication.

```
kubectl apply -f known-nf-se-dr.yaml
```

Sample *known-nf-se-dr.yaml* file:

```

apiVersion: networking.istio.io/v1alpha3
kind: DestinationRule
metadata:
  name: udml-dr
  namespace: <scp-namespace>
spec:
  exportTo:
  - .
  host: s24e65f98-bay190-rack38-udm-11.oracle-ocudm.cnc.us-east.oracle.com
  trafficPolicy:
    tls:
      mode: MUTUAL
      clientCertificate: /etc/certs/cert-chain.pem
      privateKey: /etc/certs/key.pem

```

```

        caCertificates: /etc/certs/root-cert.pem
---
apiVersion: networking.istio.io/v1alpha3
kind: ServiceEntry
metadata:
  name: udml-se
  namespace: <scp-namespace>
spec:
  exportTo:
    - .
  hosts:
    - "s24e65f98-bay190-rack38-udm-11.oracle-ocudm.cnc.us-
east.oracle.com"
  ports:
    - number: 16016
      name: http2
      protocol: HTTP2
  location: MESH_EXTERNAL
  resolution: NONE

```

 **Note:**

DestinationRule and ServiceEntry ASM resources also need to be created for following and/or similar cases:

- a. If a NF is registered with callback URI(s) or notification URI(s) which are not part of Service Mesh Registry.
- b. If a callbackReference is used in a known call-flow and contains URI which is not part of Service Mesh Registry.

Execute the following command:

```
kubectl apply -f callback-uri-se-dr.yaml
```

Sample *callback-uri-se-dr.yaml* file:

```

apiVersion: networking.istio.io/v1alpha3
kind: DestinationRule
metadata:
  name: udm-callback-dr namespace: <scp-namespace>
spec:
  exportTo: - .
  host: udm-notifications-processor-03.oracle-ocudm.cnc.us-
east.oracle.com
  trafficPolicy:
    tls:
      mode: MUTUAL
      clientCertificate: /etc/certs/cert-chain.pem
      privateKey: /etc/certs/key.pem
      caCertificates: /etc/certs/root-cert.pem
---

```

```

apiVersion: networking.istio.io/v1alpha3
kind: ServiceEntry
metadata:
  name: udm-callback-se
  namespace: <scp-namespace>
spec:
  exportTo: - .
  hosts: - "udm-notifications-processor-03.oracle-ocudm.cnc.us-
east.oracle.com"
  ports:
    - number: 16016
      name: http2
      protocol: HTTP2
      location: MESH_EXTERNAL
      resolution: NONE

```

## SCP Deployment Configuration with ASM

### Deployment Configuration

Follow the deployment configuration steps before executing helm install:

1. Create namespace label for auto sidecar injection to automatically add the sidecars in all pods spawned in SCP namespace:

```
kubectl label ns <scp-namespace> istio-injection=enabled
```

2. Create a Service Account for SCP and a role with **appropriate security policies for sidecar proxies to work** refer to *sa-role-rolebinding.yaml* file.
3. Map the role and service accounts by creating a Role binding (see the sample):

```
kubectl apply -f sa-role-rolebinding.yaml
```

Sample *sa-role-rolebinding.yaml* file:

```

apiVersion: v1
kind: ServiceAccount
metadata:
  name: ocscp-release-1-8-0-scp-serviceaccount
  namespace: <scp-namespace>
---
apiVersion: rbac.authorization.k8s.io/v1
kind: Role
metadata:
  name: ocscp-release-1-8-0-scp-role
  namespace: <scp-namespace>
rules:
- apiGroups:
  - policy
  resources:
  - podsecuritypolicies
  verbs:
  - use

```

```
resourceNames:
- ocsdp-restricted
- apiGroups:
- networking.ocsdp.oracle.io
resources:
- virtualservices
- serviceentries
- gateways
- envoyfilters
- destinationrules
- sidecars
verbs: ["*"]
- apiGroups: ["config.ocsdp.oracle.io"]
resources: ["*"]
verbs: ["*"]
- apiGroups: ["rbac.ocsdp.oracle.io"]
resources: ["*"]
verbs: ["*"]
- apiGroups: ["authentication.ocsdp.oracle.io"]
resources: ["*"]
verbs: ["*"]
- apiGroups: [""]
resources:
- pods
- services
verbs: ["*"]
- apiGroups:
- "" # "" indicates the core API group
resources:
- secrets
- endpoints
verbs:
- get
- watch
- list
---
apiVersion: rbac.authorization.k8s.io/v1
kind: RoleBinding
metadata:
  name: ocsdp-release-1-8-0-scp-rolebinding
  namespace: <scp-namespace>
roleRef:
  apiGroup: rbac.authorization.k8s.io
  kind: Role
  name: ocsdp-release-1-8-0-scp-role
subjects:
- kind: ServiceAccount
  name: ocsdp-release-1-8-0-scp-serviceaccount
  namespace: <scp-namespace>
- kind: Group
  apiGroup: rbac.authorization.k8s.io
  name: system:serviceaccounts:<scp-namespace>
---
apiVersion: policy/v1beta1
kind: PodSecurityPolicy
```



```

metadata:
  name: ocsdp-restricted
spec:
  allowPrivilegeEscalation: false
  allowedCapabilities:
  - NET_ADMIN
  - NET_RAW
  fsGroup:
    rule: RunAsAny
  runAsUser:
    rule: RunAsAny
  seLinux:
    rule: RunAsAny
  supplementalGroups:
    rule: RunAsAny
  volumes:
  - '*'

```

4. Update *ocsdp-custom-values-1.8.0.yaml* with following annotations. Update other values such as DB details and service account as created in above steps:

```

global:
  customExtension:
    allResources:
      annotations:
        sidecar.istio.io/inject: "false"
    lbDeployments:
      annotations:
        sidecar.istio.io/inject: "true"
        oracle.com/cnc: "true"
    nonlbDeployments:
      annotations:
        sidecar.istio.io/inject: "true"
        oracle.com/cnc: "true"

  scpServiceAccountName: <"ocsdp-release-1-8-0-scp-serviceaccount">
  clusterRoleBindingEnabled: false
  database:
    dbHost: <"scp-db-connectivity-service"> #DB Service FQDN

  scpc-configuration:
    service:
      type: ClusterIP

  scp-worker:
    tracingenable: false
    service:
      type: ClusterIP
    deployment:
      customExtension:
        annotations:
          sidecar.istio.io/inject: "false" # Not required for ASM
          traffic.sidecar.istio.io/excludeInboundPorts: "8001"

```

 **Note:**

- a. **Sidecar inject = "false"** annotation on all resources prevents sidecar injection on pods created by helm jobs/hooks.
- b. Deployment overrides re-enable auto sidecar injection on all deployments.
- c. scp-worker override disables auto sidecar injection for scp-worker microservice, as it is done manually in later stages. **This override is only required for ASM release 1.4 or 1.5. If integrating with ASM release 1.6 or later, it must be removed.**
- d. `'oracle.com/cnc'` annotation is required for integration with OSO Services.
- e. Jaeger tracing must be disabled, as it may interfere with SM end-to-end traces.

### Manual sidecar injection

SCP-Worker sidecar proxy needs to be manually injected because of concurrency requirements. Follow the below configuration steps:

1. Get Sidecar injection configuration and save it in file:

```
kubectl -n istio-system get configmap istio-sidecar-injector -
o=jsonpath='{.data.config}' > inject-config.yaml
```

2. Get ASM mesh-configuration and save it in file:

```
kubectl -n istio-system get configmap istio -
o=jsonpath='{.data.mesh}' > mesh-config.yaml
```

3. Update concurrency value to '8' in *mesh-config.yaml* (can be automated using 'sed'):

```
concurrency: 8
```

4. Patch SCP-Worker deployment with sidecar injection configuration and updated mesh configuration file:

```
kubectl get deployment -n <scp-namespace> <scp-worker-deployment>
-o yaml | $ASM_HOME/bin/istioctl kube-inject --injectConfigFile
inject-config.yaml --meshConfigFile mesh-config.yaml -f - | kubectl
apply -f -
```

After sidecar injection scp-worker pods will show 2/2.

## Installing SCP

 **Note:**

If ingress gateway is not used, skip to Install SCP.

1. Unzip the release package file to the system where you want to install the network function. You can find the SCP package as follows:

```
ReleaseName-pkg-Releasenameumber.tgz
```

where:

ReleaseName is a name which is used to track this installation instance.

Releasenameumber is the release number.

For example, ocscp-pkg-1.8.0.0.tgz

2. Untar the OCSCP package file to get OCSCP docker image tar file:

```
tar -xvzf ReleaseName-pkg-Releasenameumber.tgz
```

The directory consists of following:

- a. SCP Docker Images File: tarball contains images of SCP  
ocscp-images-1.8.0.tar
  - b. Helm File: tarball contains SCP Helm charts and templates  
ocscp-1.8.0.tgz
  - c. Helm File: tarball contains Ingress Gateway Helm charts and templates  
ocscp-ingress-gateway-1.7.6.tgz
  - d. Ingress Gateway Docker Images File: tarball contains images of Ingress Gateway  
ocscp-ingress-gateway-images-1.7.6.tar
  - e. Readme txt: Contains cksum and md5sum of the tarballs  
Readme.txt
3. Load the *ocscp-images-<release\_number>.tar* file into the Docker system:

```
docker load --input /IMAGE_PATH/ocscp-images-<release_number>.tar
```

4. Verify that the image is loaded correctly by entering this command:

```
docker images
```

5. Execute the following commands to push the docker images to docker registry:

```
docker tag <image-name>:<image-tag> <docker-repo>/ <image-name>:<image-tag>
```

```
docker push <docker-repo>/<image-name>:<image-tag>
```

**6. Untar the helm files:**

```
tar -xvf <nfname>-pkg-<release-number>.tgz
```

```
helm push <image_name>.tgz <helm_repo>
```

 **Note:**

ocscp-ingress-gateway-1.7.6.tgz file must be pushed, if SCP is deployed with Ingress gateway.

**7. Go to the extracted SCP package:**

```
cd ocscp-<release_number>
```

- 8. Create the ocscp-custom-values-1.8.0.yaml file with the required input parameters. To customize the file, refer to [Customizing SCP](#) chapter. If ingress gateway is deployed with SCP, refer to [Customizing SCP with Ingress Gateway](#) chapter for customizing parameters.**

 **Note:**

In case NRF needs to be configured, refer to [Configure NRF Details](#) for more details.

- 9. Create DB user and database. SCP DB User must be created for all MySQL nodes:**

- a. Login to mysql server**
- b. Execute create database <scp\_dbname>; command.**  
Example: "create database ocscpdb; "
- c. Create users:**

- i. Create an admin user by executing the following command:**

```
CREATE USER 'username'@'%' IDENTIFIED BY 'password';
```

where username and password are MYSQL privileged user login.

For example:

```
CREATE USER 'scpPrivilegedUsr'@'%' IDENTIFIED BY  
'scpPrivilegedPasswd';
```

- ii. Create an application user by executing the following command:**

```
CREATE USER 'username'@'%' IDENTIFIED BY 'password';
```

where username and password are MYSQL application user.

For example:

```
CREATE USER 'scpApplicationUsr'@'%' IDENTIFIED BY  
'scpApplicationPasswd';
```

 **Note:**

The above steps (step a and c) must be executed on all MySQL Nodes.

- d. Grant necessary permissions to SCP users created:
  - i. Run the following command to grant permissions to admin user:

```
GRANT SELECT, INSERT, CREATE, ALTER, DROP, LOCK TABLES,  
CREATE TEMPORARY TABLES, DELETE, UPDATE, EXECUTE, REFERENCES  
ON <scp_dbname>.* TO 'username'@'%' ;
```

For example:

```
GRANT SELECT, INSERT, CREATE, ALTER, DROP, LOCK TABLES,  
CREATE TEMPORARY TABLES, DELETE, UPDATE, EXECUTE, REFERENCES  
ON ocscpdb.* TO 'scpPrivilegedUsr'@'%' ;
```

- ii. Run the following command to grant permissions to application user:

```
GRANT SELECT, INSERT, DELETE, UPDATE ON <scp_dbname>.* TO  
'username'@'%' ;
```

For example:

```
GRANT SELECT, INSERT, DELETE, UPDATE ON ocscpdb.* TO  
'scpApplicationUsr'@'%' ;
```

 **Note:**

User must use <scp\_dbname> provided on mysql server in helm chart during SCP deployment. The application user can be same as privileged user.

- e. Perform the following steps to create a kubernetes secret for admin user and application user respectively.
  - i. For privileged user:

```
kubectl create secret generic privilegeduser-  
secret --from-literal=DB_USERNAME=scpPrivilegedUsr  
--from-literal=DB_PASSWORD=scpPrivilegedPasswd --from-  
literal=DB_NAME=ocscpdb -n scpsvc
```

## ii. For application user:

```
kubectl create secret generic appuser-
secret --from-literal=DB_USERNAME=scpApplicationUsr
--from-literal=DB_PASSWORD=scpApplicationPasswd --from-
literal=DB_NAME=ocscpdb -n scpsvc
```

 **Note:**

Ingress gateway and SCP must be on the same namespace.

10. (Optional) If you want to install SCP with Aspen Service Mesh (ASM), perform the predeployment tasks as per [Predeployment Configurations to Install SCP with ASM](#).

11. (Optional) For ASM configuration, create a service entry in pod networking so that pods can access Kubernetes API Service in *ocscp-custom-values-1.8.0.yaml* file. Refer to [SCP Deployment Configuration with ASM](#)

12. (Optional) Install ingress gateway by executing the following command:

```
helm install <ocscp-ingress-gatewayreleasenumbr.tgz> --
name <release_name> --namespace <namespace_name> -f
<ocscp_ingress_gateway_values_releasenumbr.yaml>
```

**Example:**

```
helm install ocscp-ingressgateway-1.7.6.tgz --name
<release_name> --namespace <namespace_name> -f
ocscp_ingress_gateway_values_1.7.6.yaml
```

13. Install SCP using HELM tgz file by executing the following command:

**a.** In case of Helm 2:

```
helm install <helm-repo> -f <custom_values.yaml> --name
<deployment_name> --namespace <namespace_name> --version
<helm_version>
```

**b.** In case of Helm 3:

```
helm install <release name> -f <custom_values.yaml> --namespace
<namespace> <helm-repo>/chart_name --version <helm_version>
```

**c.** In case charts are extracted and Helm 3 is used:

```
helm install <release name> -f <custom_values.yaml> --namespace
<namespace> <chartpath>
```

**Example:**

```
helm install ocscp-helm-repo/ocscp -f <custom values.yaml> --name
ocscp --namespace scpsvc --version <helm version>
```

14. (Optional) In case SCP is installed with ASM, configure SCP-Worker sidecar proxy manually as mentioned in [Manual sidecar injection](#) section.

15. Execute the following command to check the status:

- a. In case of Helm 2:  
helm status <helm-release>
  - b. In case of Helm 3:  
  
helm status <helm-release> --namespace <namespace>
16. Check if all the services are deployed and running:  
kubectl -n <namespace\_name> get services
  17. Check if all the pods are up and running:  
kubectl -n <namespace\_name> get pods  
  
**Note:** Worker and pilot status must be Running and Ready must be n/n. scpc-soothsayer status must be Running and Ready must be n/n, where n is number of containers in the pod and sds service must be up.
  18. (Optional) Upon successful installation, if SCP is deployed with ASM, perform the steps mentioned in [Post-deployment tasks for SCP with ASM](#).

## Post-deployment tasks for SCP with ASM

### Inter-NF communication

For every new NF participating in new Call flows, DestinationRule and ServiceEntry needs to be created in SCP namespace to enable communication. This can be done same way as done earlier for known call flows. Execute the following command:

```
kubectl apply -f new-nf-se-dr.yaml
```

Sample *new-nf-se-dr.yaml* file for DestinationRule and ServiceEntry:

```
apiVersion: networking.istio.io/v1alpha3
kind: DestinationRule
metadata:
  name: <unique DR name for NR>
  namespace: <scp-namespace>
spec:
  exportTo:
  - .
  host: <NF-public-FQDN>
  trafficPolicy:
    tls:
      mode: MUTUAL
      clientCertificate: /etc/certs/cert-chain.pem
      privateKey: /etc/certs/key.pem
      caCertificates: /etc/certs/root-cert.pem
---
apiVersion: networking.istio.io/v1alpha3
kind: ServiceEntry
metadata:
  name: <unique SE name for NR>
  namespace: <scp-namespace>
spec:
  exportTo:
```

```
- .
hosts:
- <NF-public-FQDN>
ports:
- number: <NF-public-port>
  name: http2
  protocol: HTTP2
location: MESH_EXTERNAL
resolution: NONE
```

### Operations Services Overlay Installation

Refer to Operations Services Overlay (OSO) Installation Guide for the installation instructions.

#### Note:

If OSO must be deployed in same namespace as SCP, make sure all deployments of OSO has the annotation to skip sidecar injection as OSO currently does not support ASM sidecar proxy.

### OCCNE common services for logging

Refer to Cloud Native Environment (CNE) Installation Guide for the installation instructions.

#### Note:

If CNE must be deployed CNE in same namespace as SCP, make sure all deployments of CNE has the annotation to skip sidecar injection as CNE currently does not support ASM sidecar proxy.

## Configure NRF Details

NRF details must be defined during SCP installation using the SCP YAML file. User needs to update the NRF details in SCP YAML file.

#### Note:

User can configure a primary NRF and an optional secondary NRF (NRFs must have backend DB Synced).

An IPv4 address of the NRF needs to be configured in case the NRF is outside the Kubernetes cluster. If the NRF is inside the Kubernetes cluster, the user can configure FQDN as well. If both IPv4 address and FQDN are provided, IPv4 Address will take precedence over FQDN.



 **Note:**

The user needs to configure (or remove) **apiPrefix** parameter based on the APIPrefix supported (or not Supported) by NRF.

 **Note:**

The user needs to update the FQDN, ipv4Address, and Port of NRF to point to NRF's FQDN/IP and Port. The Primary NRF profile must be always set to higher (i.e. 0), both (primary and secondary) must not be set to same priority.

## Configure SCP as HTTP Proxy

Consumer NFs are required to set `http_proxy/HTTP_PROXY` to `scp-worker's <FQDN or IPV4 address>:<PORT of SCP-Worker>` for consumer NFs to route messages towards SCP.

 **Note:**

Execute these commands from where SCP worker and FQDN can be accessed.

Follow the below procedure to configure SCP as HTTP proxy:

1. To test successful deployment of SCP, use the below curl command:

```
$ curl -v -X GET --url 'http://<FQDN:PORT of SCP-Worker>/nnrf-nfm/v1/subscriptions/' --header 'Host:<FQDN:PORT of NRF>'
```

2. Fetch the current subscription list (as a client) from NRF by sending the request to NRF through SCP:  
Example:

```
$ curl -v -X GET --url 'http://scp-worker.scpsvc:8000/nnrf-nfm/v1/subscriptions/' --header 'Host:ocnrf-ambassador.nrfsvc:80'
```

# 3

## Customizing SCP

This section provides list of configuration parameters in the Helm file that are used for customizing SCP. The OCNRF deployment is customized by overriding the default values of various configurable parameters.

Follow the below steps to customize the `ocscp_values_1.8.0.yaml` file as per the required parameters:

1. Go to the Oracle Documentation Help Center (OHC) Web site.
2. Navigate to **Industries->Communications->Cloud Native Core->Release 2.3.0**.
3. Click the **SCP Custom Template** link to download the zip file.
4. Unzip the file to get `ocscp-custom-configtemplates-mibs-1.8.0` file that contains the `ocscp-custom-configTemplates-1.8.0.0.0`. This file is used during installation.
5. Customize the `ocscp_values_1.8.0.yaml` file.
6. Save the updated `ocscp_values_1.8.0.yaml` file in the helm chart directory.

### SCP Configuration Parameters

The following sections explain the list of configuration parameters in the Helm file.

#### Note:

In the following tables, the generic notations are: M: Mandatory; O: Optional; C: Conditional.

### Global Parameters

This configuration is used by all the micro services and the user can modify the values of these parameters.

Table 3-1 Global Parameters

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
domain	string	Labels can be letter a-z, number 0-9, hyphen (-). Hyphen cannot be first character. Label combined with dot (.) forms domain	svc.cluster.local	M	Option to configure the Service Domain of the K8 cluster. To know cluster domain one can use command: kubect1 -n kube-system get configmap kubeadm-config -o yaml   grep clusterName
clusterDomain	string	Labels can be letter a-z, number 0-9, hyphen (-). Hyphen cannot be first character. Label combined with dot (.) forms domain	cluster.local	M	Option to configure the Domain of the K8 cluster. Ideally, it is domain attribute value by removing "svc."
ingressGatewayAvailable	boolean	true/false	false	O	Option to indicate whether Ingress Gateway is present in the deployment. If ingress gateway is available then set ingressGatewayAvailable flag to true and provide ingress gateway IP and Port in publicSignalingIP and publicSignalingPort respectively, else set to false. <b>Note:</b> If ingressGatewayAvailable flag is true then service type for scp-worker will be set to ClusterIP, otherwise it will be set to LoadBalancer.
publicSignalingIPSpecified	boolean	true/false	false	O	Option to enable/disable Loadbalancer IP configuration statically for Signaling interface.

Table 3-1 (Cont.) Global Parameters

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
publicSignalingIP	IPv4 Address	Valid IPV4 address as per RFC 791	N/A	C	Option to configure static Signaling Loadbalancer IP. Configured value will be used only if signalingloadbalanceripenabled is configured as "true".
publicSignalingPort	integer	Min- 0 , Max-65535	8000	M	Option to configure Signaling Port
adminport	integer	Min- 0 , Max-65535	8001	M	Option to configure Admin Port (used for debugging purpose)
imageRepository	string	valid repository	<scp_repository_path>:5000/ocscp	M	User need to set imageRepository to the repository where SCP images are loaded.
customExtension.allResources.labels	string	K8s label object syntax	{}	O	Option to configure custom labels for the entire deployment, applicable to all resource types. Format is: <string_label_1_key>: <string_label_1_value> <string_label_2_key>: <string_label_2_value> .....

Table 3-1 (Cont.) Global Parameters

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
customExtension.allResources.annotations	string	K8s annotation object syntax	{}	O	<p>Option to configure custom annotations for the entire deployment, applicable to all resource types. Format is:</p> <pre>&lt;string_annotation_1_key&gt;: &lt;string_annotation_1_value&gt;  &lt;string_annotation_2_key&gt;: &lt;string_annotation_2_value&gt; .....</pre> <p><b>Note:</b> Following is the mandatory annotations if deploying SCP in Aspen Service Mesh:</p> <pre>sidecar.istio.io/inject: "false"</pre>
customExtension.lbServices.labels	string	K8s label object syntax	{}	O	<p>Option to configure custom labels for the LoadBalancer pod(s) of the deployment, applicable to "Service" resource type. Format is:</p> <pre>&lt;string_label_1_key&gt;: &lt;string_label_1_value&gt;  &lt;string_label_2_key&gt;: &lt;string_label_2_value&gt; .....</pre>

Table 3-1 (Cont.) Global Parameters

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
customExtension.lbServices.annotations	string	K8s annotation object syntax	{}	O	<p>Option to configure custom annotations for the LoadBalancer pod(s) of the deployment, applicable to "Service" resource type. Format is:</p> <pre>&lt;string_annotation_1_key&gt;: &lt;string_annotation_1_value&gt;  &lt;string_annotation_2_key&gt;: &lt;string_annotation_2_value&gt; .....</pre> <p><b>Note:</b> Following is the mandatory annotations if deploying SCP in Aspen Service Mesh:</p> <pre>sidecar.istio.io /inject: "true"</pre> <p>If integrating with OSO 1.6 monitoring services in Aspen SM, use following annotations:</p> <pre>oracle.com/cnc: "true"</pre>

Table 3-1 (Cont.) Global Parameters

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
customExtension.lbDeployments.labels	string	K8s label object syntax	{}	O	<p>Option to configure custom labels for the LoadBalancer pod(s) of the deployment, applicable to "Deployment" resource type. Format is:</p> <pre>&lt;string_label_1_key&gt;: &lt;string_label_1_value&gt;  &lt;string_label_2_key&gt;: &lt;string_label_2_value&gt; .....</pre>
customExtension.lbDeployments.annotations	string	K8s annotation object syntax	{}	O	<p>Option to configure custom annotations for the LoadBalancer pod(s) of the deployment, applicable to "Deployment" resource type. Format is:</p> <pre>&lt;string_annotation_1_key&gt;: &lt;string_annotation_1_value&gt;  &lt;string_annotation_2_key&gt;: &lt;string_annotation_2_value&gt; .....</pre>

Table 3-1 (Cont.) Global Parameters

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
customExtension.nonLoadBalancerService.labels	string	K8s label object syntax	{}	O	Option to configure custom labels for the Non LoadBalancer pod(s) of the deployment, applicable to "Service" resource type. Format is:  <pre>&lt;string_label_1_key&gt;: &lt;string_label_1_value&gt;  &lt;string_label_2_key&gt;: &lt;string_label_2_value&gt; .....</pre>
customExtension.nonLoadBalancerService.annotations	string	K8s annotation object syntax	{}	O	Option to configure custom annotations for the Non LoadBalancer pod(s) of the deployment, applicable to "Service" resource type. Format is:  <pre>&lt;string_annotation_1_key&gt;: &lt;string_annotation_1_value&gt;  &lt;string_annotation_2_key&gt;: &lt;string_annotation_2_value&gt; .....</pre>



Table 3-1 (Cont.) Global Parameters

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
customExtension.nonLoadBalancers.labels	string	K8s label object syntax	{}	O	<p>Option to configure custom labels for the Non LoadBalancer pod(s) of the deployment, applicable to "Deployment" resource type. Format is:</p> <pre>&lt;string_label_1_key&gt;: &lt;string_label_1_value&gt;  &lt;string_label_2_key&gt;: &lt;string_label_2_value&gt; .....</pre>

Table 3-1 (Cont.) Global Parameters

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
customExtension.nonLoadBalancerDeployments.annotations	string	K8s annotation object syntax	{}	O	<p>Option to configure custom annotations for the Non LoadBalancer pod(s) of the deployment, applicable to "Deployment" resource type. Format is:</p> <pre>&lt;string_annotation_1_key&gt;: &lt;string_annotation_1_value&gt;  &lt;string_annotation_2_key&gt;: &lt;string_annotation_2_value&gt; .....</pre> <p><b>Note:</b> Following is the mandatory annotations if deploying SCP in Aspen Service Mesh:</p> <pre>sidecar.istio.io/inject: "true"</pre> <p>If integrating with OSO 1.6 monitoring services in Aspen SM, use following annotations:</p> <pre>oracle.com/cnc: "true"</pre>
k8sResource.container.prefix	string	NA	{}	O	Option to add prefix to container names.
k8sResource.container.suffix	string	NA	{}	O	Option to add suffix to container names.
hookJob.resources.limits.cpu	integer	N/A	1	M	Maximum limit of cpu for hook job.

Table 3-1 (Cont.) Global Parameters

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
hookJob.resources.limits.memory	integer	N/A	1Gi	M	Max limit of memory for hook job in Giga Bytes.
hookJob.resources.requests.cpu	integer	N/A	1	M	Max allocated vCPU for hook job
hookJob.resources.requests.memory	integer	N/A	1Gi	M	Requested memory (RAM) for hook job in Giga Bytes
database.dbHost	string	Valid IPv4 address as per RFC 791 or Valid FQDN	N/A	M	Hostname or IP address of DB connection service
database.dbPort	string	Valid port value	N/A	M	Port for MySQL Database connection service
database.dbAppUserSecretName	string	N/A	N/A	M	Name of the Kubernetes secret object containing Database username and password
database.dbPrivilegedUserSecretName	string	N/A	N/A	M	Name of the Kubernetes secret object containing Database username and password for an admin user
scpInfo.fqdn	string	Labels can be letter a-z, number 0-9, hyphen (-). Hyphen cannot be first character. Label combined with dot (.) forms domain	N/A	M	Fully Qualified Domain Name of SCP Format: <releaseName>-scp-worker.<Namespace>.<domain>
scpInfo.nfType	string	NA	CUSTOM_ORACLE_SCP	M	NA
scpInfo.locality	string	As per 3GPP TS 29.510 spec	N/A	M	Locality of the current SCP Instance (e.g. geographic location, data center). Same locality must be present in ServingLocalities also.

Table 3-1 (Cont.) Global Parameters

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpInfo.mediation_status	string	mediation_status: ENABLED/DISABLED	DISABLED	O	Option to enable/disable mediation. Note once this option is enabled, all the requests will get routed towards mediation. To turn it disable state, user needs to redeploy SCP.
scpInfo.customInfo.mateScpInfo.capacity	integer	Min = 0, Max = 65535	500	M	Static capacity information in the range of 0-65535, expressed as a weight relative to other SCP instances of the same type.
scpInfo.customInfo.mateScpInfo.priority	integer	Priority: Min = 0, Max = 65535.	1	M	priority: Priority (relative to other SCPs) in the range of 0-65535, to be used for NF selection; lower values indicate a higher priority.
scpInfo.customInfo.mateScpInfo.mateSCPLocalities	string	Localities: As per 3GPP TS 29.510 spec	mateSCPLocalities: - Loc10	M	List of mated localities of the current SCP.
scpInfo.customInfo.servingLocalities	string	NA	servingLocalities: Loc7, Loc8, Loc9, USEast	M	List of serving localities of the current SCP (apart from the locality in present in "locality" attribute)
scpInfo.customInfo.remainingLocalities	string	NA	remainingLocalities: Loc1, Loc2, Loc3, Loc4, Loc5, Loc6	M	List of localities which will be served by current SCP but are not part of mateSCPLocalities and servingLocalities

Table 3-1 (Cont.) Global Parameters

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpInfo.customInfo.servingScope	string	NA	servingScope: Reg1, Reg2	M	Region that SCP can support. It is optional and if left blank then it needs to be left blank in NRF Details as well. If it is not present then servingScope will be taken as "default". Hence put a need on NRF details to have servingScope set either to "default" or leave it blank servingScope from there so that "default" will be used in NRF Detail's servingScope"
scpInfo.nfInstanceId	string	String uniquely identifying a NF instance. The format of the NF Instance ID shall be a Universally Unique Identifier (UUID) version 4, as described in IETF RFC 4122 [15].	N/A	M	String uniquely identifying current SCP instance. The format of the Instance ID shall be a Universally Unique Identifier (UUID) version 4, as described in IETF RFC 4122.

Table 3-1 (Cont.) Global Parameters

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpInfo.nfServices.serviceInstanceId	string	String uniquely identifying a NF service instance. The format of the NF Service Instance ID is Universally Unique Identifier (UUID) version 4, as described in IETF RFC 4122 [15].	f86b54b7-aef9-4c78-b346-3bf7f380812	O	Instance ID of the SCP service. <b>Note:</b> <ul style="list-style-type: none"> <li>nfServices are completely optional, one or all services can be removed, for removing all services, user also need to remove nfServices key as well.</li> <li>nfServices block from ocscp_values.yaml can be removed, if user need to configure any of this services, user need to provide this configuration while deploying it through helm using custom ocscp_values.yaml file.</li> </ul>
scpInfo.nfServices.serviceName	string	NA	nmediation-http	O	Supported values for serviceName: <ul style="list-style-type: none"> <li>nmediation-http (Mediation service)</li> <li>ocscp-sds (Subscriber Data Service)</li> </ul>
scpInfo.nfServices.fqdn	string	fqdn: Labels can be letter a-z, number 0-9, hyphen(-). Hyphen cannot be first character. Label combined with dot(.) forms domain.	NA	O	FQDN of SCP domain. For ocscp-sds FQDN: Format is ocscp-sds service: <releaseName>-scp-sds.<Namespace>.<domain>
scpInfo.nfServices.port	integer	port: 0 to 65535	80	O	Port number of the NF service.

**Table 3-1 (Cont.) Global Parameters**

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpInfo.nfServices.scheme	string	NA	http	O	HTTP scheme.
scpInfo.nfServices.priority	integer	0 to 65535	0	O	Mention the priority of the service.
scpInfo.nfServices.capacity	integer	0 to 65535	100	O	Mention the capacity of the service.
scpInfo.nfServices.load	integer	0 to 100	0	O	Mention the load of the service.
scpInfo.nfServices.nfServiceStatus	string	REGISTERED or SUSPENDED (TS 29.510)	REGISTERED	O	Mention the status of the service specific to the NF.
scpInfo.nfServices.ipEndpoints.ipv4Address	ipv4Address	NA	NA	O	It is the IP address of the NF.
scpInfo.nfServices.ipEndpoints.port	integer	NA	80	O	Port of the NF
scpInfo.nfServices.apiPrefix	integer	Can be combination of letters from a-z and A-Z	NA	O	API Prefix
scpInfo.nfServices.versions.apiFullVersion	string	NA	NA	O	Version of API
scpInfo.nfServices.versions.apiVersionInUri	string	NA	NA	O	URI of API
applicationConfig.nfType	string	Valid 5g NF Type as per 3GPP TS 29.510.	NA	O	Type of NF service.
applicationConfig.serviceName	string	Valid 5g Service name as per 3GPP TS 29.510.	NA	O	Service Name

Table 3-1 (Cont.) Global Parameters

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
applicationConfig.applicationPriority	string	nmediation-http ocscp-sds	NA	O	Following are the values: nmediation-http ocscp-sds
scplocalityconfig.mapping_param	string	LOCALITY, NFINSTANCEID, FQDN	LOCALITY	M	Mapping parameter(or Key to look for), will be used to query the corresponding field in NF profile received in response to NF discovery.  This configuration is used to update the Discovery response based on the match criteria (id_value) with SCP IP/Port/FQDN in NF Profile received. It is used to handle case of AMF discovery from any consumer so that consumer can send requests back to SCP and not directly to AMF after discovering it. For this functionality consumers must send AMF discovery requests to SCP.
scplocalityconfig.mapping_info.id_value	string	NA	N/A	M	Used to match value against the value obtained from mapping parameter.
scplocalityconfig.mapping_info.ip_v4_address	string	Valid IPV4 address as per RFC 791	NA	M	The IP address to be used while updating ipv4Address and callback URI in NF discovery response.
scplocalityconfig.mapping_info.fqdn	string	Labels can be letter a-z, number 0-9, hyphen (-). Hyphen cannot be first character. Label combined with dot (.) forms domain.	NA	M	The fqdn to be used while updating fqdn in NF discovery response.
scplocalityconfig.mapping_info.port	integer	0 to 65535	NA	M	The port to be used while updating port in NF discovery response.



**Table 3-1 (Cont.) Global Parameters**

<b>Attribute Name</b>	<b>Data Type</b>	<b>Range</b>	<b>Default Value</b>	<b>M/O/C</b>	<b>Description</b>
PROBING_LISTENER_PORT	integer	Min- 0, Max-65535	8002	M	This port will be used by scp-worker listening for probing.
SIGNALING_LISTENER_PORT	integer	Min- 0, Max-65535	8080	M	This port will be used by scp-worker listening for signaling.

Table 3-1 (Cont.) Global Parameters

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpServiceAccount	string	NA	NA	O	<p>Service account that SCP pods will use. User may provide SCP service account but if it is left empty (or removed), a default Service Account is created by SCP for its use. Default is empty.</p> <p>The following is the default Clusterrole used by SCP when <code>clusterRoleBindingEnabled</code> flag is true:</p> <p>ClusterRole Rules rules:</p> <ul style="list-style-type: none"> <li>- apiGroups: ["config.ocscp.oracle.io"] resources: ["*"] verbs: ["*"]</li> <li>- apiGroups: ["rbac.ocscp.oracle.io"] resources: ["*"] verbs: ["*"]</li> <li>- apiGroups: ["networking.ocscp.oracle.io"] resources: ["*"] verbs: ["*"]</li> <li>- apiGroups: ["authentication.ocscp.oracle.io"] resources: ["*"] verbs: ["*"]</li> <li>- apiGroups: ["apiextensions.k8s.io"] resources: ["customresourcedefinitions"] verbs: ["*"]</li> <li>- apiGroups: ["extensions"] resources: ["thirdpartyresources", "thirdpartyresources.e</li> </ul>

Table 3-1 (Cont.) Global Parameters

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
					<pre> xtensions", "ingresses", "ingresses/status"] verbs: ["*"] - apiGroups: [""] resources: ["configmaps"] verbs: ["create", "get", "list", "watch", "update"] - apiGroups: [""] resources: ["endpoints", "pods", "services", "namespaces", "nodes", "secrets"] verbs: ["get", "list", "watch"] The following is the default Role used by SCP when clusterRoleBindin gEnabled flag is set to false: rules: - apiGroups: - networking.ocscp.orac le.io resources: - virtualservices - serviceentries - gateways - envoyfilters - destinationrules - sidecars verbs: ["*"] - apiGroups: ["config.ocscp.oracle.i o"] resources: ["*"] verbs: ["*"] - apiGroups: ["rbac.ocscp.oracle.io" ] resources: ["*"] verbs: ["*"] </pre>

Table 3-1 (Cont.) Global Parameters

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
					<ul style="list-style-type: none"> <li>- apiGroups: ["authentication.ocscp.oracle.io"]</li> <li>resources: ["*"]</li> <li>verbs: ["*"]</li> <li>- apiGroups: [""]</li> <li>resources: <ul style="list-style-type: none"> <li>- pods</li> <li>- services</li> </ul> </li> <li>verbs: ["*"]</li> <li>- apiGroups: <ul style="list-style-type: none"> <li>- "" # "" indicates the core API group</li> </ul> </li> <li>resources: <ul style="list-style-type: none"> <li>- secrets</li> <li>- endpoints</li> </ul> </li> <li>verbs: <ul style="list-style-type: none"> <li>- get</li> <li>- watch</li> <li>- list</li> </ul> </li> </ul>

Table 3-1 (Cont.) Global Parameters

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
clusterRoleBindingEnabled	Boolean	true/false	true	M	<p>When clusterRoleBindingEnabled flag is set to true, the pilot creates custom resources definition (CRD) and thus user must delete CRDs manually, as earlier, after deletion of scp deployment. In case a user provides custom serviceAccount, the application has sufficient role to create CRDs in that cluster.</p> <p>When clusterRoleBindingEnabled flag is set to false, CRDs are created during SCP helm deployment and deleted after deletion of SCP deployment.</p> <p>When clusterRoleBindingEnabled flag is set to false, scp discovery services are restricted to its namespaces only.</p>
nrfProfiles.nfType	string	Valid 5g NF Type as per 3GPP TS 29.510.	[] <i>i.e. Blank, which means subscribe for all supported NF Types.</i>	M	Description is nfType of NRF

Table 3-1 (Cont.) Global Parameters

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
nrfProfiles.servingScope	string	Region that NRF can support	USEast	O	Blank value is treated as "default" region with the condition that scplInfo also configured with Blank. Partial configuration is invalid and will not be accepted. SCP auto detect its own region based on the servingLocalities. If serving localities belong to different regions then NRF will treat it as a error and will not creating reverseProxy. This field is applicable only for NRF and if provided used in grouping NFs with same ServingScope.
nrfProfiles.capacity	integer	0 to 65535	10000	O	Mention the capacity of the service.
nrfProfiles.locality	string	As per 3GPP TS 29.510 spec	N/A	M	Locality of the current NRF Instance (e.g. geographic location, data center). Same locality must be present in ServingLocalities also.
nrfProfiles.nfInstanceId	string	String uniquely identifying a NF instance. The format of the NF Instance ID shall be a Universally Unique Identifier (UUID) version 4, as described in IETF RFC 4122 [15].	N/A	M	String uniquely identifying current NRF instance. The format of the Instance ID shall be a Universally Unique Identifier (UUID) version 4, as described in IETF RFC 4122.
nrfProfiles.priority	integer	0 to 65535	0	O	Mention the priority of the service.
nrfProfiles.nfServices.serviceName	string	NA	nmediation-http	O	Supported values for serviceName: <ul style="list-style-type: none"> <li>nmediation-http (Mediation service)</li> <li>ocscp-sds (Subscriber Data Service)</li> </ul>

Table 3-1 (Cont.) Global Parameters

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
nrfProfiles.nfServices.fqdn	string	fqdn: Labels can be letter a-z, number 0-9, hyphen(-). Hyphen cannot be first character. Label combined with dot(.) forms domain.	NA	O	FQDN of SCP domain.
nrfProfiles.nfServices.port	integer	port: 0 to 65535 apiPrefix: Can be combination of letters from a-z and A-Z	80	O	Port number of the NF service.
nrfProfiles.nfServices.scheme	string	NA	http	O	HTTP scheme.
nrfProfiles.nfServices.priority	integer	0 to 65535	0	O	Mention the priority of the service.
nrfProfiles.nfServices.capacity	integer	0 to 65535	100	O	Mention the capacity of the service.
nrfProfiles.nfServices.load	integer	0 to 100	0	O	Mention the load of the service.
nrfProfiles.nfServices.nfServiceStatus	string	REGISTERED or SUSPENDED (TS 29.510)	REGISTERED	O	Mention the status of the service specific to the NF.
nrfProfiles.nfServices.ipEndpoints.ipv4Address	ipv4Address	NA	NA	O	It is the IP address of the NF.
nrfProfiles.nfServices.ipEndpoints.port	integer	NA	80	O	Port of the NF
nrfProfiles.nfServices.apiPrefix	integer	Can be combination of letters from a-z and A-Z	NA	O	API Prefix

Table 3-1 (Cont.) Global Parameters

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
nrfProfiles.nfServices.apiFullVersion	string	NA	NA	O	API version
nrfProfiles.nfServices.apiVersionInUri	string	NA	NA	O	API version in URI
nrfProfiles.nfServices.serviceInstanceId	string	String uniquely identifying a NF service instance. The format of the NF Service Instance ID is Universally Unique Identifier (UUID) version 4, as described in IETF RFC 4122 [15].	f86b54b7-aef9-4c78-b346-3bf7f380812	O	Instance ID of the SCP service. <b>Note:</b> <ul style="list-style-type: none"> <li>• nfServices are completely optional, one or all services can be removed, for removing all services, user also need to remove nfServices key as well.</li> <li>• nfServices block from values.yaml can be removed, if user need to configure any of this services, user need to provide this configuration while deploying it through helm using custom ocscp_values.yaml file.</li> </ul>
scpSoothsayerConfig.systemOptions.trafficPolicy.connectionPool.tcp.tcpKeepalive.probes	integer	Maximum number of keepalive probes to send without response before deciding the connection is dead.	9	O	NA



**Table 3-1 (Cont.) Global Parameters**

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpSoothsayerConfig.systemOptions.trafficPolicy.connectionPool.tcp.tcpKeepalive.time	integer	The time duration that a connection must be idle before keep-alive probes start being sent.	180s	O	NA
scpSoothsayerConfig.systemOptions.trafficPolicy.connectionPool.tcp.tcpKeepalive.interval	integer	The time duration between keep-alive probes.	60s	O	NA
scpSoothsayerConfig.systemOptions.trafficPolicy.connectionPool.tcp.connectTimeout	integer	NA	250ms	O	TCP keep alive settings for upstream connections.

Table 3-1 (Cont.) Global Parameters

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpSoothsayerConfig.systemOptions.trafficPolicy.connectionPool.http.idleTimeout	integer	NA	3600s	O	<p>HTTP Idle timeout for upstream connections. TCP keep alive settings for upstream connections. All 3 (probe, time and interval) are required if tcpkeepalive is enabled. Following the scenarios while using these parameters:</p> <ol style="list-style-type: none"> <li>1. Only HTTP IdleTimeout is configured. idleTimeout must be set to a value less than kube-proxy timeout value so that before kube-proxy silently discards connection, connection gets terminated gracefully by HTTP.</li> <li>2. Only TCP keepalive is configured. TCP keepalive must be set to a value less than kube-proxy timeout value so that before kube-proxy silently discards connection, connection gets terminated by TCP RESET if no ACK is received within the defined interval.</li> <li>3. Both TCP keepalive and HTTP idleTimeout are configured. In this case idleTimeout can be more than kube-proxy</li> </ol>

Table 3-1 (Cont.) Global Parameters

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
					timeout but TCP keepalive must be less than kube-proxy timeout. TCP keepalive keeps refreshing the connection at kube-proxy and if no HTTP request is received within the idleTimeout period, connection will get gracefully terminated by HTTP.
scpSoothsayerConfig.reverseProxyEnabled	boolean	true/false	true	M	If enabled then for all the NFs which support reverseProxy, Reverse proxy (reverseProxySupport = true) will get enabled by default. In case user wants to turn it off after deployment, then use the APIs provided to reconfigure reverseProxySupport option.
scpSoothsayerConfig.nrfServiceForAudit	string	nnrf-nfm/nnrf-disc	nnrf-nfm	O	Configure NRF service type Service to get profiles from NRF. Possible values are: <ul style="list-style-type: none"> <li>• nnrf-nfm</li> <li>• nnrf-disc</li> </ul> User needs to configure one of the above which will be used by Audit to query to NRF for fetching the profiles.

#### SCP Soothsayer Configuration Parameter

This configuration is specific to soothsayer configuration microservice.

Table 3-2 scpc-configuration

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-configuration .imageDetails .image	string	image: Name components may contain lowercase letters, digits and separators. A separator is defined as a period, one or two underscores , or one or more dashes. A name component may not start or end with a separator	scpc-configuration	M	Image Tag to be used for Configuration container
scpc-configuration .imageDetails .tag	string	Tag: valid ASCII that may contain lowercase and uppercase letters, digits, underscores , periods and dashes. A tag name may not start with a period or a dash and may contain a maximum of 128 characters	NA	M	Tag name of SCP Configuration image
scpc-configuration .imageDetails .pullPolicy	string	Always, IfNotPresent , Never	Always	M	This setting indicates if image need to be pulled or not
scpc-configuration .resources.requests.memory	integer	NA	4Gi	M	Requested memory (RAM) for configuration micro-service in Giga Bytes.

Table 3-2 (Cont.) scpc-configuration

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-configuration.resources.requests.cpu	integer	NA	3	M	Max allocated vCPU for configuration micro-service
scpc-configuration.resources.limits.memory	integer	NA	4Gi	M	Max limit of memory for configuration micro-service.
scpc-configuration.resources.limits.cpu	integer	NA	3	M	Max limit of cpu for configuration micro-service.
scpc-configuration.log.level	string	{TRACE, DEBUG, INFO, WARN, ERROR}	INFO	O	Enable desired level of logging for the service.
scpc-configuration.defaultTopologySource	string	{NRF,LOCAL}	NRF	O	Used to set Topology Source globally (For all NFs).
scpc-configuration.initializationFailTimeout	integer	NA	160000	O	initializationFailTimeout in ms - Maximum lifetime in milliseconds of a connection in the pool after it is closed.
scpc-configuration.idleTimeout	integer	NA	10000	O	idleTimeout in ms - Maximum idle time for connection
scpc-configuration.minimumIdle	integer	NA	1	O	Minimum number of idle connections maintained by HikariCP in a connection pool
scpc-configuration.connectionTimeout	integer	NA	20000	O	connectionTimeout in ms - Maximum number of milliseconds that a client will wait for a connection
scpc-configuration.maxPoolSize	integer	NA	10	O	Maximum pool size Hikari CP can create
scpc-configuration.maxLifetime	integer	NA	240	O	Maximum lifetime in ms of a connection in the pool after it is closed.
scpc-configuration.service.type	string	ClusterIP, LoadBalancer, NodePort	LoadBalancer	O	When this value is enabled, it overrides the default derivation of Service Type.

Table 3-2 (Cont.) scpc-configuration

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-configuration.service.publicConfigIPSpecified	boolean	true/false	false	O	Option to enable/disable Loadbalancer IP configuration statically for OAM interface.
scpc-configuration.service.publicConfigIP	<IPv4 Address>	Valid IPV4 address as per RFC 791	NA	C	Option to configure static Loadbalancer IP. Configured value will be used only if oamloadbalanceripenabled is configured as "true"
scpc-configuration.service.staticnodeportenabled	boolean	true/false	false	O	Option to enable/disable configuring static Node Port for OAM interface.
scpc-configuration.service.nodeport	integer	30000 to 32767	31612	C	Option to configure static Node Port for OAM interface. Configured value will be used only if staticnodeportenabled is configured as "true"
scpc-configuration.service.configServiceNetworkNameEnabled	boolean	true/false	false	O	Option to enable/disable metalLB IP allocation dynamically from the pool for OAM interface.
scpc-configuration.service.configServiceNetworkName	string	NA	metallb.universe.tf/address-pool: oam	C	metalLB network name
scpc-configuration.service.customExtension.labels	<string_label_1_key>: <string_label_1_value>  <string_label_2_key>: <string_label_2_value>	K8s label object syntax	customExtension: labels: {}  annotations: {}	O	Optional field to configure service specific labels applicable to "Service" Resource Type

Table 3-2 (Cont.) scpc-configuration

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-configuration.service.customExtension.annotations	<pre>&lt;string_annotation_1_key&gt;: &lt;string_annotation_1_value&gt;  &lt;string_annotation_2_key&gt;: &lt;string_annotation_2_value&gt;</pre>	K8s annotations object syntax	<pre>customExtension:   labels:   {}  annotations: {}</pre>	O	Optional field to configure service specific annotations applicable to "Service" Resource Type
scpc-configuration.deployment.customExtension.labels	<pre>&lt;string_label_1_key&gt;: &lt;string_label_1_value&gt;  &lt;string_label_2_key&gt;: &lt;string_label_2_value&gt;</pre>	K8s label object syntax	<pre>customExtension:   labels:   {}  annotations: {}</pre>	O	Optional field to configure service specific labels applicable to "Service" Resource Type

Table 3-2 (Cont.) scpc-configuration

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-configuration.deployment.customExtension.annotations	<pre>&lt;string_annotation_1_key&gt;: &lt;string_annotation_1_value&gt;  &lt;string_annotation_2_key&gt;: &lt;string_annotation_2_value&gt;</pre>	K8s annotations object syntax	<pre>customExtension:   labels: {}  annotations: {}</pre>	O	Optional field to configure service specific annotations applicable to "Service" Resource Type
scpc-configuration.nodeSelector.nodeKey	string	nodeSelector: Use this configuration to apply nodeSelector to Configuration service pods nodeKey: Key of the node label	ocscp	O	Enable node selector for Configuration Service pods
scpc-configuration.nodeSelector.nodeValue	string	nodeValue: Value of the node label	scpc-configuration	O	Value of the node label

### SCP Soothsayer Subscription Parameter

This configuration is specific to soothsayer subscription microservice.



**Table 3-3** scpc-subscription

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-subscription. imageDetails. image	string	image: Name components may contain lowercase letters, digits and separators. A separator is defined as a period, one or two underscores , or one or more dashes. A name component may not start or end with a separator	soothsayer-subscription	M	NA
scpc-subscription. imageDetails. tag	string	Tag: valid ASCII that may contain lowercase and uppercase letters, digits, underscores , periods and dashes. A tag name may not start with a period or a dash and may contain a maximum of 128 characters.	1.8.0	M	Image Tag to be used for Configuration container.
scpc-subscription. imageDetails. pullPolicy	string	Always, IfNotPresent , Never	Always	M	NA
scpc-subscription. resources.req uests.memory	integer	NA	1Gi	M	Requested memory (RAM) for configuration micro-service in Giga Bytes.

Table 3-3 (Cont.) scpc-subscription

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-subscription.resources.requests.cpu	integer	NA	0.5	M	Max allocated vCPU for configuration micro-service
scpc-subscription.resources.limits.memory	integer	NA	1Gi	M	Max limit of memory for configuration micro-service.
scpc-subscription.resources.limits.cpu	integer	NA	0.5	M	Max limit of cpu for configuration micro-service.
scpc-subscription.guardTime	integer	Min: 5 Max: 180 (in seconds)	10	O	Configure guardTime in seconds. This is the advance time before validityTimerExpiry at which subscription is initiated.
scpc-subscription.subscriptionValidityPeriod	integer	Min: 1 Max: 168 (in hours)	168	O	Parameter used to set the period after which a subscription gets expired. NRF may or may not accept honor this. Defaulted to 7 days i.e. 168 hours
scpc-subscription.log.level	string	{TRACE, DEBUG, INFO, WARN, ERROR}	INFO	O	Enable desired level of logging for the service.
scpc-subscription.scpToRegisterWithNrfRegions	string	Valid Regions to be registered with or empty for no registration	[]	M	Set scpToRegisterWithNrfRegions with regions, to register the high priority NRFs in specified regions. Example - scpToRegisterWithNrfRegions: ["reg1,reg2"] Or can be set in below format. Example - scpToRegisterWithNrfRegions: - reg1 - reg2
scpc-subscription.initializationFailTimeout	integer	NA	160000	O	initializationFailTimeout in ms - Maximum lifetime in milliseconds of a connection in the pool after it is closed.
scpc-subscription.idleTimeout	integer	NA	10000	O	idleTimeout in ms - Maximum idle time for connection

Table 3-3 (Cont.) scpc-subscription

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-subscription.minimumIdle	integer	NA	1	O	Minimum number of idle connections maintained by HikariCP in a connection pool
scpc-subscription.connectionTimeout	integer	NA	20000	O	connectionTimeout in ms - Maximum number of milliseconds that a client will wait for a connection
scpc-subscription.maxPoolSize	integer	NA	10	O	Maximum pool size HikariCP can create
scpc-subscription.maxLifetime	integer	NA	240	O	Maximum lifetime in ms of a connection in the pool after it is closed.
scpc-subscription.service.type	string	ClusterIP, LoadBalancer, NodePort	ClusterIP	O	When this value is enabled, it overrides the default derivation of Service Type.
scpc-subscription.service.customExtension.labels	<pre>&lt;string_label_1_key&gt;: &lt;string_label_1_value&gt;  &lt;string_label_2_key&gt;: &lt;string_label_2_value&gt;</pre>	K8s label object syntax	<pre>customExtension:   labels:   {}  annotations: {}</pre>	O	Optional field to configure service specific labels applicable to "Service" Resource Type

Table 3-3 (Cont.) scpc-subscription

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-subscription.service.customExtension.annotations	<pre>&lt;string_annotation_1_key&gt;: &lt;string_annotation_1_value&gt;  &lt;string_annotation_2_key&gt;: &lt;string_annotation_2_value&gt;</pre>	K8s annotations object syntax	<pre>customExtension:   labels: {}  annotations: {}</pre>	O	Optional field to configure service specific annotations applicable to "Service" Resource Type
scpc-subscription.deployment.customExtension.labels	<pre>&lt;string_label_1_key&gt;: &lt;string_label_1_value&gt;  &lt;string_label_2_key&gt;: &lt;string_label_2_value&gt;</pre>	K8s label object syntax	<pre>customExtension:   labels: {}  annotations: {}</pre>	O	Optional field to configure service specific labels applicable to "Service" Resource Type

**Table 3-3 (Cont.) scpc-subscription**

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-subscription.deployment.customExtension.annotations	<pre>&lt;string_annotation_1_key&gt;: &lt;string_annotation_1_value&gt;  &lt;string_annotation_2_key&gt;: &lt;string_annotation_2_value&gt;</pre>	K8s annotations object syntax	<pre>customExtension:   labels: {}  annotations: {}</pre>	O	Optional field to configure service specific annotations applicable to "Service" Resource Type
scpc-subscription.nodeSelector.nodeKey	string	nodeSelector: Use this configuration to apply nodeSelector to Configuration service pods nodeKey: Key of the node label	ocscp	O	Enable node selector for Configuration Service pods
scpc-subscription.nodeSelector.nodeValue	string	nodeValue: Value of the node label	scpc-subscription	O	Value of the node label

**SCP Soothsayer Notification Parameter**

This configuration is specific to soothsayer notification microservice.

Table 3-4 scpc-notification

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-notification.imageDetails.image	string	image: Name components may contain lowercase letters, digits and separators. A separator is defined as a period, one or two underscores , or one or more dashes. A name component may not start or end with a separator	soothsayer-notification	M	Image name of SCP notification.
scpc-notification.imageDetails.tag	string	Tag: valid ASCII that may contain lowercase and uppercase letters, digits, underscores , periods and dashes. A tag name may not start with a period or a dash and may contain a maximum of 128 characters	1.8.0	M	Image Tag to be used for Configuration container
scpc-notification.imageDetails.pullPolicy	string	Always, IfNotPresent , Never	Always	M	
scpc-notification.resources.requests.memory	integer	NA	4Gi	M	Requested memory (RAM) for configuration micro-service in Giga Bytes.

**Table 3-4 (Cont.) scpc-notification**

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-notification.resources.requests.cpu	integer	NA	3	M	Max allocated vCPU for configuration micro-service
scpc-notification.resources.limits.memory	integer	NA	4Gi	M	Max limit of memory for configuration micro-service.
scpc-notification.resources.limits.cpu	integer	NA	3	M	Max limit of cpu for configuration micro-service.
scpc-notification.log.level	string	{TRACE, DEBUG, INFO, WARN, ERROR}	INFO	O	Enable desired level of logging for the service.
scpc-notification.defaultLocalityToScp	boolean	true/false	true	O	If set to true then registration notification for NF coming to SCP with no locality present will get considered in SCP's locality and that NF will get treated as within serving locality.
scpc-notification.initializationFailTimeout	integer	NA	160000	O	initializationFailTimeout in ms - Maximum lifetime in milliseconds of a connection in the pool after it is closed.
scpc-notification.idleTimeout	integer	NA	10000	O	idleTimeout in ms - Maximum idle time for connection
scpc-notification.minimumIdle	integer	NA	1	O	Minimum number of idle connections maintained by HikariCP in a connection pool
scpc-notification.connectionTimeout	integer	NA	20000	O	connectionTimeout in ms - Maximum number of milliseconds that a client will wait for a connection
scpc-notification.maxPoolSize	integer	NA	10	O	Maximum pool size Hikari CP can create
scpc-notification.maxLifetime	integer	NA	240	O	Maximum lifetime in ms of a connection in the pool after it is closed.

Table 3-4 (Cont.) scpc-notification

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-notification.mergeNFService.status	boolean	true/false	false	M	Option to enable/disable merge NF Services within a NF Profile.
scpc-notification.mergeNFService.supportedNFServices	List of strings. (example in description)	Valid 5g NF Services as per 3GPP TS 29.510. [i.e. Blank, which means consider all supported NF Services. If not provided, all supported NF Services will be considered	nudm-uecm, nudm-sdm	C	List of NF Service's for which merge nf services within a NF Profile will be triggered. Format Example: supportedNFServices: - nudm-uecm - nudm-sdm <b>Note:</b> This list will be considered only if above status flag is enabled.
scpc-notification.service.type	string	ClusterIP, LoadBalancer, NodePort	ClusterIP	O	When this value is enabled, it overrides the default derivation of Service Type.
scpc-notification.service.customExtension.labels	<string_label_1_key>: <string_label_1_value>  <string_label_2_key>: <string_label_2_value>	K8s label object syntax	customExtension: labels: {}  annotations: {}	O	Optional field to configure service specific labels applicable to "Service" Resource Type



Table 3-4 (Cont.) scpc-notification

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-notification.service.customExtension.annotations	<pre>&lt;string_annotation_1_key&gt;: &lt;string_annotation_1_value&gt;  &lt;string_annotation_2_key&gt;: &lt;string_annotation_2_value&gt;</pre>	K8s annotations object syntax	<pre>customExtension:   labels: {}  annotations: {}</pre>	O	Optional field to configure service specific annotations applicable to "Service" Resource Type
scpc-notification.deployment.customExtension.labels	<pre>&lt;string_label_1_key&gt;: &lt;string_label_1_value&gt;  &lt;string_label_2_key&gt;: &lt;string_label_2_value&gt;</pre>	K8s label object syntax	<pre>customExtension:   labels: {}  annotations: {}</pre>	O	Optional field to configure service specific labels applicable to "Service" Resource Type

Table 3-4 (Cont.) scpc-notification

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-notification.deployment.customExtension.annotations	<pre>&lt;string_annotation_1_key&gt;: &lt;string_annotation_1_value&gt;  &lt;string_annotation_2_key&gt;: &lt;string_annotation_2_value&gt;</pre>	K8s annotations object syntax	<pre>customExtension:   labels: {}  annotations: {}</pre>	O	Optional field to configure service specific annotations applicable to "Service" Resource Type
scpc-notification.nodeSelector.nodeKey	string	nodeSelector: Use this configuration to apply nodeSelector to Configuration service pods nodeKey: Key of the node label	ocscp	O	Enable node selector for Configuration Service pods
scpc-notification.nodeSelector.nodeValue	string	nodeValue: Value of the node label	scpc-notification	O	Value of the node label

**SCP Soothsayer Audit Parameter**

This configuration is specific to soothsayer audit microservice.

Table 3-5 scpc-audit

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-audit.imageDe tails.image	string	image: Name components may contain lowercase letters, digits and separators. A separator is defined as a period, one or two underscores , or one or more dashes. A name component may not start or end with a separator	soothsayer-audit	M	Image name of the SCP audit.
scpc-audit.imageDe tails.tag	string	Tag: valid ASCII that may contain lowercase and uppercase letters, digits, underscores , periods and dashes. A tag name may not start with a period or a dash and may contain a maximum of 128 characters	1.8.0	M	Image Tag to be used for Configuration container
scpc-audit.imageDe tails.pullPolicy	string	Always, IfNotPresent , Never	Always	M	
scpc-audit.resources.requests.memory	integer	NA	4Gi	M	Requested memory (RAM) for configuration micro-service in Giga Bytes.

Table 3-5 (Cont.) scpc-audit

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-audit.resources.requests.cpu	integer	NA	3	M	Max allocated vCPU for configuration micro-service
scpc-audit.resources.limits.memory	integer	NA	4Gi	M	Max limit of memory for configuration micro-service.
scpc-audit.resources.limits.cpu	integer	NA	3	M	Max limit of cpu for configuration micro-service.
scpc-audit.auditInterval	integer	Min: 1 Max: 2147483647	120	M	Time interval in seconds that user want to configure
scpc-audit.auditInitialRetryInterval	integer	Min: 1 Max: 2147483647	2	M	Retry interval in seconds for which audit keeps on retrying until successful response from NRF.
scpc-audit.log.level	string	{TRACE, DEBUG, INFO, WARN, ERROR}	INFO	O	Enable desired level of logging for the service.
scpc-audit.initializationFailTimeout	integer	NA	160000	O	initializationFailTimeout in ms - Maximum lifetime in milliseconds of a connection in the pool after it is closed.
scpc-audit.idleTimeout	integer	NA	10000	O	idleTimeout in ms - Maximum idle time for connection
scpc-audit.minimumIdle	integer	NA	1	O	Minimum number of idle connections maintained by HikariCP in a connection pool
scpc-audit.connectionTimeout	integer	NA	20000	O	connectionTimeout in ms - Maximum number of milliseconds that a client will wait for a connection
scpc-audit.maxPoolSize	integer	NA	10	O	Maximum pool size HikariCP can create
scpc-audit.maxLifetime	integer	NA	240	O	Maximum lifetime in ms of a connection in the pool after it is closed.
scpc-audit.service.type	string	ClusterIP, LoadBalancer, NodePort	ClusterIP	O	When this value is enabled, it overrides the default derivation of Service Type.

Table 3-5 (Cont.) scpc-audit

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-audit.service.customExtension.labels	<pre>&lt;string_label_1_key&gt;: &lt;string_label_1_value&gt;  &lt;string_label_2_key&gt;: &lt;string_label_2_value&gt;</pre>	K8s label object syntax	<pre>customExtension:   labels: {}  annotations: {}</pre>	O	Optional field to configure service specific labels applicable to "Service" Resource Type
scpc-audit.service.customExtensions.annotations	<pre>&lt;string_annotation_1_key&gt;: &lt;string_annotation_1_value&gt;  &lt;string_annotation_2_key&gt;: &lt;string_annotation_2_value&gt;</pre>	K8s annotations object syntax	<pre>customExtension:   labels: {}  annotations: {}</pre>	O	Optional field to configure service specific annotations applicable to "Service" Resource Type

Table 3-5 (Cont.) scpc-audit

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-audit.deployent.customExtension.labels	<pre>&lt;string_label_1_key&gt;: &lt;string_label_1_value&gt;  &lt;string_label_2_key&gt;: &lt;string_label_2_value&gt;</pre>	K8s label object syntax	<pre>customExtension:   labels: {}  annotations: {}</pre>	O	Optional field to configure service specific labels applicable to "Service" Resource Type
scpc-audit.deployent.customExtensions	<pre>&lt;string_annotation_1_key&gt;: &lt;string_annotation_1_value&gt;  &lt;string_annotation_2_key&gt;: &lt;string_annotation_2_value&gt;</pre>	K8s annotations object syntax	<pre>customExtension:   labels: {}  annotations: {}</pre>	O	Optional field to configure service specific annotations applicable to "Service" Resource Type
scpc-audit.nodeSelector.nodeKey	string	nodeSelector: Use this configuration to apply nodeSelector to Configuration service pods nodeKey: Key of the node label	ocscp	O	Enable node selector for Configuration Service pods

**Table 3-5 (Cont.) scpc-audit**

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-audit.nodeSelector.nodeValue	string	nodeValue: Value of the node label	scpc-audit	O	Value of the node label

**SCP Worker Parameter**

This configuration is specific to SCP worker.

**Table 3-6 scp-worker**

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scp-worker.imageDetails.image	string	image: Name components may contain lowercase letters, digits and separators. A separator is defined as a period, one or two underscores, or one or more dashes. A name component may not start or end with a separator	scp-worker	M	Image name of SCP worker.

Table 3-6 (Cont.) scp-worker

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scp-worker.imageDetails.tag	string	Tag: valid ASCII that may contain lowercase and uppercase letters, digits, underscores, periods and dashes. A tag name may not start with a period or a dash and may contain a maximum of 128 characters	1.8.0	M	Image Tag to be used for scp worker container.
scp-worker.imageDetails.pullPolicy	string	Always, IfNotPresent, Never	Always	M	
scp-worker.resources.requests.memory	integer	NA	8Gi	M	Requested memory (RAM) for configuration micro-service in Giga Bytes.
scp-worker.resources.requests.cpu	integer	NA	4	M	Max allocated vCPU for configuration micro-service
scp-worker.resources.limits.memory	integer	NA	8Gi	M	Max limit of memory for configuration micro-service.
scp-worker.resources.limits.cpu	integer	NA	4Gi	M	Max limit of cpu for configuration micro-service.



Table 3-6 (Cont.) scp-worker

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scp-worker.jaeger.address	fqdn	Labels can be letter a-z, number 0-9, hyphen(-). Hyphen cannot be first character. Label combined with dot(.) forms domain	N/A	M	Option to Configure Jaeger Collector FQDN
scp-worker.jaeger.port_value	integer	Min: 0 Max: 65535	N/A	M	Option to Configure Jaeger Collector Port
scp-worker.tracingenable	boolean	true/false	true	O	Option to enable/disable Jaeger tracing.
scp-worker.admin.enablejaegerbody	boolean	true/false	false	O	Option to enable/disable tracing for full body of all Request/Response messages. The configuration will be added only if tracingenable is configured as "true".
scp-worker.admin.retrytimeoutvalue	integer	min: 1 max: 3600	5	O	Option to configure time to wait (in seconds) before making new requests to the a upstream cluster after receiving 503 or 429 response code.  This value will only be used if 'retry-after' header is not present in response.
scp-worker.log.level	string	trace/debug/info/warning	warning	O	Enable desired level of logging for the service.

Table 3-6 (Cont.) scp-worker

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scp-worker.log.format	string	NA	'{"messageTimestamp": "%Y-%m-%dT.%e%z", "threadid": "%t", "severity": "%l", "logger_name": "%n", "messagebody": "%v", "procid": "%P"}'	O	Option to specify log format for worker
scp-worker.service.type	string	ClusterIP, LoadBalancer, NodePort	ClusterIP	O	When this value is enabled, it overrides the default derivation of Service Type.
scp-worker.service.customExtension.labels	<string_label_1_key> <string_label_1_value>  <string_label_2_key> <string_label_2_value>	K8s label object syntax	customExtension: labels: {}  annotations: {}	O	Optional field to configure service specific labels applicable to "Service" Resource Type

Table 3-6 (Cont.) scp-worker

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scp-worker.service.customExtension.annotations	<pre>&lt;string_annotation_1_key&gt;: &lt;string_annotation_1_value&gt;  &lt;string_annotation_2_key&gt;: &lt;string_annotation_2_value&gt;</pre>	K8s annotations object syntax	<pre>customExtension:   labels: {}  annotations: {}</pre>	O	Optional field to configure service specific annotations applicable to "Service" Resource Type
scp-worker.deployment.customExtensions.labels	<pre>&lt;string_label_1_key&gt;: &lt;string_label_1_value&gt;  &lt;string_label_2_key&gt;: &lt;string_label_2_value&gt;</pre>	K8s label object syntax	<pre>customExtension:   labels: {}  annotations: {}</pre>	O	Optional field to configure service specific labels applicable to "Service" Resource Type

Table 3-6 (Cont.) scp-worker

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scp-worker.deploy ment.customEx tension.annot ations	<string_anno tation_1_key >: <string_anno tation_1_val ue>  <string_anno tation_2_key >: <string_anno tation_2_val ue>	K8s annotations object syntax	customExte nsion: labels: {}  annotation s: {}	O	Optional field to configure service specific annotations applicable to "Service" Resource Type <b>Note:</b> Following is the mandatory annotations if deploying SCP in Aspen Service Mesh:  sidecar.istio.io/ inject: "true"  If integrating with OSO 1.6 monitoring services in Aspen SM, use following annotations: traffic.sidecar.istio .io/ excludeInboundPorts: "8001"
scp- worker.nodeSe lector.nodeKe y	string	nodeSelecto r: Use this configuration to apply nodeSelecto r to Configuratio n service pods nodeKey: Key of the node label	ocscp	O	Enable node selector for Configuration Service pods
scp- worker.nodeSe lector.nodeVa lue	string	nodeValue: Value of the node label	scp-worker	O	Value of the node label
scp- worker.ignore SdsDbError	boolean	true/false	false	O	Flag to decide to ignore DB errors reported from SDS App. If set to true any DB error reported by SDS app will be ignored.
scp- worker.promet heus	boolean	true/false	true	O	Option to enable/disable Prometheus metrics scraping.
scp- worker.minrep licas	integer	NA	2	M	Minimum replica count of scp-worker micro-service.

Table 3-6 (Cont.) scp-worker

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scp-worker.maxreplicas	integer	Min: 2 Max: 32	32	M	Maximum replica count of scp-worker micro-service.
scp-worker.refresh_interval.seconds	integer	NA	N/A	O	Refresh Interval (250 milliseconds) to check memory Overload condition
scp-worker.refresh_interval.nanos	integer	NA	N/A	O	
scp-worker.resource_monitors.max_heap_size_bytes	integer	NA	N/A	O	Maximum configured heap size for scp-worker micro-service (4GB)
scp-worker.actions.stop_accepting_requests	%age in decimal value	Min: 0 Max: 1	0.70	O	Option to configure threshold percentage at which SCP will stop accepting new requests.
scp-worker.actions.stop_accepting_connections	%age in decimal value	Min: 0 Max: 1	0.75	O	Option to configure threshold percentage at which SCP will stop accepting new connections. This percentage should be always greater than the percentage configured for stop_accepting_requests
scp-worker.actions.shrink_heap	%age in decimal value	Min: 0 Max: 1	0.70	O	Option to configure threshold percentage at which SCP will start freeing unused memory blocks. This percentage should be always minimum of threshold configured for stop_accepting_requests and stop_accepting_connections

Table 3-6 (Cont.) scp-worker

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scp-worker.downstream.idleTimeout	integer	NA	3600 (in seconds)	O	The idle timeout is defined as the period in which there are no active requests. When the idle timeout is reached the connection is closed. Refer to the scenarios/recommendations mentioned in <code>systemOptions</code> under <b>scpc-soothsayer</b> for more details. <b>Note:</b> The request based timeouts mean that HTTP/2 PINGs will not keep the connection alive.
scp-worker.downstream.tcpKeepalive.probes	integer	NA	9 # linux default	<i>tcpKeepalive-O</i> <i>tcpKeepalive.probes-M</i> . if <i>tcpKeepalive</i> is set.	Set <i>tcpKeepalive</i> attribute to enable TCP Keepalives. <i>tcpKeepalive.probes-M</i> Maximum number of keepalive probes to send without response before deciding the connection is dead
scp-worker.downstream.tcpKeepalive.time	integer	NA	180 (in seconds)	<i>M</i> . if <i>tcpKeepalive</i> is set.	The time duration that a connection must be idle before keep-alive probes start being sent.
scp-worker.downstream.tcpKeepalive.interval	integer	NA	60 (in seconds)	<i>M</i> . if <i>tcpKeepalive</i> is set.	The time duration between keep-alive probes.

**SCP Pilot Parameter**

This configuration is specific to SCP pilot.

Table 3-7 scpc-pilot

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-pilot.imageDe tail.image	string	image: Name components may contain lowercase letters, digits and separators. A separator is defined as a period, one or two underscores , or one or more dashes. A name component may not start or end with a separator	N/A	M	docker repository that contains scpc-pilot micro service image
scpc-pilot.imageDe tail.tag	string	Tag: valid ASCII that may contain lowercase and uppercase letters, digits, underscores , periods and dashes. A tag name may not start with a period or a dash and may contain a maximum of 128 characters	N/A	M	Image Tag to be used for scpc-pilot micro service
scpc-pilot.imageDe tails.pullPolicy	string	Always, IfNotPresent , Never	Always	M	
scpc-pilot.enableTracing	boolean	true/false	True	O	Option to enable/disable tracing request.
scpc-pilot.minreplicas	integer	NA	1	M	Minimum replica count of scp-pilot micro-service.

Table 3-7 (Cont.) scpc-pilot

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-pilot.maxreplicas	integer	Min: 1 Max: 4	4	M	Maximum replica count of scpc-pilot micro-service.
scpc-pilot.nodeSelector.nodeKey	string	NA	N/A	O	Use this configuration to apply nodeSelector to Configuration service pods nodeKey: Key of the node label
scpc-pilot.nodeSelector.nodeValue	string	NA	NA	O	Value of the node label
scpc-pilot.resources.requests.memory	integer	NA	6Gi	M	Requested memory (RAM) for configuration micro-service in Giga Bytes.
scpc-pilot.resources.requests.cpu	integer	NA	4	M	Max allocated vCPU for configuration micro-service
scpc-pilot.resources.limits.memory	integer	NA	6Gi	M	Max limit of memory for configuration micro-service.
scpc-pilot.resources.limits.cpu	integer	NA	4	M	Max limit of cpu for configuration micro-service.
scpc-pilot.log.logOutputLevel	"<Module:level> ,<Module:level> ,.... "	Supported Modules: ads, default, mcp, model, rbac Supported Level: debug, info, warn, error, fatal, none	"default:info"	O	Option to increase/decrease scpc-pilot log level.



Table 3-7 (Cont.) scpc-pilot

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-pilot.log.logStacktraceLevel	"<Module:level>, <Module:level>, . . . ."	Supported Modules: ads, default, mcp, model, rbac Supported Level: debug, info, warn, error, fatal, none	"default:none"	O	Option to increase/decrease scpc-pilot Stack Trace level.
scpc-pilot.traceSampling	integer	0.0 to 100.0 with a precision of 0.01	1	O	Option to set the sampling rate for Jaeger traces (e.g 1 means 1% of traffic passing through scp-w will get traced.) If traceSampling is omitted, it will be taken as 1.
scpc-pilot.service.customExtension.labels	<string_label_1_key>: <string_label_1_value>  <string_label_2_key>: <string_label_2_value>	K8s label object syntax	customExtension: labels: {}  annotations: {}	O	Optional field to configure service specific labels applicable to "Service" Resource Type

Table 3-7 (Cont.) scpc-pilot

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-pilot.service.customExtension.annotations	<pre>&lt;string_annotation_1_key&gt;: &lt;string_annotation_1_value&gt;  &lt;string_annotation_2_key&gt;: &lt;string_annotation_2_value&gt;</pre>	K8s annotations object syntax	<pre>customExtension:   labels: {}  annotations: {}</pre>	O	Optional field to configure service specific annotations applicable to "Service" Resource Type
scpc-pilot.deployment.customExtension.labels	<pre>&lt;string_label_1_key&gt;: &lt;string_label_1_value&gt;  &lt;string_label_2_key&gt;: &lt;string_label_2_value&gt;</pre>	K8s label object syntax	<pre>customExtension:   labels: {}  annotations: {}</pre>	O	Optional field to configure service specific labels applicable to "Service" Resource Type

Table 3-7 (Cont.) scpc-pilot

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scpc-pilot.deployments.customExtension.annotations	<pre>&lt;string_annotation_1_key&gt;: &lt;string_annotation_1_value&gt;  &lt;string_annotation_2_key&gt;: &lt;string_annotation_2_value&gt;</pre>	K8s annotations object syntax	<pre>customExtension:   labels: {}  annotations: {}</pre>	O	Optional field to configure service specific annotations applicable to "Service" Resource Type

**SDS Database Parameter**

This configuration is specific to SCP SDS database.

Table 3-8 scp-pilot

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scp-sds.imageDetail.image	string	image: Name components may contain lowercase letters, digits and separators. A separator is defined as a period, one or two underscores , or one or more dashes. A name component may not start or end with a separator	N/A	M	docker repository that contains scp-sds micro service image
scp-sds.imageDetail.tag	string	Tag: valid ASCII that may contain lowercase and uppercase letters, digits, underscores , periods and dashes. A tag name may not start with a period or a dash and may contain a maximum of 128 characters	N/A	M	Image Tag to be used for scp-sds micro service
scp-sds.imageDetails.pullPolicy	string	Always, IfNotPresent , Never	Always	M	
scp-sds.initializationFailTimeout	integer	NA	160000	O	initializationFailTimeout in ms - Maximum lifetime in milliseconds of a connection in the pool after it is closed.

Table 3-8 (Cont.) scp-pilot

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scp-sds.idleTimeout	integer	NA	10000	O	idleTimeout in ms - Maximum idle time for connection
scp-sds.minimumIdle	integer	NA	1	O	Minimum number of idle connections maintained by HikariCP in a connection pool
scp-sds.connectionTimeout	integer	NA	20000	O	connectionTimeout in ms - Maximum number of milliseconds that a client will wait for a connection
scp-sds.maxPoolSize	integer	NA	10	O	Maximum pool size HikariCP can create
scp-sds.maxLifetime	integer	NA	240	O	Maximum lifetime in ms of a connection in the pool after it is closed.
scp-sds.minreplicas	integer	NA	2	M	Minimum replica count of scp-sds micro-service.
scp-sds.maxreplicas	integer	Min: 2 Max: 32	32	M	Maximum replica count of scp-sds micro-service.
scp-sds.nodeSelector.nodeKey	string	NA	N/A	O	Use this configuration to apply nodeSelector to Configuration service pods nodeKey: Key of the node label
scp-sds.nodeSelector.nodeValue	string	NA	NA	O	Value of the node label
scp-sds.resources.requests.memory	integer	NA	2Gi	M	Requested memory (RAM) for configuration micro-service in Giga Bytes.
scp-sds.resources.requests.cpu	integer	NA	4	M	Max allocated vCPU for configuration micro-service
scp-sds.resources.limits.memory	integer	NA	2Gi	M	Max limit of memory for configuration micro-service.
scp-sds.resources.limits.cpu	integer	NA	4	M	Max limit of cpu for configuration micro-service.
scp-sds.log.level	string	TRACE/ DEBUG/ INFO/WARN	INFO	O	Option to increase/decrease scp-sds log level.

Table 3-8 (Cont.) scp-pilot

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scp-sds.service.customExtension.labels	<pre>&lt;string_label_1_key&gt;: &lt;string_label_1_value&gt;  &lt;string_label_2_key&gt;: &lt;string_label_2_value&gt;</pre>	K8s label object syntax	<pre>customExtension:   labels: {}  annotations: {}</pre>	O	Optional field to configure service specific labels applicable to "Service" Resource Type
scp-sds.service.customExtension.annotations	<pre>&lt;string_annotation_1_key&gt;: &lt;string_annotation_1_value&gt;  &lt;string_annotation_2_key&gt;: &lt;string_annotation_2_value&gt;</pre>	K8s annotations object syntax	<pre>customExtension:   labels: {}  annotations: {}</pre>	O	Optional field to configure service specific annotations applicable to "Service" Resource Type

Table 3-8 (Cont.) scp-pilot

Attribute Name	Data Type	Range	Default Value	M/O/C	Description
scp-sds.deployments.customExtension.labels	<pre>&lt;string_label_1_key&gt;: &lt;string_label_1_value&gt;  &lt;string_label_2_key&gt;: &lt;string_label_2_value&gt;</pre>	K8s label object syntax	<pre>customExtension:   labels:     {}  annotations: {}</pre>	O	Optional field to configure service specific labels applicable to "Service" Resource Type
scp-sds.deployments.customExtension.annotations	<pre>&lt;string_annotation_1_key&gt;: &lt;string_annotation_1_value&gt;  &lt;string_annotation_2_key&gt;: &lt;string_annotation_2_value&gt;</pre>	K8s annotations object syntax	<pre>customExtension:   labels:     {}  annotations: {}</pre>	O	Optional field to configure service specific annotations applicable to "Service" Resource Type

 **Note:**

By default, the sampling rate of jaeger tracing is 1%. If the user wants to increase it then use the below tag at same level as 'resources' under 'scpc-pilot' section. traceSampling: <% user wants sampling rate to be> Example: traceSampling: 10

## Logging level

The description of each logging level is as mentioned below:

**Table 3-9 Logging level**

Logging Level	Description
ALL	All levels including custom levels.
DEBUG	Designates fine-grained informational events that are most useful to debug an application.
INFO	Designates informational messages that highlight the progress of the application at coarse-grained level.
WARN	Designates potentially harmful situations.
ERROR	Designates error events that might still allow the application to continue running.
FATAL	Designates very severe error events that will presumably lead the application to abort.
OFF	The highest possible rank and is intended to turn off logging.
TRACE	Designates finer-grained informational events than the DEBUG.



# 4

## Customizing SCP with Ingress Gateway

This section describes the parameters that are configured while installing SCP with Ingress Gateway.

 **Note:**

configmap name, addRequestHeader, and loadbalancer IPs need to be changed if more than one ingress gateways are being deployed for SCP.

**Table 4-1 SCP with Ingress Gateway**

Attribute Name	Description	Mandatory	Default Value	Notes
global.dockerRegistry	Update local registry details	No	<local docker registry >/ocscp	
global.metallbIpAllocationEnabled	Enable or disable IP Address allocation from Metallb Pool	No	true	
global.staticIpAddressEnabled	If Static load balancer IP needs to be set, then set staticIpAddressEnabled flag to true and provide value for staticIpAddress Else random IP will be assigned by the metalLB from its IP Pool	No	false	
global.staticIpAddress	StaticIp		10.75.2 12.60	Static IP to be requested from metalLb
routesConfig[0].id	id of the route	Yes		
routesConfig[0].uri	Service name of the internal microservice of this NF	Yes		It should be same as SCP fqdn and signaling port defined in SCP deployment file.
routesConfig[0].path	Provide the path to be matched.	Yes		
routesConfig[0].order	Provide the order of the execution of this route.	Yes		

Table 4-1 (Cont.) SCP with Ingress Gateway

Attribute Name	Description	Mandatory	Default Value	Notes
<code>routesConfig[0].filters.addRequestHeader[0].name</code>	This field is used for adding a request header at route level.	No	x-scp-igw-Authority	The value of "name" attribute denotes the name of the request header which must be added at route level. Header to pass ingress gateway authority to SCP. <b>Note:</b> Do not change the Default value.
<code>routesConfig[0].filters.addRequestHeader[0].value</code>	Ingress Gateway Static loadbalancer IP requested above with ingress gateway signaling port.	No		Ingress gateway Static loadbalancer IP requested above with ingress gateway signaling port.
<code>minAvailable</code>	Number of Pods must always be available, even during a disruption	Yes	2	Set minimum number of replicas available at a time.
<code>minReplicas</code>	Min replicas to scale to maintain an average CPU utilization	Yes	2	Set to min replicas required.
<code>maxReplicas</code>	Max replicas to scale to maintain an average CPU utilization	Yes	5	Set to max replicas required.
<code>nodeselector.nodekey</code>	node selector key specific to chart (note this will be looked first and then if not present global node key will be picked)			Comment node selector section if not required.
<code>nodeselector.nodevalue</code>	node selector value specific to chart (note this will be looked first and then if not present global node value will be picked)			
<code>ingressServer.keepAlive.enabled</code>	Enable or disable keep alive feature.	No	false	
<code>ingressServer.keepAlive.idleTime</code>	Idle time before keepalive messages are sent to the remote peer.	No	180s	
<code>ingressServer.keepAlive.count</code>	Number of messages sent before terminating the connection.	No	9	
<code>ingressServer.keepAlive.interval</code>	The time duration between keep-alive probes.	No	60s	

# 5

## Uninstalling SCP

SCP can be uninstalled as follows. Execute the following steps from a server that has access to Kubectl and helm commands.

1. Execute the following command to uninstall SCP:

- a. In case of Helm 2:

```
$ helm del --purge <release_name>
```

- b. In case of Helm 3:

```
helm uninstall <release_name> --namespace <namespace>
```

2. Execute the following command to remove SCP custom resources definitions:

```
$ kubectl get crds -o name | grep  
<SCP_deployment_namespace>.oracle.io | xargs kubectl delete
```

**Example:** \$ kubectl get crds -o name | grep scp.oracle.io | xargs  
kubectl delete

3. Execute the following command to delete the namespace:

```
$ kubectl delete namespace <SCP_deployment_namespace>
```

**Note:** Deleting the namespace deletes all the other kubernetes objects in that namespace.

4. (Optional) In case ingress-gateway is installed, execute the following command to uninstall the ingress-gateway:

- a. In case of Helm 2:

```
$ helm del --purge <ingress-gateway_deployment>
```

- b. In case of Helm 3:

```
helm uninstall <release_name> --namespace <ingress-  
gateway_deployment>
```

5. Execute the following steps to cleanup DB:

- a. Login to mysql client on SQL NODE with scp user and password:

```
mysql -h <IP_adress of SQL Node> -uscuser -pscpass
```

- b. Change to scp db and drop the following tables:

```
mysql> use ocscpdb;  
mysql> drop table CANARY_RELEASES;  
mysql> drop table ENGINEERING_CONFIGURATIONS;
```

```
mysql> drop table MEDIATION_CONFIGURATIONS;
mysql> drop table NF_PROFILES;
mysql> drop table NF_PROFILE_HASHES;
mysql> drop table NF_RESOURCE_MAPPINGS;
mysql> drop table NF_SERVICE_GROUPS;
mysql> drop table NF_SUBSCRIPTIONS;
mysql> drop table NRF_NF_DETAILS;
mysql> drop table ROUTING_OPTIONS;
mysql> drop table ReleaseConfig;
mysql> drop table SCP_NF_PROFILES;
mysql> drop table SYSTEM_OPTIONS;
mysql> drop table SiteJsonSchemaVersionInfo;
mysql> drop table TOPOLOGY_SOURCE_INFO;
```

- c. Optionally, AMF and SMF subscriber data tables should be dropped if SDS app was enabled and old subscriber data need to be purged before new installation.

```
mysql> drop table SubscriberAmfBindingPei;
mysql> drop table SubscriberAmfBindingGpsi;
mysql> drop table SubscriberAmfBindingData;
mysql> drop table SubscriberSmfBindingData;
```

- d. Make sure no pod exists. This should be done to make sure that no new connections are made when we kill connections in the coming steps. Execute the following command to check if there are any pods:

```
kubectl get pods -n <namespace>
```

# 6

## Troubleshooting SCP

This section provides information to troubleshoot the common error which can be encountered during the installation and upgrade of Service Communication Proxy (SCP).

Following are the troubleshooting procedures:

- [Helm Install Failure](#)
- [Custom Value File Parse Failure](#)
- [Curl HTTP2 Not Supported](#)
- [Kubernetes Node Failure](#)
- [SCP DB goes into deadlock state](#)
- [Tiller Pod Failure](#)

### Generic Checklist

The following sections provide generic checklist for troubleshooting tips.

#### Deployment related tips

Perform the following checks before the deployment:

- Are OCSCP deployment, pods and services created, running and available?  
Execute following the command:

```
# kubectl -n <namespace> get deployments,pods,svc
```

Inspect the output, check the following columns:

- AVAILABLE of deployment
- READY, STATUS and RESTARTS of pod
- PORT(S) of service
- Is the correct image used and the correct environment variables set in the deployment?  
Execute following the command:

```
# kubectl -n <namespace> get deployment <deployment-name> -o yaml
```

- Check if the micro-services can access each other via REST interface.  
Execute following command:

```
# kubectl -n <namespace> exec <pod name> -- curl <uri>
```

Example:

```
# kubectl -n scp-svc exec $(kubectl -n scp-svc get pods -o name|cut
-d '/' -f2|grep nfs) --
    curl http://ocscp-nfregistration:8080/nscp-nfm/v1/nf-
instances
```

```
# kubectl -n scp-svc exec $(kubectl -n scp-svc get pods -o name|cut
-d '/' -f2|grep nfr) --
    curl http://ocscp-nfsubscription:8080/nscp-nfm/v1/nf-
instances
```

 **Note:**

These commands are in their simple form and display the logs only if there is 1 scp<registration> and nfs<subscription> pod deployed.

### Application related tips

Check the application logs and look for exceptions, by executing the following command:

```
# kubectl -n <namespace> logs -f <pod name>
```

You can use '-f' to follow the logs or 'grep' for specific pattern in the log output.

Example:

```
# kubectl -n scp-svc logs -f $(kubectl -n scp-svc get pods -o name|cut
-d '/' -f2|grep nfr)
# kubectl -n scp-svc logs -f $(kubectl -n scp-svc get pods -o name|cut
-d '/' -f2|grep nfs)
```

 **Note:**

These commands are in their simple form and display the logs only if there is 1 scp<registration> and nf<subscription> pod deployed.

## Helm Install Failure

This section describes the various scenarios in which `helm install` might fail. Following are some of the scenarios:

- [Incorrect image name in ocscp-custom-values files](#)
- [Docker registry is configured incorrectly](#)
- [Continuous Restart of Pods](#)

## Incorrect image name in ocscp-custom-values files

### Problem

`helm install` might fail if incorrect image name is provided in the `ocscp-custom-values` file.

### Error Code/Error Message

When `kubectl get pods -n <ocscp_namespace>` is executed, the status of the pods might be `ImagePullBackOff` or `ErrImagePull`.

### Solution

Perform the following steps to verify and correct the image name:

1. Edit `ocscp-custom-values` file and provide release specific image name and tags.
2. Execute `helm install` command.
3. Execute `kubectl get pods -n <ocscp_namespace>` to verify if the status of all the pods is **Running**.

## Docker registry is configured incorrectly

### Problem

`helm install` might fail if docker registry is not configured in all primary and secondary nodes.

### Error Code/Error Message

When `kubectl get pods -n <ocscp_namespace>` is executed, the status of the pods might be `ImagePullBackOff` or `ErrImagePull`.

### Solution

Configure docker registry on all primary and secondary nodes.

## Continuous Restart of Pods

### Problem

`helm install` might fail if MySQL primary and secondary hosts may not be configured properly in `ocscp-custom-values.yaml`.

### Error Code/Error Message

When `kubectl get pods -n <ocscp_namespace>` is executed, the pods restart count increases continuously.

### Solution

MySQL servers(s) may not be configured properly. Refer to [Installation Tasks](#) for more information on MySQL configuration.

## Custom Value File Parse Failure

This section explains troubleshooting procedure in case of failure during parsing custom values file.

### Problem

Not able to parse *ocscp-custom-values-x.x.x.yaml*, while running helm install.

### Error Code/Error Message

Error: failed to parse ocscp-custom-values-x.x.x.yaml: error converting YAML to JSON: yaml

### Symptom

While creating the *ocscp-custom-values-x.x.x.yaml* file, if the above mentioned error is received, it means that the file is not created properly. The tree structure may not have been followed and/or there may also be tab spaces in the file.

### Solution

Following the procedure as mentioned:

1. Download the latest SCP templates zip file from OHC. Refer to [Installation Tasks](#) for more information.
2. Follow the steps mentioned in the [Installation Tasks](#) section.

## Curl HTTP2 Not Supported

### Problem

curl http2 is not supported on the system.

### Error Code/Error Message

Unsupported protocol error is thrown or connection is established with HTTP/1.1 200 OK

### Symptom

If unsupported protocol error is thrown or connection is established with http1.1, it is an indication that curl http2 support may not be present on your machine.

### Solution

Following is the procedure to install curl with HTTP2 support:

1. Make sure git is installed:

```
$ sudo yum install git -y
```

2. Install nghttp2:

```
$ git clone https://github.com/tatsuhiro-t/nghttp2.git  
$ cd nghttp2
```



```

$ autoreconf -i
$ automake
$ autoconf

$ ./configure
$ make
$ sudo make install

$ echo '/usr/local/lib' > /etc/ld.so.conf.d/custom-libs.conf

$ ldconfig

```

### 3. Install the latest Curl:

```

$ wget http://curl.haxx.se/download/curl-7.46.0.tar.bz2 (NOTE: Check for
latest version during Installation)
$ tar -xvzf curl-7.46.0.tar.bz2
$ cd curl-7.46.0

$ ./configure --with-nghttp2=/usr/local --with-ssl

$ make

$ sudo make install

$ sudo ldconfig

```

### 4. Make sure HTTP2 is added in features by executing the following command:

```

$ curl --http2-prior-knowledge -v "<http://10.75.204.35:32270/nscp-
disc/v1/nf-instances?requester-nf-type=AMF&target-nf-type=SMF>"

```

## Kubernetes Node Failure

### Problem

Kubernetes nodes goes down.

### Error Code/Error Message

"NotReady" status is displayed against the Kubernetes node.

### Symptom

On running the command **kubectl get nodes**, "NotReady" status is displayed, as shown below:

**Figure 6-1** Kubernetes Nodes Output

```

[root@bastion-2 artifacts]# kubectl get nodes
NAME                                STATUS    ROLES    AGE    VERSION
k8s-1.odyssey.morrisville.us.lab.oracle.com Ready     master   57d    v1.15.3
k8s-2.odyssey.morrisville.us.lab.oracle.com NotReady  master   57d    v1.15.3
k8s-4.odyssey.morrisville.us.lab.oracle.com Ready     <none>   57d    v1.15.3
k8s-5.odyssey.morrisville.us.lab.oracle.com Ready     <none>   57d    v1.15.3
k8s-6.odyssey.morrisville.us.lab.oracle.com Ready     <none>   57d    v1.15.3
k8s-7.odyssey.morrisville.us.lab.oracle.com NotReady  <none>   57d    v1.15.3

```

## Solution

Following is the procedure to identify the kubernetes nodes failure:

1. Execute the following command to describe the node:

```
kubectl describe node <kubernete_node_name>
```

**Example:** kubectl describe node  
k8s-1.odyssey.morrisville.us.lab.oracle.com

2. Check Nodes utilization by running the command:

```
kubectl top nodes
```

# SCP DB goes into deadlock state

## Problem

MySQL locks gets struck.

## Error Code/Error Message

ERROR 1213 (40001): Deadlock found when trying to get lock; try restarting transaction

## Symptom

Unable to access MySQL.

## Solution

Following is the procedure to remove the deadlock as follows:

1. Execute the following command on each SQL node:

```
SELECT  
CONCAT('KILL ', id, ';')  
FROM INFORMATION_SCHEMA.PROCESSLIST  
WHERE `User` = <DbUsername>  
AND `db` = <DbName>;
```

This command will retrieve the list of commands to kill each connections.

**Example:**

```
select  
CONCAT('KILL ', id, ';')  
FROM INFORMATION_SCHEMA.PROCESSLIST  
where `User` = 'scpuser'  
      AND `db` = 'ocscpdb';  
+-----+  
| CONCAT('KILL ', id, ';') |  
+-----+  
| KILL 204491;             |  
| KILL 200332;             |  
| KILL 202845;             |
```

```
+-----+  
3 rows in set (0.00 sec)
```

2. Execute the kill command on each SQL node.

## Tiller Pod Failure

### Problem

Tiller Pod is not ready to run helm install.

### Error Code/Error Message

The error '*could not find a ready tiller pod*' message is received.

### Symptom

When `helm ls` is executed, '*could not find a ready tiller pod*' message is received.

### Solution

Following is the procedure to install helm and tiller using the below commands:

1. Delete the pre-installed helm:

```
kubectl delete svc tiller-deploy -n kube-system  
kubectl delete deploy tiller-deploy -n kube-system
```

2. Install helm and tiller using this commands:

```
helm init --client-only  
helm plugin install https://github.com/rimusz/helm-tiller  
helm tiller install  
helm tiller start kube-system
```