Oracle® Communications

Service Communication Proxy (SCP) Cloud Native Installation Guide

Release 1.6
F30752-01
May 2020

ORACLE

Oracle Communications Service Communication Proxy (SCP) Cloud Native Installation Guide, Release 1.6

F30752-01

Contents

What's New in This Guide

This section introduces the documentation updates for Release 1.6.0 in Oracle Communications Cloud Native Service Communication Proxy (SCP) Installation Guide.

Release 1.6.0

The following configuration parameters are added in Customizing SCP:

1. guardTime
2. subscriptionValidityTime
3. scpToRegisterWithNrfRegions
4. servingScope

List of Tables

1 Installation Overview

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

The 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.

References

1. Cloud Native Environment (CNE) 1.4 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
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 SCP Software

Software	Version
Kubernetes	v1.15.3
HELM	v2.14.3

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

Additional software that needs to be deployed as per the requirement of the services:

Table 2-2 Additional Softwares

Software	Chart Version	Notes
elasticsearch	5.5.4	Needed for Logging Area
elastic-curator	5.5.4	Needed for Logging Area
elastic-exporter	1.0.2	Needed for Logging Area
logs	2.0.7	Needed for Logging Area
kibana	6.7.0	Needed for Logging Area
grafana	6.1.6	Needed for Metrics Area
prometheus	9.1.2	Needed for Metrics Area
prometheus-node-exporter	0.17.0	Needed for Metrics Area
metallb	0.7.3	Needed for External IP
metrics-server	0.3.1	Needed for Metric Server
tracer	0.8.3	Needed for Tracing Area

Network access

The Kubernetes cluster hosts must have network access to:

- Local docker image repository where the SCP images are available
- Local helm repository where the SCP helm charts are available
- Service FQDN of SCP must be discoverable from outside of 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 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 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
	soothsayer-notification
	soothsayer-subscription
	soothsayer-audit
SCP-Apps	scp-db-app

Installation Sequence

This section provides information on prerequsites 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 the tasks that the user needs to follow for installing SCP.

Downloading SCP package

Following is the porcedure to download the release package from MOS:

1. Login to MOS using the appropriate login credentials.
2. Select **Product & 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 Security Commnication 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. Click on the zip file to download the network function patch to the system where network function must be installed.

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-Releasenumber.tgz`

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

   Releasenumber is the release number.

   For example, ocscp-pkg-1.6.0.0.0.tgz
2. Untar the OCSCP package file to get OCSCP docker image tar file:

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

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-<marketing-release-number>>.tgz
   ```

   The directory consists of following:

   a. SCP Docker Images File: tarball contains images of SCP `ocscp-images-1.6.0.tar`
   b. Helm File: tarball contains Helm charts and templates `ocscp-1.6.0.tgz`
   c. Readme txt: Contains cksum and md5sum of the tarballs `Readme.txt`

7. Create DB user and database:

   a. Login to mysql server
   b. Execute `create database <scp_dbname>;` command

      E.g. " create database ocscpdb; "
   c. Create scp user: Execute command "`CREATE USER '<username>'@'%' IDENTIFIED BY '<password>';`"
   d. Grant database access to scp user created: Execute command "`GRANT SELECT, INSERT, CREATE, ALTER, DROP, LOCK TABLES, CREATE TEMPORARY TABLES, DELETE, UPDATE, EXECUTE, INDEX ON <scp dbname>.* TO '<scp user>'@'%';`"
      Note: User must use `<scp dbname>` provided on mysql server in helm chart during scp deployment.

      Example:

      ```
      CREATE DATABASE ocscpdb;
      CREATE USER 'scpuser'@'%' IDENTIFIED BY 'scppass';
      GRANT SELECT, INSERT, CREATE, ALTER, DROP, LOCK TABLES, CREATE TEMPORARY TABLES, DELETE, UPDATE, EXECUTE, INDEX ON ocscpdb.* TO 'scpuser'@'%';
      ```

e. Execute the following command to create secrets

```
kubectl create secret generic <secretName> --from-
literal=DB_USERNAME=<userName> --from-
literal=DB_PASSWORD=<password> --from-literal=DB_NAME=<dbName> -n
<SCPNamespace>
```

Example:

```
kubectl create secret generic cred --from-
literal=DB_USERNAME='root' --from-literal=DB_PASSWORD='lLn94uba5p'
--from-literal=DB_NAME='ocscpdb' -n scpsvc
```

8. Create the customize ocscp-custom-values-1.6.0.yaml file with the required input parameters. To customize the file, refer to Customizing SCP chapter.
9. Go to the extracted SCP package as explained in:

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

10. Install SCP by executing the following command:
`helm install <helm-repo> -f <custom_values.yaml> --name <deployment_name> --namespace <namespace_name> --version <helm_version>`

    Example:

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

11. Execute the following command to check the status:
`helm status <helm-release>`

    For example: `helm status <deployment_name>`
12. Check if all the services are deployed and running:
`kubectl -n <namespace_name> get services`
13. 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.

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 needs to be configured in case the NRF is outside the Kubernates cluster. If the NRF is inside the Kubernates cluster, the user can configure FQDN as well. If both IPV4 address and FQDN are provided then 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.

Table 2-4 Configure SCP as HTTP Proxy

Step #	Procedure	Description
1 ☐	Test successful deployment of SCP	To test that SCP deployed successfully and is able to receive a message as a proxy, route it to the appropriate producer, 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>'`

Table 2-4 (Cont.) Configure SCP as HTTP Proxy

Step #	Procedure	Description
2 ☐	Fetch the current subscription list	The curl command fetches the current subscription list (as a client) from NRF by sending the request to NRF via 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

Table 3-1 provides list of configuration parameters in the Helm file. The OCNRF deployment is customized by overriding the default values of various configurable parameters.

Follow the below steps to customize the `ocscp-custom-values-1.6.0.yaml` file as per the required parameters:

1. Go to the Oracle Help Center (OHC) Web site.
2. Navigate to **Industries->Communications->Cloud Native Core->Release 2.2.0**.
3. Click the **SCP Custom Template** link to download the zip file.
4. Unzip the file to get ocscp-custom-configTemplates-1.6.0.0.0 file that contains the ocscp-custom-configTemplates-1.6.0.0.0. This file is used during installation.
5. Customize the ocscp-custom-values-1.6.0.yaml file.
6. Save the updated ocscp-custom-values-1.6.0.yaml file in the helm chart directory.

Table 3-1 SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
Global: Configuration used by all the micro services						
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	Y	Option to configure the Service Domain of the K8 cluster. To know cluster domain one can use command : `kubectl -n kube-system get configmap kubeadm-config -o yaml | grep clusterName`

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
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	Y	Option to configure the Domain of the K8 cluster. Ideally, it is domain attribute value by removing "svc."
publicSignalingIPSpecified	<boolean>	true/false	false	O	Y	Option to enable/disable Loadbalancer IP configuration statically for Signaling interface.
publicSignalingIP	<IPv4 Address>	Valid IPV4 address as per RFC 791	N/A	C	Y	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	Y	Option to configure Signaling Port
adminport	<integer>	Min- 0 , Max-65535	8001	M	Y	Option to configure Admin Port (used for debugging purpose)
imageRepository	<string>	valid repository	ocspf-registry.us.oracle.com:5000/ocscp	M	Y	User need to set imageRepository to the repository where SCP images are loaded.

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
scpInfo	SCP Profile that will be used to by SCP register with OCNRF (Primary First and Secondary if primary Fails). Registration of SCP services is optional and can be governed vis the nfService.nfServiceStatus flag. If nfServiceStatus is set to registered than that service will get registered with OCNRF. In case of anything other than registered (i.e. SUSPENDED/UNDISCOVBERABLE) that service will not get registered with OCNRF. In any one of the case the service mentioned can be used locally by SCP as long as its present in SCP Profile. In case a service is omitted from SCP profile, SCP will neither register nor be able to use that service (or in case of SDS-APP service the sds-app service is not even deployed)					
	`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	Y	Fully Qualified Domain Name of SCP
	`nfType: <string>`	NA	CUSTOM_ORACLE_SCP	M	Y	
	`locality: <string>`	As per 3GPP TS 29.510 spec	N/A	M	Y	Locality of the current SCP Instance (e.g. geographic location, data center). Same locality must be present in ServingLocalities also.

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
	`mediation_status: <string>`	mediation_status: ENABLED/ DISABLED	DISABLED	O	Y	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.

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
	customInfo: mateScpInfo: capacity: <integer> priority: <integer> mateSCPLocalities: - <string> servingLocalities: - <string> remainingLocalities: - <string> servingScope: - <string>	capacity: Min = 0, Max = 65535, Priority: Min = 0, Max = 65535. Localities: As per 3GPP TS 29.510 spec	capacity: 500 priority: 1 mateSCP Localities: - Loc10 servingLocalities: - Loc7 - Loc8 - Loc9 - USEast remaining Localities: - Loc1 - Loc2 - Loc3 - Loc4 - Loc5 - Loc6	M	Y	capacity: Static capacity information in the range of 0-65535, expressed as a weight relative to other SCP instances of the same type. priority: Priority (relative to other SCPs) in the range of 0-65535, to be used for NF selection; lower values indicate a higher priority. servingLocalities: List of serving localities of the current SCP (apart from the locality in present in "locality" attribute) remainingLocalities: List of localities which will be served by current SCP but are not part of mateSCPLocalities and servingLocalities servingScope: 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

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
						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"
	`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	Y	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.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description

	`nfServices:`
	`- serviceInstanceId: <string>`
	`serviceName: <string>`
	`fqdn: <string>`
	`port: <integer>`
	`scheme: HTTP2`
	`priority: <integer>`
	`capacity: <integer>`
	`load: <integer>`
	`ipEndPoints:`
	`- ipv4Address: <IPV4 Address>`
	`port: <integer>`
		serviceInstanceId: 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].
		fqdn: Labels can be letter a-z, number 0-9, hyphen(-). Hyphen cannot be first character. Label combined with dot(.) forms domain.
		port: 0 to 65535
		priority: 0 to 65535
		capacity: 0 to 65535
		load: 0 to 100
		apiPrefix: Can be combination of letters
			Default Value for serviceName: N/ASupported values for serviceName:
			• nmediation-http (Mediation service)
			• ocscp-sds (Subscriber Data Service)
				O	Y	Supported values for serviceName:
						• nmediation-http (Mediation service)
						• ocscp-sds (Subscriber Data Service)
						Note:
						• nfServices are completely optional, one or all services can be removed, for removing all services, user also need to remove nfServices key as well.
						• 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.

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
	nfServiceStatus: <STATUS> apiPrefix: <integer> versions: - apiFullVersion: <stirng> apiVersionInUri: <string>	from a-z and A-Z nfServiceStatus : REGISTERED or SUSPENDED (TS 29.510)				

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
scplocalityconfig	`mapping_param: LOCALITY`	LOCALITY, NFINSTANCEID, FQDN	LOCALITY	M	Y	Mapping parameter(or Key to look for), will be used to query the corresponding field in NF profile received in response to NF discovery 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.

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
	mapping_info: - id_value: <string> ip_v4_address: <string> fqdn: <string> port: <integer>	ip_v4_address: Valid IPV4 address as per RFC 791 fqdn: Labels can be letter a-z, number 0-9, hyphen (-). Hyphen cannot be first character. Label combined with dot (.) forms domain. port: 0 to 65535	N/A	M	Y	id_value: Used to match value against the value obtained from mapping parameter ip_v4_address: The IP address to be used while updating ipv4Address and callback URI in NF discovery response fqdn: The fqdn to be used while updating fqdn in NF discovery response. port: The port to be used while updating port in NF discovery response.
PROBING_LISTENER_PORT	<integer>	Min- 0 , Max-65535	8002	M	Y	This port will be used by scp-worker listening for probing.
SIGNALLING_LISTENER_PORT	<integer>	Min- 0 , Max-65535	8080	M	Y	This port will be used by scp-worker listening for signaling.

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
scpService Account	<string>			O		Service account that SCP pods will use. This can be provided by User but if left empty(or removed) a default Service Account is created by SCP for its use. Default is empty. Below Clusterrole and Role is needed by SCP: ClusterRole Rules rules: - apiGroups: ["config.ocscp.oracle.io"] resources: ["*"] verbs: ["*"] - apiGroups: ["rbac.ocscp.oracle.io"] resources: ["*"] verbs: ["*"] - apiGroups: ["networking.ocscp.oracle.io"] resources: ["*"] verbs: ["*"] - apiGroups: ["authentication.ocscp.oracle.io"] resources: ["*"] verbs: ["*"] - apiGroups: ["apiextensions.k8s.io"] resources: ["customresourcedefinitions"]

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
						verbs: ["*"] - apiGroups: ["extensions"] resources: ["thirdpartyresources", "thirdpartyresources.extensions", "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"] Role Rules: rules: - apiGroups: - soothsayer.ocscp.oracle.io resources: - ocscp-nrfdetails - ocscp-ruleprofiles - ocscp-routingoptions - ocscp-canaryreleases

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
						- ocscp-nfprofilehashes - ocscp-scpprofiles - ocscp-discoveryconfigurations - ocscp-portconfigurations - ocscp-nfsubscriptions - ocscp-systemoptions - ocscp-resourcemappings - ocscp-nfservicegroups - ocscp-applicationconfigurations - ocscp-mediationconfigurations verbs: ["*"] - apiGroups: - networking.ocscp.oracle.io resources: - virtualservices - serviceentries - gateways - envoyfilters - destinationrules verbs: ["*"] - apiGroups: [""] resources: - pods - services verbs: ["*"] - apiGroups:

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
						- "" # "" indicates the core API group resources: - secrets verbs: - get - watch - list
nrfProfiles	List of NRFs to which the current SCP instance will subscribe for notifications.					
	`nfType: <string>`	Valid 5g NF Type as per 3GPP TS 29.510.	[] *i.e. Blank, which means subscribe for all supported NF Types.*	M	N	Description is nfType of NRF

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
	servingScope	Region that NRF can support		O		Blank value is treated as "default" region with the condition that scpInfo 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 SCP 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.

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
	nrfManagement: fqdn: <string> port: '<integer>' scheme: HTTP2 priority: <integer> nfServiceStatus: REGISTERED capacity: <integer> apiPrefix: <string> ipEndPoints: - ipv4Address: <IPv4 Address>	fqdn: Labels can be letter a-z, number 0-9, hyphen (-). Hyphen cannot be first character. Label combined with dot (.) forms domain. port: 0 to 65535 priority: 0 to 65535 capacity: 0 to 65535 apiPrefix: Can be combination of letters from a-z and A-Z nfServiceStatus : status of service. Its not used by SCP but needs to be in the NF profile format with all mandatory fields.	N/A	M	Y	fqdn: Fully Qualified Domain Name of NRF port: NRF Management Service Port scheme: Always HTTP2 priority: Priority of the NRF among the NRF List. It is used for load balancing between the NRFs. capacity: Capacity of the NRF among the NRF List. It is used for load balancing between the NRFs. apiPrefix: Location of NRF. User needs to configure it (or remove it) based on the APIPrefix supported (or not Supported) by NRF. ipEndPoints: List of IPv4 Address, transport and port combination of the given NRF.

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
	transport: TCP port: <integer>					

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
	nrfDiscovery: fqdn: <string> port: '<integer>' scheme: HTTP2 nfServiceStatus: REGISTERED priority: <integer> capacity: <integer> apiPrefix: <string> ipEndPoints: - ipv4Address: <IPv4 Address>	fqdn: Labels can be letter a-z, number 0-9, hyphen (-). Hyphen cannot be first character. Label combined with dot (.) forms domain. port: 0 to 65535 priority: 0 to 65535 capacity: 0 to 65535 apiPrefix: Can be combination of letters from a-z and A-Z nfServiceStatus : status of service. Its not used by SCP but needs to be in the NF profile format with all mandatory fields.	N/A	M	Y	fqdn: Fully Qualified Domain Name of NRF port: NRF Management Service Port scheme: Always HTTP2 priority: Priority of the NRF among the NRF List. It is used for load balancing between the NRFs. capacity: Capacity of the NRF among the NRF List. It is used for load balancing between the NRFs. apiPrefix: Location of NRF. User needs to configure it (or remove it) based on the APIPrefix supported (or not Supported) by NRF. ipEndPoints: List of IPv4 Address, transport and port combination of the given NRF

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
	transport: TCP port: <integer>					
scpc-soothsayer: Configuration specific to Soothsayer Micro Service						

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description

systemOptions	`trafficPolicy:`
	`connectionPool:`
	`http:`
	`idleTimeout: 3600s`
	`tcp:`
	`tcpKeepalive:`
	`probes: 9`
	`time: 180s`
	`interval: 60s`
		tcpKeepalive.probes: Maximum number of keepalive probes to send without response before deciding the connection is dead.
		tcpKeepalive.time: The time duration that a connection must be idle before keep-alive probes start being sent.
		tcpKeepalive.interval: The time duration between keep-alive probes.
				O	Y	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:
						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.
						2. Only TCP keepalive is configured. TCP keepalive must be set to a value less than kube-proxy timeout

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
						value so that before kube-proxy silently discards connection, connection gets terminated by TCP RESET if no ACK is received within the defined interval. 3. Both TCP keepalive and HTTP idleTimeout are configured. In this case idleTimeout can be more than kube-proxy 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,

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
						connection will get gracefully terminated by HTTP.

soothsayer Database	`soothsayerDatabase:`
	
	`dbHost: "127.0.0.0"`
	
	`dbPort: "3306"`
	
	`poolSize: "10"`
	
	`dbSecretName: "cred"`
		Provide MySQL database details here for Soothsayer to connect to	N/A	M	Y	dbHost: provides the host address of ths DB for soothsayer
						dbPort: provides the port address of ths DB for soothsayer.
						poolSize: Defines number of concurrent connections to the database
						dbSecretName: Defines database secret name.

configuration	docker Image details for Configuration container of scpc-soothsayer					

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description

	`imageDetails:`
	
	`image: soothsayer-configuration`
	
	`tag: <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
		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	Y	tag: Image Tag to be used for Configuration container

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description

	`resources:`
	
	`memory: 1Gi`
	
	`cpu: 0.5`
		NA	memory: 1Gi
			cpu: 0.5
				M	N	memory: Requested memory (RAM) for subscription configuration container in soothsayer micro-service in Giga Bytes.
						cpu: Maximum allocated vCPU for configuration container in soothsayer micro-service

	`serviceName: scpc-configuration`	NA	scpc-configuration	M	Y	It is the service name of subscription configuration container.
	`logLevel: INFO`	{TRACE, DEBUG, INFO, WARN, ERROR}	INFO	O	Y	Enable desired level of logging for the service
	`defaultTopologySource`	(NRF,LOCAL)	NRF	O	Y	Used to set Topology Source globally (For all NFs)

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description

	`nodeSelector:`
	
	`nodeKey: ocscp`
	
	`nodeValue: scpc-configuration`
		nodeSelector: Use this configuration to apply nodeSelector to Configuration service pods
		nodeKey: Key of the node label
		nodeValue: Value of the node label
			N/A	O	Y	Enable node selector for Configuration Service pods

subscription	docker Image details for Subscription container of scpc-soothsayer					

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description

	`imageDetails:`
	
	`image: soothsayer-subscription`
	
	`tag: <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
		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	Y	tag: Image Tag to be used for Subscription container

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description

	`resources:`
	
	`memory: 1Gi`
	
	`cpu: 1`
		NA	memory: 1Gi
			cpu: 1
				M	N	memory: Requested memory (RAM) for subscription container in soothsayer micro-service in Giga Bytes.
						cpu: Maximum allocated vCPU for configuration container in soothsayer micro-service

	`serviceName: scpc-subscription`	NA	scpc-subscription	M	Y	It is the service name of subscription container.
	`guardTime: <integer>`	Min: 5 Max: 180 (in seconds)	10 sec	O	Y	Configure guardTime in seconds. This is the advance time before validityTimerExpiry at which subscription is initiated.
	`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.
	`logLevel: INFO`	{TRACE, DEBUG, INFO, WARN, ERROR}	INFO	O	Y	Enable desired level of logging for the service.

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
	`scpToRegisterWithNrfRegions`	Valid Regions to be registered with or empty for no registration.	[]	M		Set scpToRegisterWithNrfRegions empty/null to disable registration. Example - scpToRegisterWithNrfRegions: [] 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

	`nodeSelector:`
	`nodeKey: ocscp`
	`nodeValue: scpc-configuration`
		nodeSelector: Use this configuration to apply nodeSelector to Configuration service pods
		nodeKey: Key of the node label
		nodeValue: Value of the node label
			N/A	O	Y	Enable node selector for Subscription pods.

notification	docker Image details for Notification container of scpc-soothsayer					

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description

	`imageDetails:`
	
	`image: soothsayer-notification`
	
	`tag: <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
		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	Y	tag: Image Tag to be used for Notification container

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description

	`resources:`
	
	`memory: 4Gi`
	
	`cpu: 3`
		NA	memory: 4Gi
			cpu: 3
				M	Y	memory: Requested memory (RAM) for notification container in soothsayer micro-service in Giga Bytes.
						cpu: Maximum allocated vCPU for notification container in soothsayer micro-service

	`serviceName: scpc-notification`	NA	scpc-notification	M	Y	name of notification service
	`logLevel: INFO`	{TRACE, DEBUG, INFO, WARN, ERROR}	INFO	O	Y	Enable desired level of logging for the service

	`nodeSelector:`
	
	`nodeKey: ocscp`
	
	`nodeValue: scpc-configuration`
		nodeSelector: Use this configuration to apply nodeSelector to Configuration service pods
		nodeKey: Key of the node label
		nodeValue: Value of the node label
			N/A	O	Y	Enable node selector for notification Service pods

audit	docker Image details for Audit container of scpc-soothsayer					

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description

	`imageDetails:`
	
	`image: soothsayer-audit`
	
	`tag: <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
		Tag: valid ASCII and 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	Y	tag: Image Tag to be used for Audit container

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description

	`resources:`
	
	`memory: 1Gi`
	
	`cpu: 1`
		NA	memory: 1Gi
			cpu: 1
				M	Y	memory: Requested memory (RAM) for audit container in soothsayer micro-service in Giga Bytes.
						cpu: Maximum allocated vCPU for audit container in soothsayer micro-service

	`serviceName: scpc-audit`	NA	scpc-audit	M	Y	Service name for Audit service
	`auditInterval: 3600`	Min: 1 Max: 2147483647	3600	M	Y	auditInterval: Time interval in seconds that user need to configure.
	`auditInitialRetryInterval: 2`	Min: 1 Max: 2147483647	2	M	Y	auditInitialRetryInterval: Retry interval in seconds for which audit keeps on retrying until successful response from NRF
	`logLevel: INFO`	{TRACE, DEBUG, INFO, WARN, ERROR}	INFO	O	Y	Enable desired level of logging for the service

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description

	`nodeSelector:`
	
	`nodeKey: ocscp`
	
	`nodeValue: scpc-audit`
		nodeSelector: Use this configuration to apply nodeSelector to Configuration service pods
		nodeKey: Key of the node label
		nodeValue: Value of the node label
			N/A	O	Y	Enable node selector for audit Service pods

configService	Configuration related to Configuration container					

	`publicConfigIPSpecified:`
	
	`<boolean>`
		true/false	false	O	Y	Option to enable/disable Loadbalancer IP configuration statically for OAM interface.

	`publicConfigIP: <IPv4 Address>`	Valid IPV4 address as per RFC 791	N/A	C	Y	Option to configure static Loadbalancer IP. Configured value is used only if oamloadbalancer ipenabled is configured as "true".
	`staticnodeportenabled: <boolean>`	true/false	false	O	Y	Option to enable/disable configuring static Node Port for OAM interface

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
	`nodeport: <integer>`	As per kubernetes cluster, by default value is 30000 to 32767	30002	C	Y	Option to configure static Node Port for OAM interface. Configured value will be used only if staticnodeportenabledis configured as "true"
	`configServiceNetworkNameEnabled: <boolean>`	true/false	false	O	Y	Option to enable/disable metalLB IP allocation dynamically from the pool for OAM interface.
	`configService`	alpha-numeric	oam	C	Y	Configuration related to Configuration container
mergeNFServices	`status: <boolean>`	true/false	false	M	Y	Option to enable/disable merge NF services within a NF profile

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
	supportedNFServices: List of strings. (example in description)	1. Valid 5g NF Services as per 3GPP TS 29.510 2. [] i.e. Blank, which means consider all supported NF services 3. If not provided, all supported NF services are considered	nudm-uecm, nudm-sdm	C	Y	List of NF Services for which merge NF services within a NF Profile is triggered. Format Example: supportedNFServices: - nudm-uecm - nudm-sdm **Note**: This list is considered only if above status flag is enabled.

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
defaultLocalityToScp	<boolean>	true/false	true	O	Y	Use this flag to determine whether to consider a NF in SCP locality or outside of SCP Locality (or serving localities) in case locality information is absent in a notified NFProfile. If flag is set to **true** then any NFProfile received without Locality information will be considered as its in SCP's locality.
reverseProxyEnabled	<boolean>	true/false	true	M	Y	If enabled then for all the NFs which support reverseProxy, this parameter will get enabled by default. In case user wants to turn it off after deployment, then use the APIs provided to reconfigure reverseProxySupport option. **Note**: This flag will set reverseProxy flag as **true** but other requirements of setting DbSync as Site and RoutingPolicy as Load balance needs to be done by User.

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
nrfServiceForAudit	`nrfServiceForAudit: <string>`	Supported service options are: 1. nnrf-nfm 2. nnrf-disc	nnrf-nfm	O	Y	Configure Service to get profile from NRF. Possible values are 1. nnrf-nfm 2. nnrf-disc User must have to use nnrf-nfm if interplmnfqdn is part of profile
scp-worker: Configuration specific to Worker Micro Service						
image	docker image details for scp-worker micro service					
	`image: scp-worker`	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	Y	

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
	`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	Y	Image Tag to be used for scp-worker micro service
jaeger	Jaeger service configuration					
	`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	Y	Option to Configure Jaeger Collector FQDN
	`port_value: <integer>`	Min: 0 Max: 65535	N/A	M	Y	Option to Configure Jaeger Collector Port
tracingenable	`<boolean>`	true/false	true	O	Y	Option to enable/disable Jaeger tracing.

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
admin						
	`enablejaegerbody: <boolean>`	true/false	false	O	Y	Option to enable/disable tracing of full body of all Request/ Response messages. The configuration will be added only if tracingenable is configured as "true".
	`retrytimeoutvalue: <integer>`	min: 1 max: 3600	5	O	Y	Option to configure time to wait (in seconds) before making new requests to the upstream cluster after receiving 503 or 429 response code. This value will only be used if 'retry-after' header is not present in response.
service						
	`port: staticnodeportenabled: <boolean>`	true/false	false	O	Y	Option to enable/disable configuring static Node Port for Signaling interface

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
	`nodeport: <integer>`	As per kubernetes cluster, by default is 30000 to 32767	30001	C	Y	Option to configure static Node Port for Signaling interface. Configured value will be used only if staticnodeportenabled is configured as "true".
	`networkNameEnabled: <boolean>`	true/false	false	O	Y	Option to enable/disable metalLB IP allocation dynamically from the pool for Signaling interface.

	`networkName:`
	
	`metallb.universe.tf/address-pool:<string>`
		alpha-numeric	signaling	C	Y	Annotation to notify metalLB to allocate an IP for Signaling interface of SCP. The annotation is added only if networkNameEnabled is configured as "true". <TODO> Need few more updates after testing.

loglevel	`<string>`	trace/ debug/info/ warning	warning	O	Y	Option to increase/ decrease Logging level of scp-worker micro-service.

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
prometheus	`scrape: <boolean>`	true/false	true	O	Y	Option to enable/disable Prometheus metrics scraping.
resources	Initial requested Resource quota for scp-worker micro-service.					
	`memory: 8Gi`	NA	4096Mi	M	N	Requested memory (RAM) for scp-worker micro-service in Mega Bytes.
	`cpu: 4`	NA	4000m	M	N	Requested CPU for scp-worker micro-service in milliCPU.
limits	Maximum allocated Resource quota for scp-worker micro-service.					
	`memory: 4Gi`	NA	4Gi	M	N	Maximum allocated memory (RAM) for scp-worker micro-service in Mega Bytes.
	`cpu: 4`	NA	4	M	N	Maximum allocated CPU for scp-worker micro-service in milliCPU.
minreplicas	`<integer>`	1	1	M	N	Minimum replica count of scp-worker micro-service.

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
maxreplicas	<integer>	Min: 1 Max: 4	4	M	Y	Maximum replica count of scp-worker micro-service.
nodeSelector	nodeSelector: nodeKey: ocscp nodeValue: scpc-worker	nodeSelector: Use this configuration to apply nodeSelector to Configuration service pods nodeKey: Key of the node label nodeValue: Value of the node label	N/A	O	Y	Configuration to apply nodeSelector to SCP-Worker pods.
heapoverloadcontrol:						SCP memory overload control configuration
	refresh_interval: seconds: 0 nanos: 250000000	NA	N/A	O	N	Refresh Interval (250 milliseconds) to check memory Overload condition

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
	resource_monitors: max_heap_size_bytes: 4294967296	NA	N/A	O	N	Maximum configured heap size for scp-worker micro-service (4GB)
	actions: stop_accepting_requests: <%age in decimal value>	Min: 0 Max: 1	0.70	O	Y	Option to configure threshold percentage at which SCP will stop accepting new requests.
	stop_accepting_connections: <%age in decimal value>	Min: 0 Max: 1	0.75	O	Y	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

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
	`shrink_heap:<%age in decimal value>`	Min: 0 Max: 1	0.70	O	Y	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
downstream				O	Y	Options for downstream peers
	`idleTimeout`		3600 (in seconds)	O	Y	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 `systemOptions` under scpc-soothsayer for more details. **Note**: The request based timeouts mean that HTTP/2 PINGs will not keep the connection alive.

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description

	`tcpKeepalive:`
	
	`probes: <integer>`
	
	`time: <integer>`
	
	`interval: <integer>`
		tcpKeepalive: Enables TCP keep alive.
		tcpKeepalive.probes - Maximum number of keepalive probes to send without response before deciding the connection is dead
		tcpKeepalive.time - The time duration that a connection must be idle before keep-alive probes start being sent.
		tcpKeepalive.interval- The time duration between keep-alive probes.
			tcpKeepalive.probes -9 # linux default
			tcpKeepalive.time - 180 (in seconds)
			tcpKeepalive.interval - 60 (in seconds)
				tcpKeepalive- O
				tcpKeepalive.probes- M. if tcpKeepalive is set.
				tcpKeepalive.time - M. if tcpKeepalive is set.
				tcpKeepalive.interval- M. if tcpKeepalive is set.
					Y	Set *tcpKeepalive* attribute to enable TCP Keepalives.

scpc-pilot: Configuration specific to Pilot Micro Service						
image						docker image details for scpc-pilot micro service

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
	`image: <docker repository>/ scpc-pilot`	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	Y	docker repository that contains scpc-pilot micro service image
	`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	Y	Image Tag to be used for scpc-pilot micro service

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
enableTracing	<Boolean>	true/false	True	O	Y	Option to enable/disable tracing request.
minreplicas	<integer>	1	1	M	N	Minimum replica count of scp-pilot micro-service.
maxreplicas	<integer>	Min: 1 Max: 4	4	M	Y	Maximum replica count of scp-pilot micro-service.
nodeSelector	nodeSelector: nodeKey: ocscp nodeValue: scpc-pilot	nodeSelector: Use this configuration to apply nodeSelector to Configuration service pods nodeKey: Key of the node label nodeValue: Value of the node label	N/A	O	Y	Configuration to apply nodeSelector to SCP-pilot pods.
resources						
	memory: 6Gi	NA	6Gi	M	N	Requested memory (RAM) for scp-pilot micro-service in Mega Bytes.

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
	`cpu: 4`	NA	4	M	N	Requested CPU for scp-pilot micro-service in milliCPU.
logOutputLevel	`"<Module:level>, <Module:level>,..."`	Supported Modules: ads, default, mcp, model, rbac Supported Level: debug, info, warn, error, fatal, none	"default:info"	O	Y	Option to increase/ decrease scpc-pilot log level.
logStacktraceLevel	`"<Module:level>, <Module:level>,..."`	Supported Modules: ads, default, mcp, model, rbac Supported Level: debug, info, warn, error, fatal, none	"default:none"	O	Y	Option to increase/ decrease scpc-pilot Stack Trace level.
traceSampling	`<integer or float>`	0.0 to 100.0 with a precision of 0.01	1	O	Y	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.
scp-apps: Configuration specific to SDS Database Micro Service						

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
imageDetails	`image: <docker repository>/scp-db-app`	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	Y	docker repository that contains scp-db-app micro service image.
	`tag: <string>`	Tag: valid ASCII and 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	Y	Image Tag to be used for scpc-pilot micro service

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
dbServiceEndpoint	primary: host: <String>, can be <IPv4 Address> or Fqdn (MYSQL Primary DB Service Endpoint host) port: <String>, can be port value (MYSQL Secondary DB Service Endpoint port)	primary: EndPoint details for primary DB host: Valid IPV4 address as per RFC 791 or Valid FQDN port: valid port value	host: 127.0.0.0 port: 3306	O	Y	Mysql database server Endpoint information for Primary DB

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description

	secondary:
	  host: <String>, can be <IPv4 Address> or Fqdn (MYSQL Secondary DB Service Endpoint host)
	  port: <String>, can be port value (MYSQL Secondary DB Service Endpoint port)
		secondary: EndPoint details for secondary DB
		host: Valid IPV4 address as per RFC 791 or Valid FQDN
		port: valid port value
			host: 127.0.0.0
			port: 3306
				O	Y	Mysql database server Endpoint information for Secondary DB

dbSecretName	<String>	N/A	cred	M	Y	Mysql database secret name information
poolSize	<integer>	N/A	10	M	Y	Defines number of concurrent connections to Mysql database

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
logLevel	`<String>`	TRACE/ DEBUG/ INFO/ WARNING	INFO	O	Y	Option to increase/ decrease Logging level of scp-sds micro-service.
resources						
	memory: 2048Mi	N/A	2Gi	M	N	Requested memory (RAM) for scp-sds micro-service in Mega Bytes
	cpu: 3	N/A	3	M	N	Requested CPU for scp-sds micro-service in milliCPU
minreplicas	`<integer>`	Min: 1	1	M	Y	Minimum replica count of scp-worker micro-service
maxreplicas	`<integer>`	Max: 4	4	M	Y	Maximum replica count of scp-worker micro-service

nodeSelector	`nodeSelector:`
	`nodeKey: ocscp`
	`nodeValue: scpc-apps`
		nodeSelector: Use this configuration to apply nodeSelector to Configuration service pods
		nodeKey: Key of the node label
		nodeValue: Value of the node label
			N/A	O	Y	Configuration to apply nodeSelector to SCP-Apps pods

Table 3-1 (Cont.) SCP Configuration Parameters

Attribute Name	DataType	Range	Default Value	Mandatory(M)/ Optional(O)/ Conditional(C)	User can change?	Description
targetcpuutilpercent	<integer>	Min:50 Max:100	50	M	Y	Defines Auto Scalar for pod. If CPU utilization increase above configured value, kubernetes increase replica count

> **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 3-2 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
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:

   ```
   $ helm delete <SCP_deployment_namespace> --purge
   ```

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 Kubernates objects in that namespace.

4. 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> -uscpuser -pscppass
      ```

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

      ```
      mysql> use ocscpdb;
      mysql> drop table NF_PROFILES;
      mysql> drop table TOPOLOGY_SOURCE_INFO;
      mysql> drop table NRF_NF_DETAILS;
      mysql> drop table NF_SUBSCRIPTIONS;
      ```

   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;
      ```