Oracle® Communications

Security Edge Protection Proxy (SEPP) Cloud Native Installation Guide

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What's New in This Guide

No new updates have been implemented in this release.

2 Overview

Oracle Communication Security Edge Protection Proxy (OCSEPP) is a proxy network functions (NF) which is used for secured communication between inter-PLMN network messages. This document provides a brief overview of the recommended methods for installing SEPP.

Reference

Following is the reference document:

1. Cloud Native Environment 1.4 Installation Document

Acronyms

Table 2-1 Acronyms

Acronym	Meaning
CRD	Custom Resource Definition
CNE	Cloud Native Environment
DNS	Domain Name System
FQDN	Fully Qualified Domain Name
NF	Network Function
OHC	Oracle Help Center
OSDC	Oracle Software Delivery Cloud
PLMN	Public Land Mobile Network
SEPP	Security Edge Protection Proxy
SVC	Services
TLS	Transport Layer Security

How to use this document

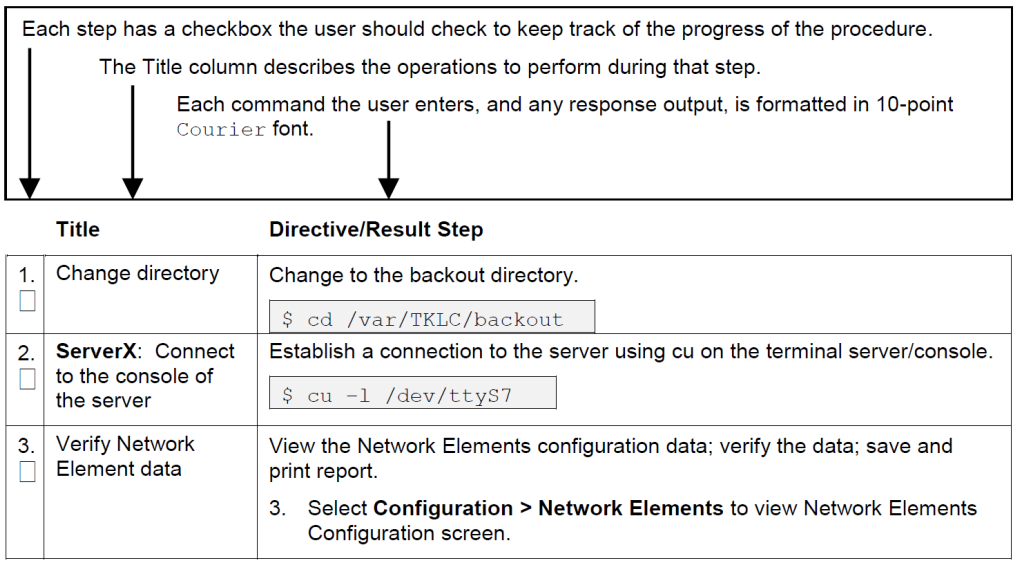
Although this document is primarily to be used as an initial installation guide, its secondary purpose is to be used as a reference for Disaster Recovery procedures.

When executing this document for either purpose, there are a few points which help to ensure that the user understands the author's intent. These points are as follows:

1. Before beginning a procedure, completely read the instructional text (it will appear immediately after the Section heading for each procedure) and all associated procedural WARNINGS or NOTES.
2. Before execution of a STEP within a procedure, completely read the left and right columns including any STEP specific WARNINGS or NOTES.

If a procedural STEP fails to execute successfully, STOP and contact Oracle's Customer Service for assistance before attempting to continue. My Oracle Support for information on contacting Oracle Customer Support.

Figure 2-1 Example of a Procedure Steps Used in This Document



Documentation Admonishments

Admonishments are icons and text throughout this manual that alert the reader to assure personal safety, to minimize possible service interruptions, and to warn of the potential for equipment damage.

Table 2-2 Admonishments

Icon	Description
	Danger: (This icon and text indicate the possibility of personal injury.)
	Warning: (This icon and text indicate the possibility of equipment damage.)
	Caution: (This icon and text indicate the possibility of service interruption.)

Locate Product Documentation on the Oracle Help Center Site

Oracle Communications customer documentation is available on the web at the Oracle Help Center site, http://docs.oracle.com. You do not have to register to access these documents. Viewing these files requires Adobe Acrobat Reader, which can be downloaded at http://www.adobe.com.

1. Access the Oracle Help Center site at http://docs.oracle.com.
2. Click **Industries**.
3. Under the Oracle Communications subheading, click **Oracle Communications documentation** link.

   The Communications Documentation page displays. Most products covered by these documentation sets display under the headings Network Session Delivery and Control Infrastructure and Platforms.
4. Click on your product and then the release number.

   A list of the documentation set for the selected product and release displays.
5. To download a file to your location, right-click the **PDF** link, select **Save target as** (or similar command based on your browser), and save to a local folder.

Customer Training

Oracle University offers training for service providers and enterprises. Visit our web site to view, and register for, Oracle Communications training at http://education.oracle.com/communication.

To obtain contact phone numbers for countries or regions, visit the Oracle University Education web site at www.oracle.com/education/contacts.

My Oracle Support

My Oracle Support (https://support.oracle.com) is your initial point of contact for all product support and training needs. A representative at Customer Access Support can assist you with My Oracle Support registration.

Call the Customer Access Support main number at 1-800-223-1711 (toll-free in the US), or call the Oracle Support hotline for your local country from the list at http://www.oracle.com/us/support/contact/index.html. When calling, make the selections in the sequence shown below on the Support telephone menu:

1. Select **2** for New Service Request.
2. Select **3** for Hardware, Networking and Solaris Operating System Support.
3. Select one of the following options:
   - For Technical issues such as creating a new Service Request (SR), select **1**.
   - For Non-technical issues such as registration or assistance with My Oracle Support, select **2**.

You are connected to a live agent who can assist you with My Oracle Support registration and opening a support ticket.

My Oracle Support is available 24 hours a day, 7 days a week, 365 days a year.

Emergency Response

In the event of a critical service situation, emergency response is offered by the Customer Access Support (CAS) main number at 1-800-223-1711 (toll-free in the US), or by calling the Oracle Support hotline for your local country from the list at http://www.oracle.com/us/support/contact/index.html. The emergency response provides immediate coverage, automatic escalation, and other features to ensure that the critical situation is resolved as rapidly as possible.

A critical situation is defined as a problem with the installed equipment that severely affects service, traffic, or maintenance capabilities, and requires immediate corrective action. Critical situations affect service and/or system operation resulting in one or several of these situations:

- A total system failure that results in loss of all transaction processing capability
- Significant reduction in system capacity or traffic handling capability
- Loss of the system's ability to perform automatic system reconfiguration
- Inability to restart a processor or the system
- Corruption of system databases that requires service affecting corrective actions
- Loss of access for maintenance or recovery operations
- Loss of the system ability to provide any required critical or major trouble notification

Any other problem severely affecting service, capacity/traffic, billing, and maintenance capabilities may be defined as critical by prior discussion and agreement with Oracle.

3
Installation Overview

This chapter describes the prerequisites and sequence for SEPP installation.

Prerequisites

The 5G SEPP requires the following environment:

The following software must be installed:

Software	Version
Kubernetes	v1.15.3
HELM	v2.14.3

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

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

> **Note:**
>
> Install the specified software items before proceeding, if any of the above services are needed and the respective software is not already installed in CNE.
> To check the installed software items, execute:
>
> ```
> helm ls
> ```
>
> Some of the systems may need to use helm command with `admin.conf` file, such as:
>
> ```
> helm --kubeconfig admin.conf
> ```

Installation Sequence

Installation Sequence provides the sequence in which SEPP must be installed.

Table 3-1 Installation Sequence

Sl.No	Phase	Description
1	Installation Preparation	Download the required files and load the files to the system. Installation Preparation
2	SEPP deployment	SEPP Deployment
3	Verify SEPP deployment	Check if the pods are up and running.

4
SEPP Installation

Installation Preparation

This section explains the preparation required before deploying SEPP.

Table 4-1 Download Images and Helm files

Step #	Procedure	Description
1 ☐	Download the SEPP package file	Customers are required to download the SEPP package file from Oracle Software Delivery Cloud (OSDC). Package is named as follows: `<nfname>-pkg-<marketing-release-number>.tgz` For example: **ocsepp-pkg-1.2.0.0.0.tgz** Extracting "ocsepp-pkg-1.2.0.0.0.tgz" gives following : 1. SEPP Docker Images File ocsepp-images-1.2.0.tar 2. Helm File ocsepp-1.2.0.tgz

2 ☐	Untar the SEPP Package File	Untar the SEPP package to the specific repository
		
		`tar -xvf <<nfname>-pkg-<marketing-release-number>>.tgz`
		
		1. SEPP Docker Images File
		`ocsepp-images-1.2.0.tar`
		2. Helm File
		`ocsepp-1.2.0.tgz`
		3. Readme txt
		`Readme.txt`

3 ☐	Check the checksums	Check the checksums of tarballs mentioned in Readme.txt. Refer to Readme.txt for the commands and checksum details.

Table 4-1 (Cont.) Download Images and Helm files

Step #	Procedure	Description
4 ☐	Load the tarball to system	Execute the following command to push the docker images to docker registry: `docker load --input <image_file_name.tar>` "ocsepp-images-1.2.0.tar" contains following docker images: 1. ocsepp/server:1.2.0 2. ocsepp/client:1.2.0 3. ocsepp-nsregistration:1.2.0 4. istio/pilot:1.2.0 5. istio/proxyv2:1.2.0 6. istio/node-agent-k8s:1.2.0

5 ☐	Push docker files to Docker registry (optional step)	Execute the following command to push the docker files to docker registry:
		
		`docker tag <image-name>:<image-tag> <docker-repo>/<image-name>:<image-tag>`
		
		`E.g: docker tag ocsepp/server:1.2.0 repo1/ocsepp1/server:1.2.0`
		
		`docker push <docker_repo>/<image_name>:<image-tag>`
		
		`E.g: docker push repo1/ocsepp1/server:1.2.0`

7 ☐	Push helm files to helm repository	Execute the following command to push the helm files to helm repository:
		
		`helm push <helm_repo> <image_name>.tgz`
		`E.g: helm push repo1 ocsepp-1.2.0.tgz`

SEPP Preparation

Following attribute values can be updated in **ocsepp-custom-values-server-1.2.0.yaml** and **ocsepp-custom-values-client-1.2.0.yaml** file:

Table 4-2 SEPP Parameters

Attribute Name	Attribute Description
nsRegistration.nf.profile	A new profile values for SEPP
nsRegistration.nrf.host	NRF server host

Table 4-2 (Cont.) SEPP Parameters

Attribute Name	Attribute Description
nsRegistration.nrf.port	NRF server port
global.nsRegistration.image	nrf client docker image name. format is <repository name:port>/<image name>. if images is hosted locally then format is <image name>
global.nsRegistration.tag	nrf client docker image tag
global.nsRegistration.pullPolicy	nrf client docker image pull policy
global.n32Client.image	N32C client docker image name. format is <repository name:port>/<image name>. if images is hosted locally then format is <image name>
global.n32Client.tag	N32C client docker image tag
global.n32Client.pullPolicy	N32C client docker image pull policy.
global.n32Server.image	N32C server docker image name. format is <repository name:port>/<image name>. if images is hosted locally then format is <image name>
global.n32Server.tag	N32C server docker image tag
global.n32Server.pullPolicy	N32C server docker image pull policy
global.mysql.image	mysql docker image name. format is <repository name:port>/<image name>. if images is hosted locally then format is <image name>
global.mysql.tag	mysql docker image tag
global.mysql.pullPolicy	mysql docker image pull policy
global.pilot.image	Istio pilot docker image name. format is <repository name:port>/<image name>. if images is hosted locally then format is <image name>
global.pilot.tag	Istio pilot docker image tag
global.pilot.pullPolicy	Istio pilot docker image pull policy
global.proxy.image	Istio proxy docker image name. format is <repository name:port>/<image name>. if images is hosted locally then format is <image name>
global.proxy.tag	Istio proxy docker image tag
global.proxy.pullPolicy	Istio proxy docker image pull policy
global.sds.image	Istio SDS docker image name. format is <repository name:port>/<image name>. if images is hosted locally then format is <image name>
global.sds.tag	Istio SDS docker image tag
global.sds.pullPolicy	Istio SDS docker image pull policy
config.localsepp.scp.ip	IP address of SCP NF.
config.localsepp.scp.port	Port of SCP NF.
config.localsepp.domain	domain for Local SEPP
config.localsepp.securityCapability	Security Capability supported by Local SEPP.
config.localsepp.tls.certificate	Certificate
config.localsepp.tls.privateKey	Private Key
config.remotesepps.domain	Domain for Remote SEPP
config.remotesepps.caCertificate	CA Certificate
config.remotesepps.n32c.ip	N32C ip address

Table 4-2 (Cont.) SEPP Parameters

Attribute Name	Attribute Description
config.remotesepps.n32c.port	N32C port
config.remotesepps.n32f.ip	N32F ip address
config.remotesepps.n32f.port	N32F port

SEPP Deployment

This section describes the steps to deploy SEPP Server and Client on CNE. The SEPP Server and the Client must be deployed in different clusters.

Server Deployment

This procedure describes the steps to deploy SEPP Server on CNE.

Table 4-3 SEPP Server Deployment

Step #	Procedure	Description
1 ☐	Prepare custom_values_server.yaml file	Prepare a custom_values_server.yaml file with the required parameter information. Refer to Server Yaml File for sample YAML file.
2 ☐	Navigate to the directory where ocsepp-1.2.0.tgz is extracted	Navigate to the directory where ocsepp-1.2.0.tgz is extracted
3 ☐	Deploy SEPP Server	Execute the following command: `helm install ocsepp-server/ --name <deployment_name> --namespace <namespace_name> -f <customized_server_yaml_file.yaml>` Where: **deployment_name** and **namespace_name**: depends on customer configuration **customized_yaml_file.yaml**: Yaml file after modifying the values based on the requirement.
4 ☐	Check repo status	Execute `helm ls` to check the deployment status.
5 ☐	Check svc status	Check if all the services are deployed and running: `kubectl -n <namespace_name> get services` **Note**: Status must be Running and Ready must be 1/1.
6 ☐	Verify SEPP deployment	Execute command `helm status <deployment_name>` and verify deployment, pod and service status should be up.

Client Deployment

This procedure describes the steps to deploy SEPP Client on CNE.

Table 4-4 SEPP Client Deployment

Step #	Procedure	Description
1 ☐	Prepare custom_values_client.yaml file	Prepare a custom_values_client.yaml file with the required parameter information. Refer to Client Yaml File for sample YAML files.
2 ☐	Navigate to directory where ocsepp-1.2.0.tgz is extracted on Master node	Navigate to directory where ocsepp-1.2.0.tgz is extracted on Master node :
3 ☐	Deploy SEPP Client	Execute the following command: `helm install ocsepp-client/ --name <deployment_name> --namespace <namespace_name> -f <customized_client_yaml_file.yaml>` Where: **deployment_name** and **namespace_name**: depends on customer configuration **customized_yaml_file.yaml**: Yaml file after modifying the client parameter values based on the requirement. **Note**: "SEPP Server Deployment" and "SEPP Client Deployment" should be deployed on SEPP2 and SEPP1 respectively as well to have both mode working on both SEPP nodes. Enable either Server or Client mode is supported per SEPP.
4 ☐	Check repo status	Execute `helm ls` to check the deployment status.
5 ☐	Check svc status	Check if all the services are deployed and running: `kubectl -n <namespace_name> get services` **Note**: Status must be Running and Ready must be 1/1.

Uninstall SEPP

Following sections explain the procedure to uninstall SEPP server and client.

Uninstall SEPP

Table 4-5 Uninstall SEPP

Step #	Procedure	Description
1 ☐	Uninstall SEPP client	Execute command to uninstall SEPP client: `helm delete sepp-client --purge`
2 ☐	Uninstall SEPP Server	Execute command to uninstall SEPP server: `helm delete sepp-server --purge`

5
Sample Yaml Files

Following are the sample YAML files for SEPP deployment:

- Server Yaml File
- Client Yaml File

Server Yaml File

Following is the sample SEPP server Yaml file:

```
# Common Services Configuration - NRF and MySQL
nsregistration:
  configFiles:
    nf.profile: |-
      {
        "plmn": {"mcc": "310", "mnc": "14"},
        "ipv4Addresses": ["10.178.246.11"],
        "priority": 1
      }
  nrf:
    host: http://10.75.157.63
    port: 31605

svc:
  mysqlPrimaryHost: 10.75.203.106
  mysqlUsername: seppusr
  mysqlPassword: sepppasswd

ocsepp-client:
  enabled: false
ocsepp-server:
  enabled: true

# Infrastrucutre Configuration - IP, Replica Count
gateways:
  sepp-ingressgateway:
    # To provide, replica count disable auto-scaling.
    autoscaleEnabled: false
    replicaCount: 1
    # To enable Metal LB, provide serviceAnnotations and loadBalancerIP
    #serviceAnnotations:
        #metallb.universe.tf/address-pool: signaling
    #loadBalancerIP: 10.x.x.x
    #type: LoadBalancer

    ports:
    - port: 8080
```

```
      targetPort: 8080
      nodePort: 31380
      name: http2
    - port: 8443
      targetPort: 8443
      nodePort: 31390
      name: https

global:
  # Infrastructure Configuration - Software Images
  nsRegistration:
    image: ocspf-registry.us.oracle.com:5000/ocsepp-nsregistration
    tag: 1.2.0
    pullPolicy: IfNotPresent
  n32Client:
    image: ocspf-registry.us.oracle.com:5000/ocsepp-client
    tag: pk102
    pullPolicy: IfNotPresent
  n32Server:
    image: ocspf-registry.us.oracle.com:5000/ocsepp-server
    tag: pkfinal
    pullPolicy: IfNotPresent
  pilot:
    image: ocspf-registry.us.oracle.com:5000/istio/pilot
    tag: original
    pullPolicy: IfNotPresent
  proxy:
    image: ocspf-registry.us.oracle.com:5000/ars/sepp-worker
    tag: pk155
    pullPolicy: IfNotPresent
  sds:
    image: ocspf-registry.us.oracle.com:5000/istio/node-agent-k8s
    tag: original
    pullPolicy: IfNotPresent
  listeners:
    httpPort: 8080
    httpsPort: 8443
  config:
    localsepp:
      scp:
        ip: 10.178.254.170
        port: 80
      domain: sepp.visitor.com
      securityCapability: TLS
      tls:
        certificate: |-
          -----BEGIN CERTIFICATE-----
          MIIDyjCCArKgAwIBAgIJANO6mMns+CWEMA0GCSqGSIb3DQEBCwUAMHoxCzAJBgNV
          BAYTAklOMQswCQYDVQQIDAJLQTEMMAoGA1UEBwwDQkxSMQ8wDQYDVQQKDAZPcmFj
          bGUxDTALBgNVBAsMBENHQlUxEjAQBgNVBAMMCWxvY2FsaG9zdDEcMBoGCSqGSIb3
          DQEJARYNYWJjQGdtYWlsLmNvbTAeFw0xOTA0MDExMTExMTJaFw0yMDAzMzExMTEx
          MTJaMHoxCzAJBgNVBAYTAklOMQswCQYDVQQIDAJLQTEMMAoGA1UEBwwDQkxSMQ8w
          DQYDVQQKDAZPcmFjbGUxDTALBgNVBAsMBENHQlUxEjAQBgNVBAMMCWxvY2FsaG9z
          dDEcMBoGCSqGSIb3DQEJARYNYWJjQGdtYWlsLmNvbTCCASIwDQYJKoZIhvcNAQEB
          BQADggEPADCCAQoCggEBALau4TZylSvrxNtuk6ec65zv83gnd++Lioei3QDutU/J
```

```
  vVyl0t51rkf1tyqmqjXhYetFwAAH3sNJ5etGKuq0N4opHZRsUaKhxVgPuZ+5bOzT
  OD/iCW+CEsGPGyGN9agUJNp7TH0R3+lruGz+Z7u0M90rlEl/dJkWgMwzZ69O17pB
  zML3fBQ+p5do7p5jzvMMLT7JzzVW+k+2+kEzuIMh0Yp1IpA/e9Qk9vI7uKYI7Uxy
  UuaPTECZrDffe+eTVTkrXRt7v0JaUM6LptI7RgL6bnSpTGz0kwN0gO7fZCxGfPSv
  7KpY7gOenZ4QtEhxg9dTNGEGEU4P7/ju2gAyWMfOjMkCAwEAAaNTMFEwHQYDVR0O
  BBYEFNQn+TW2QBzOFi2XG/IF4EBe7kePMB8GA1UdIwQYMBaAFNQn+TW2QBzOFi2X
  G/IF4EBe7kePMA8GA1UdEwEB/wQFMAMBAf8wDQYJKoZIhvcNAQELBQADggEBACgW
  kXWYuwv9OA9nScdbInXubPFpOBDK+V7LA7AnnFElxQldcowzPQvzhSmBB3UBSxfK
  JAsG4eIztVldYavECKDzk9pP1/pYtGA1SRhw2wocqKtORlZoerx7ZcVo8ogtlJIj
  +4K0AIerxREalobAkZb/vambw+Hmj6YTKFG69GTtTAJVK3A33f9xnbCP0mplYvsq
  qitUXmon713P/Zcadwz/kGfwUGzzAFO8VZcKHGS8mxaRKSHlwZMETpE2Zlj9LZDc
  +uWKg29PssujJ17T0IGNxn0C6sH2R2IEPAq4xWYwf0vkHO4SfoacpDJgfCXZMEE3
  wlMx41TEYSgcSqCcp8s=
  -----END CERTIFICATE-----
privateKey: |-
  -----BEGIN RSA PRIVATE KEY-----
  MIIEowIBAAKCAQEAtq7hNnKVK+vE226Tp5zrnO/zeCd374uKh6LdAO61T8m9XKXS
  3nWuR/W3KqaqNeFh60XAAAfew0nl60Yq6rQ3iikdlGxRoqHFWA+5n7ls7NM4P+IJ
  b4ISwY8bIY31qBQk2ntMfRHf6Wu4bP5nu7Qz3SuUSX90mRaAzDNnr07XukHMwvd8
  FD6nl2junmPO8wwtPsnPNVb6T7b6QTO4gyHRinUikD971CT28ju4pgjtTHJS5o9M
  QJmsN99755NVOStdG3u/QlpQzoum0jtGAvpudKlMbPSTA3SA7t9kLEZ89K/sqlju
  A56dnhC0SHGD11M0YQYRTg/v+O7aADJYx86MyQIDAQABAoIBABThimaR1FEv4tF+
  Iyx+eEP4/WhXgpMD7TKxv/cyUdEr6xQi9CZvZxtcj7I1WLFN8MZWs6qNO74wvTIW
  VCN9s/d72aC0fORM/2Sgb4Q9SqELR5utt4xiXsh3Fg/QzSqIGupKO6T0HRbuNCdp
  MOw4ndEDATEhe29gLhqpKYnVRj1IxLC+dTUZ0pFxi6V35v6fYLU8H8IcmbrjTML4
  H2EADGeq7b27wfSc+FL7fwFr/grTqy73obM1zBKkBcLvE1ErLGenbZbEDM0FJjlf
  8PB6Ewlxym752tcY8Lnp44dCwmBhWGGaNjREXOjqzToVzKcg59P84jy/CZ+tVTwF
  zZDzTDECgYEA2xzBJywYsflB2sIN+w9xysGJEKlpzTl/iC8UZIffkSrDRpBnbd94
  pIEpL+sBFf1GkW0AiK62STrhzu1QQX8+Kw3/D2fH8TY501NKn3KOwAgFzc5Wuc/S
  ClMU3Og2FSApfxOslMbOZC/+Fja5DjbjEkyDbYAXNq1IPlE/tqP0b40CgYEA1XAb
  82NqAwoJg4H+ZNa05IkvfIxBhhghG4g7nM2E1+mcawfS3uKQMt3AwVw7J7GI2KhQ
  gnkhBwtXRF8U96BqbMUlS3ok5MUft91163rA7cQQAJe0GiszeJh9R33PE56tBOFS
  68LB5jS0MFbatgw9Lj/0rAThXr5F5dReDq+p9S0CgYBKtBsGh/pDc4AIXXD2z+U0
  A5f/nkL8PUZF4AdL3ydSDwpU3Jbm1vIC5CZut+i+3oNYwZkVALwVa4XhTve13PQN
  KdB0KCX7D0nXyuX+Rsh0oEeaS2c2Iqyx6HGMf38w5K5BLSwB7WYgslwmprGhLwVs
  D7ofczR2581hscHPO0bzYQKBgBJeO4mOnKj2TCtNHJ+A+sBQLg4B5AGuQeskpjyw
  UyZhrFxpp/QWe2JlQxlg3pZj6Or8UTFpSzZX+4KezCcjXwVNUhBUyqgFbt1b6bIC
  Nmg/30CtzYoS/bL7LIziftepaCprWb+AWz98eaVPVDMmin1Yc636HYsRxOIqjI2n
  AHFhAoGBAK2jTK4b2DMukPJWpuMTZgJHQLGYUiyuzx4g0rSOM5ZKhlv3ES7fbd5N
  4BcsBEoHIZNmv6Loxv2v1sWTGOthyxDY/t/Nl0n+E0MJj80D132+fO+5Uo6NFiS/
  nktoowkZ1R7Ns33feOd36IlD3v4Qg3f39ImOkBsTKIwT4Vcq/ltx
  -----END RSA PRIVATE KEY-----
minProtocolVersion: TLSV1_3
maxProtocolVersion: TLSV1_3
cipherSuites:
  - "[ECDHE-ECDSA-AES128-GCM-SHA256|ECDHE-ECDSA-CHACHA20-POLY1305]"
  - "[ECDHE-RSA-AES128-GCM-SHA256|ECDHE-RSA-CHACHA20-POLY1305]"
  - ECDHE-ECDSA-AES128-SHA256
  - ECDHE-RSA-AES128-SHA256
  - ECDHE-ECDSA-AES128-SHA
  - ECDHE-RSA-AES128-SHA
  - AES128-GCM-SHA256
  - AES128-SHA256
  - AES128-SHA
  - ECDHE-ECDSA-AES256-GCM-SHA384
```

```
        - ECDHE-RSA-AES256-GCM-SHA384
        - ECDHE-ECDSA-AES256-SHA384
        - ECDHE-RSA-AES256-SHA384
        - ECDHE-ECDSA-AES256-SHA
        - ECDHE-RSA-AES256-SHA
        - AES256-GCM-SHA384
        - AES256-SHA256
        - AES256-SHA
    remotesepps:
      - domain: sepp.home.com
        caCertificate: |-
          -----BEGIN CERTIFICATE-----
          MIIDyDCCArCgAwIBAgIJAJ/NlN2hRmiiMA0GCSqGSIb3DQEBCwUAMHkxCzAJBgNV
          BAYTAlVTMQswCQYDVQQIDAJDQTELMAkGA1UEBwwCU1YxDTALBgNVBAoMBENHQlUx
          DzANBgNVBAsMBk9yYWNsZTESMBAGA1UEAwwJbG9jYWxob3N0MRwwGgYJKoZIhvcN
          AQkBFg14eXpAZ21haWwuY29tMB4XDTE5MDQwMTExMTQxNloXDTIwMDMzMTExMTQx
          NloweTELMAkGA1UEBhMCVVMxCzAJBgNVBAgMAkNBMQswCQYDVQQHDAJTVjENMAsG
          A1UECgwEQ0dCVTEPMA0GA1UECwwGT3JhY2xlMRIwEAYDVQQDDAlsb2NhbGhvc3Qx
          HDAaBgkqhkiG9w0BCQEWDXh5ekBnbWFpbC5jb20wggEiMA0GCSqGSIb3DQEBAQUA
          A4IBDwAwggEKAoIBAQC/zV8n5kOOKWLuqlZD1cf7KAtgSAH1MB8biR9mKAJ/sH1M
          1/OR11FXrEs4Sq3yB+6HcNgwg/le3XAncGXbKRSI8MeuLftewwfj2q9q8QnIUftX
          Dlyq92Zd675wpPzp4JjRewPgJFsSBMa8svZBZJzIDWLaIke90Bx9bJNzhs+aLijW
          10rZVeO5bRzKaU8ze/7Py1IGc/HWhR+S+DRVInMwMui5ozqyZZaprVHjDititSoS
          HcWphI0ef8e6w/mfe2AcUKNugI4GGfK+egJ3SXSe5BzJSx+EJgKQaSP3/DTGCSju
          C33uSKch43IhX+zWL2FOQD0I/Y8YCIYHTA0GJevPAgMBAAGjUzBRMB0GA1UdDgQW
          BBS5wMSwF048S+pa+onXF7t5LBw3EDAfBgNVHSMEGDAWgBS5wMSwF048S+pa+onX
          F7t5LBw3EDAPBgNVHRMBAf8EBTADAQH/MA0GCSqGSIb3DQEBCwUAA4IBAQBQEG9o
          IAIOwGkpbsqbFfFti9gSilaaP8rzSN8Thj7PvHxem6oc/Gj9ioyWcCAKk3t6gZgd
          dtXo5SJp+DXFpNnzmmLkHFLbloZwc8QwPoIE4aqiYknBlKdvmXGZSaRYI8CEk8dK
          uH5Dot5mJWGE391zAuRPqvJSl4rborTZGfk1Nl8KQPi4P2GnoFxZHzM8Pt6LYYJq
          lOn7BgF8rGMoSwVB1+Znt2R5KaeMANE4WOW9qrqE2fd0Oq23cOBXckizCzc5HwDF
          6Ny3JHxs/sf0ZX8teyXlHgv153O/KMaQijYcU1WCJ5ETAC/UbzkRgWUbcoDFFUSr
          sRpvmOpp7/KKGh3c
          -----END CERTIFICATE-----
        n32c:
          ip: 10.178.254.249
          port: 31390
        n32f:
          ip: 10.178.254.249
          port: 31390
```

Client Yaml File

Following is the sample SEPP client Yaml file:

```
# Common Services Configuration - NRF and MySQL
nsregistration:
  configFiles:
    nf.profile: |-
      {
        "plmn": {"mcc": "310", "mnc": "14"},
        "ipv4Addresses": ["10.178.246.11"],
        "priority": 1
      }
```

```
  nrf:
    host: http://10.75.157.63
    port: 31605

svc:
  mysqlPrimaryHost: 10.75.203.106
  mysqlUsername: seppusr
  mysqlPassword: sepppasswd

ocsepp-client:
  enabled: true
ocsepp-server:
  enabled: false

# Infrastrucutre Configuration - IP, Replica Count
gateways:
  sepp-ingressgateway:
    # To provide, replica count disable auto-scaling.
    autoscaleEnabled: false
    replicaCount: 1
    # To enable Metal LB, provide serviceAnnotations and loadBalancerIP
    #serviceAnnotations:
        #metallb.universe.tf/address-pool: signaling
    #loadBalancerIP: 10.x.x.x
    #type: LoadBalancer

    ports:
    - port: 8080
      targetPort: 8080
      nodePort: 31380
      name: http2
    - port: 8443
      targetPort: 8443
      nodePort: 31390
      name: https

global:
  # Infrastructure Configuration - Software Images
  nsRegistration:
    image: ocspf-registry.us.oracle.com:5000/ocsepp-nsregistration
    tag: 1.2.0
    pullPolicy: IfNotPresent
  n32Client:
    image: ocspf-registry.us.oracle.com:5000/ocsepp-client
    tag: pk102
    pullPolicy: IfNotPresent
  n32Server:
    image: ocspf-registry.us.oracle.com:5000/ocsepp-server
    tag: pkfinal
    pullPolicy: IfNotPresent
  pilot:
    image: ocspf-registry.us.oracle.com:5000/istio/pilot
    tag: original
    pullPolicy: IfNotPresent
  proxy:
```

```
  image: ocspf-registry.us.oracle.com:5000/ars/sepp-worker
  tag: pk155
  pullPolicy: IfNotPresent
sds:
  image: ocspf-registry.us.oracle.com:5000/istio/node-agent-k8s
  tag: original
  pullPolicy: IfNotPresent
listeners:
  httpPort: 8080
  httpsPort: 8443
config:
  localsepp:
    domain: sepp.home.com
    securityCapability: TLS
    scp:
      ip: 10.75.203.79
      port: 30081
    tls:
      certificate: |-
        -----BEGIN CERTIFICATE-----
        MIIDyDCCArCgAwIBAgIJAJ/NlN2hRmiiMA0GCSqGSIb3DQEBCwUAMHkxCzAJBgNV
        BAYTAlVTMQswCQYDVQQIDAJDQTELMAkGA1UEBwwCU1YxDTALBgNVBAoMBENHQlUx
        DzANBgNVBAsMBk9yYWNsZTESMBAGA1UEAwwJbG9jYWxob3N0MRwwGgYJKoZIhvcN
        AQkBFg14eXpAZ21haWwuY29tMB4XDTE5MDQwMTExMTQxNloXDTIwMDMzMTExMTQx
        NloweTELMAkGA1UEBhMCVVMxCzAJBgNVBAgMAkNBMQswCQYDVQQHDAJTVjENMAsG
        A1UECgwEQ0dCVTEPMA0GA1UECwwGT3JhY2xlMRIwEAYDVQQDDAlsb2NhbGhvc3Qx
        HDAaBgkqhkiG9w0BCQEWDXh5ekBnbWFpbC5jb20wggEiMA0GCSqGSIb3DQEBAQUA
        A4IBDwAwggEKAoIBAQC/zV8n5kOOKWLuqlZD1cf7KAtgSAH1MB8biR9mKAJ/sH1M
        1/OR11FXrEs4Sq3yB+6HcNgwg/le3XAncGXbKRSI8MeuLftewwfj2q9q8QnIUftX
        Dlyq92Zd675wpPzp4JjRewPgJFsSBMa8svZBZJzIDWLaIke90Bx9bJNzhs+aLijW
        10rZVeO5bRzKaU8ze/7Py1IGc/HWhR+S+DRVInMwMui5ozqyZZaprVHjDititSoS
        HcWphI0ef8e6w/mfe2AcUKNugI4GGfK+egJ3SXSe5BzJSx+EJgKQaSP3/DTGCSju
        C33uSKch43IhX+zWL2FOQD0I/Y8YCIYHTA0GJevPAgMBAAGjUzBRMB0GA1UdDgQW
        BBS5wMSwF048S+pa+onXF7t5LBw3EDAfBgNVHSMEGDAWgBS5wMSwF048S+pa+onX
        F7t5LBw3EDAPBgNVHRMBAf8EBTADAQH/MA0GCSqGSIb3DQEBCwUAA4IBAQBQEG9o
        IAIOwGkpbsqbFfFti9gSilaaP8rzSN8Thj7PvHxem6oc/Gj9ioyWcCAKk3t6gZgd
        dtXo5SJp+DXFpNnzmmLkHFLbloZwc8QwPoIE4aqiYknBlKdvmXGZSaRYI8CEk8dK
        uH5Dot5mJWGE391zAuRPqvJSl4rborTZGfk1Nl8KQPi4P2GnoFxZHzM8Pt6LYYJq
        lOn7BgF8rGMoSwVB1+Znt2R5KaeMANE4WOW9qrqE2fd0Oq23cOBXckizCzc5HwDF
        6Ny3JHxs/sf0ZX8teyXlHgv153O/KMaQijYcU1WCJ5ETAC/UbzkRgWUbcoDFFUSr
        sRpvmOpp7/KKGh3c
        -----END CERTIFICATE-----
      privateKey: |-
        -----BEGIN RSA PRIVATE KEY-----
        MIIEogIBAAKCAQEAv81fJ+ZDjili7qpWQ9XH+ygLYEgB9TAfG4kfZigCf7B9TNfz
        kddRV6xLOEqt8gfuh3DYMIP5Xt1wJ3Bl2ykUiPDHri37XsMH49qvavEJyFH7Vw5c
        qvdmXeu+cKT86eCY0XsD4CRbEgTGvLL2QWScyA1i2iJHvdAcfWyTc4bPmi4o1tdK
        2VXjuW0cymlPM3v+z8tSBnPx1oUfkvg0VSJzMDLouaM6smWWqa1R4w4rYrUqEh3F
        qYSNHn/HusP5n3tgHFCjboCOBhnyvnoCd0l0nuQcyUsfhCYCkGkj9/w0xgko7gt9
        7kinIeNyIV/s1i9hTkA9CP2PGAiGB0wNBiXrzwIDAQABAoIBABQHonRMO6nQ8J/z
        8eZLoQK9f9KiMnIkgFsjyr+kVf53s94efzUvwzLgr0pFojywT1ydkDYg0h3yChBU
        UI6+j4JtgqzR6HpQ67YD1GXanibpSNIikdLY2zvbrpuc3zydU9gsfI8fvNL45Lg4
        CDd0Bltt6nDVO6C65v7CI/PglDWJhia2oz3HfR8ruDPw3EP8W+L7qtSVcKprVj82
        v8LQC/SVhzwCAyA9RlpU/z6NHD5wqn3a4+f3fNnAzFWfVp8S8ZxYemiw7q0mowob
        2ogf9eHuIMy2P20bqHcU4LeJlaGz1PkPiUtXuRPwRJNkA1FiR+2dm/35BofO/XpZ
```

```
      m9UYoSECgYEA6q4PoHYHB/8yQv+2N2xFZmgW83fFAsfCojPteSxb7lUBf/9EEkbB
      PuY30PCeyOceEBy+Iz7PbkxBzcwkdPos1qs82knGMOM7TCDFlVm1kJRWg/M+LBP9
      c14mj3+PbazWQJTIo2fPzbJUSY29qBzyUWXtOaQIZ8pSxTVVc8lhTWsCgYEA0Tob
      OufE8x5LVRdqOF0b97za50z9cAkS9d6hb9eJ+ApEkTe07DBgnhmDzup98WMEvPM6
      Kd2jb0U9ACAo3Dudz1dDtfLHjdWd27QKInS2hw5xXceStMV55NOAFNQ0oF+dfJa8
      aBua8m9b+BzQQAh6NSqytcHVak1aliDY5GUl8C0CgYBePOlfiSXHq022o9K7LMot
      lkzpFcZSGH9q/Sk2SH7eFNqWWJ4wLKN7K51sVMOeb1ieJbygkJ9hblPaXUiihLeu
      uHKmQYvJo+Xy6xIMqEqFtVuMfwgPUTOsuTkI1LN22jnrExQCsjQ7KIo6QyXOtVkF
      IMYDKICLlS5prMIUzeA54wKBgHfBAWry05iv40Bd+Y8vQ93Fe6neOEVS/EY8WjyQ
      qsiM3/gaYXS6r+JuCjJ5pwJtwX2A3e6ujGgYwjR7M8fyW34cnYXb4vo8pXDmGNLl
      6L9eteaOX1sWmJEvuWSynTiZ4aM5B7ey7ToMISDfJRcxgvlBai58NnH0un+pZ1s6
      xb81AoGAB7sIVYgdJXXCS1KMtYlhpxhOOOkvuJBe0YSfzYXb9kjktoKOK8xSqKGE
      mLQsZzMWP5CubRY3PiJ7GhcV1RvEJsj5sR493Mk8ukEP/LTWlZMh7BR5YXr4tg2U
      9gCKExnTlMkeDJNRuw43MslPxJiaXMds7BDgkCvcf3Av9OEvEvk=
      -----END RSA PRIVATE KEY-----
    minProtocolVersion: TLSV1_3
    maxProtocolVersion: TLSV1_3
    cipherSuites:
      - "[ECDHE-ECDSA-AES128-GCM-SHA256|ECDHE-ECDSA-CHACHA20-POLY1305]"
      - "[ECDHE-RSA-AES128-GCM-SHA256|ECDHE-RSA-CHACHA20-POLY1305]"
      - ECDHE-ECDSA-AES128-SHA256
      - ECDHE-RSA-AES128-SHA256
      - ECDHE-ECDSA-AES128-SHA
      - ECDHE-RSA-AES128-SHA
      - AES128-GCM-SHA256
      - AES128-SHA256
      - AES128-SHA
      - ECDHE-ECDSA-AES256-GCM-SHA384
      - ECDHE-RSA-AES256-GCM-SHA384
      - ECDHE-ECDSA-AES256-SHA384
      - ECDHE-RSA-AES256-SHA384
      - ECDHE-ECDSA-AES256-SHA
      - ECDHE-RSA-AES256-SHA
      - AES256-GCM-SHA384
      - AES256-SHA256
      - AES256-SHA
remotesepps:
  - domain: sepp.visitor.com
    caCertificate: |-
      -----BEGIN CERTIFICATE-----
      MIIDyjCCArKgAwIBAgIJANO6mMns+CWEMA0GCSqGSIb3DQEBCwUAMHoxCzAJBgNV
      BAYTAklOMQswCQYDVQQIDAJLQTEMMAoGA1UEBwwDQkxSMQ8wDQYDVQQKDAZPcmFj
      bGUxDTALBgNVBAsMBENHQlUxEjAQBgNVBAMMCWxvY2FsaG9zdDEcMBoGCSqGSIb3
      DQEJARYNYWJjQGdtYWlsLmNvbTAeFw0xOTA0MDExMTExMTJaFw0yMDAzMzExMTEx
      MTJaMHoxCzAJBgNVBAYTAklOMQswCQYDVQQIDAJLQTEMMAoGA1UEBwwDQkxSMQ8w
      DQYDVQQKDAZPcmFjbGUxDTALBgNVBAsMBENHQlUxEjAQBgNVBAMMCWxvY2FsaG9z
      dDEcMBoGCSqGSIb3DQEJARYNYWJjQGdtYWlsLmNvbTCCASIwDQYJKoZIhvcNAQEB
      BQADggEPADCCAQoCggEBALau4TZylSvrxNtuk6ec65zv83gnd++Lioei3QDutU/J
      vVyl0t51rkf1tyqmqjXhYetFwAAH3sNJ5etGKuq0N4opHZRsUaKhxVgPuZ+5bOzT
      OD/iCW+CEsGPGyGN9agUJNp7TH0R3+lruGz+Z7u0M90rlEl/dJkWgMwzZ69O17pB
      zML3fBQ+p5do7p5jzvMMLT7JzzVW+k+2+kEzuIMh0Yp1IpA/e9Qk9vI7uKYI7Uxy
      UuaPTECZrDffe+eTVTkrXRt7v0JaUM6LptI7RgL6bnSpTGz0kwN0gO7fZCxGfPSv
      7KpY7gOenZ4QtEhxg9dTNGEGEU4P7/ju2gAyWMfOjMkCAwEAAaNTMFEwHQYDVR0O
      BBYEFNQn+TW2QBzOFi2XG/IF4EBe7kePMB8GA1UdIwQYMBaAFNQn+TW2QBzOFi2X
      G/IF4EBe7kePMA8GA1UdEwEB/wQFMAMBAf8wDQYJKoZIhvcNAQELBQADggEBACgW
```

```
  kXWYuwv9OA9nScdbInXubPFpOBDK+V7LA7AnnFElxQldcowzPQvzhSmBB3UBSxfK
  JAsG4eIztVldYavECKDzk9pP1/pYtGA1SRhw2wocqKtORlZoerx7ZcVo8ogtlJIj
  +4K0AIerxREalobAkZb/vambw+Hmj6YTKFG69GTtTAJVK3A33f9xnbCP0mplYvsq
  qitUXmon713P/Zcadwz/kGfwUGzzAFO8VZcKHGS8mxaRKSHlwZMETpE2Zlj9LZDc
  +uWKg29PssujJ17T0IGNxn0C6sH2R2IEPAq4xWYwf0vkHO4SfoacpDJgfCXZMEE3
  wlMx41TEYSgcSqCcp8s=
  -----END CERTIFICATE-----
n32c:
  ip: 10.75.203.74
  port: 31390
n32f:
  ip: 10.75.203.74
  port: 31390
```