ORACLE

Deploying Oracle SBC with High availability in Oracle Cloud Infrastructure

Technical Application Note

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Revision History

Version	Description of Changes	Date Revision Completed
1.0	Deploying Oracle SBC with HA in Oracle cloud	15-11-2019
2.0	Added Oracle SBC marketplace deployment	13-05-2020
3.0	Refreshed the app note with new screenshots and SBC version	10-09-2024

Table of Contents

1. Introduction

This document describes how to deploy the Oracle SBC with High availability configuration on OCI. This technical application note is intended for IT or telephony professionals. It assumes that the reader is familiar with basic operations of the Oracle Session Border Controller and OCI Cloud Deployments.

2. Document Overview

You can deploy the Oracle Communications Session Border Controller (OCSBC) on OCI via OCI Marketplace. OCI provides multiple ways of managing your environment(s), including via its web portal and CLI interfaces. This document focuses on the portal. This procedure also assume you have reviewed Oracle Cloud Infrastructure documentation and can access portal pages and navigation. This document also assumes that you are aware of the high availability configuration in Oracle SBC.

3. Related documentation

3.1 Oracle SBC

- Oracle® Communications Session Border Controller Platform Preparation and Installation Guide
- Oracle® Enterprise Session Border Controller Web GUI User Guide
- Oracle® Enterprise Session Border Controller Configuration Guide
- Oracle® Enterprise Session Border Controller Release Notes

3.2 Oracle Cloud Infrastructure

- Oracle Cloud Infrastructure Documentation
- Managing Compartments
- OCI Security Best Practices
- Managing Dynamic Groups
- OCI Training

4. Requirements

1) A subscription for Oracle Cloud Interface called Tenancy account. For more information, refer the documentation here https://docs.oracle.com/en-us/iaas/Content/GSG/Concepts/settinguptenancy.htm

Tip: You can utilize the search bar at the top of the OCI portal to quickly locate any element, resource or document during configuration and deployment of the Oracle SBC in OCI Cloud.

5. Create and deploy on OCI

5.1 Prerequisites

The following pre-requisites should be taken care, before deploying the oracle SBC on the OCI cloud.

- Selecting a Region
- Setting up or picking a compartment
- Creating dynamic groups and policies
- Setting up Networking
- Setting up Security lists.

5.2 Selecting a Region

Oracle Cloud Infrastructure is hosted in regions and availability domains. A region is a localized geographic area, and an availability domain is one or more data centers located within a region. A region is composed of one or more availability domains. Please select the following

- Accessible region
- Availability domain
- Fault domain

Note: For deploying the Oracle SBC in HA mode, the SBC's can be in

- Either the same availability region with different fault domains
- Different availability regions altogether

Choosing either of the above, depends entirely on the customer environment. In this deployment, we have deployed two SBC's in HA mode in same availability region with different fault domain.

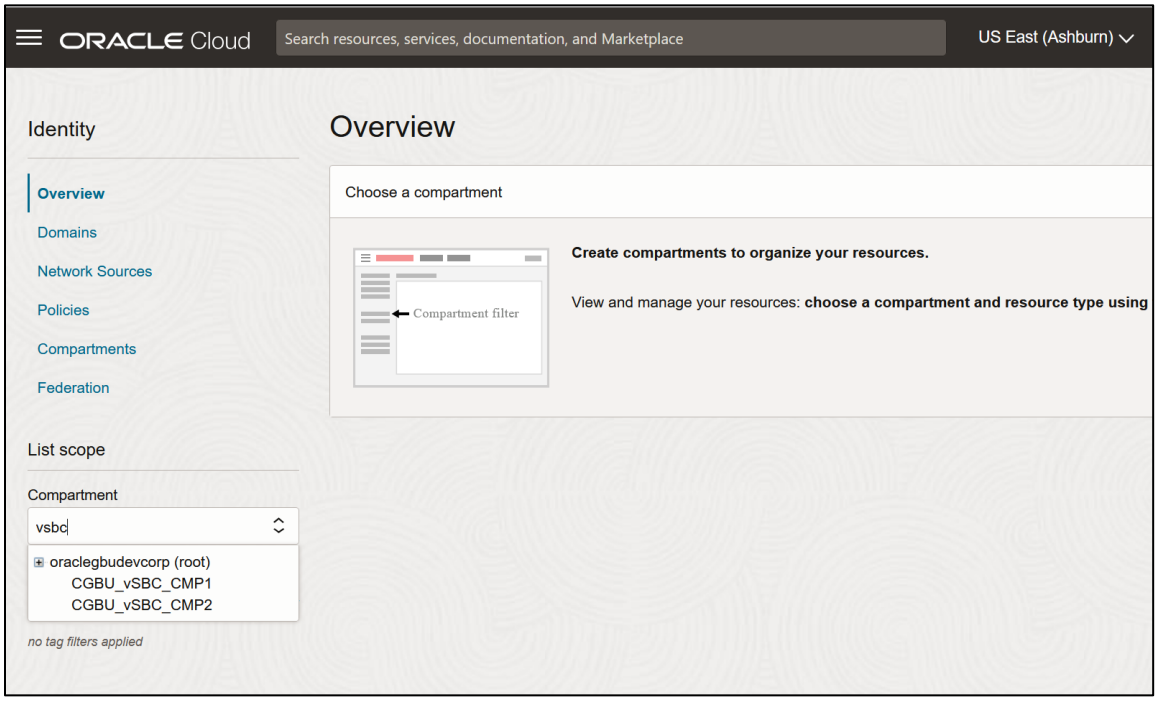
5.3 Setting up/Picking a compartment

Compartments are the primary building blocks you use to organize your cloud resources. Compartments helps us organize and isolate your resources to make it easier to manage and secure access to them.
When your tenancy is provisioned, a root compartment is created for you. If you are looking to set up a new compartment, please refer the documentation here.

https://docs.oracle.com/en-us/iaas/Content/Identity/Tasks/managingcompartments.htm

Setting up a new compartment depends on the tenancy as well. For more information, please refer
https://docs.cloud.oracle.com/iaas/Content/GSG/Concepts/settinguptenancy.htm

Similarly, resources can be deployed in the existing compartment as well. this compartment comes along with your tenancy account and can be chosen as shown below.



Oracle SBC can be deployed in both a new and an existing compartment. Here we have chosen the existing compartment. Also, both the SBC's are deployed in the same compartment.

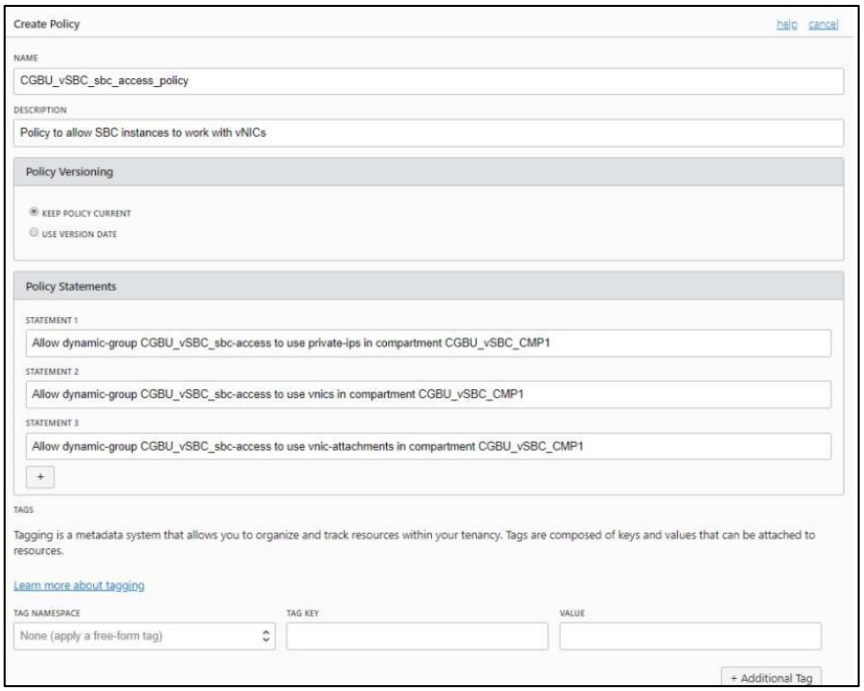
5.4 Creating Dynamic Groups and policy

Dynamic Groups allow instances to have permissions that a user would have. This is required for HA deployments as the instances need to make calls to the OCI API for state transitions.

For creating dynamic groups, go to Identity->dynamic group.

Create Policy

Create the following policy and assign it to the dynamic group.



Name: CGBU_vSBC_sbc_access_policy(this can be anything)

Policy Statements:

- Allow dynamic-group CGBU_vSBC_sbc-access to read all-resources in compartment CGBU_vSBC_CMP1
- Allow dynamic-group CGBU_vSBC_sbc-access to use private-ips in compartment CGBU_vSBC_CMP1
- Allow dynamic-group CGBU_vSBC_sbc-access to use vnics in compartment CGBU_vSBC_CMP1
- Allow dynamic-group CGBU_vSBC_sbc-access to use vnic-attachments in compartment CGBU_vSBC_CMP1

Note: The dynamic-group name, in this example CGBU_vSBC_sbc-access, shall match the name given to the Dynamic Group in the previous step.

5.5 Setting up Networking

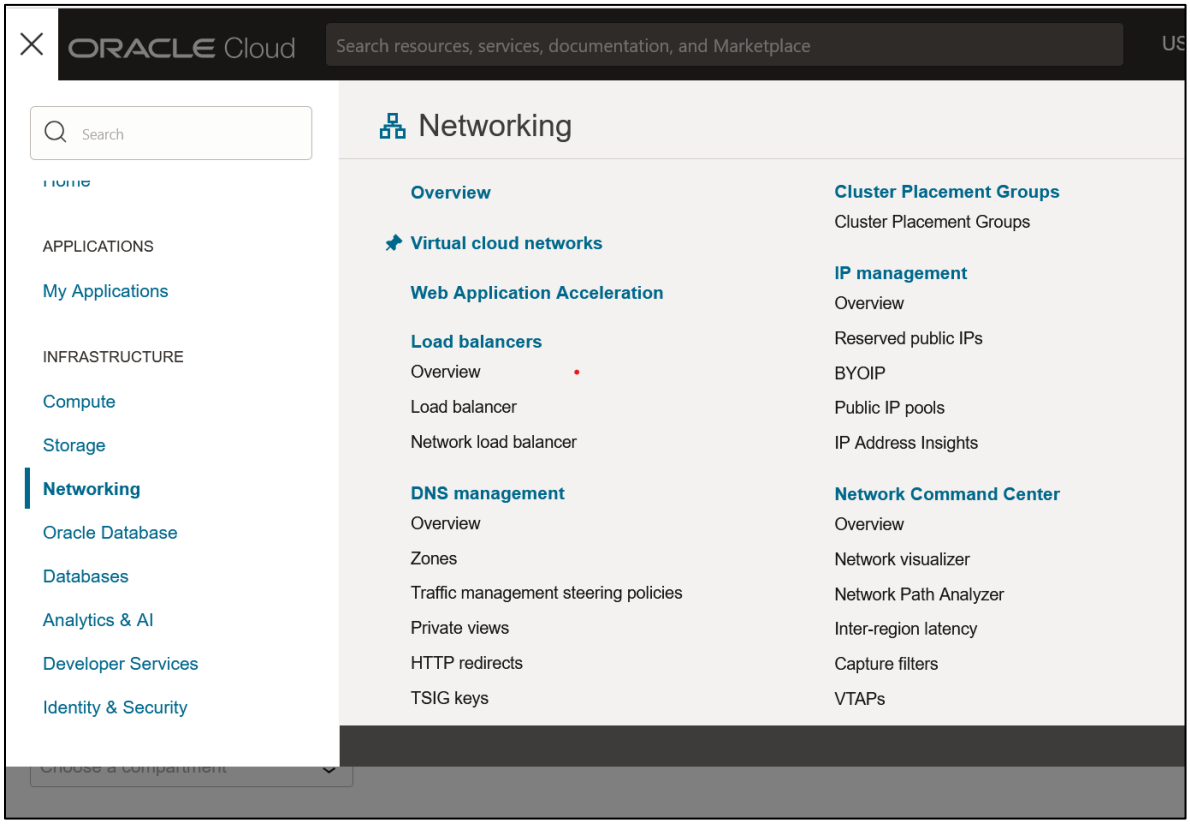
To setup networking on Oracle cloud, you have to create a Virtual Cloud Network (VCN) ,with all its resources.

5.5.1 Creating a Virtual cloud Network

Virtual cloud network is a private network that resides in Oracle data center and closely resembles a traditional network. A VCN resides in a single Oracle Cloud Infrastructure region and covers a single, contiguous IPv4 CIDR block of your choice. For more information on the virtual cloud networks, refer the following documentation

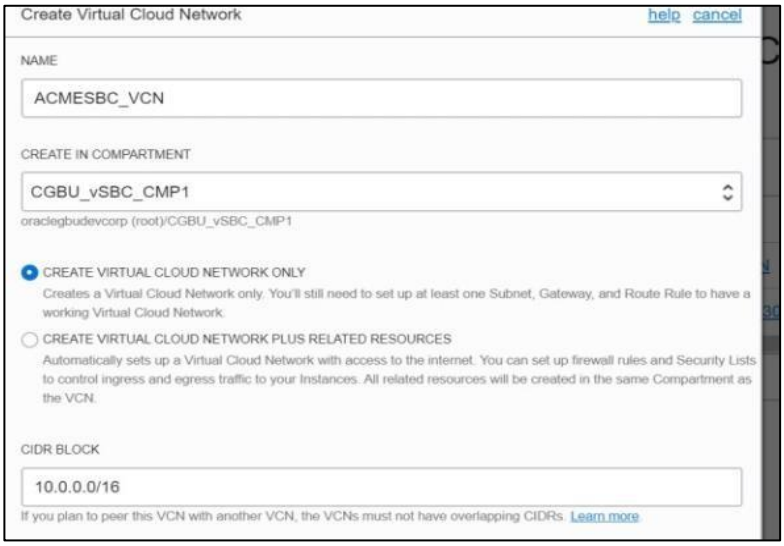
https://docs.oracle.com/en-us/iaas/Content/Network/Concepts/overview.htm

To create a Virtual cloud Network (VCN), go to Networking->Virtual cloud Networks



Here we are creating the related resources, one by one after creating the VCN. **Here we have chosen a CIDR 10.0.0.0/16 for deploying the SBC.**

Note: Choosing the CIDR block, varies according to your deployment



Here is the list of resources that are mandatory for the Oracle SBC to be deployed on the OCI.

- Subnets
- Route Tables - default
- Internet Gateways - default
- Security Lists
- DHCP Options - default

The following resources are required only based on the customer deployment and are optional.

- Dynamic Routing Gateways
- Local Peering Gateways
- NAT Gateways
- Service Gateways

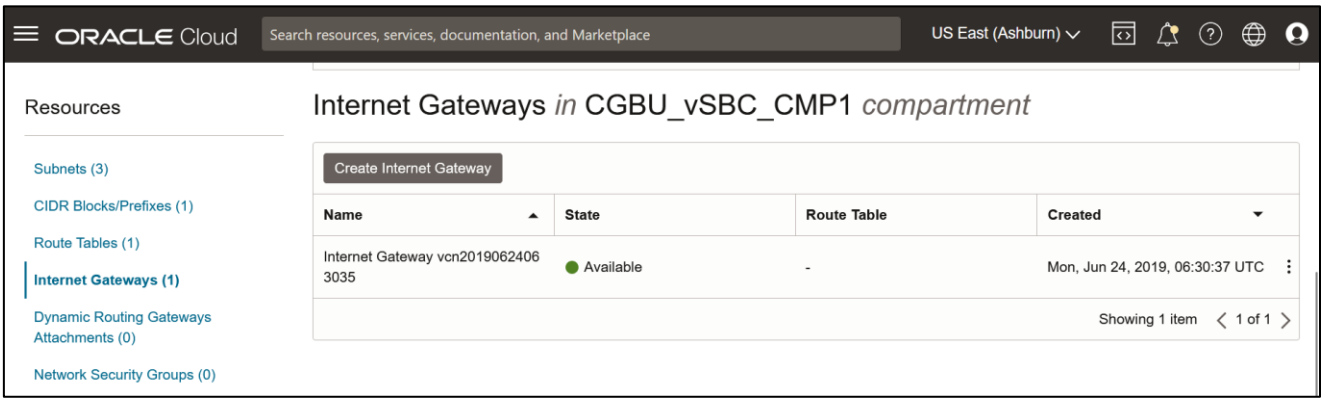
5.5.2 *Internet Gateway*

An internet gateway is an optional virtual router that connects the edge of the VCN with the internet. To use the gateway, the hosts on both ends of the connection must have public IP addresses for routing. Connections that originate in your VCN and are destined for a public IP address (either inside or outside the VCN) go through the internet gateway.

Connections that originate outside the VCN and are destined for a public IP address inside the VCN go through the internet gateway.

To create an internet gateway, follow the below steps.

- Select your VCN, click Internet Gateways
- Click Create Internet Gateway.
- Enter the following:
- Name
- Create in Compartment: The compartment where you want to create the internet gateway.
- Tags
- Click Create Internet Gateway.



5.5.3 *Route Tables*

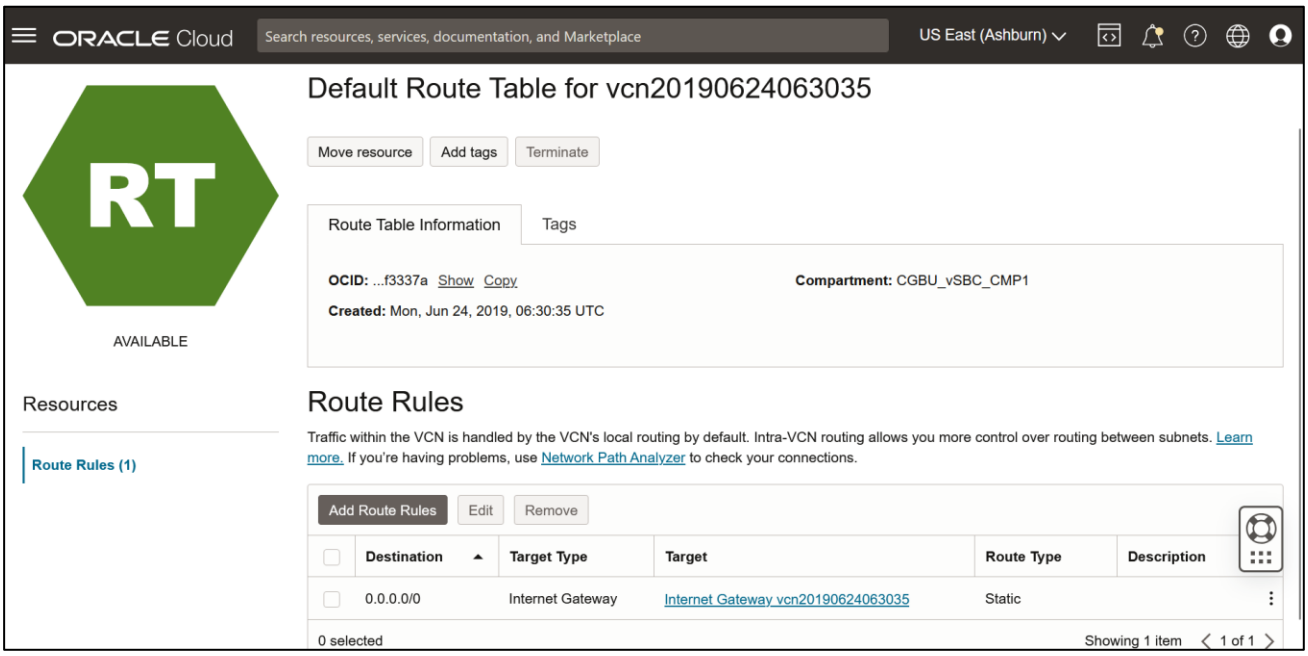
Each VCN automatically comes with a default route table that has no rules. If you don't specify otherwise, every subnet uses the VCN's default route table. When you add route rules to your VCN, you can simply add them to the default table if that suits your needs

Here, for Oracle SBC to work and connect to the outer world, we add the internet gateway to the route table to route it to the internet.

We have created 2 route tables for 3 subnets

- A route table with internet gateway added for management interface(wancom0)
- A route table with internet gateway added for media

For HA interface (wancom1 and wancom2) route tables are not required.

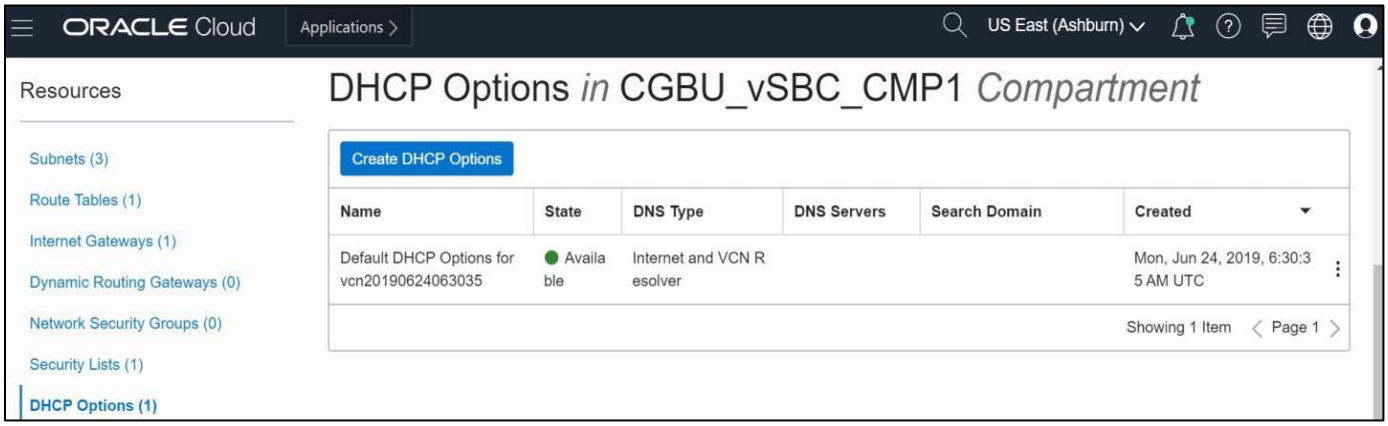


5.5.4 *DHCP Options*

The Networking service uses DHCP to automatically provide configuration information to instances when they boot up. Although DHCP lets you change some settings dynamically, others are static and never change. For example, when you launch an instance, either you or Oracle specifies the instance's private IP address. Each time the instance boots up or you restart the instance's DHCP client, DHCP passes that same private IP address to the instance. The address never changes during the instance's lifetime

To create DHCP options,

- Go to your VCN
- Under Resources, click DHCP Options.
- Click Create DHCP Options.
- Enter the following:
- Name:.
- Create in Compartment:
- DNS Type: for Oracle SBC, select Internet and VCN Resolver..
- Search Domain: Optional
- Tags:
- When you're done, click Create DHCP Options



5.5.5 *Creating Security Lists*

A security list acts as a virtual firewall for an instance, with ingress and egress rules that specify the types of traffic allowed in and out. **Here for Oracle SBC, we configure security lists at the subnet level**, which means that all VNICs in a given subnet are subject to the same set of security lists. The security lists apply to a given VNIC whether it's communicating with another instance in the VCN or a host outside the VCN.

For Media, security lists stateless security lists are recommended.

For Oracle SBC, we create 3 security lists.

- Management security list
- Media security list
- HA security list

To create a security list, please follow the following steps

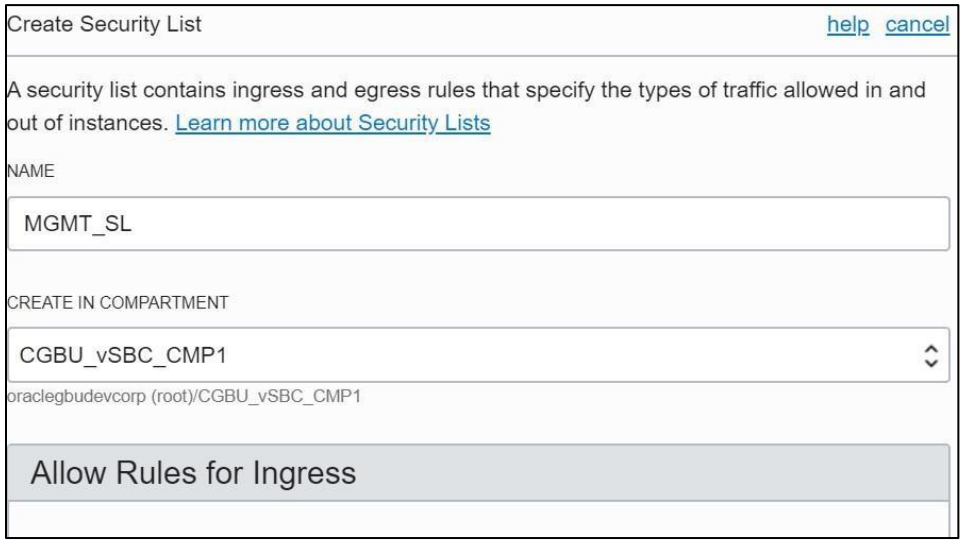
- Go to Networking and click Virtual Cloud Networks.
- Click on your VCN
- Under Resources, click Security Lists.
- Click Create Security List.
- Enter the following:
- Name
- Create in Compartment
- Add either an ingress rule or egress rule (for examples of rules, see Networking Scenarios):
- Click either Add Ingress Rule or Add Egress Rule.
- Choose whether it's a stateful or stateless rule (see Stateful Versus Stateless Rules). By default, rules are stateful unless you specify otherwise.
- Enter either the source CIDR (for ingress) or destination CIDR (for egress).
- Select the IP protocol (for example, TCP, UDP, ICMP, "All protocols", and so on).
- Enter further details depending on the protocol:
- Repeat the preceding step for each rule you want to add to the list.
- Tags
- When you're done, click Create Security List.

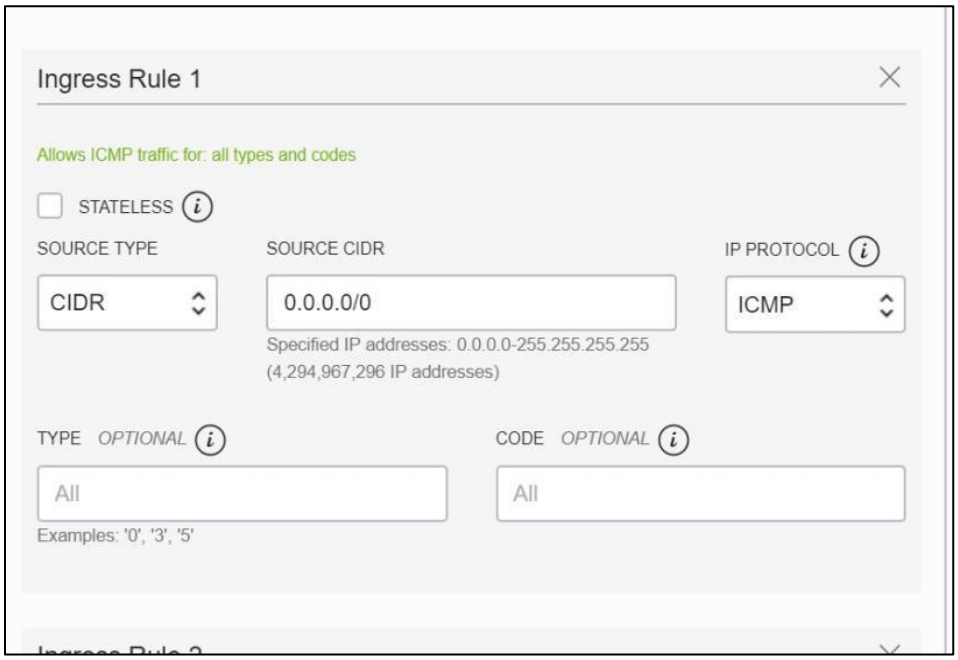
5.5.5.1 Management security list

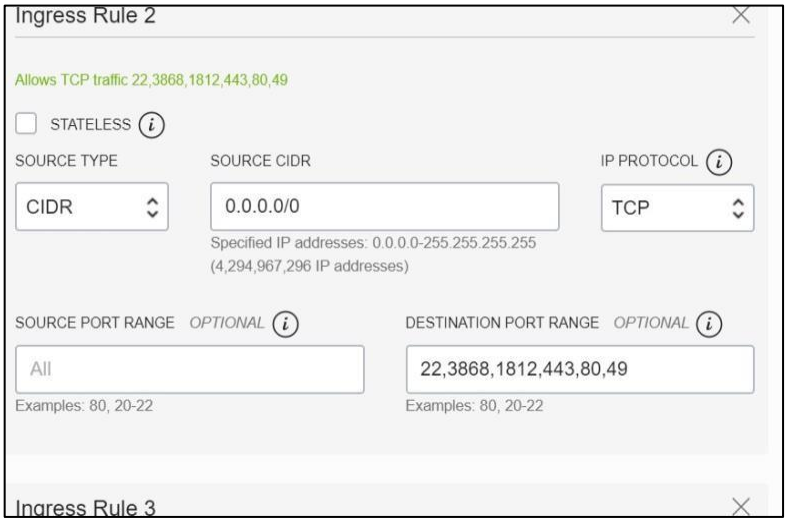
The security list for management ports can be stateful,

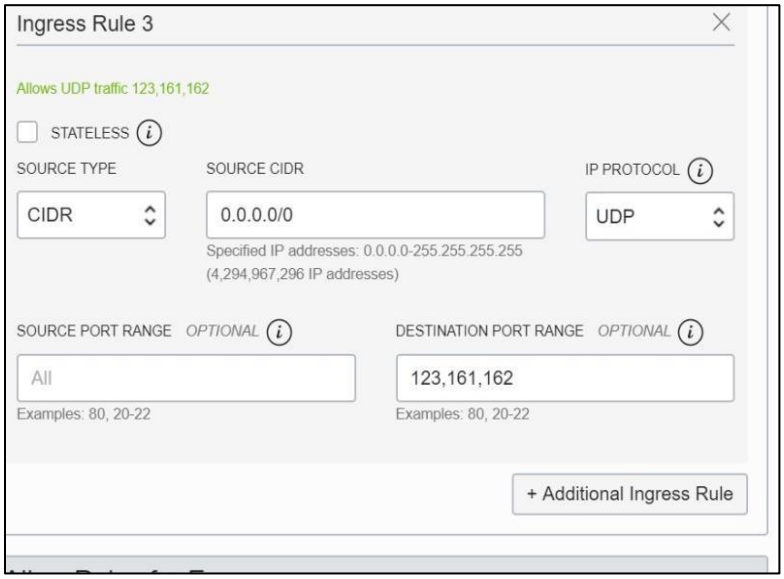
The following TCP/UDP protocols and/or ports should be opened for Oracle SBC ingress side. On the egress side, we have opened all ports as shown. These ports can be configured in security lists, according to customer's environment.

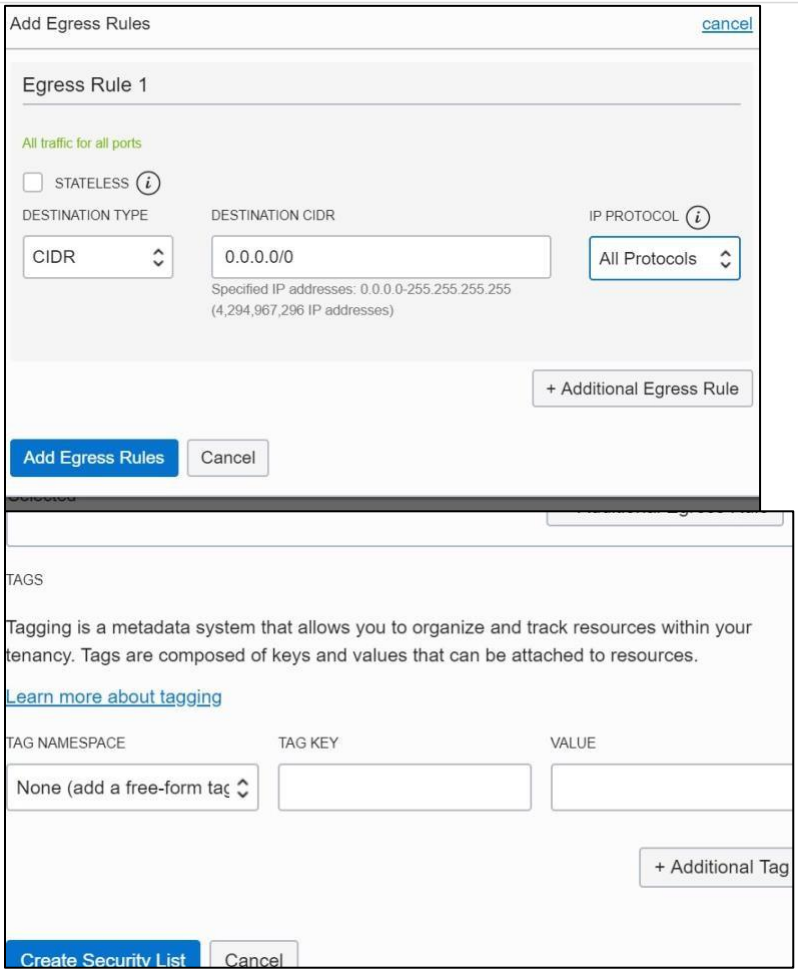
Protocol	Port
ICMP	n/a
SSH	22
NTP	123
SNMP	161
SNMP Trap	162
Diameter	3868
Radius	1812
TACACS	49
HTTP	80
HTTPS	443




Ingress Rule 1
Allows ICMP traffic for: all types and codes
STATELESS
SOURCE TYPE
CIDR
SOURCE CIDR
0.0.0.0/0
Specified IP addresses: 0.0.0.0-255.255.255.255
(4,294,967,296 IP addresses)
IP PROTOCOL
ICMP
TYPE OPTIONAL
All
Examples: '0', '3', '5'
CODE OPTIONAL
All


Ingress Rule 2
Allows TCP traffic 22,3868,1812,443,80,49
STATELESS
SOURCE TYPE
CIDR
SOURCE CIDR
0.0.0.0/0
Specified IP addresses: 0.0.0.0-255.255.255.255
(4,294,967,296 IP addresses)
IP PROTOCOL
TCP
SOURCE PORT RANGE OPTIONAL
All
Examples: 80, 20-22
DESTINATION PORT RANGE OPTIONAL
22,3868,1812,443,80,49
Examples: 80, 20-22
Ingress Rule 3


Ingress Rule 3
Allows UDP traffic 123,161,162
STATELESS
SOURCE TYPE
CIDR
SOURCE CIDR
0.0.0.0/0
Specified IP addresses: 0.0.0.0-255.255.255.255
(4,294,967,296 IP addresses)
IP PROTOCOL
UDP
SOURCE PORT RANGE OPTIONAL
All
Examples: 80, 20-22
DESTINATION PORT RANGE OPTIONAL
123,161,162
Examples: 80, 20-22
+ Additional Ingress Rule


Add Egress Rules
cancel
Egress Rule 1
All traffic for all ports
STATELESS
DESTINATION TYPE
CIDR
DESTINATION CIDR
0.0.0.0/0
Specified IP addresses: 0.0.0.0-255.255.255.255
(4,294,967,296 IP addresses)
IP PROTOCOL
All Protocols
+ Additional Egress Rule
Add Egress Rules
Cancel
TAGS
Tagging is a metadata system that allows you to organize and track resources within your tenancy. Tags are composed of keys and values that can be attached to resources.
Learn more about tagging
TAG NAMESPACE
None (add a free-form tag
TAG KEY
VALUE
+ Additional Tag
Create Security List
Cancel

5.5.5.2 Media security list

It is recommended that the security lists for media ports be **stateless** to avoid performance penalties.

OCI and the SBC VM implement separate security rules. For some protocols to operate the media port configuration should mirror the security list below**. If a security list allows icmp, it is not necessary that the SBC VM also allows icmp.**

Protocol	Port
ICMP	N/a
SSH	22
IKE	500
SIP	5060
SIP	5061
H323	1719
H323 (sig)	1720

RTP	10000-12000(according to steering pool config)

5.5.5.3 HA Security List

For the HA configuration, we use private regional subnet. The following ports should be opened for Oracle SBC on ingress side. **Here we create a security list with 9090 port to support the redundancy configuration.** The source CIDR can be of the private subnet.

We also recommend customers using any one of the below methods for HA configuration security list.

- Set the Security List to allow all traffic sourced only from IPs in the wancom1 subnet.
- Set a Network Security Group with the 'Type' set to 'NSG' and apply that to the wancom1 VNICs.

  This will lock it down so that only traffic sourced from the appropriate IP's from those VNIC's are allowed, while allowing traffic on all ports.

5.6 Subnets

Each subnet in a VCN consists of a contiguous range of IPv4 addresses that do not overlap with other subnets in the VCN.

Example: 172.16.1.0/24. The first two IPv4 addresses and the last in the subnet's CIDR are reserved by the Networking service. For more information please refer the documentation

https://docs.oracle.com/en-us/iaas/Content/Network/Tasks/managingVCNs.htm

Each VCN can be divided into multiple subnets. The SBC has 3 types of vNICs: management (wancom0), HA (wancom1/wancom2) and Media (s0p0, s1p0 etc). To maintain traffic separation, each of the vNICs should be connected to a separate subnet within the VCN. Depending on whether access to these vNICs is required through Internet or not a public IP should be associated.

For any HA deployment we require the following subnets .The following subnets are mandatory

- wancom0
- wancom1
- Network interfaces (s0p0, s1p0) (according to your environment. Maximum up to 8) Here in this deployment, we have considered wancom2 as optional.

Please follow the below table to create subnets required for the deployment of Oracle SBC in HA mode.

Subnet Name	**Type of subnet**	**Public subnet**	**Ephemeral Public IP**	**Reserved Public IP**
wancom0	Regional	yes	yes	n/a
s0p0,s0p1	Regional	yes	no	yes
wancom1	Regional	no	n/a	no

To create a subnet,

- Open the navigation menu. In Core Infrastructure, go to Networking and click Virtual Cloud Networks.
- Click on the VCN created.
- Click Create Subnet.
- Enter the following:
- Create in Compartment
- Name

- **Subnet Type: Regional or AD-specific subnet**: Oracle recommends creating only regional subnets, which means that the subnet can contain resources in any of the region's availability domainser created in this subnet must also be in that availability domain.
- **CIDR Block**: A single, contiguous CIDR block for the subnet (for example, 172.16.0.0/24). Make sure it's within the cloud network's CIDR block and doesn't overlap with any other subnets. You cannot change this value later.
- **Route Table**: The route table created in the above section
- **Subnet Access**: Private or public subnet: This controls whether VNICs in the subnet can have public IP addresses.

  Follow the above table and create a subnet for Oracle SBC.

- **DNS Resolution**: Use DNS Hostnames in this Subnet
- **DHCP Options**: Created in the section here
- **Security Lists**: Created in the section here.
- **Tags**
  Click Create.

Create Subnet help cancel

If the Route Table, DHCP Options, or Security Lists are in a different Compartment than the Subnet, enable Compartment selection for those resources: Click here

NAME

ACMESBC_wancom0

SUBNET TYPE

REGIONAL (RECOMMENDED)
Instances in the subnet can be created in any availability domain in the region. Useful for high availability.

AVAILABILITY DOMAIN-SPECIFIC
Instances in the subnet can only be created in one availability domain in the region.

CIDR BLOCK

10.0.10.0/24

Specified IP addresses: 10.0.10.0-10.0.10.255 (256 IP addresses)

SUBNET ACCESS

PRIVATE SUBNET
Prohibit public IP addresses for Instances in this Subnet

PUBLIC SUBNET
Allow public IP addresses for Instances in this Subnet

DNS RESOLUTION

USE DNS HOSTNAMES IN THIS SUBNET
Allows assignment of DNS hostname when launching an Instance

DNS LABEL

ACMESBCwancom0

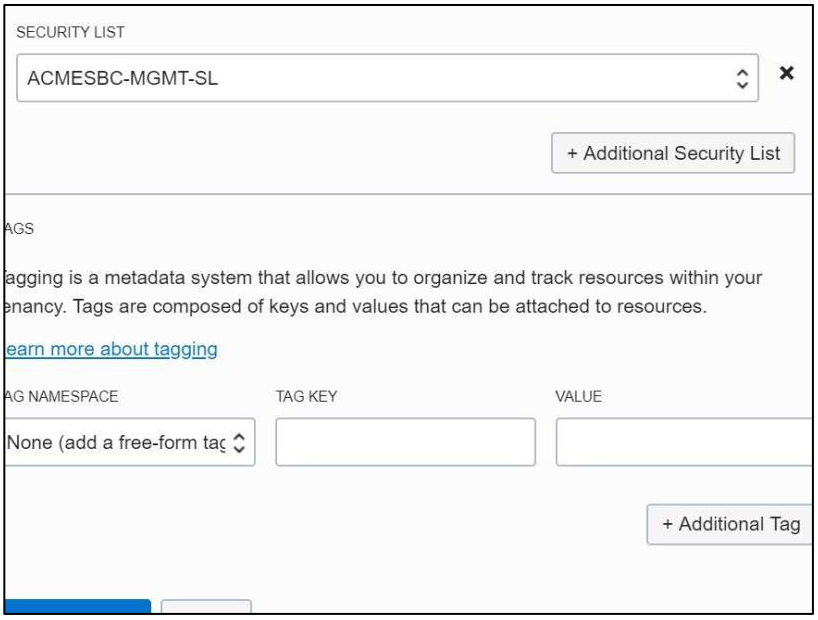
Only letters and numbers, starting with a letter. 15 characters max.

DNS DOMAIN NAME *READ-ONLY*

<dns-label>.acmesbcvcn.oraclevcn.com

DHCP OPTIONS

ACMESBC_DHCP_Options



6. Creating a SBC Instance

The SBC is now available as an easy to deploy instance in the OCI Marketplace listed as “Oracle Enterprise Virtual Session Border Controller”. This section walks through creating an SBC instance via OCI Marketplace.

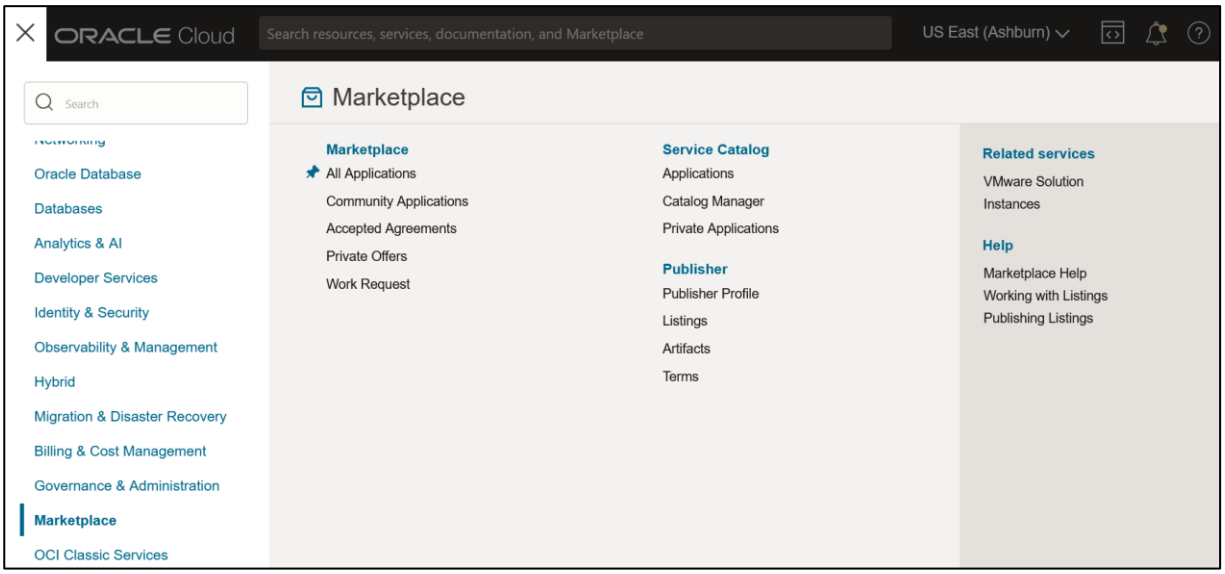
The supported VM shapes are listed as below:

Figure 1. Table 1 Supported VM shapes

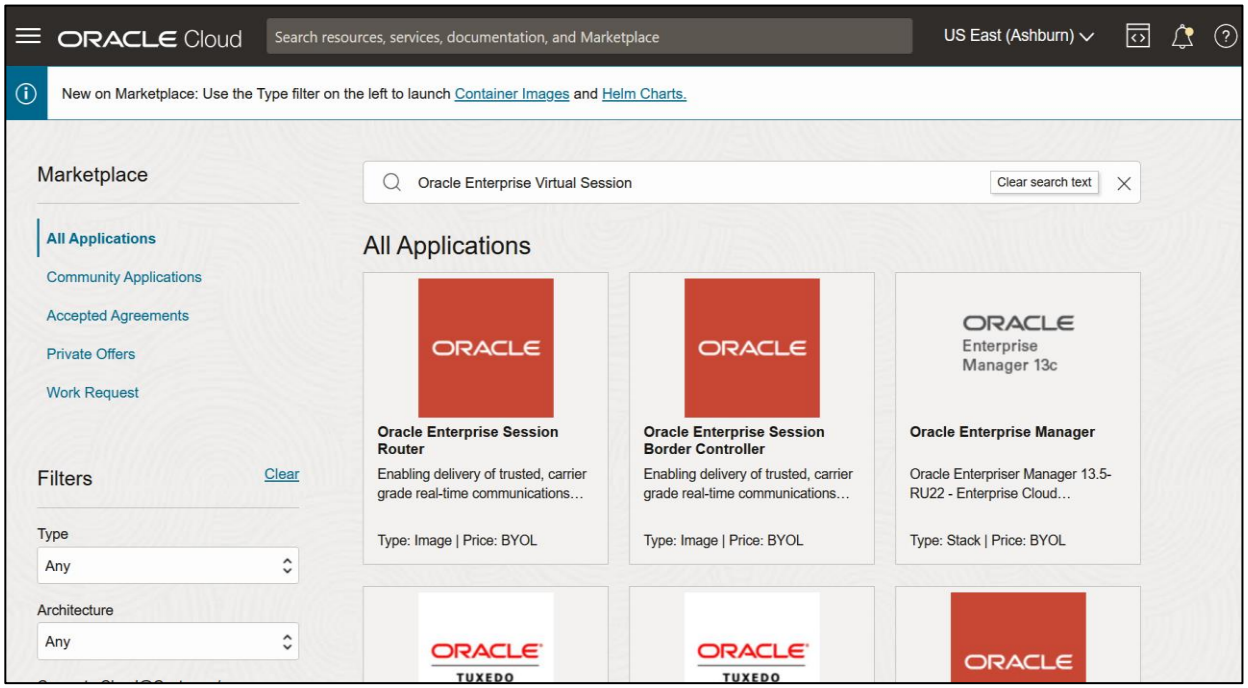
Shape	Supported	OCPUs/VCPUs	vNICs	Tx/Rx Queues	MAX Forwarding Cores	DOS Protection
VM.Standard1.1	*N*	*1/2*	*2*	*2*	*0*	*N*
VM.Standard1.2	Y	2/4	2	2	1	N
VM.Standard1.4	Y	4/8	4	2	2	Y
VM.Standard1.8	Y	8/16	8	2	2	Y
VM.Standard1.16	Y	16/32	16	2	2	Y
VM.Standard2.1	*N*	*1/2*	*2*	*1*	*0*	*N*
VM.Standard2.2	Y	2/4	2	1	1	N
VM.Standard2.4	Y	4/8	4	1	1	Y
VM.Standard 2.8	Y	8/16	8	1	1	Y
VM.Standard 2.16	Y	16/32	16	1	1	Y

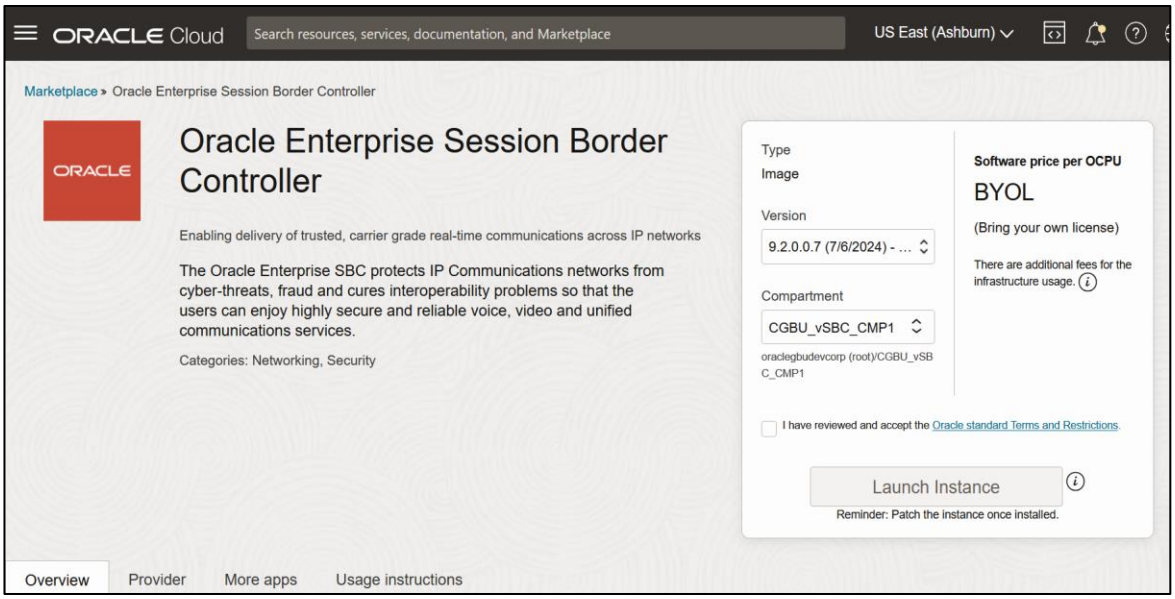
Following are the steps to create a SBC Instance.

- **Select Marketplace-> All Applications from the OCI portal.**
- **Search for "Oracle Enterprise Virtual Session Border Controller"**

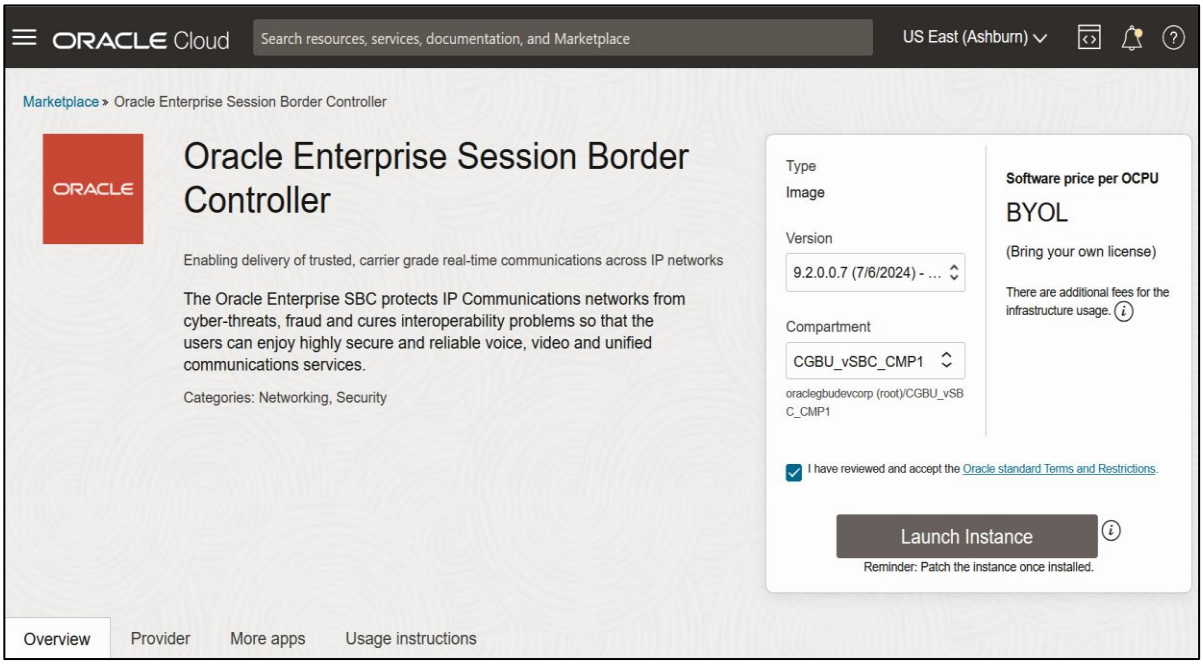


- **Search for "Oracle Enterprise Virtual Session" and select "Oracle Enterprise Session Border Controller"**

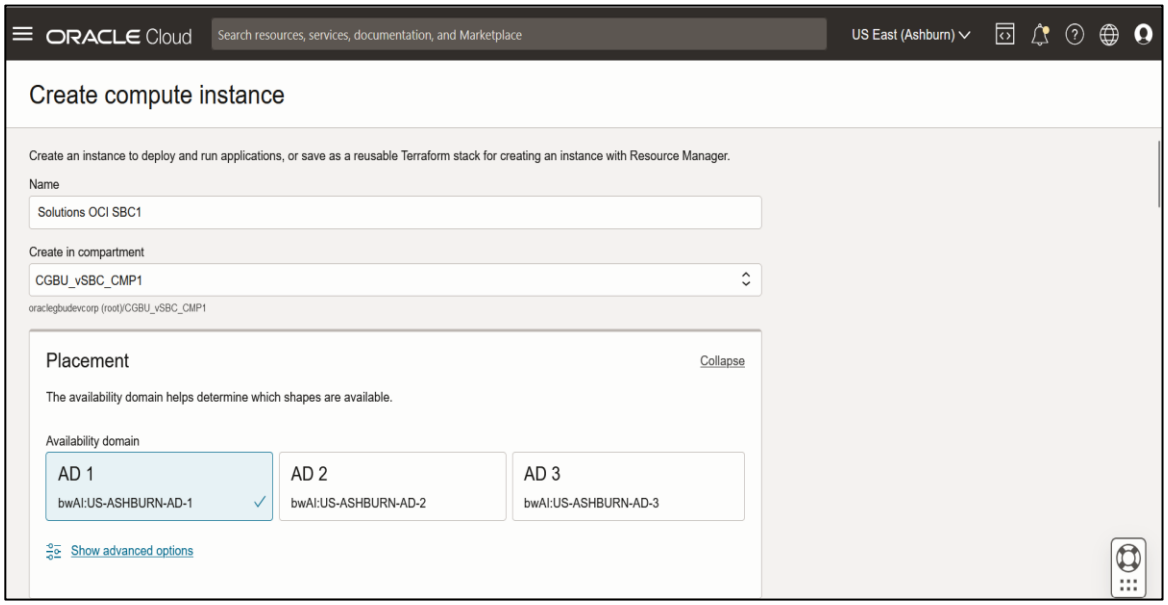


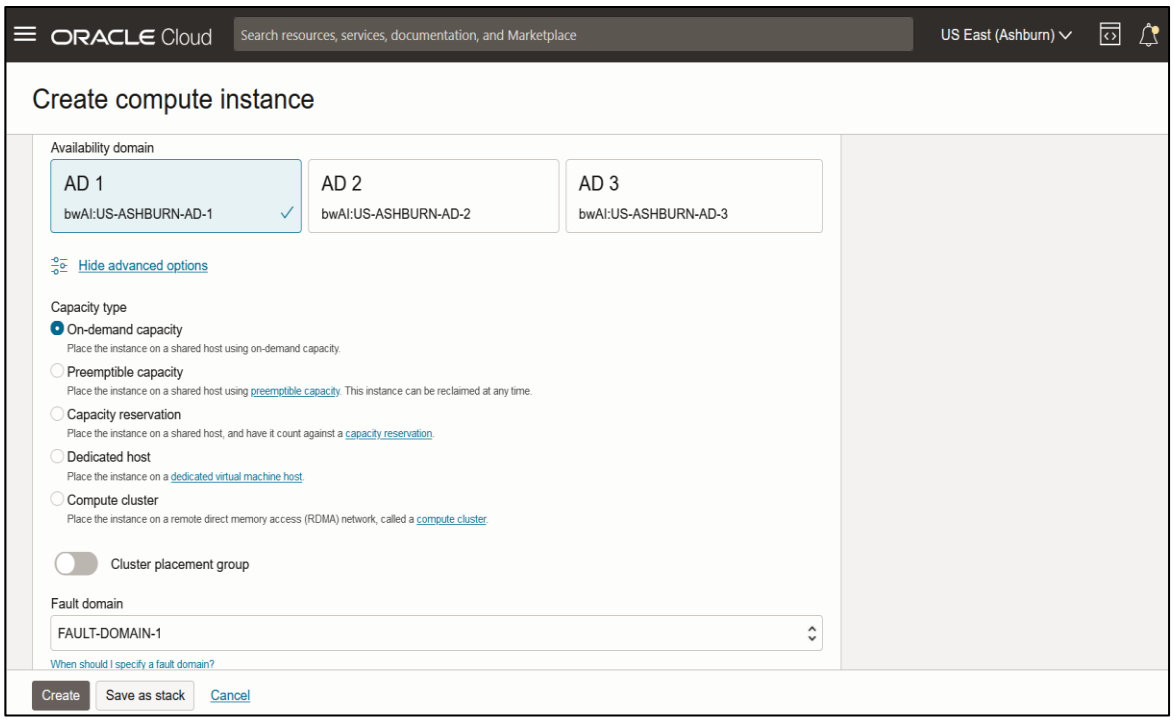


- **Select checkbox "I have reviewed and accept" and click "Launch Instance."**
- **We can also select the appropriate SBC builds listed from the drop-down menu.**

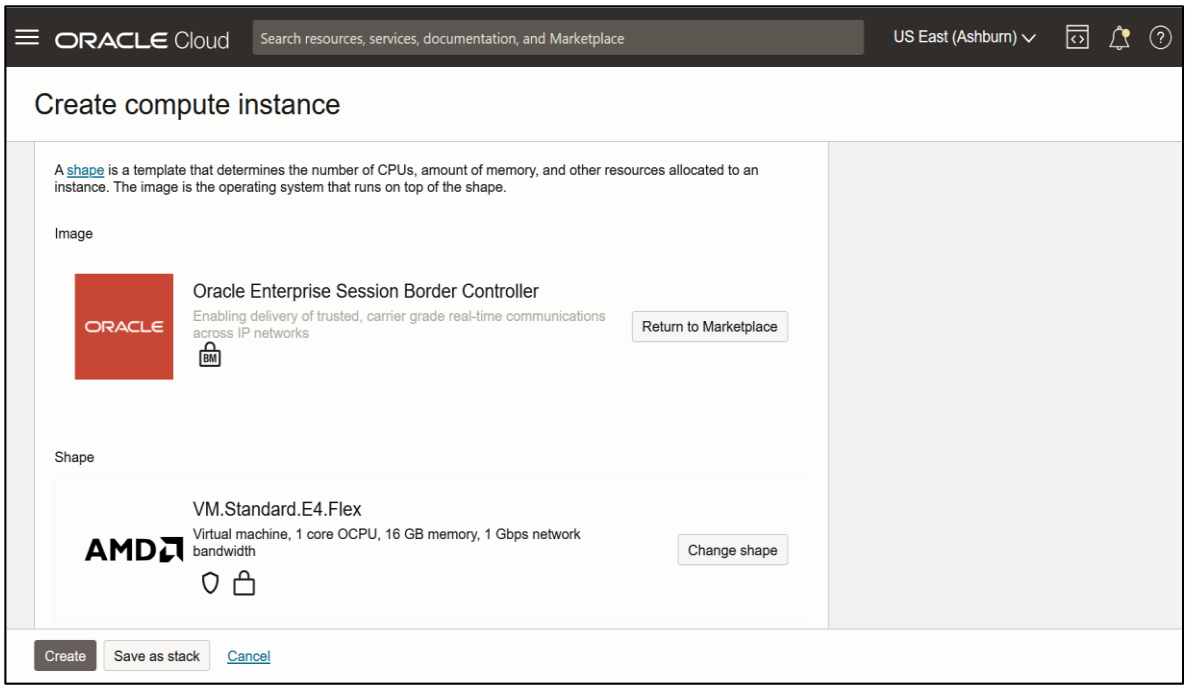


- **Populate Name for your instance**
- **Select "Availability Domain" and the "Instance Type" and fault Domain.**

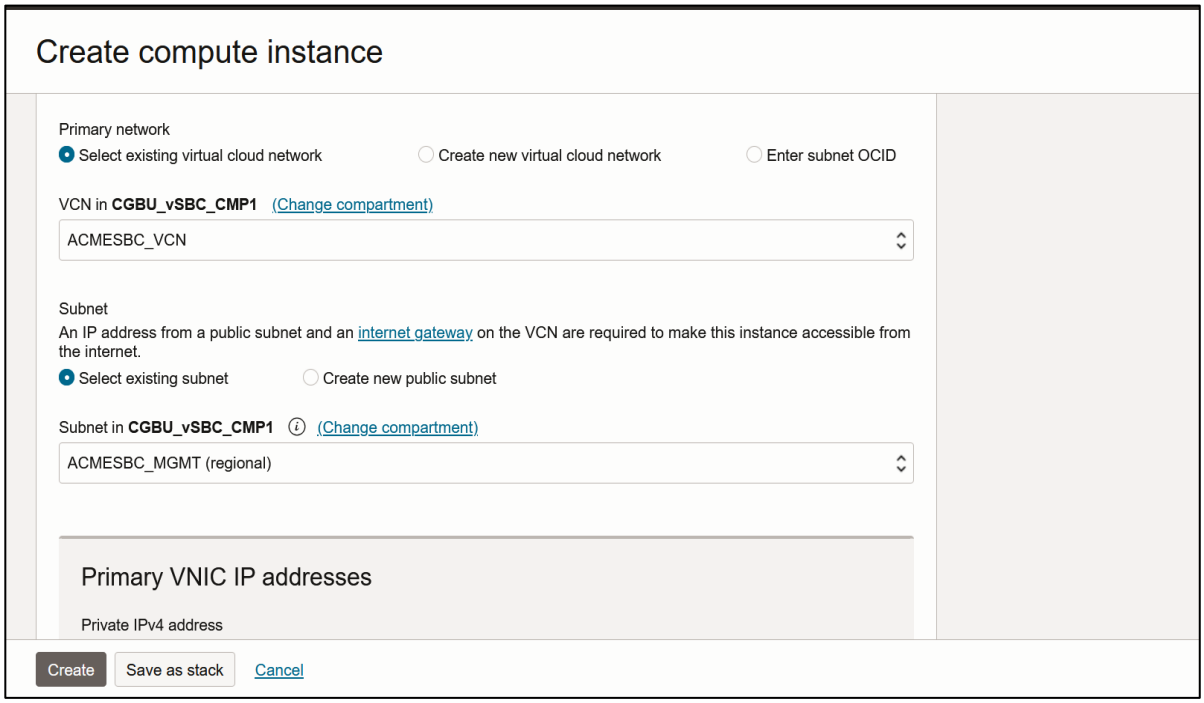




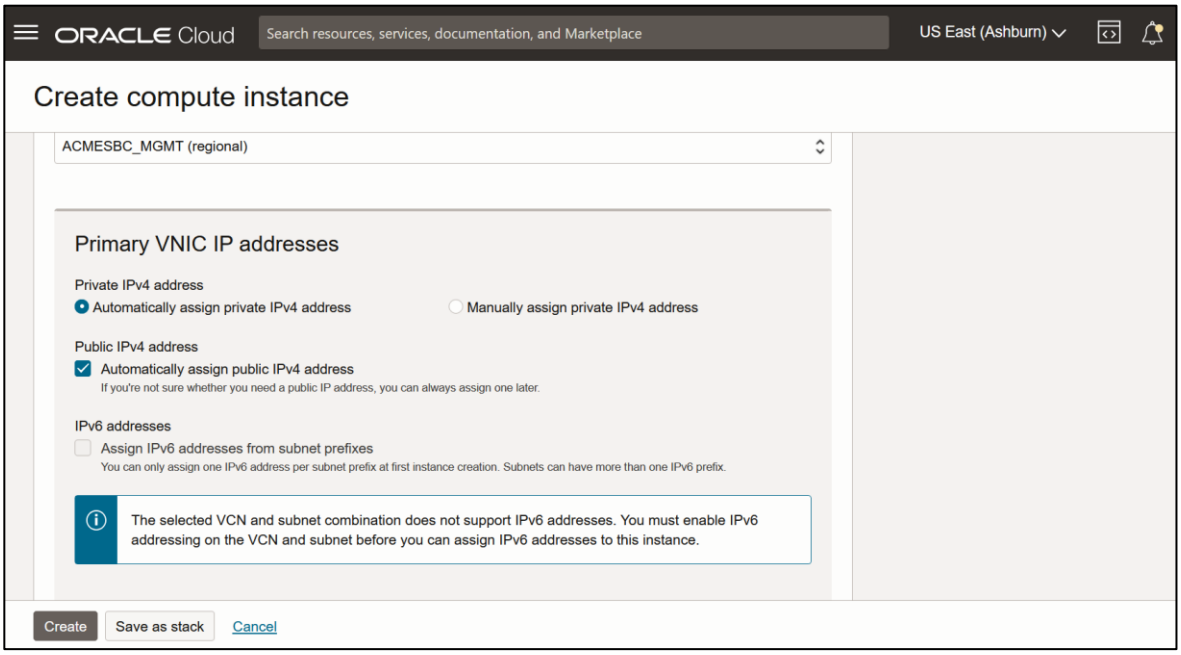
- **Choose the appropriate shape.**



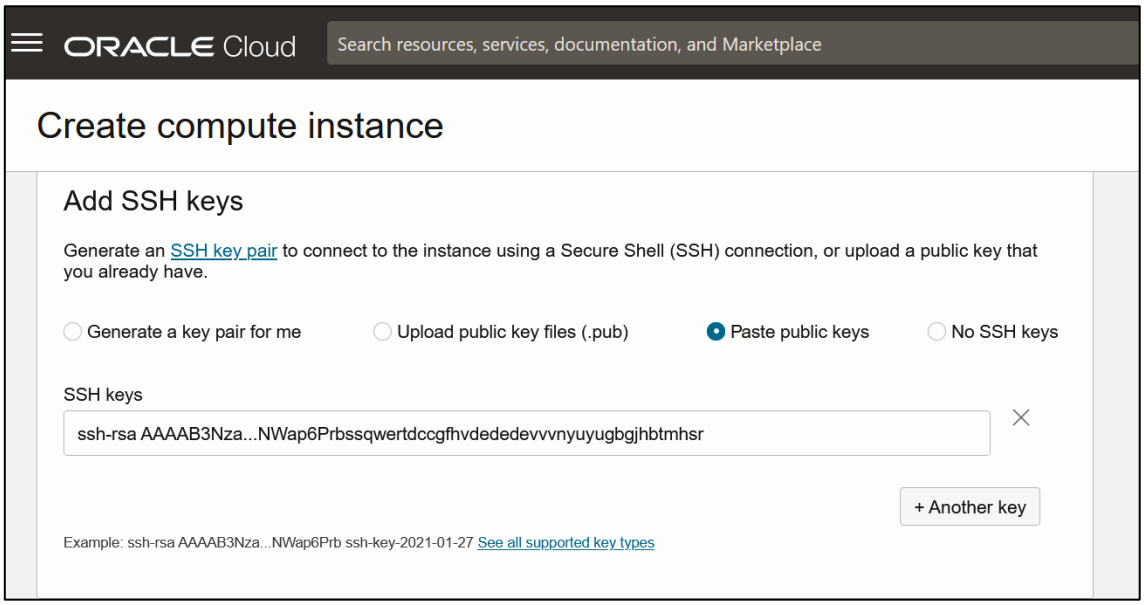
- **Choose the corresponding VCN, compartment and subnets. Here choose the management subnet to access the Oracle SBC immediately after deployment.**



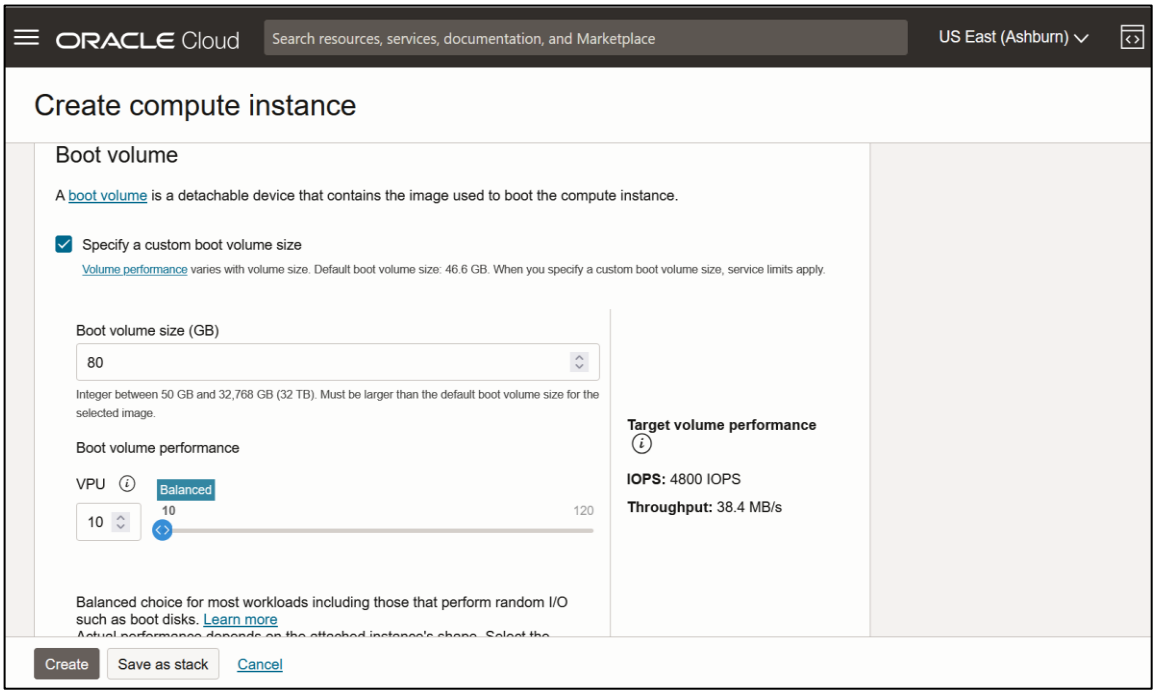
- **Click on Assign a public IP to the instance. (ephemeral),so that the Oracle SBC is accessible from the internet as well**



Paste the public key in ssh keys

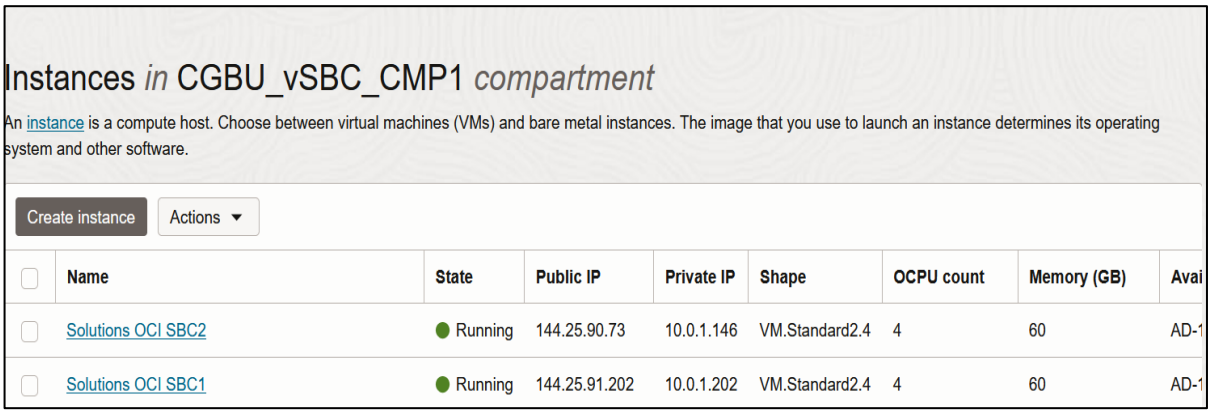


- **Select Custom Boot Size Volume. Choose the size of the boot volume as 80GB.**



In this deployment**, we have deployed the 2 SBCs in same availability domain and different fault domain. As mentioned earlier, you can also deploy the SBC's in different availability domains altogether**

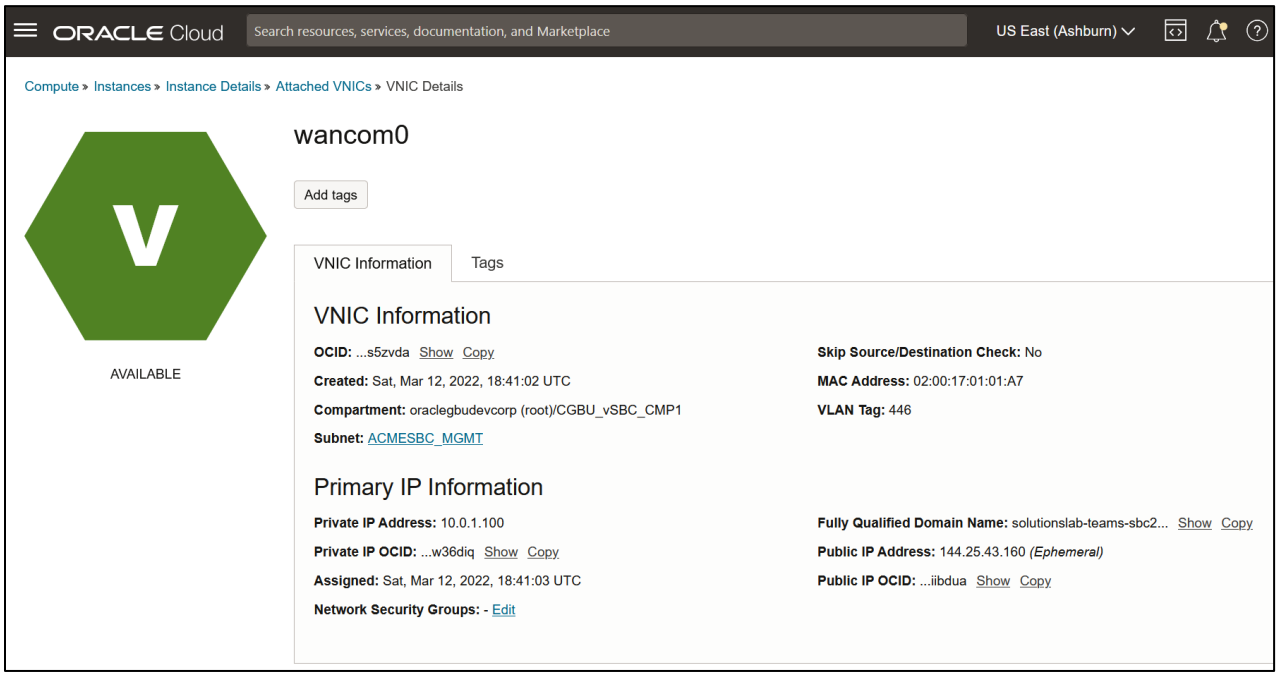
Once the instances are deployed, they are shown in Compute->Instances



6.1 Assigning VNIC's to the instances

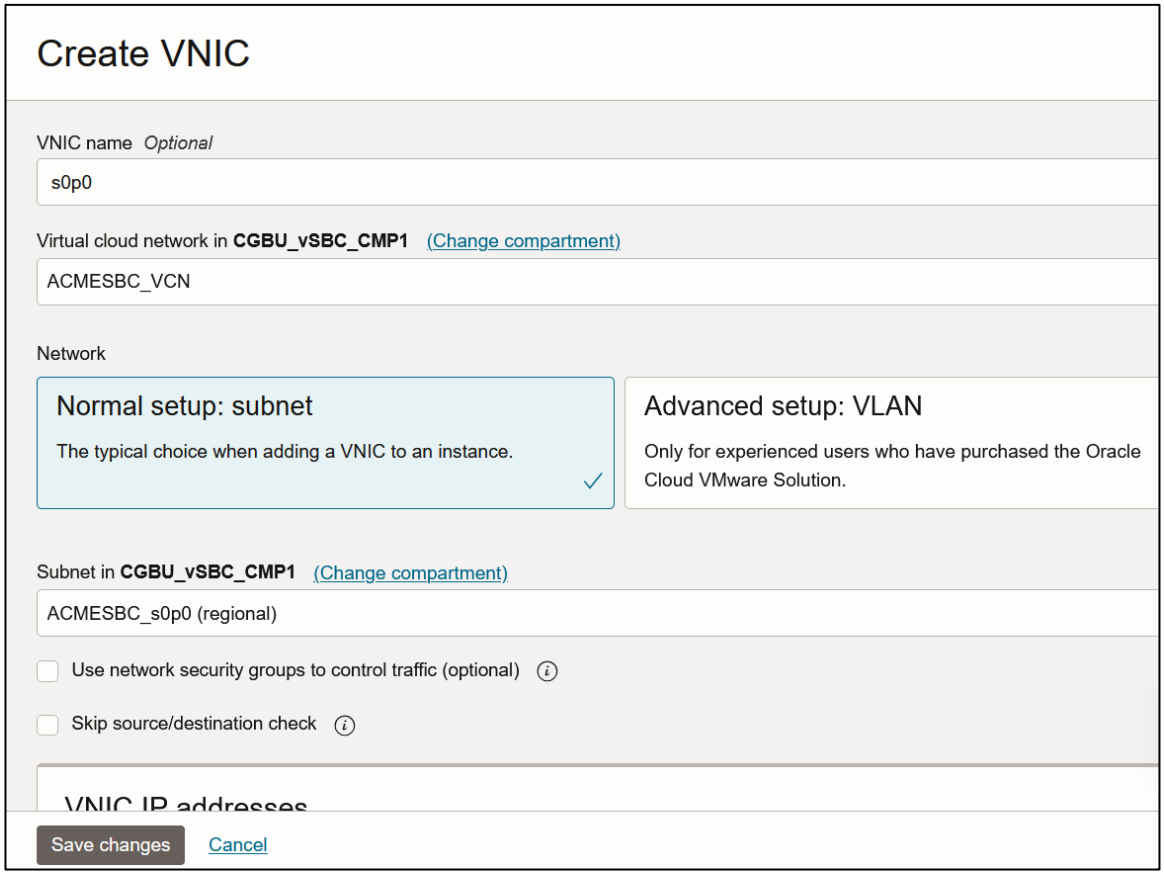
Once the instances are deployed click on the Instance. Go to Resources->Attached VNIC's

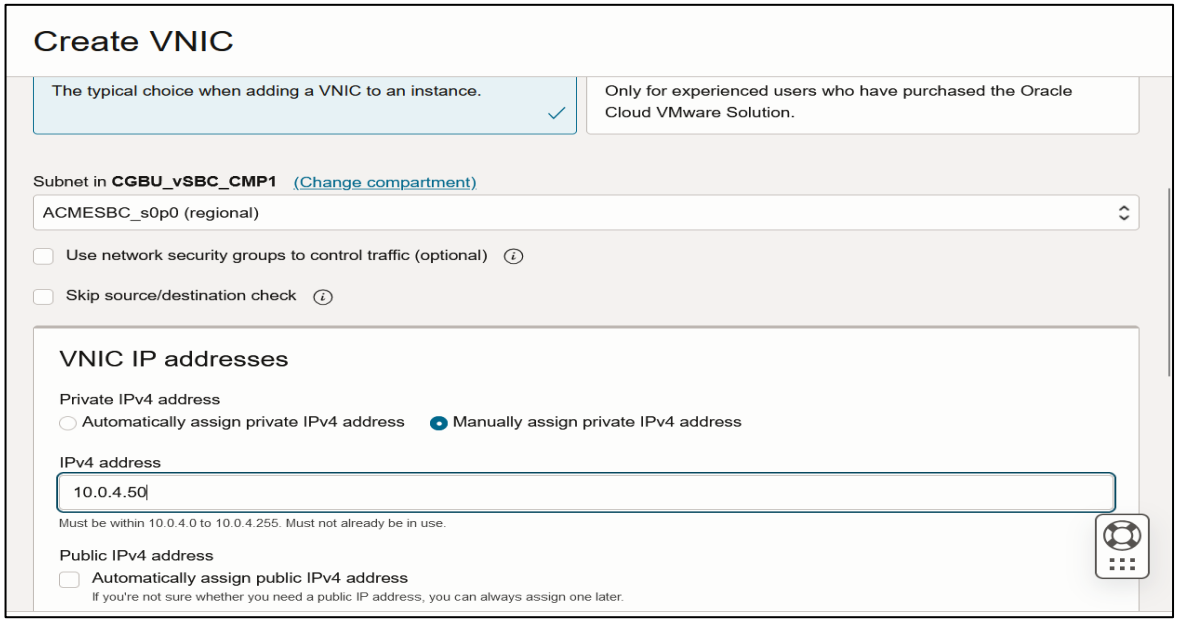
At first there is only one VNIC attached to the instance. (Created when creating The instance). After assigning the VNIC's, reboot the instances, so that the changes are applied.



Now create VNIC's for the other subnets required, according to your deployment. Here we have deployed these subnets.

- Open Create VNIC dialog box, you specify which VCN and subnet to put the VNIC in.
- Enter the following:
- Name
- Subnet
- Skip Source/Destination Check: By default, this check box is NOT selected, which means the VNIC performs the source/destination check. Only select this check box if you want the VNIC to be able to forward traffic.
- See Source/Destination Check.
- Private IP Address: An available private IP address of your choice from the subnet's CIDR (
- Assign public IP address: Whether to assign an ephemeral public IP address to the VNIC's primary private IP.
- Available only if the subnet is public. Not required in case of Oracle media and HA subnets, as we are creating reserved public IP for Media.
- Hostname
- Tags
- Click Create VNIC.

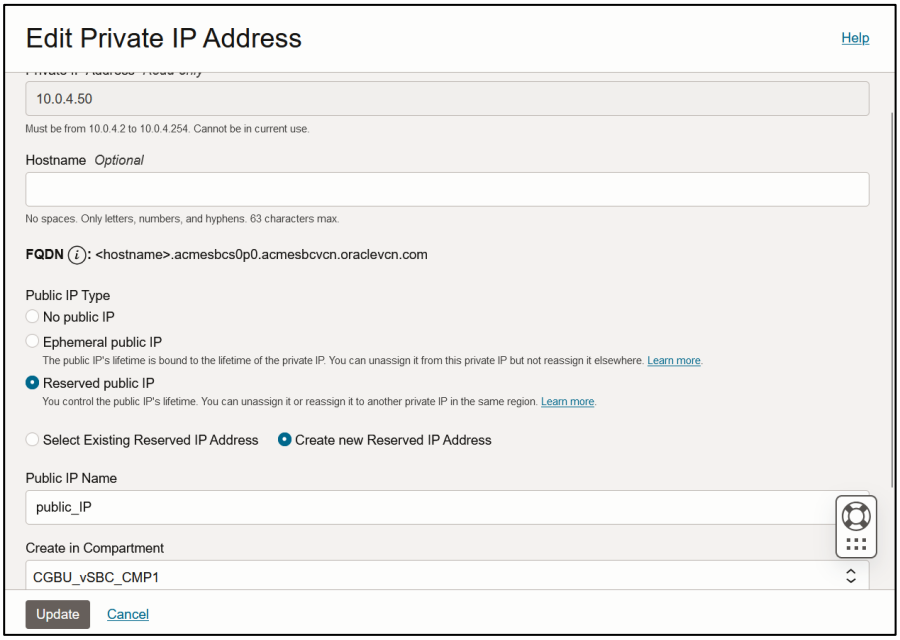

Create VNIC
VNIC name Optional
s0p0
Virtual cloud network in CGBU_vSBC_CMP1 (Change compartment)
ACMESBC_VCN
Network
Normal setup: subnet
The typical choice when adding a VNIC to an instance.
Advanced setup: VLAN
Only for experienced users who have purchased the Oracle Cloud VMware Solution.
Subnet in CGBU_vSBC_CMP1 (Change compartment)
ACMESBC_s0p0 (regional)
Use network security groups to control traffic (optional)
Skip source/destination check
Save changes
Cancel


Create VNIC
The typical choice when adding a VNIC to an instance.
Only for experienced users who have purchased the Oracle Cloud VMware Solution.
Subnet in CGBU_vSBC_CMP1 (Change compartment)
ACMESBC_s0p0 (regional)
Use network security groups to control traffic (optional)
Skip source/destination check
VNIC IP addresses
Private IPv4 address
Automatically assign private IPv4 address
Manually assign private IPv4 address
IPv4 address
10.0.4.50
Must be within 10.0.4.0 to 10.0.4.255. Must not already be in use.
Public IPv4 address
Automatically assign public IPv4 address
If you're not sure whether you need a public IP address, you can always assign one later.

6.2 Assign Reserved Public IP's to Media Interfaces

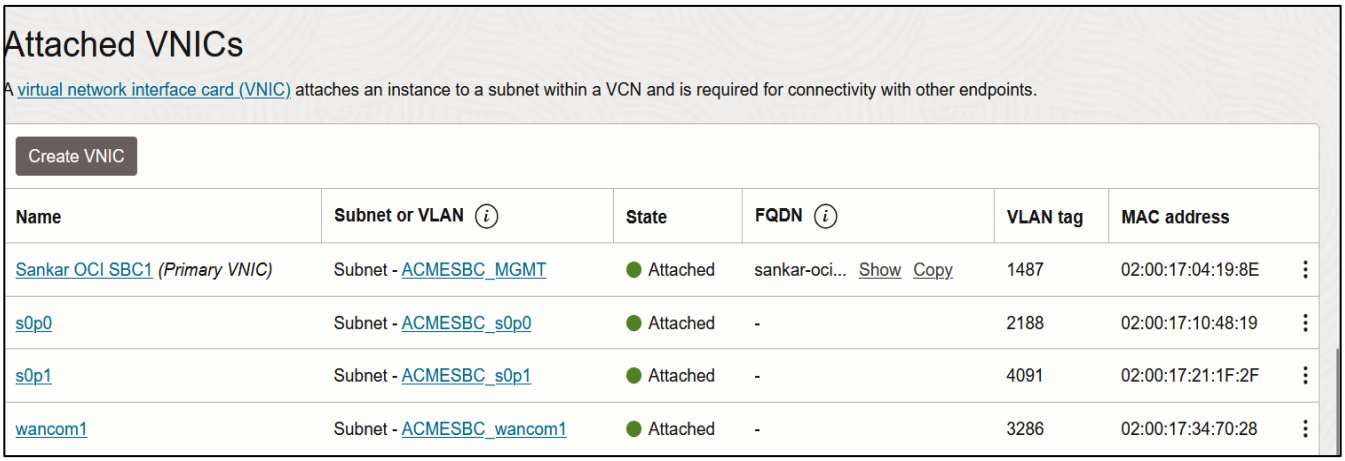
For the media interfaces, (public IP's are required, if traffic flows through them),we have to assign reserved public IP's To assign a reserve public IP to the Media subnet

- Click on the attached VNIC (example s0p0) and go to IP address
- Click on the edit option and assign reserved public IP



Assign reserved public IP only for primary SBC media interfaces (i.e only for one SBC)

Once the network interfaces are created, it will be shown like below in the primary SBC.
We should create similar network interfaces in the Secondary SBC too.

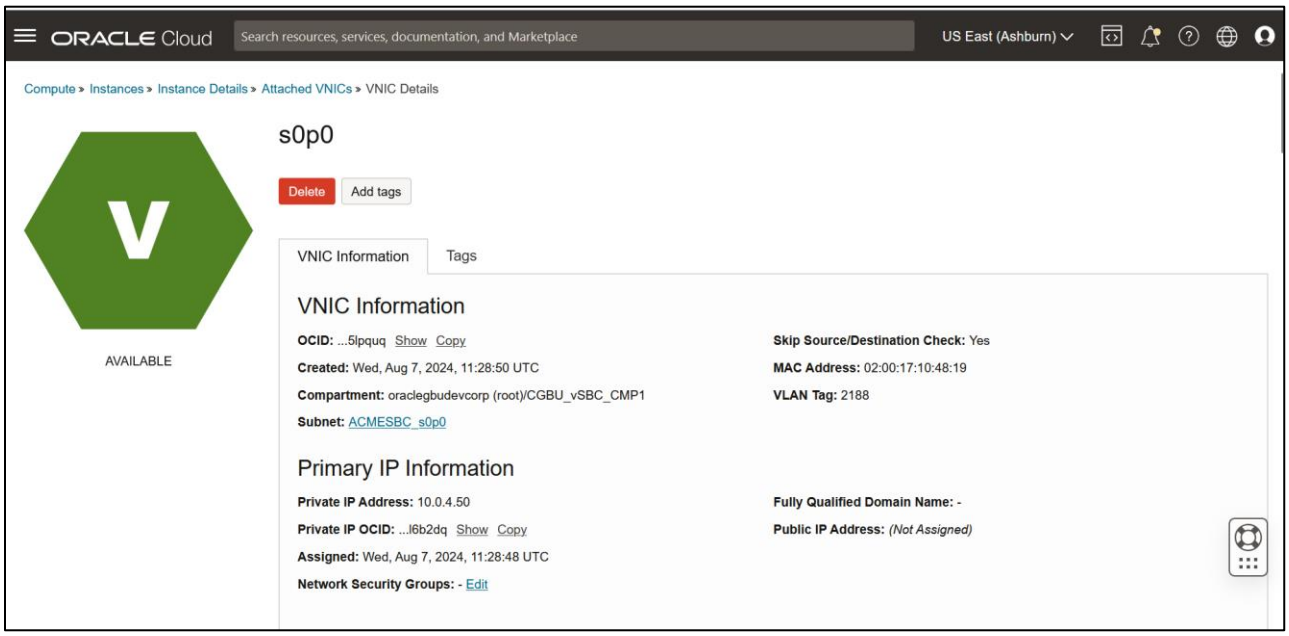


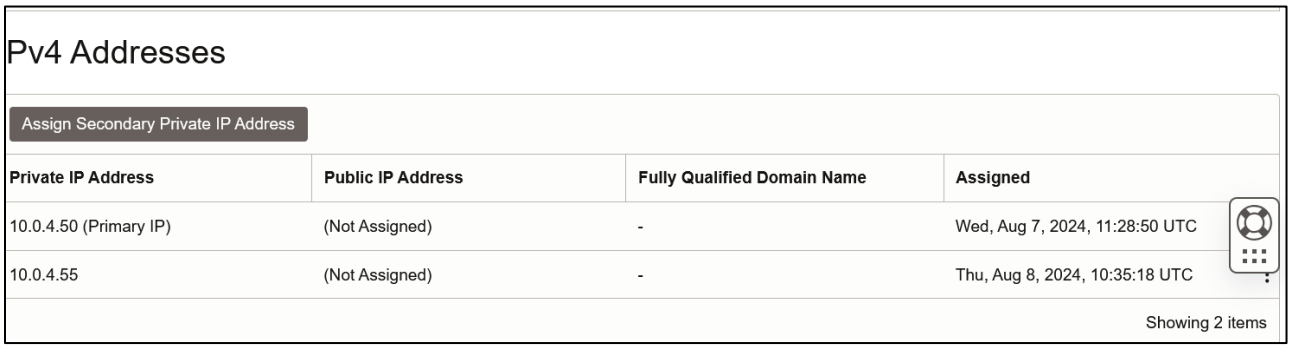
6.3 Assigning utility addresses from OCI

For HA deployment we require pri-utility address and sec-utility address for the media interfaces. So, we must add an additional IP address to the media interfaces. Primary-utility address will be the address of media interface assigned to SBC1 and Sec-utility-address will be the address of media interface assigned to SBC2.

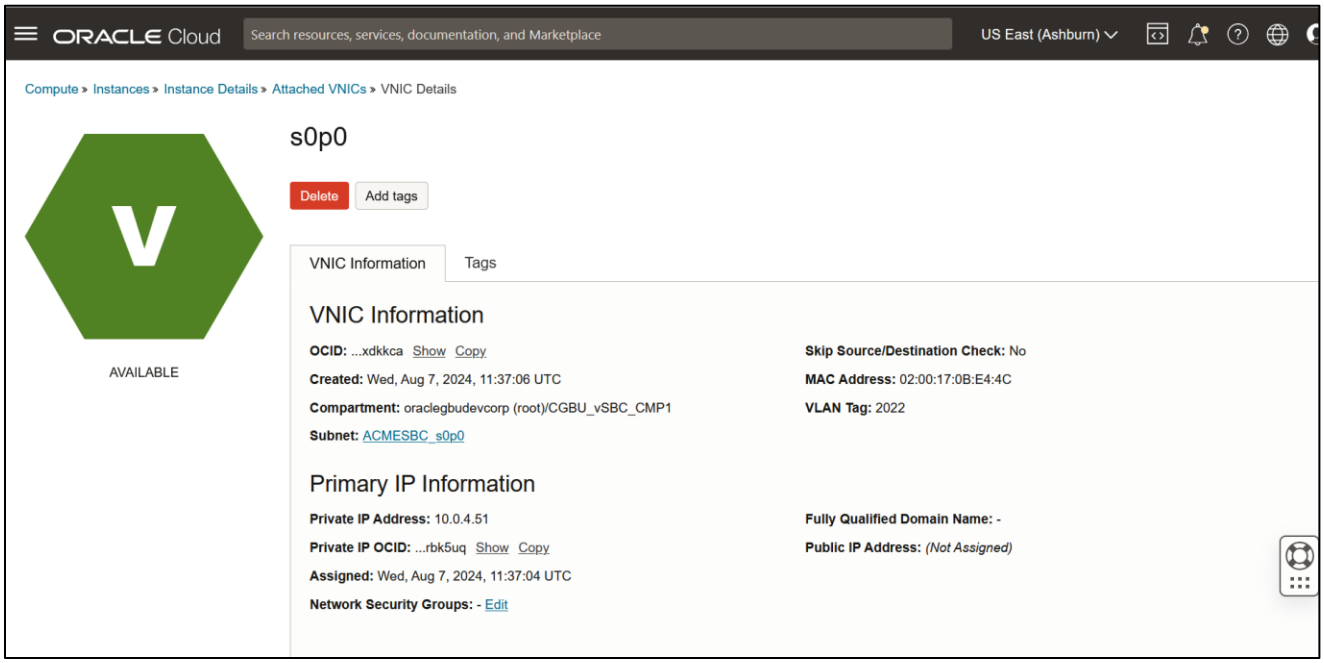
In the below screen, 10.0.4.55 is the primary utility IP address assigned to s0p0 media interface of Primary SBC.

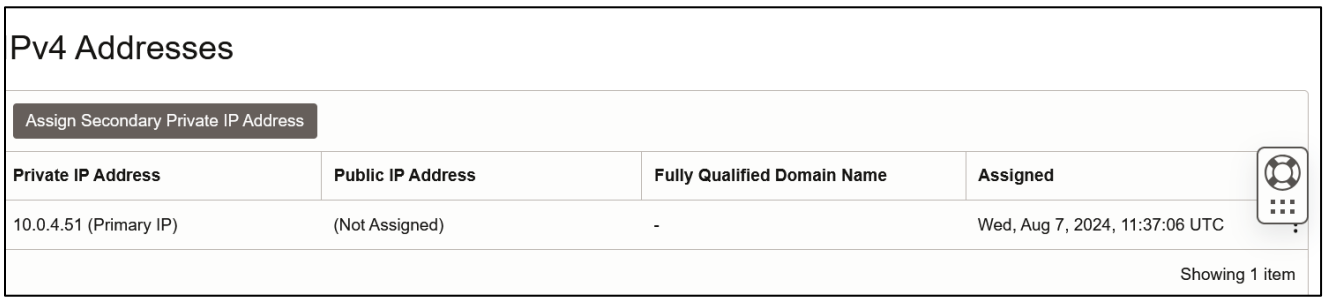
Please note that these IP address has to be assigned in the SBC network interface for media-interfaces.





Similarly in the below screen, 10.0.4.51 is the secondary utility IP address assigned to s0p0 media interface of Primary SBC.



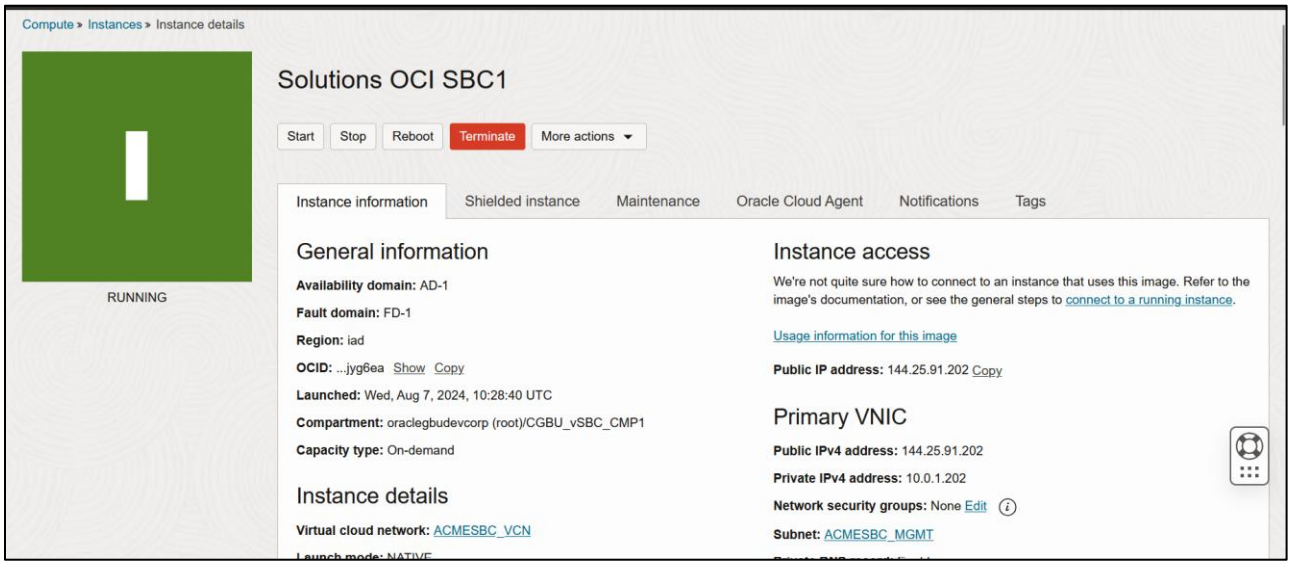


For more information on OCI layer 2 configurations for SBC, please refer the below link

https://blogs.oracle.com/cloud-infrastructure/post/oracle-sbc-l2-ha-idnat

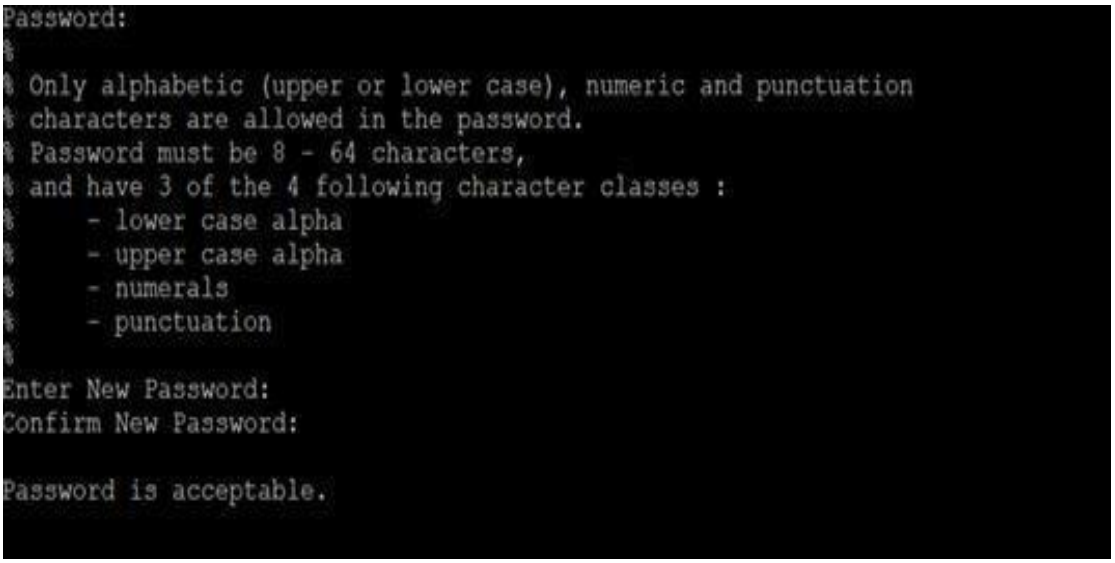
7. Configuring SBC for HA in OCI

After the configuration is completed, connect the SBC using Putty through the management IP assigned as shown. **Repeat the** steps **for both the SBC's**



Once we connect the instance using Putty, following window appears to change the password. The default username is “admin” and default password is “packet”+OCID (we can copy this from OCID from the above screen)

The password has to be changed according to the rules shown below.



Setup product type to “Enterprise Session Border Controller” as shown below.

To configure product type, type in setup product in the terminal

```
PE-6300-1# setup product

-----------------------------------------------------------------
WARNING:
Alteration of product alone or in conjunction with entitlement
changes will not be complete until system reboot

Last Modified 2019-09-11 13:57:32
-----------------------------------------------------------------
 1 : Product        : Enterprise Session Border Controller
```

```
Entitlements for Enterprise Session Border Controller
Last Modified: Never
-----------------------------------------------------------------
 1 : Session Capacity                          : 0
 2 :   Advanced                                :
 3 : Admin Security                            :
 4 : Data Integrity (FIPS 140-2)               :
 5 : Transcode Codec AMR Capacity              : 0
 6 : Transcode Codec AMRWB Capacity            : 0
 7 : Transcode Codec EVRC Capacity             : 0
 8 : Transcode Codec EVRCB Capacity            : 0
 9 : Transcode Codec EVS Capacity              : 0
 10: Transcode Codec OPUS Capacity             : 0
 11: Transcode Codec SILK Capacity             : 0

Enter 1 - 11 to modify, d' to display, 's' to save, 'q' to exit. [s]: 1

  Session Capacity (0-128000)                  : 500

Enter 1 - 11 to modify, d' to display, 's' to save, 'q' to exit. [s]: 3

*********************************************************
CAUTION: Enabling this feature activates enhanced security
functions. Once saved, security cannot be reverted without
resetting the system back to factory default state.
*********************************************************
  Admin Security (enabled/disabled)            :

Enter 1 - 11 to modify, d' to display, 's' to save, 'q' to exit. [s]: 5

  Transcode Codec AMR Capacity (0-102375)      : 50

Enter 1 - 11 to modify, d' to display, 's' to save, 'q' to exit. [s]: 2

    Advanced (enabled/disabled)                : enabled

Enter 1 - 11 to modify, d' to display, 's' to save, 'q' to exit. [s]: 10

  Transcode Codec OPUS Capacity (0-102375)     : 50

Enter 1 - 11 to modify, d' to display, 's' to save, 'q' to exit. [s]: 11

  Transcode Codec SILK Capacity (0-102375)     : 50
```

Enable the features for the ESBC using the setup entitlements command as shown. Save the changes and reboot the SBC.

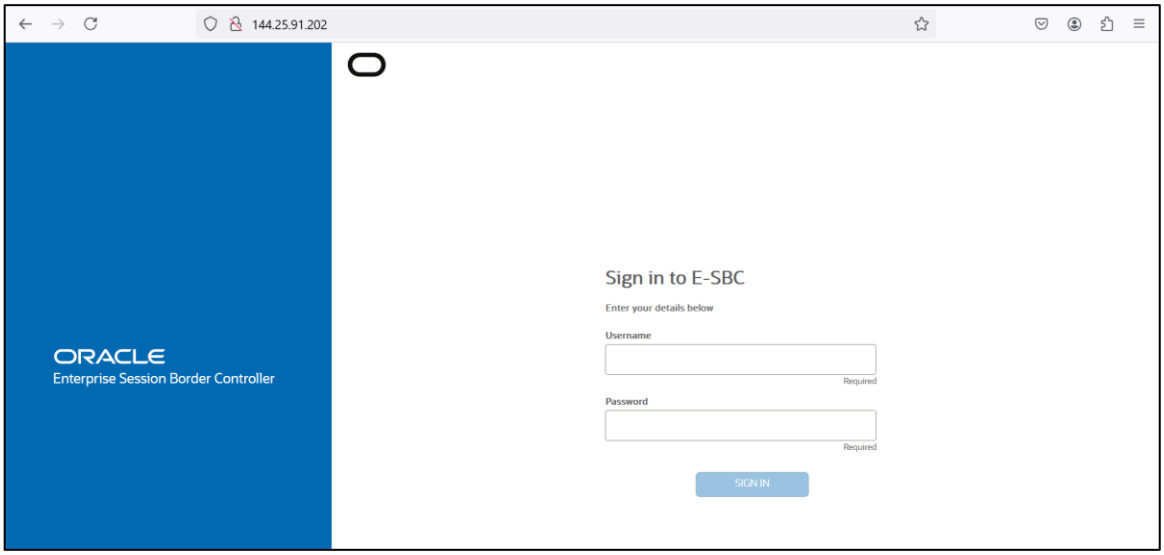
Go to configure terminal->system->http-server-config. Enable the http-server-config to access the SBC using Web GUI. Save and activate the config and the config looks as shown below.

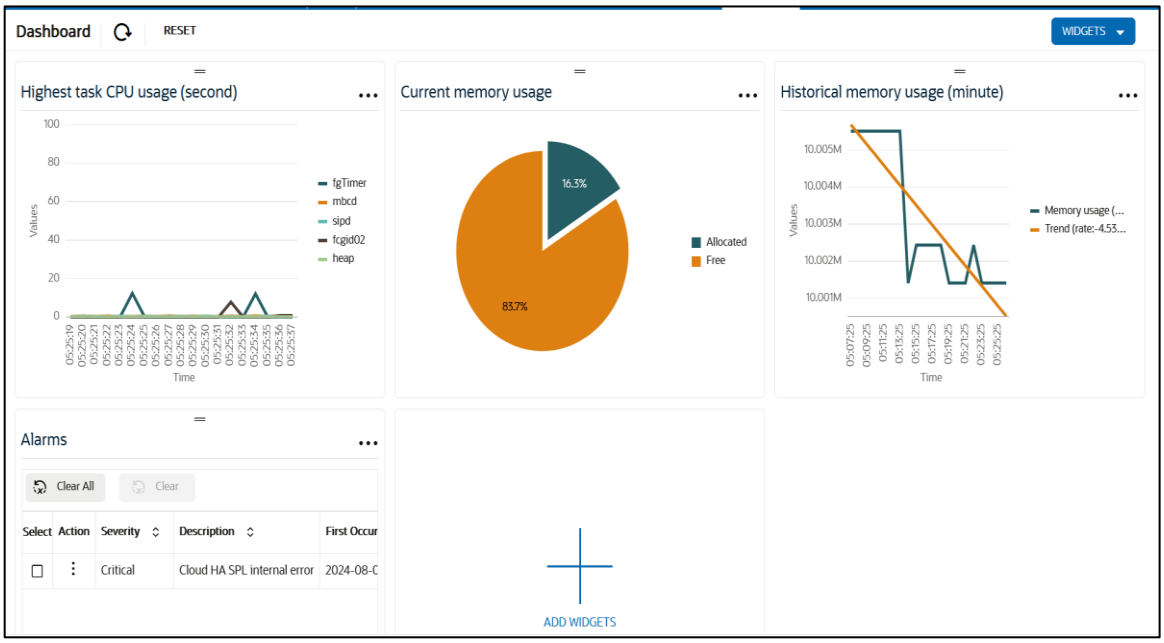
```
http-server
        name                                    Webserver
        state                                   enabled
        realm
        ip-address
        http-state                              enabled
        http-port                               80
        HTTP-strict-transport-security-policy   disabled
        https-state                             disabled
        https-port                              443
        http-interface-list                     GUI
        http-file-upload-size                   0
        tls-profile
        auth-profile
        last-modified-by                        admin@209.17.43.241
        last-modified-date                      2024-08-08 10:03:51
```

Once you have done the above step, the SBC can be accesses via GUI.

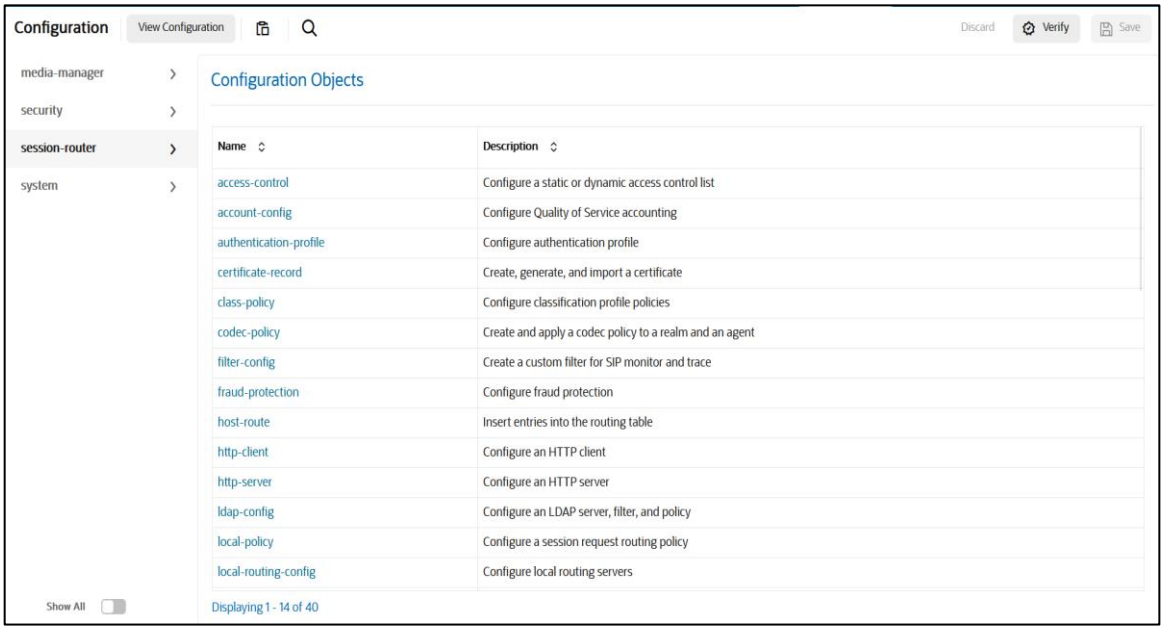
7.1. Configure SBC using Web GUI

The WebGUI can be accessed through the url https://<SBC_MGMT_IP>. The username and password is the same as that of CLI. We need to perform some more steps for HA configuration in SBC and we can perform those steps from SBC GUI or CLI. In our example we perform those steps from SBC GUI.





Go to Configuration as shown below, to configure the SBC



Kindly refer to the GUI User Guide

https://docs.oracle.com/en/industries/communications/enterprise-session-border-controller/9.2.0/webgui/web-gui-guide.pdf for more information.

The expert mode is used for configuration.

Tip: To make this configuration simpler, one can directly search the element to be configured ,from the Objects tab available.

7.2. Interface Mapping

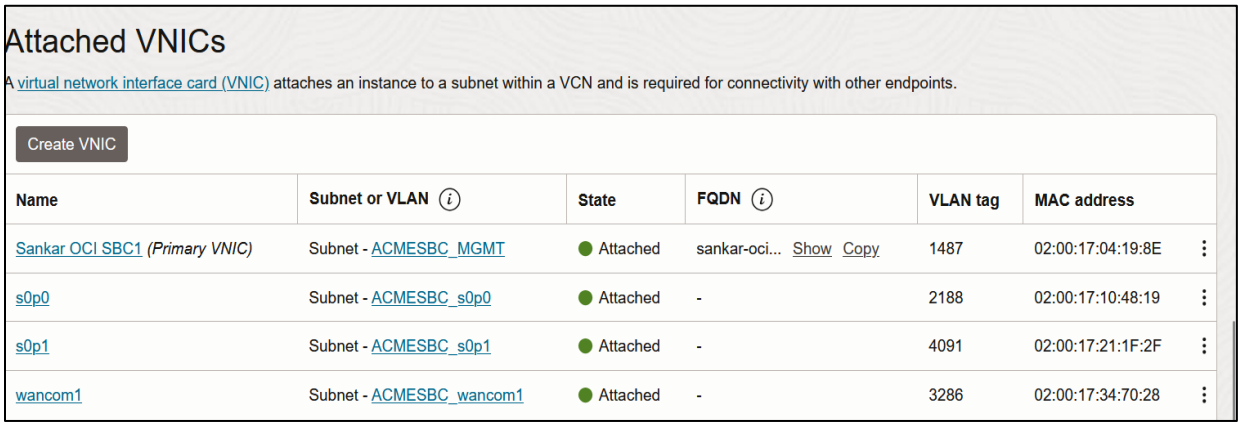
The next step in deploying the Oracle SBC in HA mode is to verify the network interfaces have MAC addresses assigned to them.

Run the command show interface mapping and check the output as shown below

```
SolutionsOCISBC1# show interfaces mapping
Interface Mapping Info
------------------------------------------
Eth-IF   MAC-Addr                Label
wancom0  02:00:17:04:19:8E       #present
wancom1  02:00:17:21:1F:2F       #generic
s0p0     02:00:17:10:48:19       #generic
s0p1     02:00:17:34:70:28       #generic
wancom2  FF:FF:FF:FF:FF:FF       #dummy
spare    FF:FF:FF:FF:FF:FF       #dummy
s1p0     FF:FF:FF:FF:FF:FF       #dummy
s1p1     FF:FF:FF:FF:FF:FF       #dummy
s0p2     FF:FF:FF:FF:FF:FF       #dummy
s1p2     FF:FF:FF:FF:FF:FF       #dummy
s0p3     FF:FF:FF:FF:FF:FF       #dummy
s1p3     FF:FF:FF:FF:FF:FF       #dummy

SolutionsOCISBC1#
```

Please check the interface mapping with the VNIC information of OCI and see whether the MAC address is correct for each interface.



- As you can see above, we'll need to correct the interface to MAC address mappings for wancom1 and s0p1.
- The interface mapping branch on the SBC includes a swap command, which allows us to make those adjustments. A reboot is required for the changes to take effect.
- While in enable mode in the SBC CLI, type:

```
> # interface-mapping (enter)
> (interface-mapping)# swap wancom1 s1p0

  Changes could affect service, and Requires Reboot to
  become effective. Continue [y/n]?: y (enter)
```

Below is the output after executing the swap command which now matches VNIC details.

```
SolutionsOCISBC1# show interfaces mapping
Interface Mapping Info
-----------------------------------------
Eth-IF  MAC-Addr                Label
wancom0 02:00:17:04:19:8E       #present
wancom1 02:00:17:34:70:28       #generic
s0p0    02:00:17:10:48:19       #generic
s0p1    02:00:17:21:1F:2F       #generic
wancom2 FF:FF:FF:FF:FF:FF       #dummy
spare   FF:FF:FF:FF:FF:FF       #dummy
s1p0    FF:FF:FF:FF:FF:FF       #dummy
s1p1    FF:FF:FF:FF:FF:FF       #dummy
s0p2    FF:FF:FF:FF:FF:FF       #dummy
s1p2    FF:FF:FF:FF:FF:FF       #dummy
s0p3    FF:FF:FF:FF:FF:FF       #dummy
s1p3    FF:FF:FF:FF:FF:FF       #dummy

SolutionsOCISBC1#
```

When the SBC comes back up from reboot, it is now ready for full configuration.

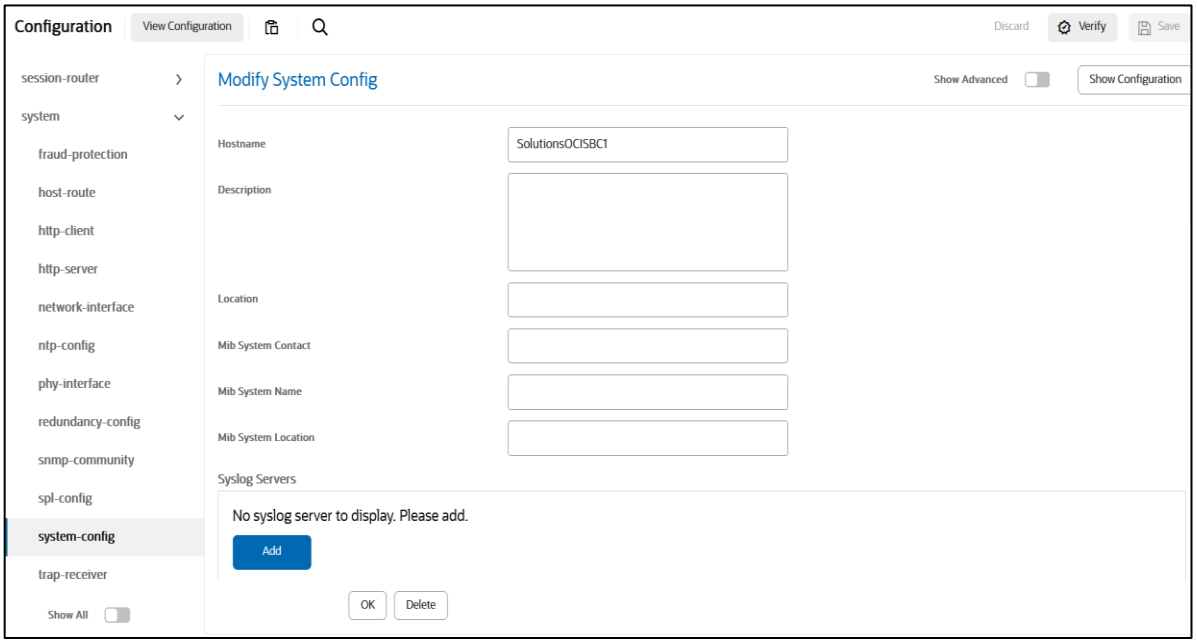
Also note that the usage of “swap” command is based on customer environment. Depending on the setup, the mapping may vary.

The interfaces should be checked and mapped in both the SBC’s (primary and secondary)

7.3. Configure system-config

For HA configuration, make sure the hostname is assigned in both primary and secondary.

In the WebGUI, Go to system->system-config



The CLI users can access the configuration by accessing configure terminal->system->system-config

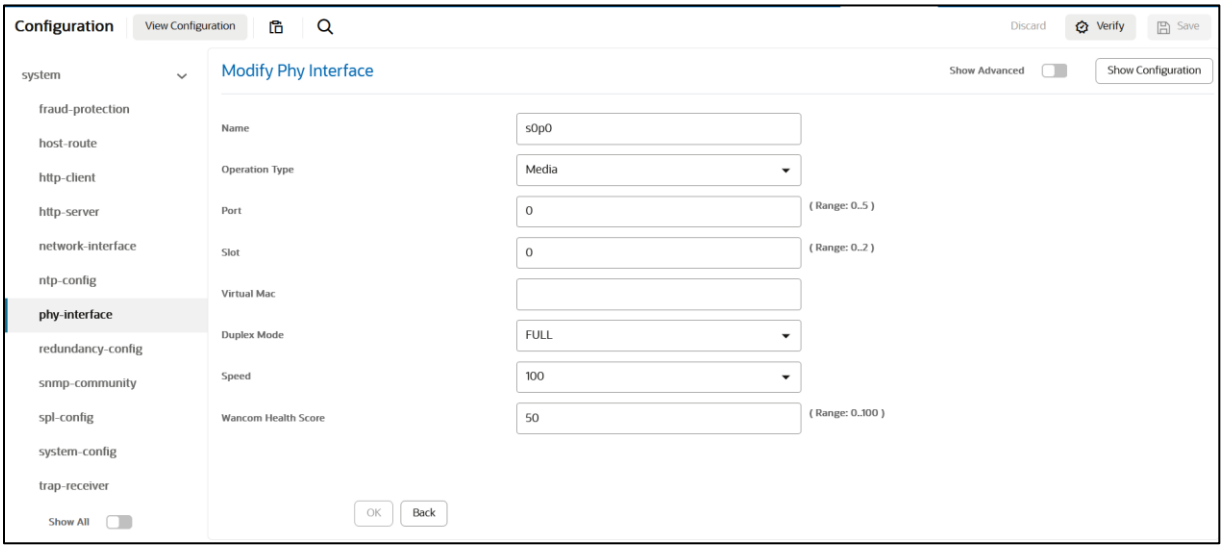
```
SolutionsOCISBC1(system-config)# hostname SolutionsOCISBC1
SolutionsOCISBC1(system-config)# location Cloud
SolutionsOCISBC1(system-config)# done
```

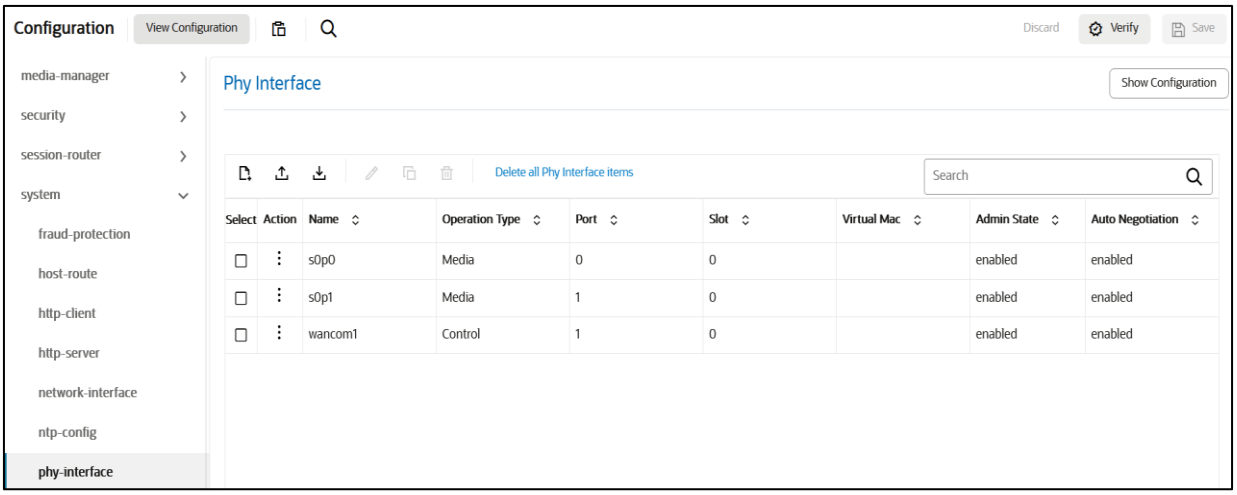
The following configuration has to be applied only in the SBC which is going to be the Primary SBC. The configuration will be replicated later in the secondary SBC using acquire-config.

7.4. Configure Physical Interface Values

To configure physical interface values from the WebGUI, Go to system->phy-interface. Create the following physical interfaces in SBC1 from GUI as shown below:

Parameter Name	s0p0	s0p1	wancom1
Slot	0	0	0
Port	0	1	1
Operation Mode	Media	Media	Control





To configure from CLI, Go to configure terminal->system ->phy-interface

SolutionsOCISBC1# show running-config phy-interface

```
phy-interface
        name                                    s0p0
        operation-type                          Media
        port                                    0
        slot                                    0
        virtual-mac
        admin-state                             enabled
        auto-negotiation                        enabled
        duplex-mode                             FULL
        speed                                   100
        wancom-health-score                     50
        overload-protection                     disabled
        last-modified-by                        webHTTP-admin@209.17.43.241:55066
        last-modified-date                      2024-08-08 10:27:55
```

```
phy-interface
        name                                    s0p1
        operation-type                          Media
        port                                    1
        slot                                    0
        virtual-mac
        admin-state                             enabled
        auto-negotiation                        enabled
        duplex-mode                             FULL
        speed                                   100
        wancom-health-score                     50
        overload-protection                     disabled
        last-modified-by                        webHTTP-admin@209.17.43.241:61998
        last-modified-date                      2024-08-08 16:26:41
phy-interface
        name                                    wancom1
        operation-type                          Control
        port                                    1
        slot                                    0
        virtual-mac
        admin-state                             enabled
        auto-negotiation                        enabled
        duplex-mode
        speed
        wancom-health-score                     25
        overload-protection                     disabled
        last-modified-by                        webHTTP-admin@209.17.43.241:59959
        last-modified-date                      2024-08-08 11:34:09
SolutionsOCISBC1#
```

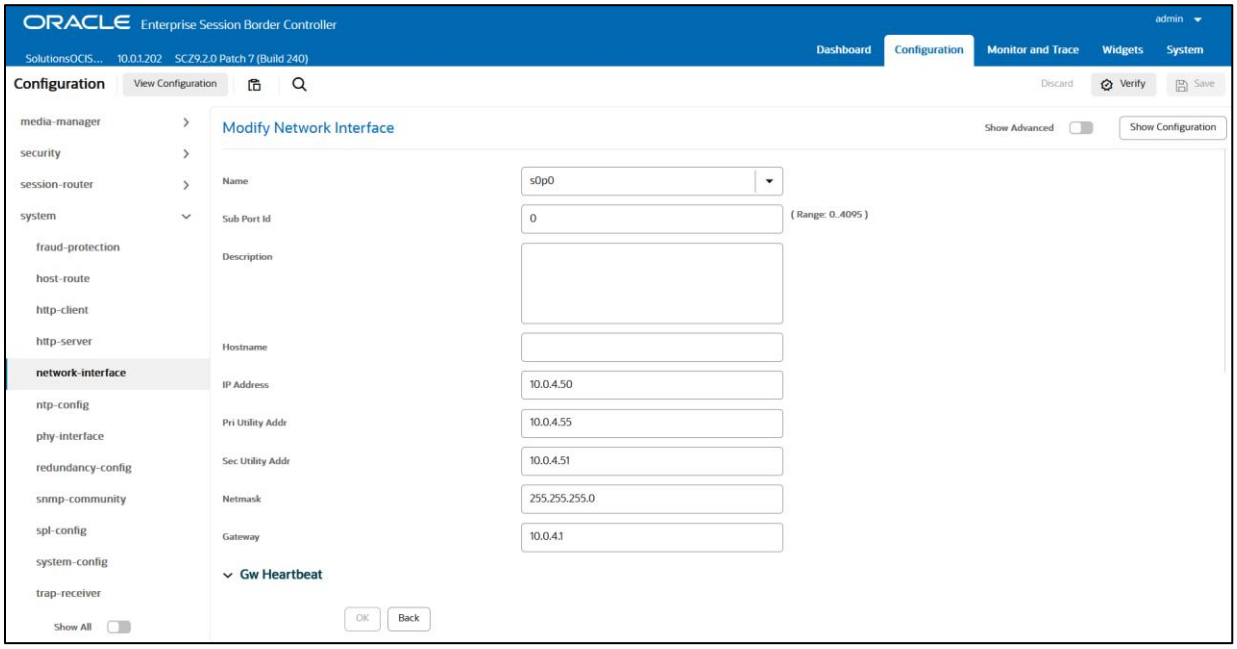
7.5. Configure Network Interface Values

To configure network-interface from GUI, go to system->Network-Interface. Configure three interfaces, s0p0, s0p1 and wancom1. In the below example the s0p0 is shown. Configure the other interfaces in the same manner. Please note that these IP address should match the IP address that is assigned to the OCI VNIC configuration explained in Sec 6 of this application note document.

The table below lists the parameters, to be configured for all the interfaces and they should be modified according to the customer environment.

Name	s0p0	s0p1	Wancom1
IP address	10.0.4.50 (Private IP Address of s0p0 assigned in OCI for SBC1 instance)	10.0.6.50 (Private IP Address of s1p0 assigned in OCI for SBC1 instance)	
Pri-utility-addr	10.0.4.55 (Private IP Address of s0p0 assigned in OCI for SBC1 instance)	10.0.6.55 (Private IP Address of s1p0 assigned in OCI for SBC1 instance)	10.0.2.50(Private IP Address of wancom1 assigned in OCI for SBC1 instance)
Netmask	255.255.255.0	255.255.255.0	

Gateway	10.0.4.1	10.0.5.1	
Sec-utility-addr	10.0.4.51 (Private IP Address of s0p0 assigned in OCI for SBC2 instance)	10.0.6.51 (Private IP Address of s1p0 assigned in OCI for SBC2 instance)	10.0.2.51(Private IP Address of wancom1 assigned in OCI for SBC2 instance)



To configure network interface through CLI, go to configure terminal->system->network-interface

SolutionsOCISBC1# show running-config network-interface

```
network-interface
        name                                    s0p0
        sub-port-id                             0
        description
        hostname
        ip-address                              10.0.4.50
        pri-utility-addr                        10.0.4.55
        sec-utility-addr                        10.0.4.51
        netmask                                 255.255.255.0
        gateway                                 10.0.4.1
        sec-gateway
        gw-heartbeat
                state                                   disabled
                heartbeat                               0
                retry-count                             0
                retry-timeout                           1
                health-score                            0
        bfd-config
                state                                   disabled
                health-score                            0
                options
        dns-ip-primary
        dns-ip-backup1
```

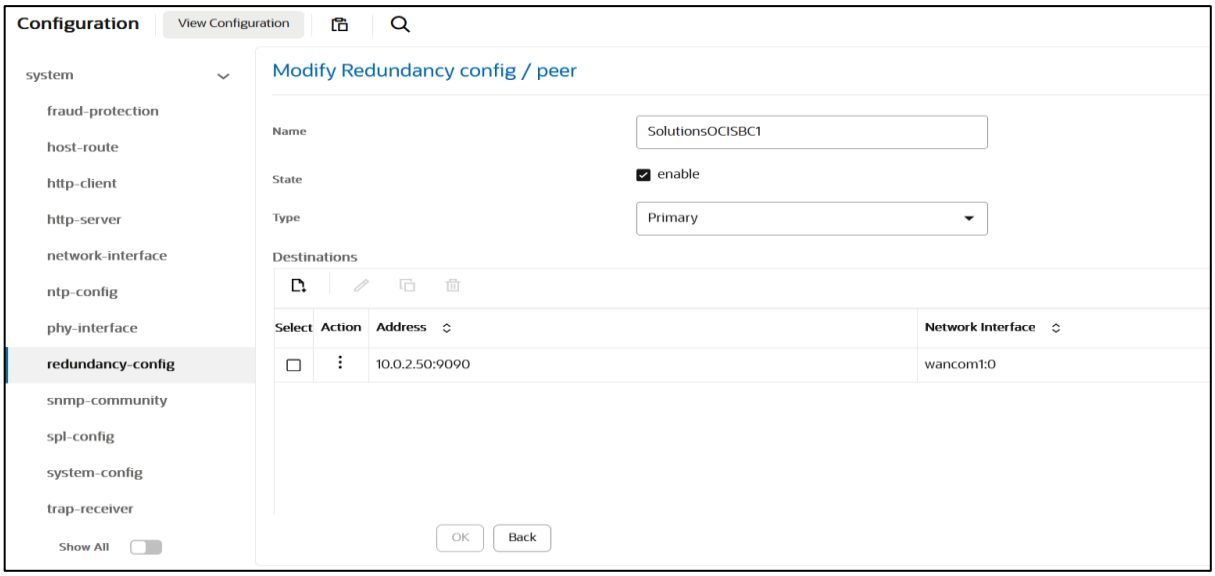
```
        dns-ip-backup2
        dns-domain
        dns-timeout                             11
        dns-max-ttl                             86400
        signaling-mtu                           0
        hip-ip-list                             10.0.4.50
        icmp-address
        snmp-address
        ssh-address
        last-modified-by                        webHTTP-admin@209.17.43.241:55066
        last-modified-date                      2024-08-08 10:37:57
network-interface
        name                                    s0p1
        sub-port-id                             0
        description
        hostname
        ip-address                              10.0.6.50
        pri-utility-addr                        10.0.6.55
        sec-utility-addr                        10.0.6.51
        netmask                                 255.255.255.0
        gateway                                 10.0.6.1
        sec-gateway
        gw-heartbeat
                state                                   disabled
                heartbeat                               0
                retry-count                             0
                retry-timeout                           1
                health-score                            0
        bfd-config
                state                                   disabled
                health-score                            0
                options
        dns-ip-primary
        dns-ip-backup1
        dns-ip-backup2
        dns-domain
        dns-timeout                             11
        dns-max-ttl                             86400
        signaling-mtu                           0
        hip-ip-list                             10.0.6.50
        icmp-address
        snmp-address
        ssh-address
        last-modified-by                        webHTTP-admin@209.17.43.241:55066
        last-modified-date                      2024-08-08 10:39:55
network-interface
        name                                    wancom1
        sub-port-id                             0
        description
        hostname
        ip-address
        pri-utility-addr                        10.0.2.50
        sec-utility-addr                        10.0.2.51
        netmask                                 255.255.255.0
        gateway                                 10.0.2.1
        sec-gateway
        gw-heartbeat
                state                                   enabled
                heartbeat                               0
                retry-count                             0
                retry-timeout                           1
                health-score                            0
        bfd-config
                state                                   disabled
                health-score                            0
                options
        dns-ip-primary
        dns-ip-backup1
        dns-ip-backup2
        dns-domain
        dns-timeout                             11
```

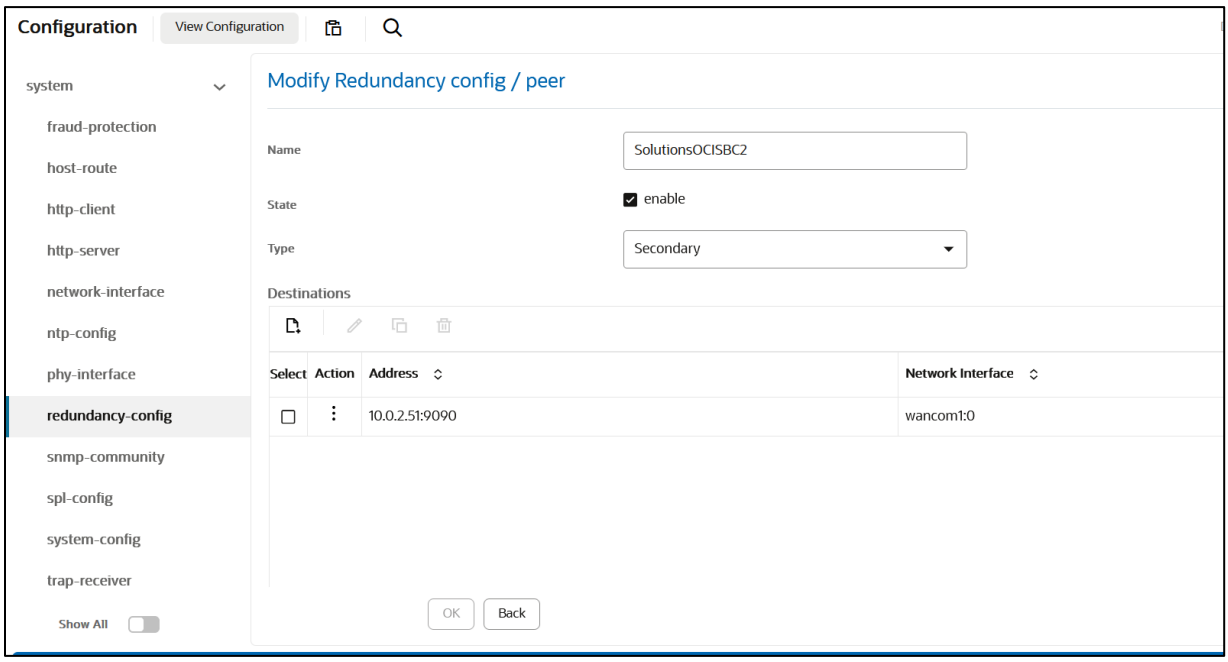
```
        dns-max-ttl                          86400
        signaling-mtu                        0
        hip-ip-list
        icmp-address
        snmp-address
        ssh-address
        last-modified-by                     webHTTP-admin@209.17.43.241:64044
        last-modified-date                   2024-08-08 12:09:30
SolutionsOCISBC1#
```

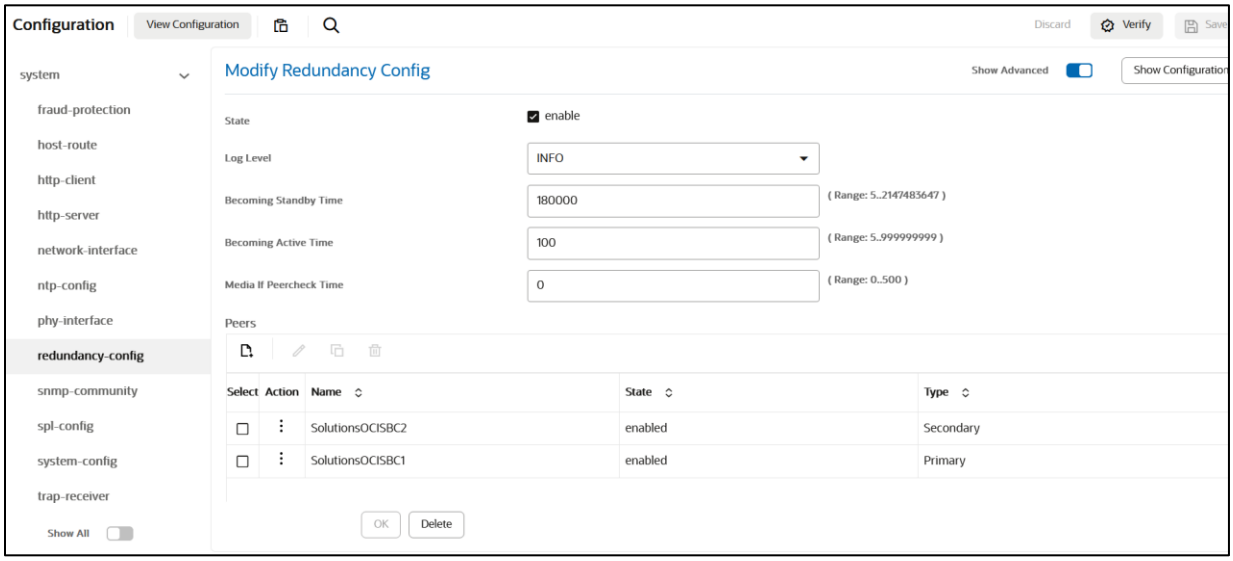
7.6. Configure Redundancy

Here we assign the primary and secondary SBC's. The IP address used here are the addresses of wancom1assigned to both SBC.

For configuring from WebGUI , go to system->redundancy-config and configure the peers.







To configure from CLI, go to conf t->system->redundancy config

SolutionsOCISBC1# show running-config redundancy-config

```
redundancy-config
 state                                  enabled
 log-level                              INFO
 health-threshold                       75
 emergency-threshold                    50
 port                                   9090
 advertisement-time                     500
 percent-drift                          210
 initial-time                           1250
 becoming-standby-time                  180000
```

```
becoming-active-time                    100
cfg-port                                1987
cfg-max-trans                           10000
cfg-sync-start-time                     5000
cfg-sync-comp-time                      1000
gateway-heartbeat-interval              0
gateway-heartbeat-retry                 0
gateway-heartbeat-timeout               1
gateway-heartbeat-health                0
media-if-peercheck-time                 0
peer
        name                                    SolutionsOCISBC2
        state                                   enabled
        type                                    Secondary
        destination
                address                                 10.0.2.51:9090
                network-interface                       wancom1:0
peer
        name                                    SolutionsOCISBC1
        state                                   enabled
        type                                    Primary
        destination
                address                                 10.0.2.50:9090
                network-interface                       wancom1:0
```

At this stage, we have completed the configuration in the primary SBC.

7.7. Acquiring configuration from the Primary SBC.

To configure the secondary SBC, please follow the below steps from SBC CLI mode.

- Delete configuration if any in the secondary SBC.
- Check whether the primary and secondary SBC are in ntp sync
- To acquire configuration from the primary SBC, execute the following command in the secondary SBC

SolutionsOCISBC2# acquire-config 10.0.1.202

(where 10.0.1.202 is the management interface of the primary SBC) Alternatively, we can use the Ephemeral IP assigned from the OCI VCN for that VNIC.

7.8. Switching over SBC

After configuring the SBC, check the health of the primary and secondary SBC's

SolutionsOCISBC1# show health

```
Media Synchronized              true
SIP Synchronized                true
REC Synchronized                disabled
XSERV Synchronized              disabled
Config Synchronized             true
Collect Synchronized            disabled
RADIUS CDR Synchronized         disabled
Rotated CDRs Synchronized       disabled
IPSEC Synchronized              disabled
```

```
        Iked Synchronized             disabled
        Lbpd Synchronized             disabled
        tCCD Synchronized             disabled
        Service Health Synchronized   true
        Active Peer Address

Redundancy Protocol Process (v3):
        State                           Active
        Health                          100
        Lowest Local Address            10.0.2.50:9090
        1 peer(s) on 1 socket(s):
        SolutionsOCISBC2: v3, Standby, health=100, max silence=1050
                         last received from 10.0.2.51 on wancom1:0

        Switchover log:

SolutionsOCISBC2# show health

        Media Synchronized            true
        SIP Synchronized              true
        REC Synchronized              disabled
        XSERV Synchronized            disabled
        Config Synchronized           true
        Collect Synchronized          disabled
        RADIUS CDR Synchronized       disabled
        Rotated CDRs Synchronized     disabled
        IPSEC Synchronized            disabled
        Iked Synchronized             disabled
        Lbpd Synchronized             disabled
        tCCD Synchronized             disabled
        Service Health Synchronized   true
        Active Peer Address           10.0.2.50



Redundancy Protocol Process (v3):
        State                           Standby
        Health                          100
        Lowest Local Address            10.0.2.51:9090
        1 peer(s) on 1 socket(s):
        SolutionsOCISBC1: v3, Active, health=100, max silence=1050
                         last received from 10.0.2.50 on wancom1:0

        Switchover log:
```

We can switchover the SBC's by using the following command.

SolutionsOCISBC1# notify berpd force

Now the active SBC becomes standby and vice-versa.

8. Deploying SBC behind the OCI-NAT

The SPL-configuration is a must for SBC deployed in Cloud Environments.

Here, the SBC is placed behind the OCI NAT. The SBC behind SPL NAT plugin is essential for proper signaling and voice path between the SBC deployed on OCI cloud and PSTN

The plug-in changes information in SIP messages to hide the end point located inside the private network of OCI SBC. Configure the Support for SBC Behind NAT SPL plug-in for each SIP interface on the SBC. One public-private address pair is required for each SIP interface that uses the SPL plug-in, as follows.

- The private IP address must be the same as the SIP Interface IP address.
- The public IP address must be the reserved public IP address configured in OCI Cloud for particular network interface.

Here is an example configuration with SBC Behind NAT SPL config. The SPL is applied to the s0p0 interface. To configure SBC Behind NAT SPL Plug in using the GUI,

Go to session-router->sip-interface->spl-options.

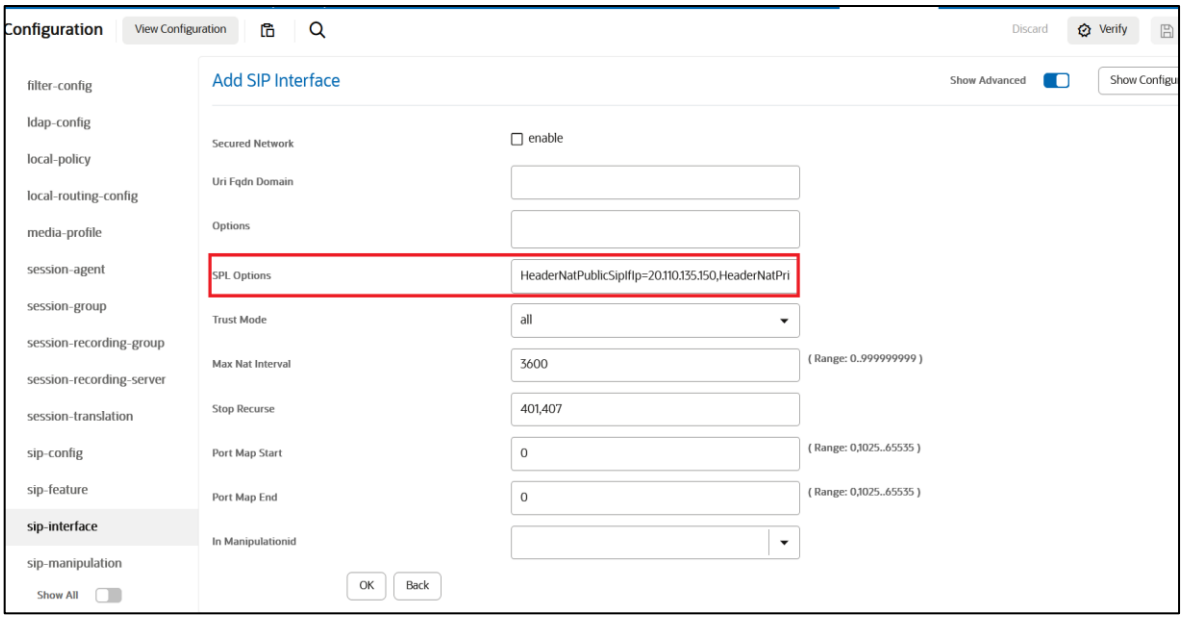
Input the following value, save and activate.

The below value given in the screen is just an example and the users can give this value according to their network configuration.

The format of SPL option is given as below.

HeaderNatPublicSipIfIp=<Reserved Public IP of the s0p0 interface>

HeaderNatPrivateSipIfIP =<Private IP of the s0p0interface >



To configure header NAT SPL from ACLI

ACLI Path: config t→session-router→sip-interface

Choose the sip interface on which the header NAT SPL needs to be applied under spl-options. Add the entry as per example shared below.

```
spl-options

HeaderNatPublicSipIfIp=20.110.135.150,HeaderNatPrivateSipIfIp=10.0.4.60
```

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