
# Oracle SBC integration with Genesys Pure Engage and Twilio Elastic Sip Trunking

**Technical Application Note**

twilio

ORACLE
COMMUNICATIONS

# Disclaimer

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described for Oracle's products remains at the sole discretion of Oracle.

# Revision History

| Version | Description of Changes | Date Revision Completed |
|---|---|---|
| 1.0 | Oracle SBC integration with Genesys Pure Engage and Twilio Elastic Sip Trunking | 04th June 2021 |
| 1.1 | Added new section for SBC config/Deployment Using Configuration Assistant | 07th January 2022 |

## Table of Contents

# 1. Intended Audience

This document is intended for use by Oracle Systems Engineers, third party Systems Integrators, Oracle Enterprise customers and partners and end users of the Oracle Enterprise Session Border Controller (SBC). It is assumed that the reader is familiar with basic operations of the Oracle Enterprise Session Border Controller platform along with Genesys Pure Engage.

# 2. Document Overview

This Oracle technical application note outlines how to configure the Oracle SBC to interwork between Twilio Elastic Sip Trunk with on premises Genesys Pure Engage. The solution contained within this document has been tested using Oracle Communication SBC with **OS840p5**

Please find the related documentation links below:

## 2.1. Twilio Elastic SIP Trunking

Twilio Elastic SIP Trunking is a cloud-based solution that provides connectivity for IP-based communications infrastructure to connect to the PSTN for making and receiving telephone calls to the rest of the world via any broadband internet connection. Twilio's Elastic SIP Trunking service automatically scales, up or down, to meet your traffic needs with unlimited capacity. In just minutes you can deploy globally with Twilio's easy-to-use self-service tools without having to rely on slow providers.

Sign up for a free Twilio trial and learn more about configuring your Twilio Elastic SIP Trunk.

## 2.2. Genesys Pure Engage

SIP Server is the Genesys software component that provides an interface between your telephony hardware and the rest of the Genesys software components in your enterprise. It translates and keeps track of events and requests that come from and are sent to the telephony device. SIP Server is a TCP/IP-based server that can also act as a messaging interface between SIP Server clients. It is the critical point in allowing your Genesys solution to facilitate and track the contacts that flow through your enterprise and this reduces the cost and complexity of extending an enterprise's telephony system outside its network borders.

Genesys Pure Engage solution consists of the following components and the user should perform the configuration of the below servers.

Testing is performed as per below product release version.

- Genesys SIP Server, Version 8.1.1
- Genesys Media Control Platform, Version 9.0.013.61
- Genesys SIP Proxy Server, Version 8.1.100.76
- Genesys SIP Feature Server, Version 8.1.202.1
- Genesys Configuration Manager 8.1.1

**The configuration of Genesys SIP Server, including Media Server, SIP Proxy, Configuration Manager and SIP Feature Server are out of scope of this document**. **Please note that the IP Addresses, FQDN and configuration names and details given in this document are used for reference purposes only. These same details cannot be used in customer configurations. End users of this document can use the configuration details according to their network requirements. There are some public facing IPs (externally routable IPs) that we use for our testing are masked in this document for security reasons. The customers can configure any publicly routable IPs for these sections as per their network architecture needs.**

# 3. Introduction

### 3.1. Audience

This is a technical document intended for telecommunications engineers with the purpose of configuring Genesys Pure Engage using Oracle Enterprise SBC. There will be steps that require navigating the Oracle SBC GUI interface, understanding the basic concepts of TCP/UDP, IP/Routing, DNS server, SIP/RTP and TLS/SRTP are also necessary to complete the configuration and for troubleshooting, if necessary.

### 3.2. Requirements

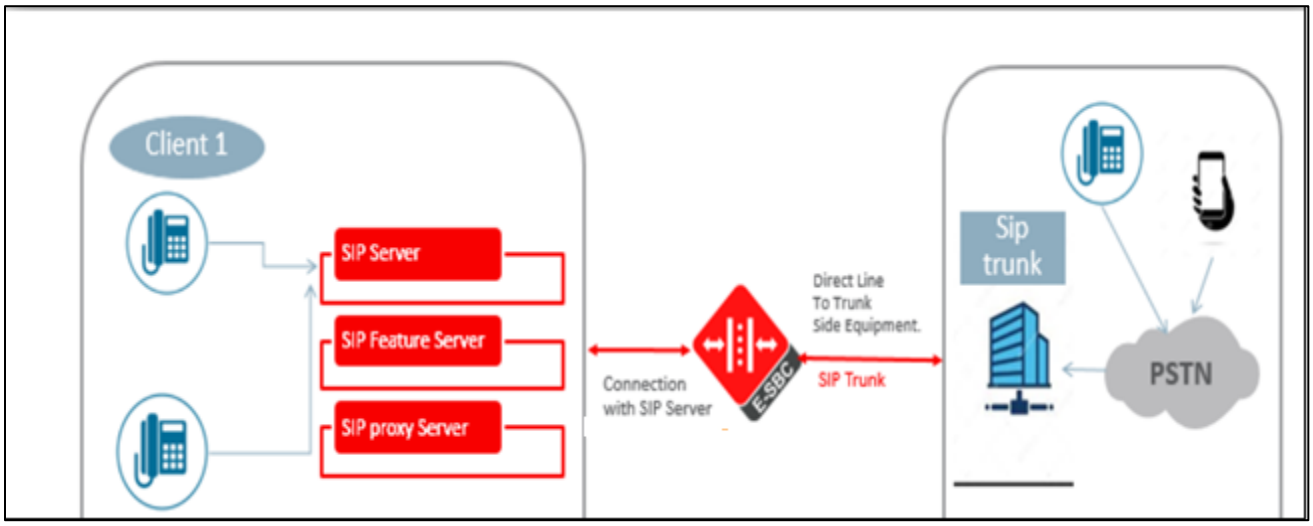
- Fully functioning Genesys SIP Server deployment, including Media Server, SIP Proxy and SIP Feature Server
- Oracle Enterprise Session Border Controller (hereafter Oracle SBC) running 8.4.0 version

The below revision table explains the versions of the software used for each component:
This table is Revision 1 as of now:

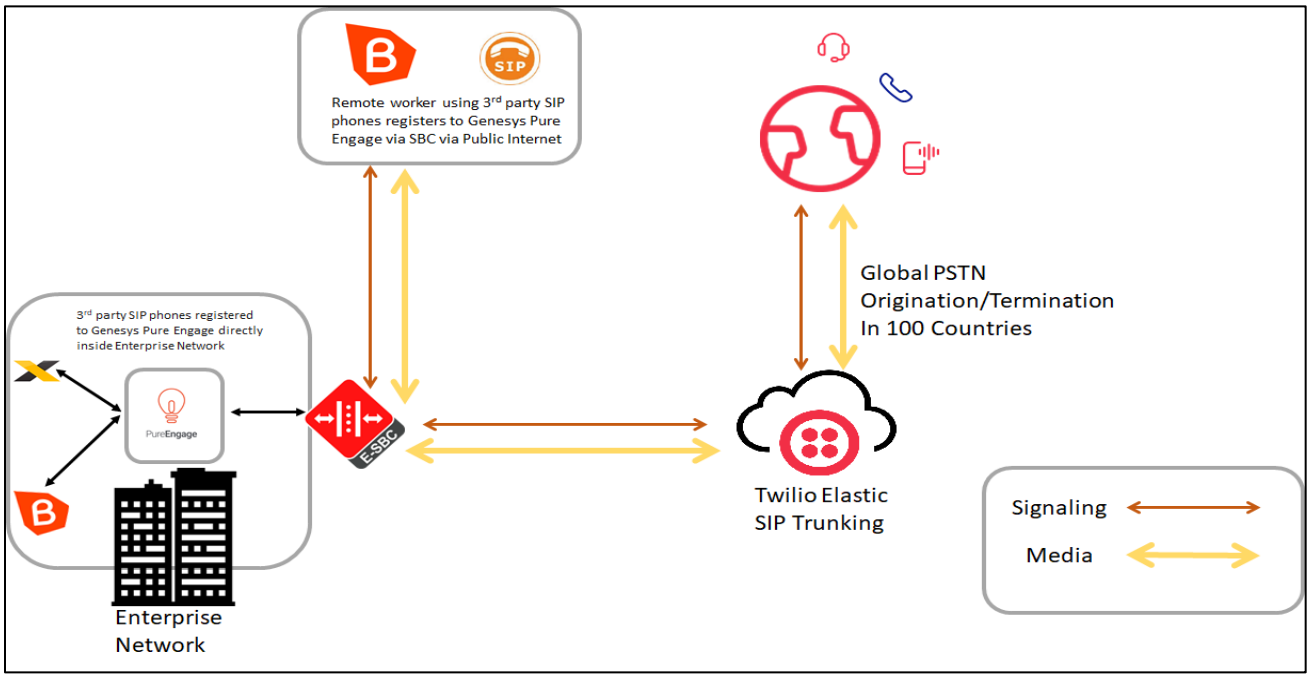
| Software Used | SBC Version | Genesys Pure Engage |
|---|---|---|
| Revision 1 | 8.4.0 | 8.1.1 |
| | | |

### 3.3. Architecture

The General architecture of Genesys Pure Engage with PSTN trunk is given below.




The lab setup used for the testing is given below specific to Genesys Pure Engage with Twilio SIP trunk.



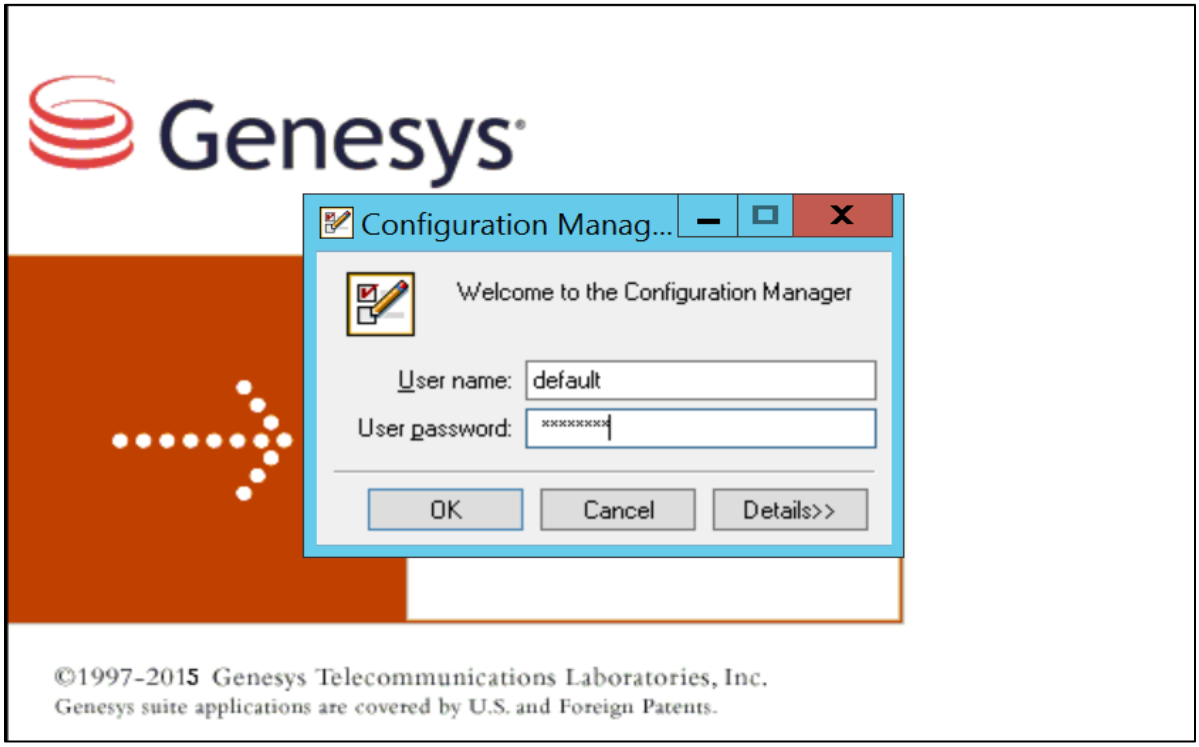

The configuration, validation and troubleshooting are the focuses of this document and will be described in three phases:

- Phase 1 – Configuring the Genesys Pure Engage for Oracle SBC.
- Phase 2 – Configuring the Oracle SBC.
- Phase 3 – Configuring the Twilio Elastic SIP Trunk

# 4. Configuring the Genesys Pure Engage

Please login to Genesys Configuration Manager GUI with proper login credentials (Username and password) as given below. After that, perform the steps below in the given order.

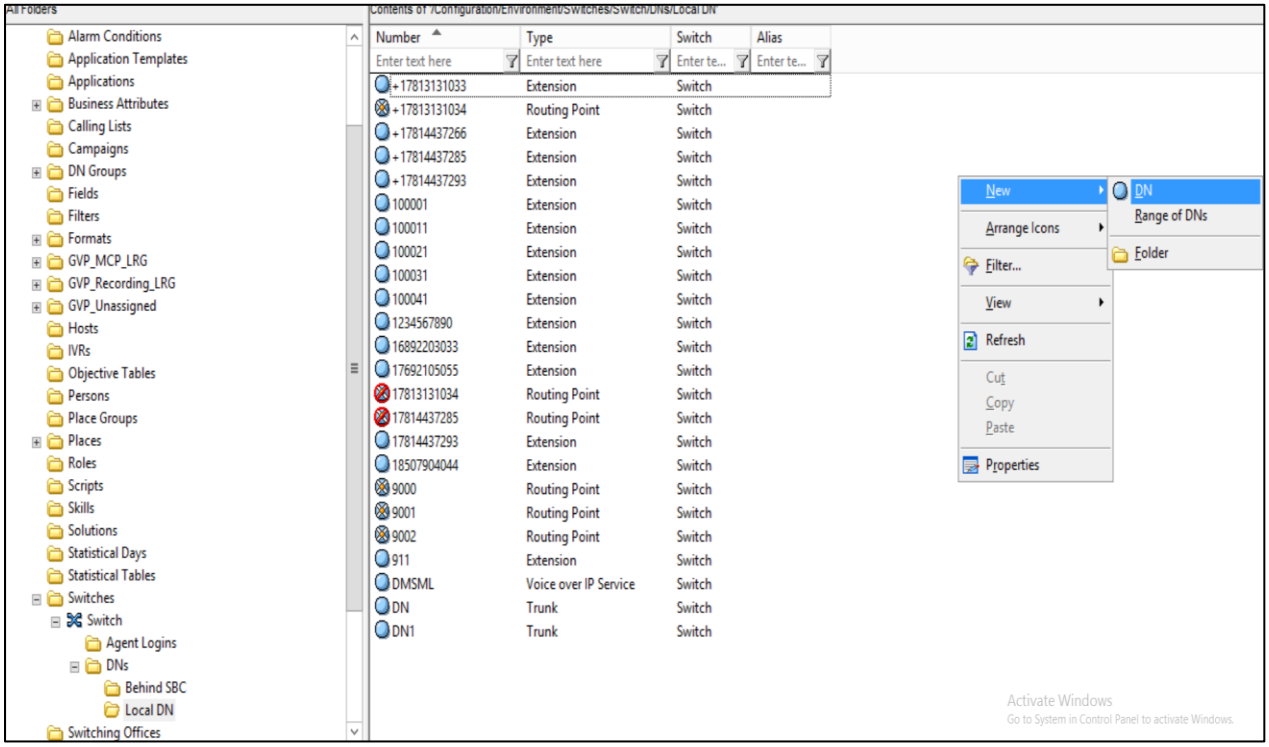
Note: The pre-requisite here is that user has done the basic config of Genesys Configuration Manager and knows the provisioning steps that's are given below.

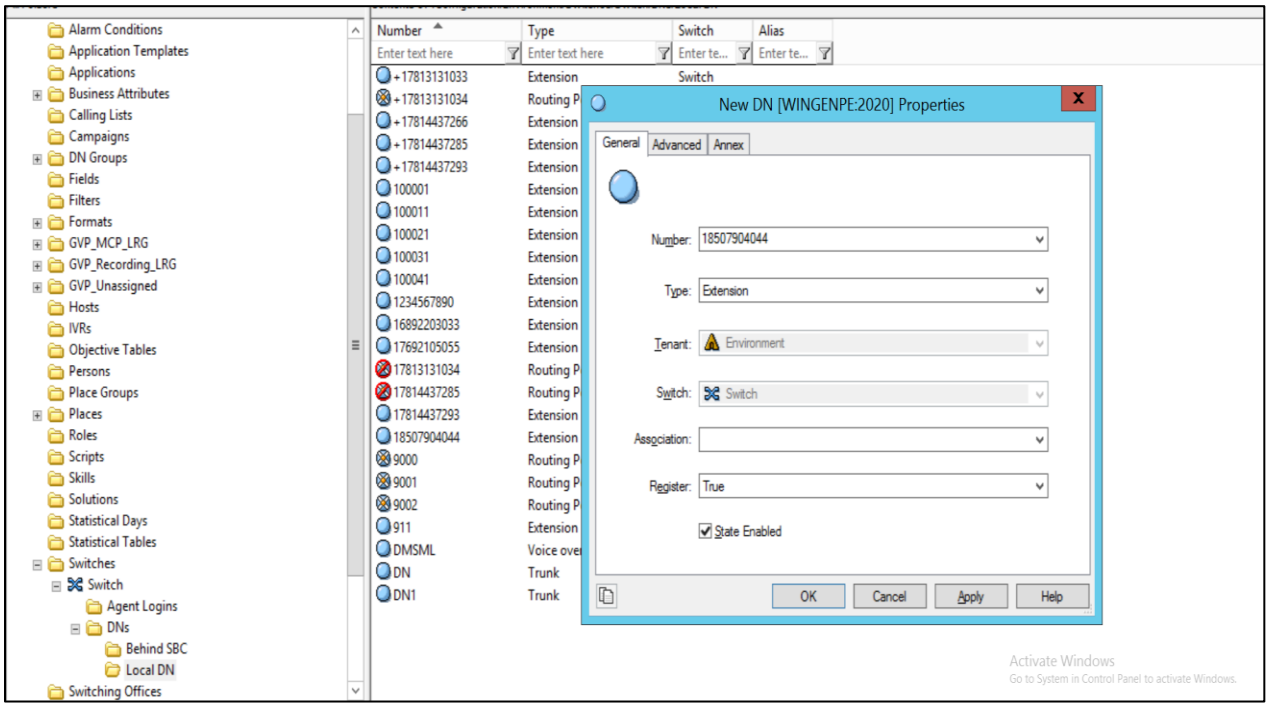



## 4.1. Configuring a new DN

01) Go to Environment ----- Switches ----- Switch (SIP Switch) ---- DNs – Local DNs ---- Add New
02) Select Number as the DN or DID that needs to be assigned.
03) Select Type as "Extension" from the drop-down menu.
04) Leave other fields to Default values.
05) Click Apply and OK to save the DN.

You can follow the same procedure to add more DNs to the Genesys Configuration Manager.


All Folders
Contents of /Configuration/Environment/Switches/Switch/DNs/Local DN
Alarm Conditions
Application Templates
Applications
Business Attributes
Calling Lists
Campaigns
DN Groups
Fields
Filters
Formats
GVP_MCP_LRG
GVP_Recording_LRG
GVP_Unassigned
Hosts
IVRs
Objective Tables
Persons
Place Groups
Places
Roles
Scripts
Skills
Solutions
Statistical Days
Statistical Tables
Switches
Switch
Agent Logins
DNs
Behind SBC
Local DN
Switching Offices
Number
Type
Switch
Alias
Enter text here
+17813131033 Extension Switch
+17813131034 Routing Point Switch
+17814437266 Extension Switch
+17814437285 Extension Switch
+17814437293 Extension Switch
100001 Extension Switch
100011 Extension Switch
100021 Extension Switch
100031 Extension Switch
100041 Extension Switch
1234567890 Extension Switch
16892203033 Extension Switch
17692105055 Extension Switch
17813131034 Routing Point Switch
17814437285 Routing Point Switch
17814437293 Extension Switch
18507904044 Extension Switch
9000 Routing Point Switch
9001 Routing Point Switch
9002 Routing Point Switch
911 Extension Switch
DMSML Voice over IP Service Switch
DN Trunk Switch
DN1 Trunk Switch
New
Arrange Icons
Filter...
View
Refresh
Cut
Copy
Paste
Properties
DN
Range of DNs
Folder
Activate Windows
Go to System in Control Panel to activate Windows.


Alarm Conditions
Application Templates
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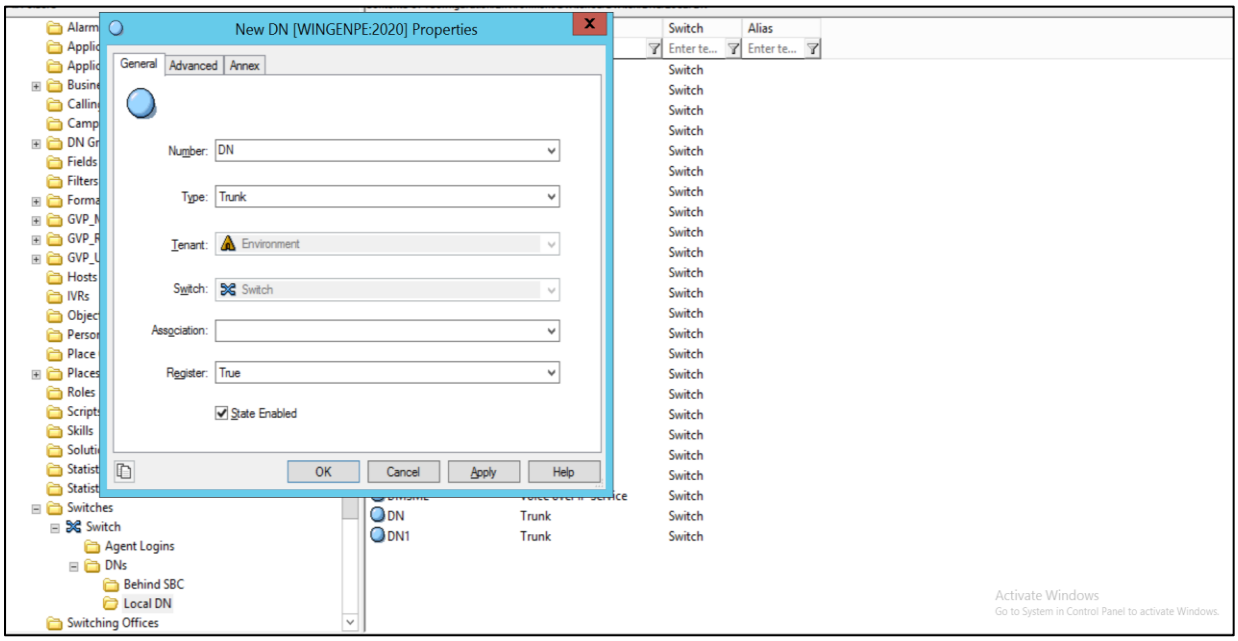
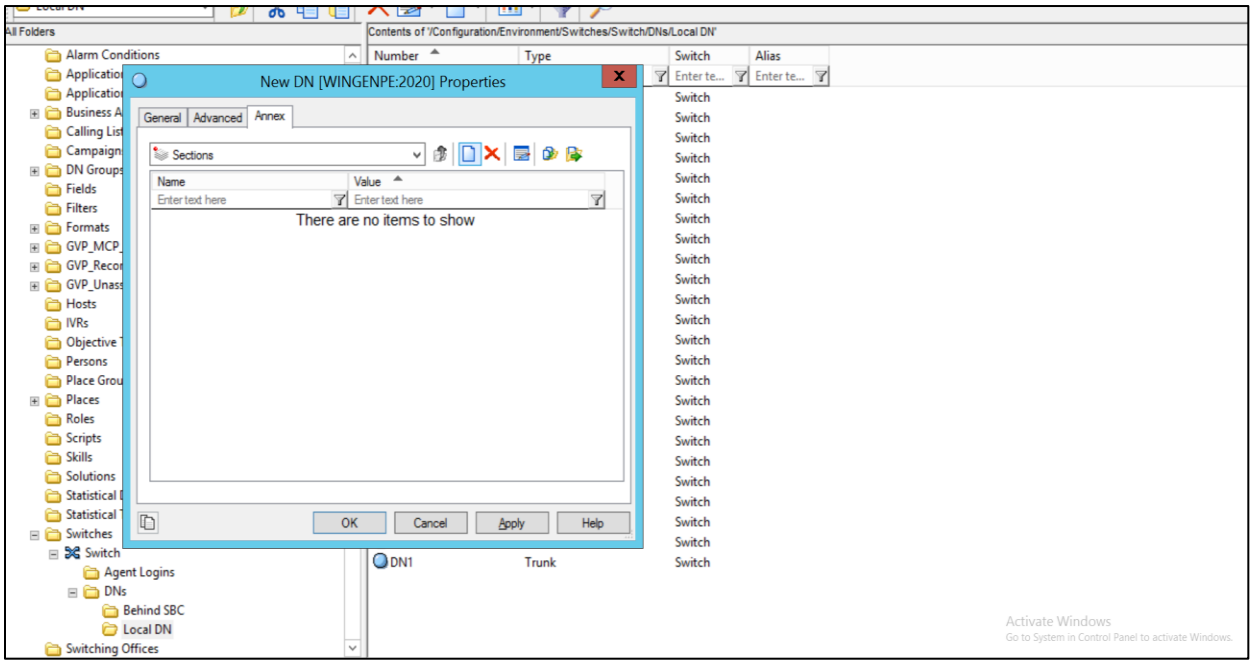
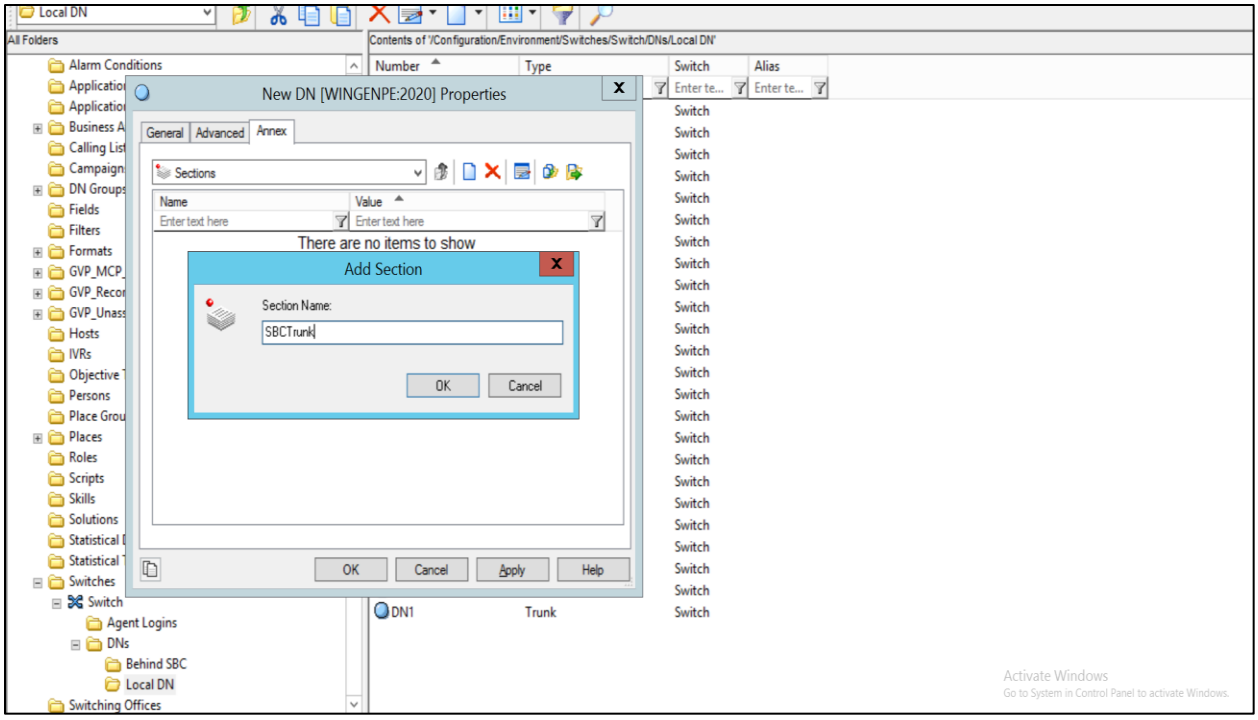
GVP_MCP_LRG
GVP_Recording_LRG
GVP_Unassigned
Hosts
IVRs
Objective Tables
Persons
Place Groups
Places
Roles
Scripts
Skills
Solutions
Statistical Days
Statistical Tables
Switches
Switch
Agent Logins
DNs
Behind SBC
Local DN
Switching Offices
Number
Type
Switch
Alias
New DN [WINGENPE:2020] Properties
General
Advanced
Annex
Number: 18507904044
Type: Extension
Tenant: Environment
Switch: Switch
Association:
Register: True
State Enabled
OK
Cancel
Apply
Help
Activate Windows
Go to System in Control Panel to activate Windows.

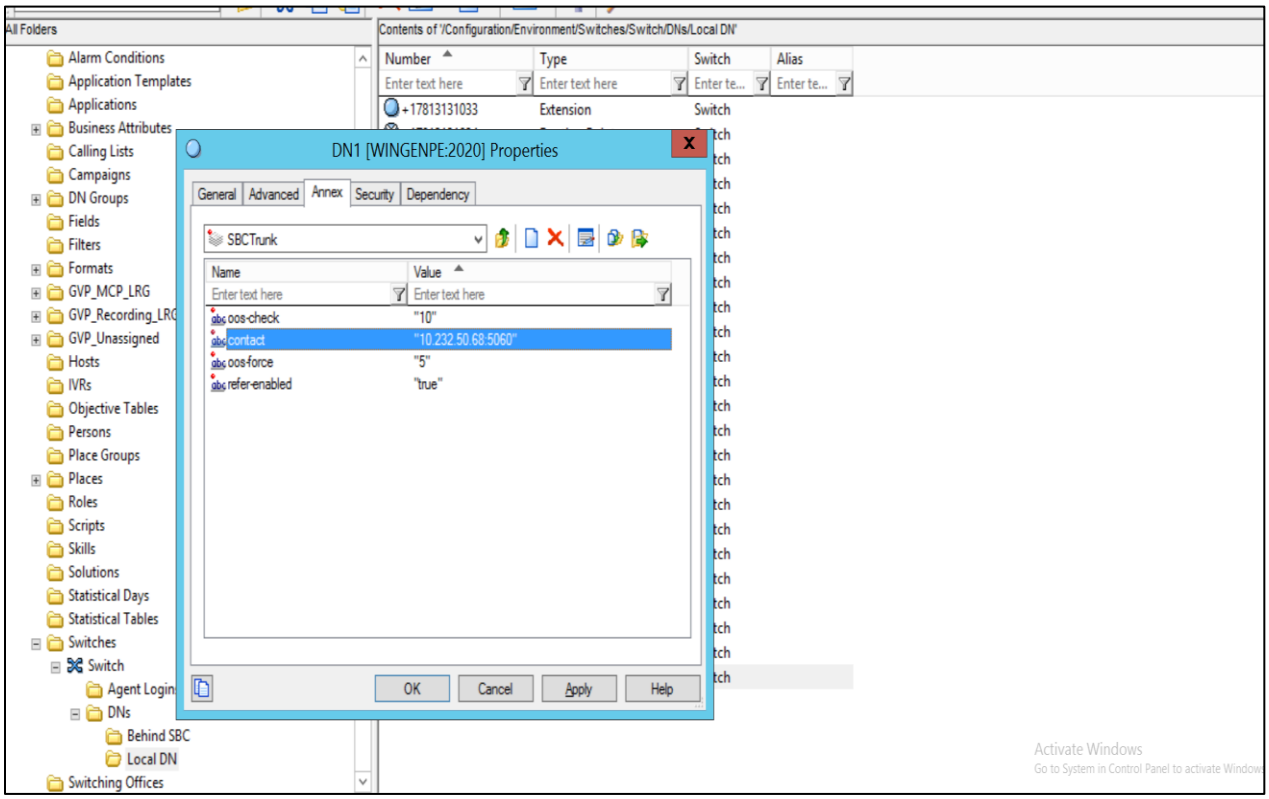
## 4.2. Configure a new Trunk for SBC.

01) Go to Environment ----- Switches ----- Switch (SIP Switch) ---- DNs – Local DNs ---- Add New
02) Select Number as the DN (Default value)
03) Select Type as “Trunk” from the drop-down menu.
04) Click on Annex Tab and select Create New section/ option and give an appropriate name and click OK.
05) After Trunk name is created, select Create New section/ option again.
06) Add the following parameters given below and Click Apply and OK to save the Trunk configuration.
**The important parameter is “Contact” where we give SBC inside SIP interface (Core side)**






With these steps, the Genesys Pure Engage configuration is complete.

# 5. Configuring the SBC

This chapter provides step-by-step guidance on how to configure Oracle SBC for Genesys Pure Engage and Twilio Elastic SIP Trunking. **In this SBC config, Twilio Elastic SIP trunk side is secure (TLS/SRTP) and Genesys Pure Engage Side is unsecure (UDP or TCP/RTP).** If the Oracle SBC being deployed is new, with no existing configuration, the simplest way to configure it to interface with Genesys PureEngage is by utilizing the Configuration Assistant feature.

## 5.1. Validated Oracle SBC version

Oracle conducted tests with Oracle SBC 8.4 software – this software with the configuration listed below can run on any of the following products:

- AP 1100
- AP 3900
- AP 4600
- AP 6300
- AP 6350
- VME

# 6. New SBC configuration

If the customer is looking to setup a new SBC from scratch, please follow the section below.

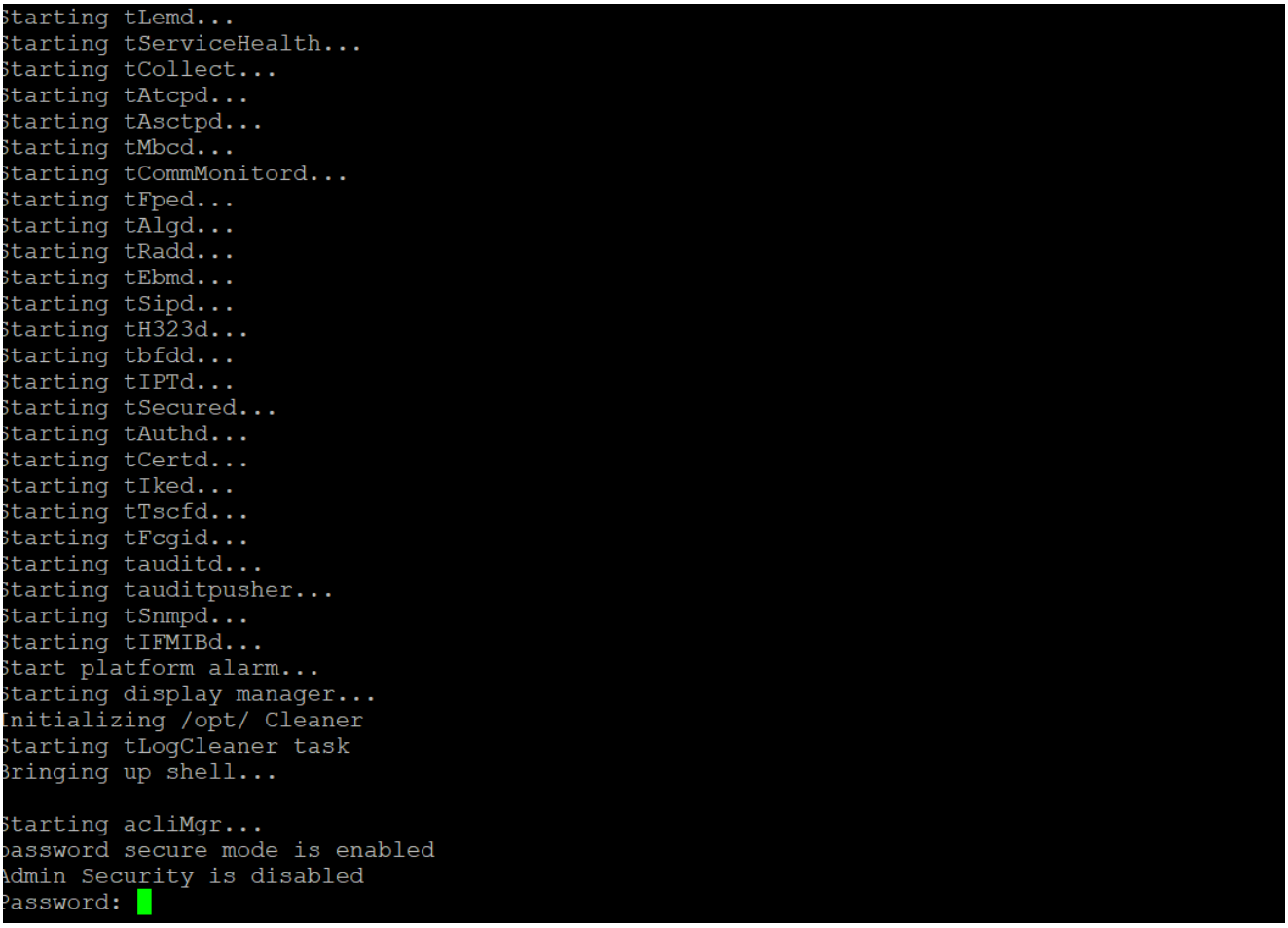
**Please note that the setup of VM and Cloud is different from hardware SBC and the steps below is to be used with hardware based SBC.**

## 6.1. Establishing a serial connection to the SBC

Connect one end of a straight-through Ethernet cable to the front console port (which is active by default) on the SBC and the other end to console adapter that ships with the SBC, connect the console adapter (a DB-9 adapter) to the DB-9 port on a workstation, running a terminal emulator application such as Putty. Start the terminal emulation application using the following settings:

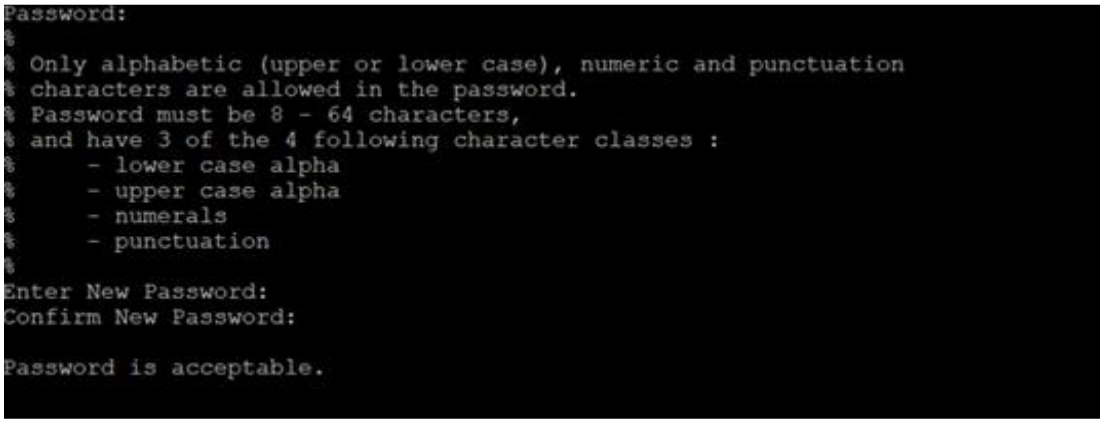
- Baud Rate=115200
- Data Bits=8
- Parity=None
- Stop Bits=1
- Flow Control=None

Power on the SBC and confirm that you see the following output from the boot-up sequence




Enter the default password to log in to the SBC. Note that the default SBC password is “acme” and the default super user password is “packet”.

Both passwords have to be changed according to the rules shown below.



Now set the management IP of the SBC by setting the IP address in bootparam.

To access bootparam. Go to Configure terminal->bootparam.

```
NN4600-139# conf t
NN4600-139(configure)# bootparam

'.' = clear field;  '-' = go to previous field;  q = quit

Boot File               : /boot/nnSCZ840p5.bz
IP Address              : 10.138.194.139
VLAN                    : 0
Netmask                 : 255.255.255.192
Gateway                 : 10.138.194.129
IPv6 Address            :
IPv6 Gateway            :
Host IP                 :
FTP username            : vxftp
FTP password            : vxftp
Flags                   :
Target Name             : NN4600-139
Console Device          : COM1
Console Baudrate        : 115200
Other                   :

NOTE: These changed parameters will not go into effect until reboot.
Also, be aware that some boot parameters may also be changed through
PHY and Network Interface Configurations.


        ERROR   : space in /boot      (Percent Free: 6)

NN4600-139(configure)#
NN4600-139(configure)#
```

Note: There is no management IP configured by default.

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

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

```
NN4600-139#
NN4600-139# setup product


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

Last Modified 2020-04-30 22:38:15
-------------------------------------------------------------
 1 : Product       : Enterprise Session Border Controller

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

Save the changes and reboot the SBC.

```
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
```

The SBC comes up after reboot and is now ready for configuration.

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.

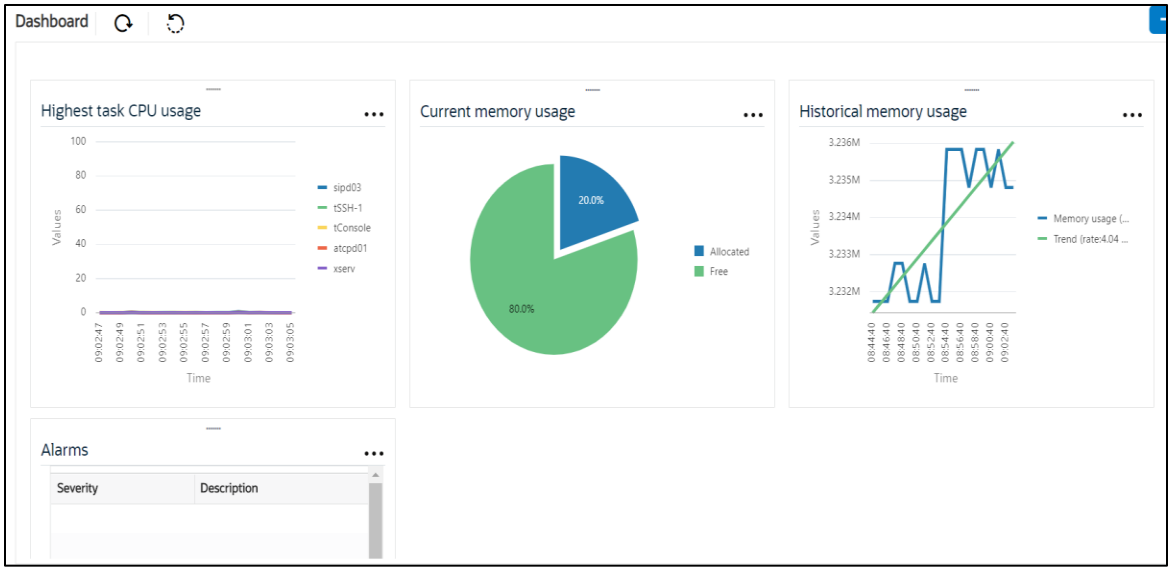
```
NN4600-139(http-server)#
NN4600-139(http-server)# show
http-server
        name                                    webServerInstance
        state                                   enabled
        realm
        ip-address
        http-state                              enabled
        http-port                               80
        https-state                             disabled
        https-port                              443
        http-interface-list                     REST,GUI
        http-file-upload-size                   0
        tls-profile
        auth-profile
        last-modified-by                        @
        last-modified-date                      2021-01-25 00:16:28

NN4600-139(http-server)#
```

## 6.2. Configure SBC using Web GUI

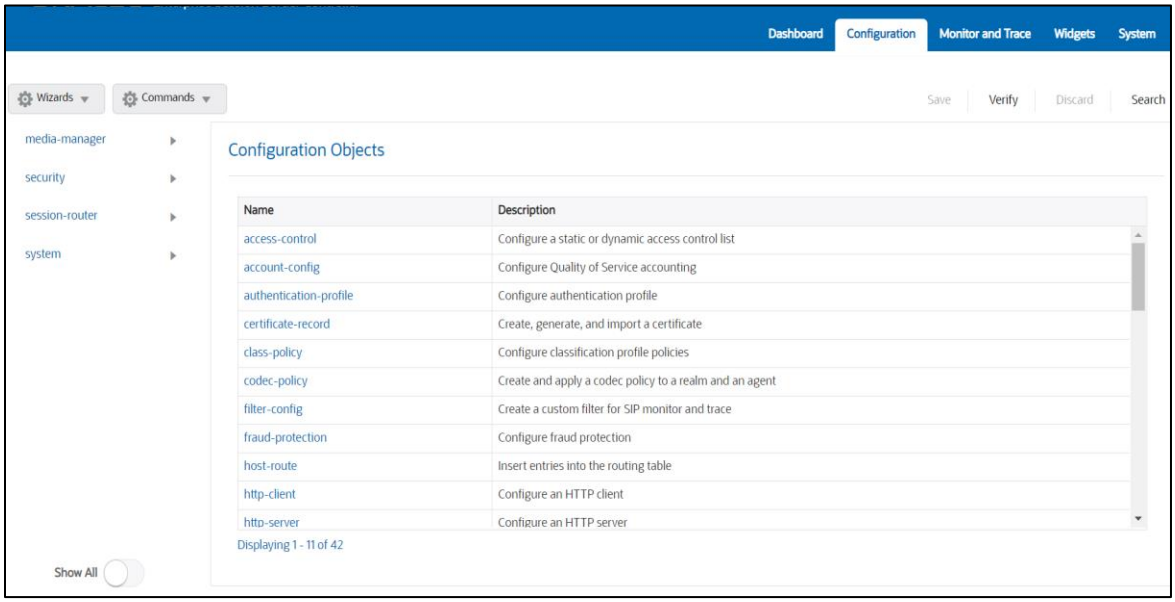
In this app note, we configure SBC using the WebGUI.

The Web GUI can be accessed through the url http://<SBC_MGMT_IP>.


The username and password is the same as that of CLI.




Go to Configuration as shown below, to configure the SBC




Kindly refer to the GUI User Guide given below for more information.

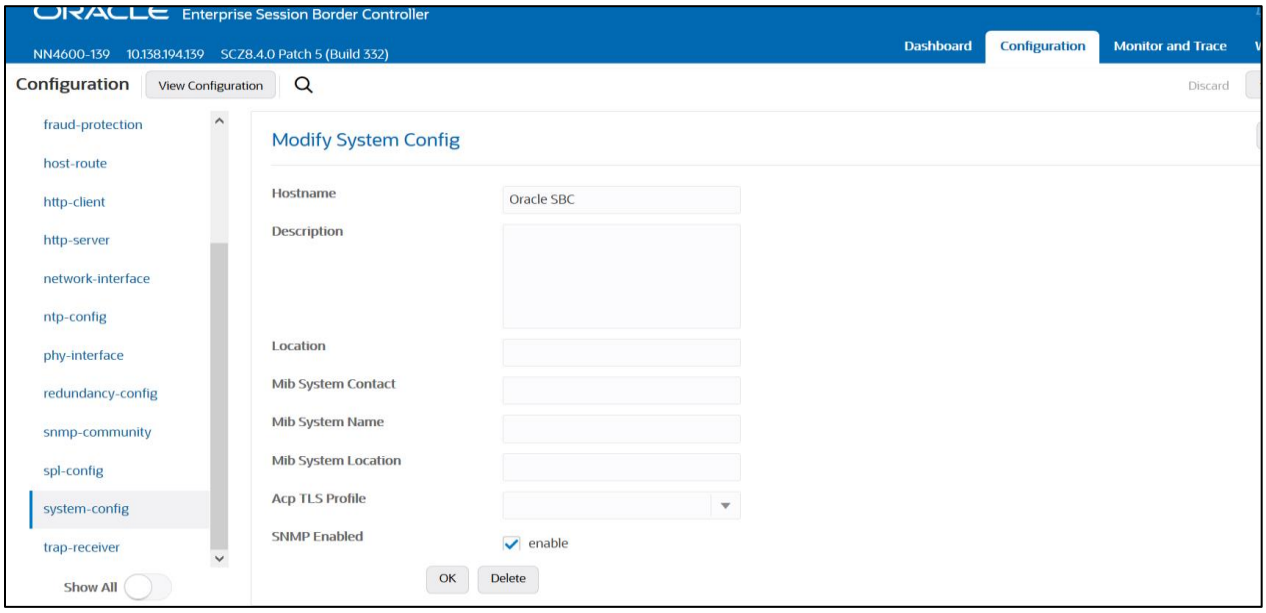
https://docs.oracle.com/en/industries/communications/enterprise-session-border-controller/8.4.0/webgui/esbc_scz840_webgui.pdf

The expert mode is used for configuration.

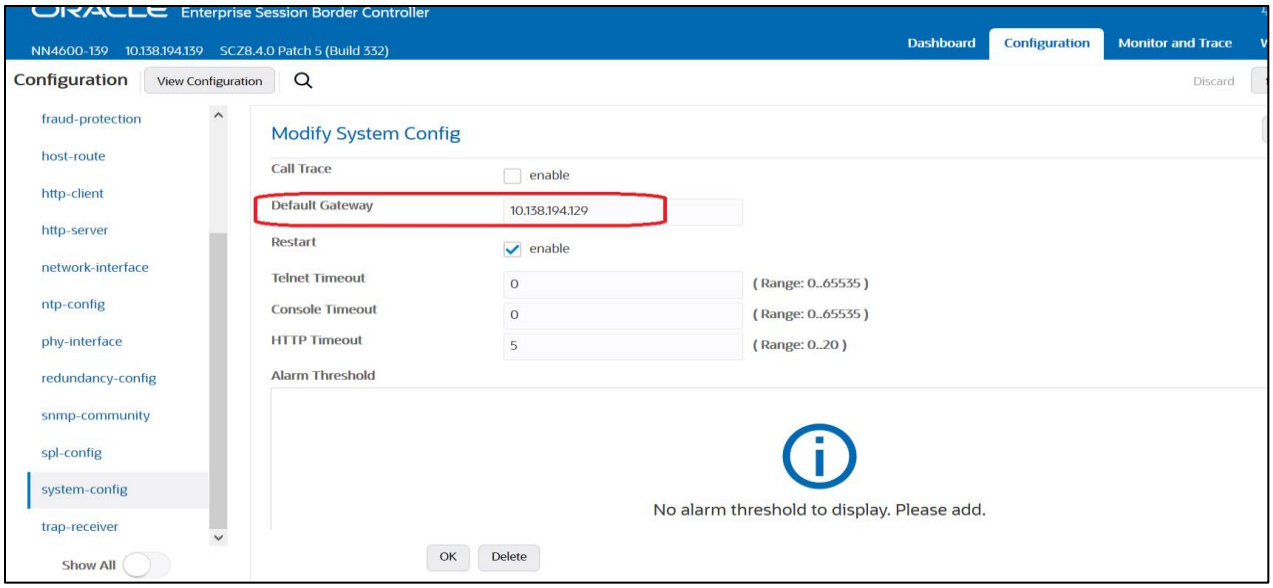
**Tip:** To make this configuration simpler, one can directly search the element to be configured, from the Objects tab available.

## 6.3. Configure system-config

Go to system->system-config




Please enter the default gateway value in the system config page.




For VME, transcoding cores are required. Please refer the documentation here for more information

https://docs.oracle.com/en/industries/communications/enterprise-session-border-controller/8.4.0/releasenotes/esbc_scz840_releasenotes.pdf

The above step is needed only if any transcoding is used in the configuration.
If there is no transcoding involved, then the above step is not needed.

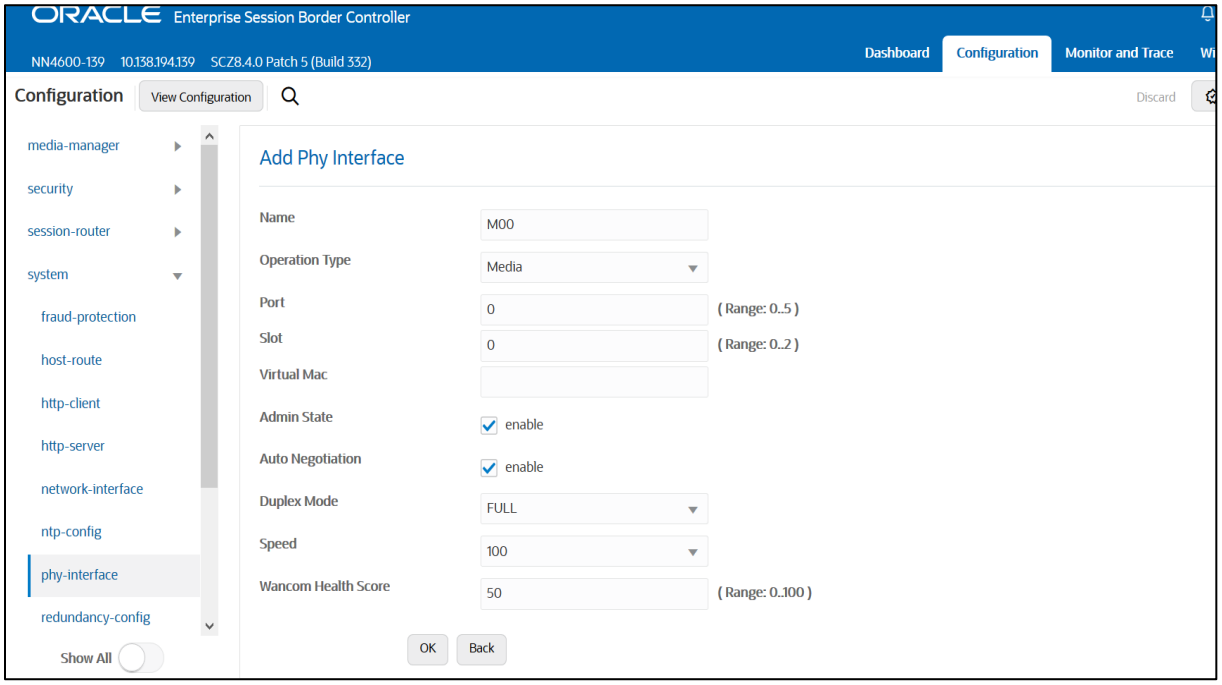
## 6.4. Configure Physical Interface values

To configure physical Interface values, go to System->phy-interface.

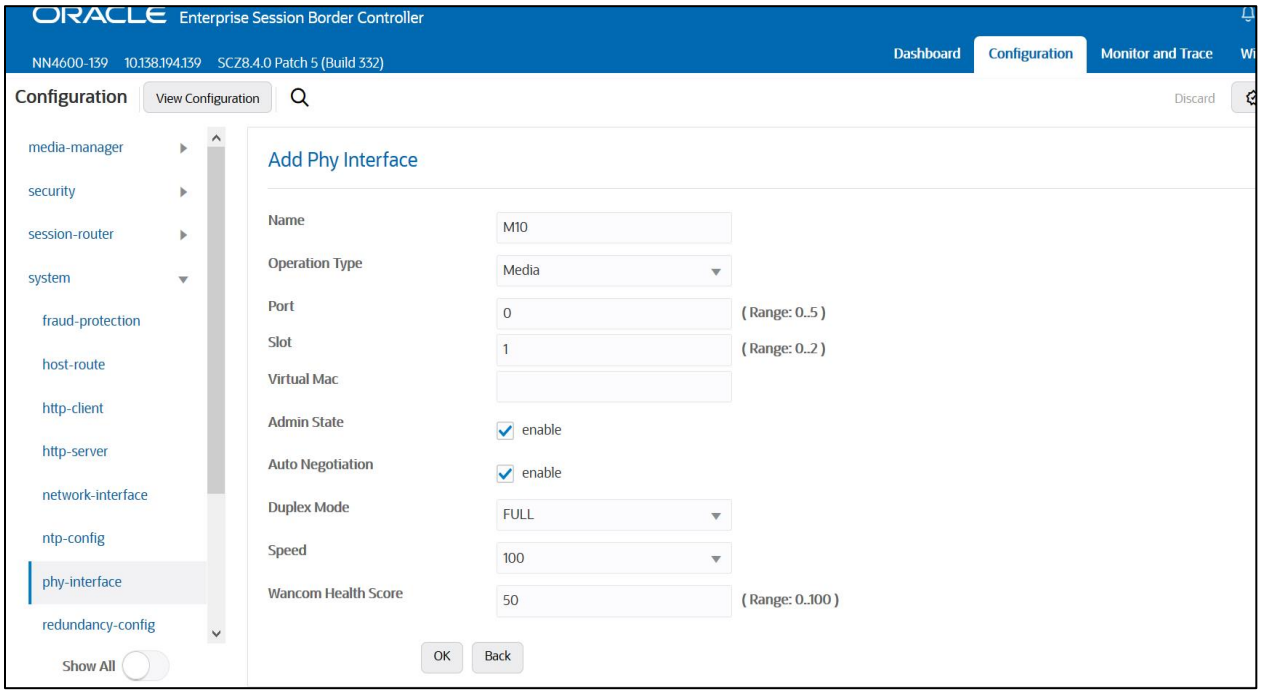
Please configure M00 for Twilio side and M10 for Genesys side.

| Parameter Name | Twilio Elastic Sip Trunk side (M00) | Genesys side (M10) |
|---|---|---|
| Slot | 0 | 1 |
| Port | 0 | 0 |
| Operation Mode | Media | Media |

Please configure M00 interface as below.



Please configure M10 interface as below



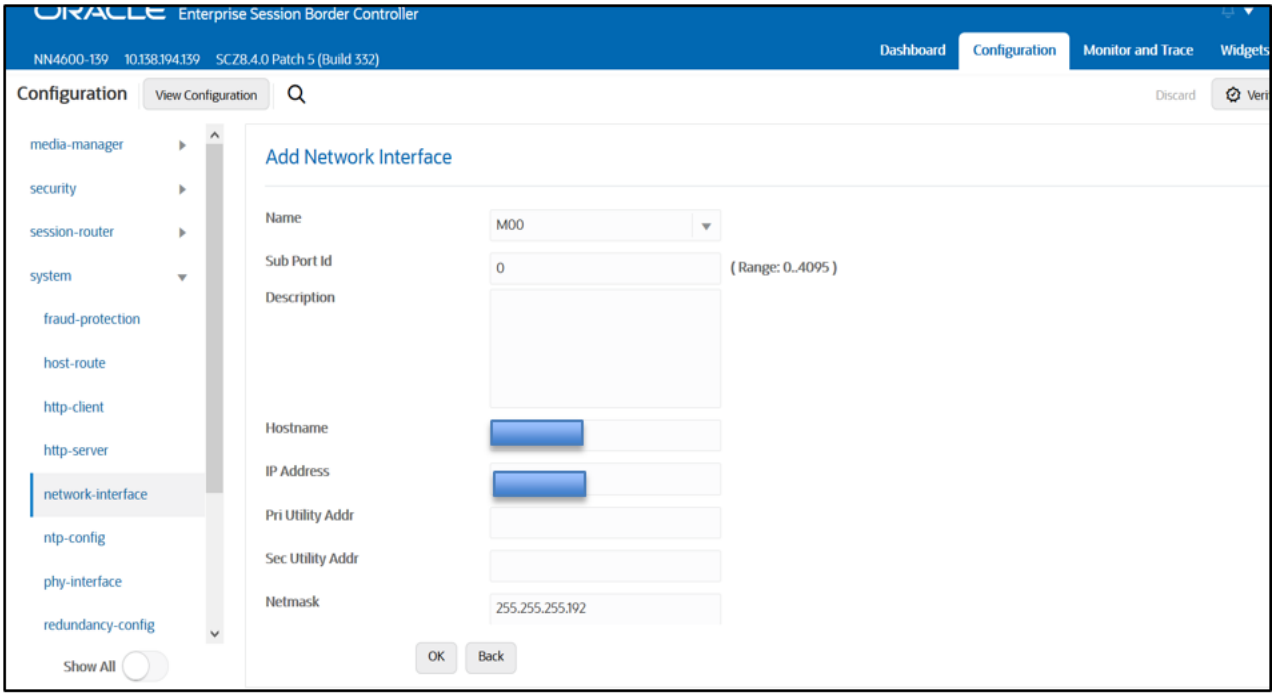

## 6.5. Configure Network Interface values

To configure network-interface, go to system->Network-Interface. Configure interface

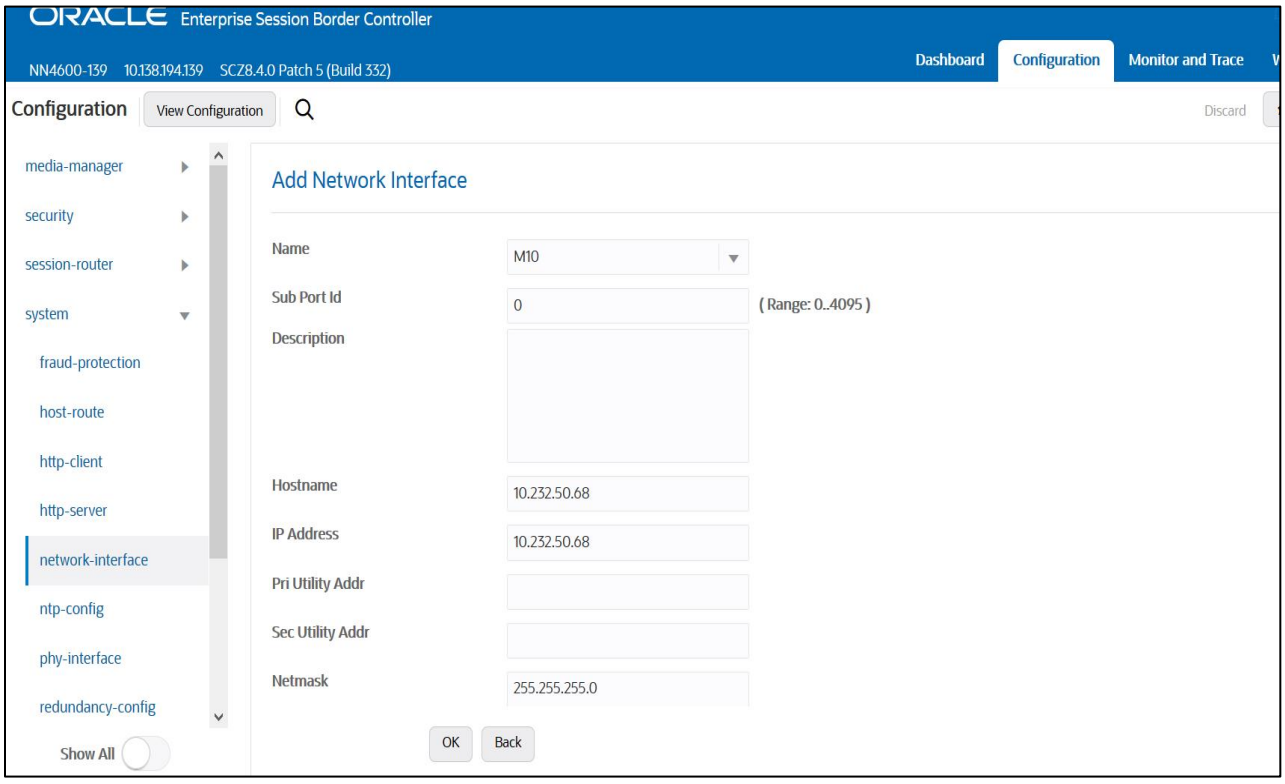
The table below lists the parameters, to be configured for both the interfaces.

| Parameter Name | Twilio side Network interface | Genesys side Network interface |
|---|---|---|
| Name | M00 | M10 |
| Host Name | | |
| IP address | [redacted] | 10.232.50.68 |
| Netmask | 255.255.255.192 | 255.255.255.0 |
| Gateway | [redacted] | 10.232.50.1 |

Please configure network interface M00 as below



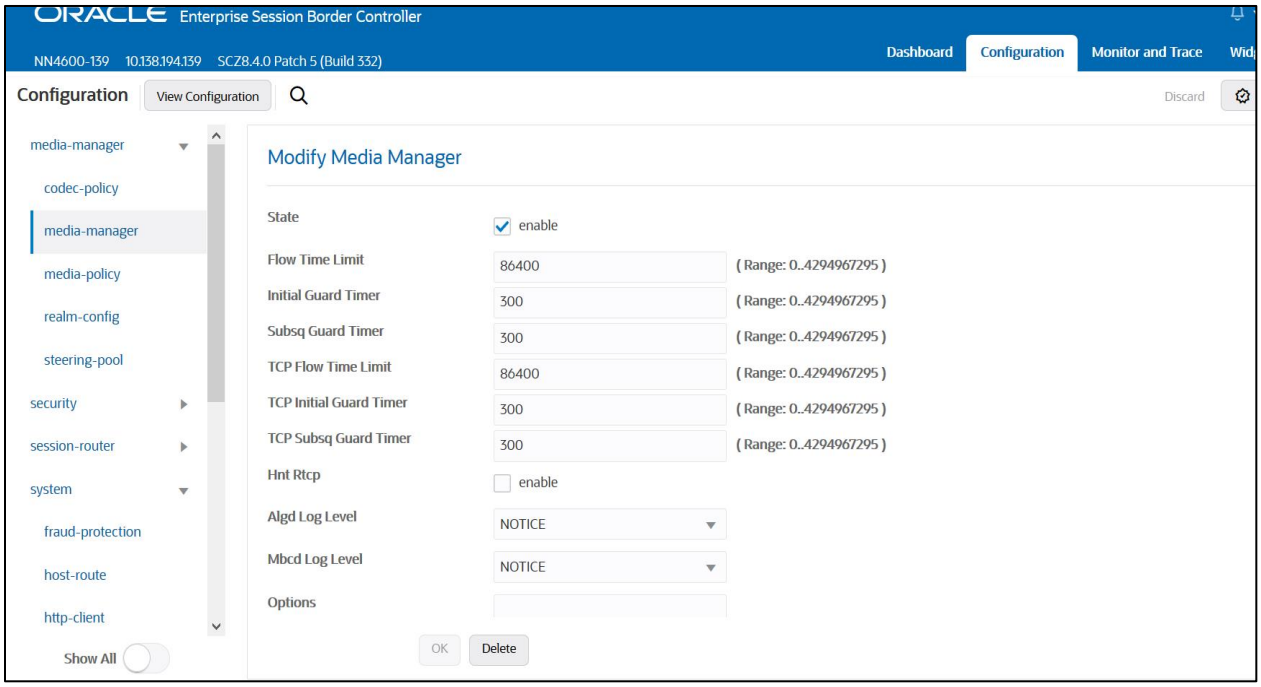

Similarly, configure network interface M10 as below

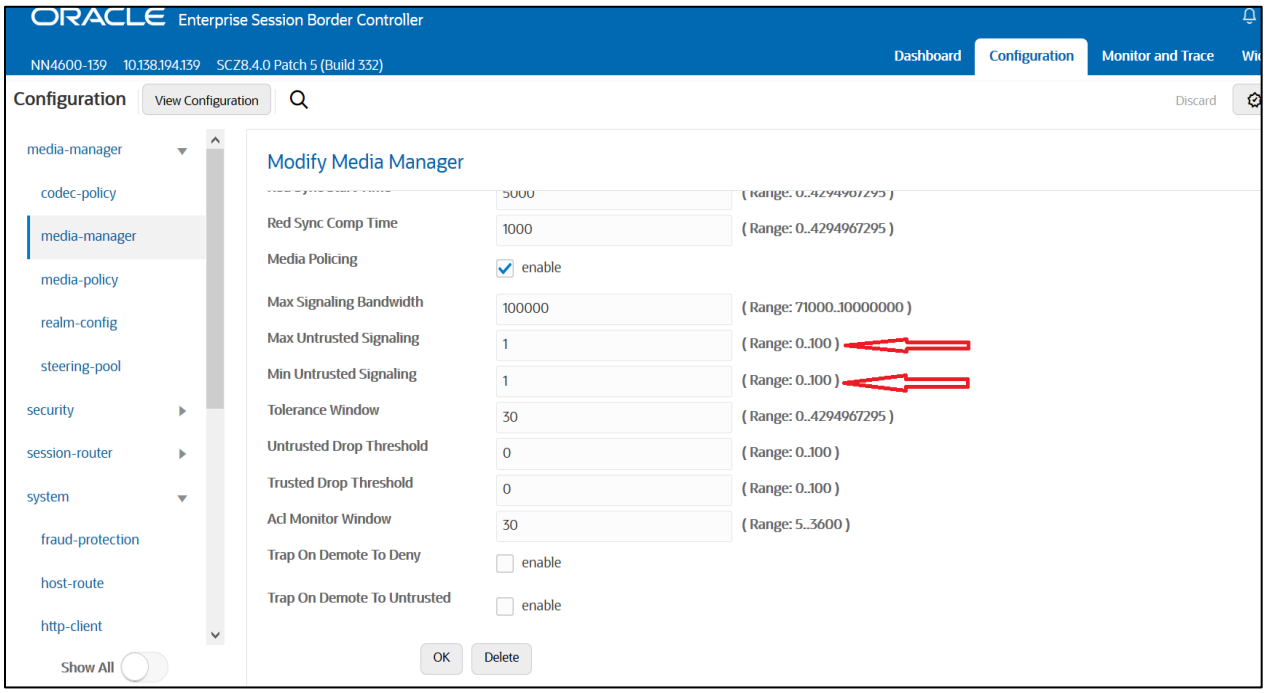


## 6.6. Enable media manager

Media-manager handles the media stack required for SIP sessions on the SBC. Enable the media manager option as below.

In addition to the above config, please set the max and min untrusted signaling values to 1.
Go to Media-Manager->Media-Manager



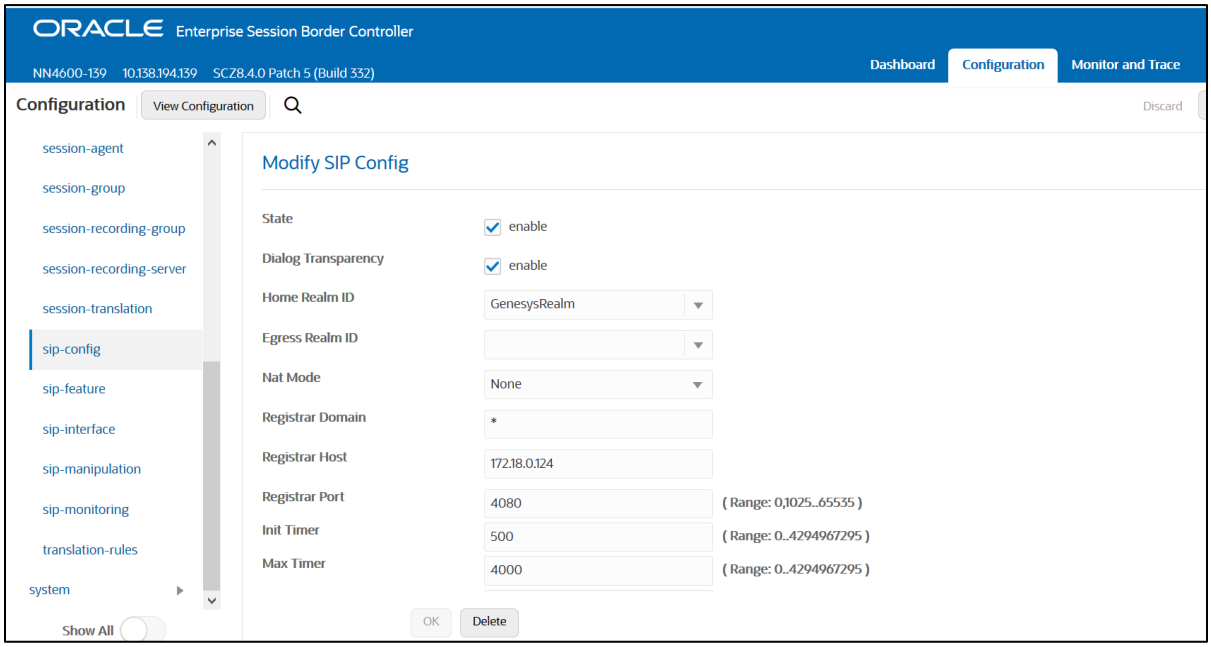



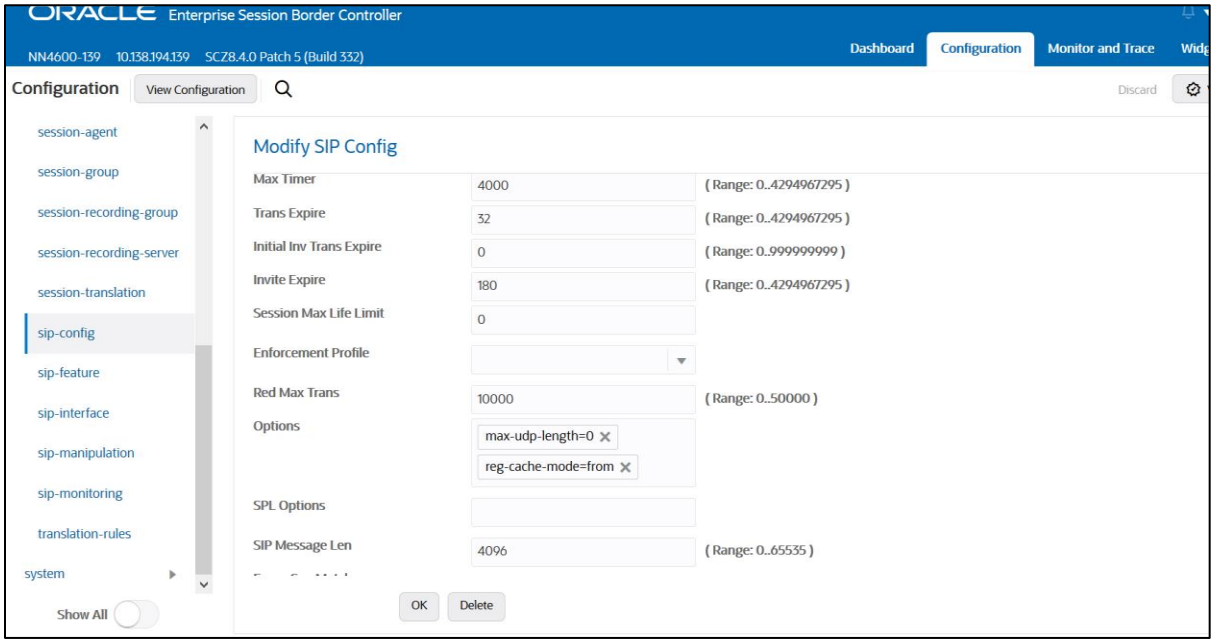
## 6.7. Enable sip-config

SIP config enables SIP handling in the SBC.
Make sure the home realm-id, registrar-domain and registrar-host are registrar-port are configured as below  (The below example is specific to Genesys config that we have configured)
Also add the options to the sip-config as shown below.

To configure sip-config, Go to Session-Router->sip-config and in options, add the below

- add max-udp-length =0
- reg-cach-mode=from



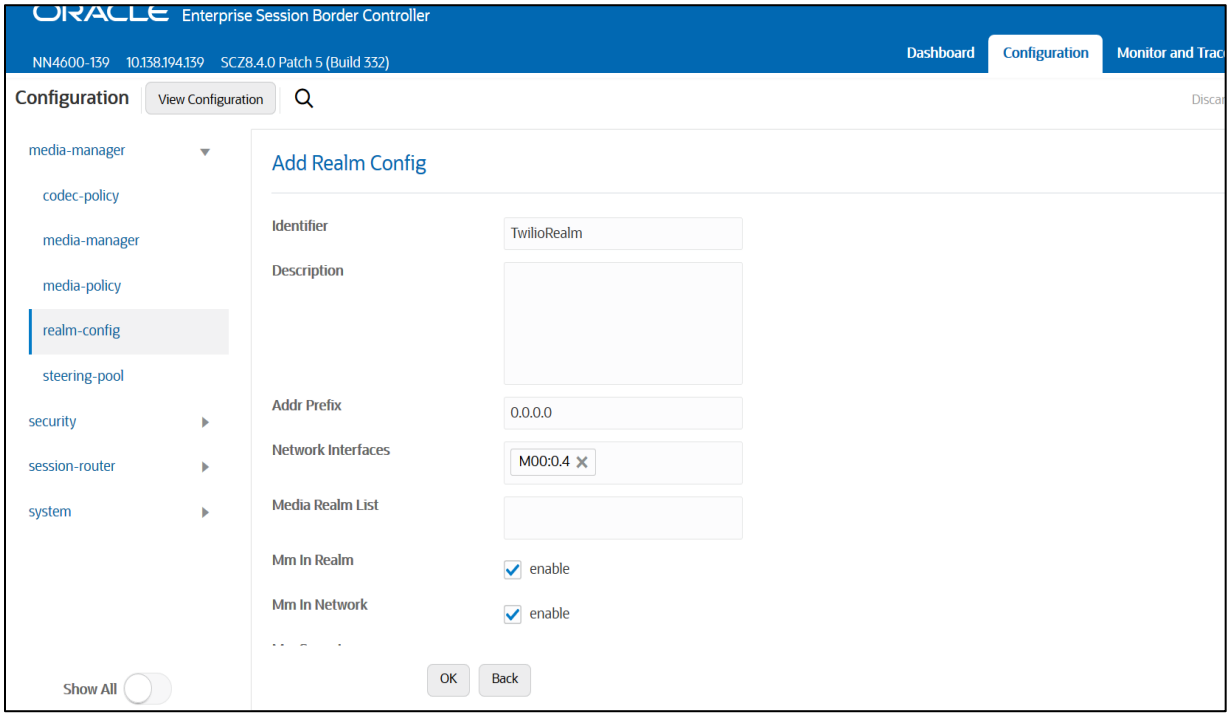
## 6.8. Configure Realms

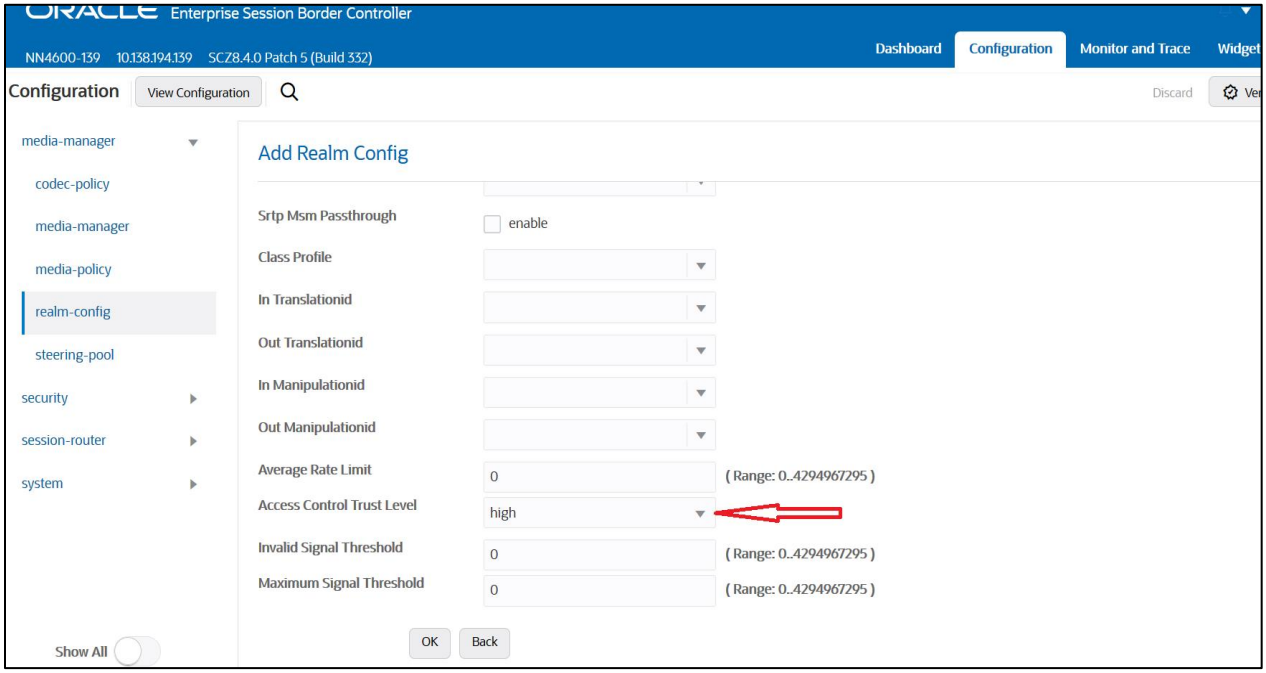
Navigate to realm-config under media-manager and configure a realm as shown below
The name of the Realm can be any relevant name according to the user convenience.

Use the following table as a configuration example for the two realms used in this configuration:

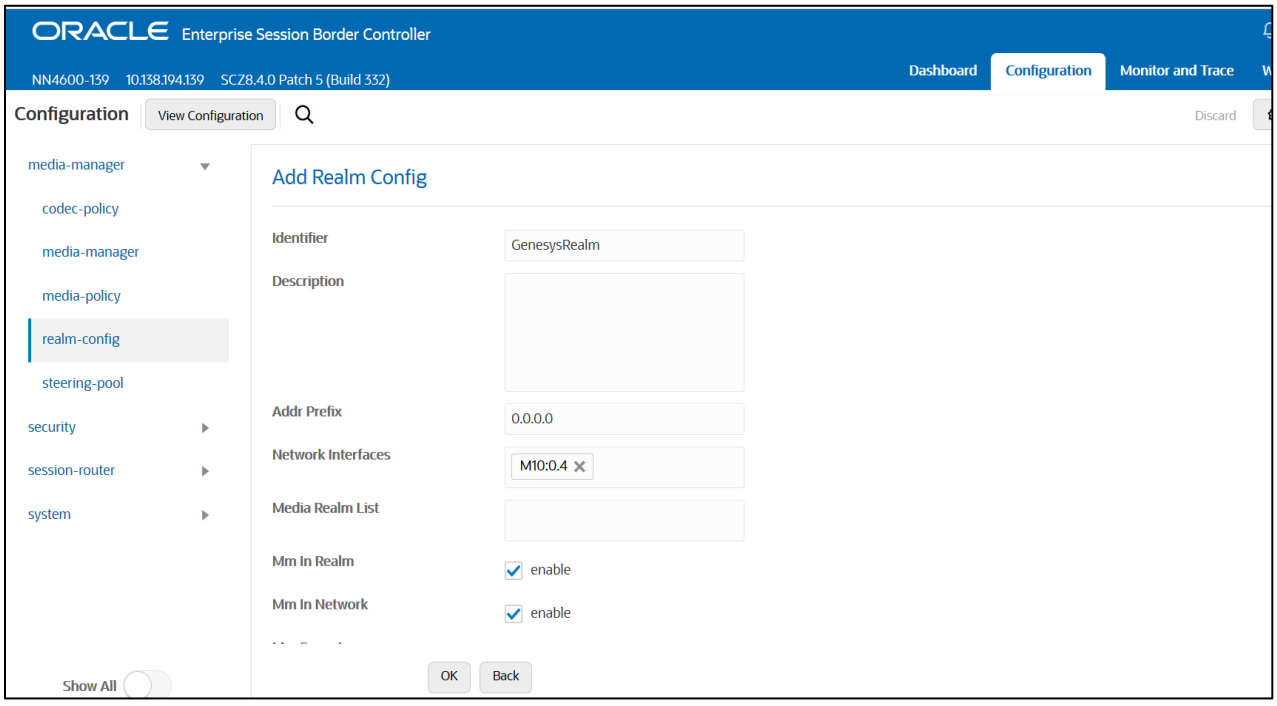
| Config Parameter | Twilio Side | Genesys Side |
|---|---|---|
| Identifier | TwilioRealm | GenesysRealm |
| Network Interface | M00 | M10 |
| Mm in realm | ☑ | ☑ |
| FQDN | | |
| Media Sec policy | sdespolicy | RTP |
| Access Control Trust Level | High | High |

In the below case, Realm name is given as TwilioRealm for Twilio Elastic SIP Trunking Side
Please set the Access Control Trust Level as high for this realm






Similarly, Realm name is given as GenesysRealm for Genesys side.
Please set the Access Control Trust Level as high for this realm too.
**We can use the same realm for Genesys Remote worker config too (Discussed in later part)**




For more information on Access Control Trust Level, please refer to SBC Security guide link given below:

https://docs.oracle.com/en/industries/communications/session-border-controller/8.4.0/security/sbc_scz840_security.pdf

## 6.9. Configuring a certificate for SBC

This section describes how to configure the SBC for TLS and SRTP communication for Twilio Elastic SIP Trunking.

Twilio Elastic SIP Trunking allows TLS connections from SBC's for SIP traffic, and SRTP for media traffic. It requires a certificate signed by one of the trusted Certificate Authorities.
The process includes the following steps:

1) Create a certificate-record – "Certificate-record" are configuration elements on Oracle SBC which captures information for a TLS certificate – such as common-name, key-size, key-usage etc.

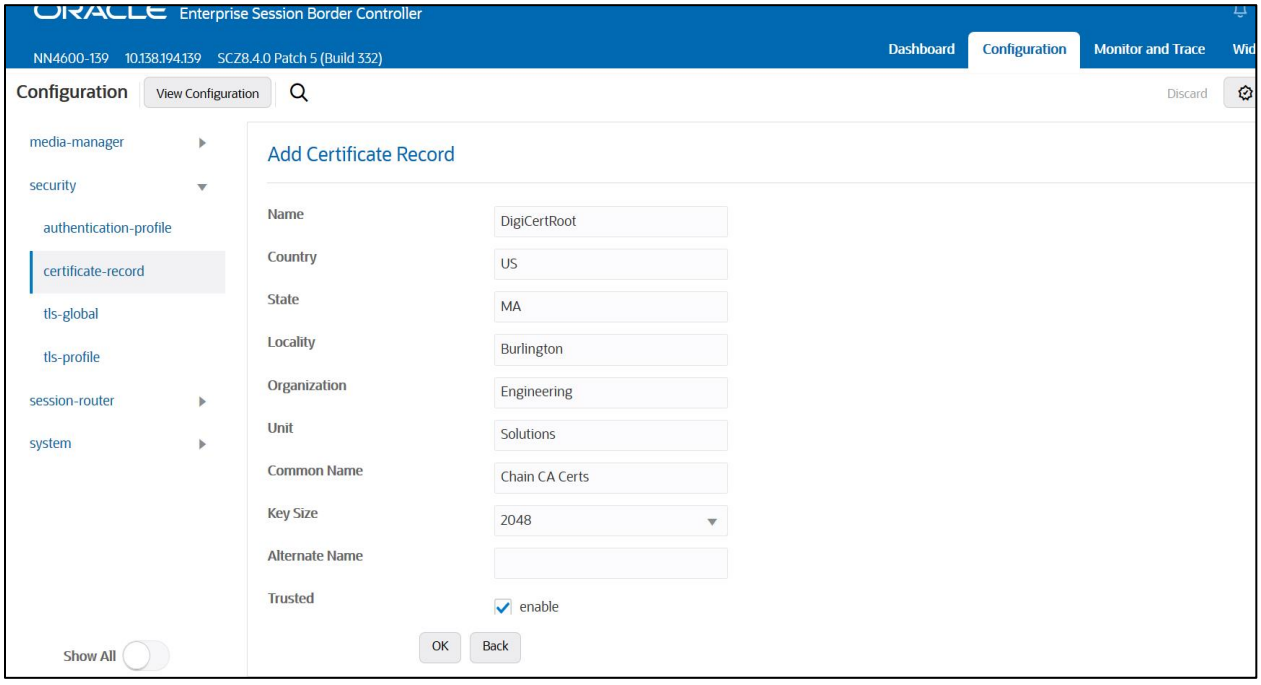
- SBC – 1 certificate-record assigned to SBC
- Root – 1 certificate-record for root cert

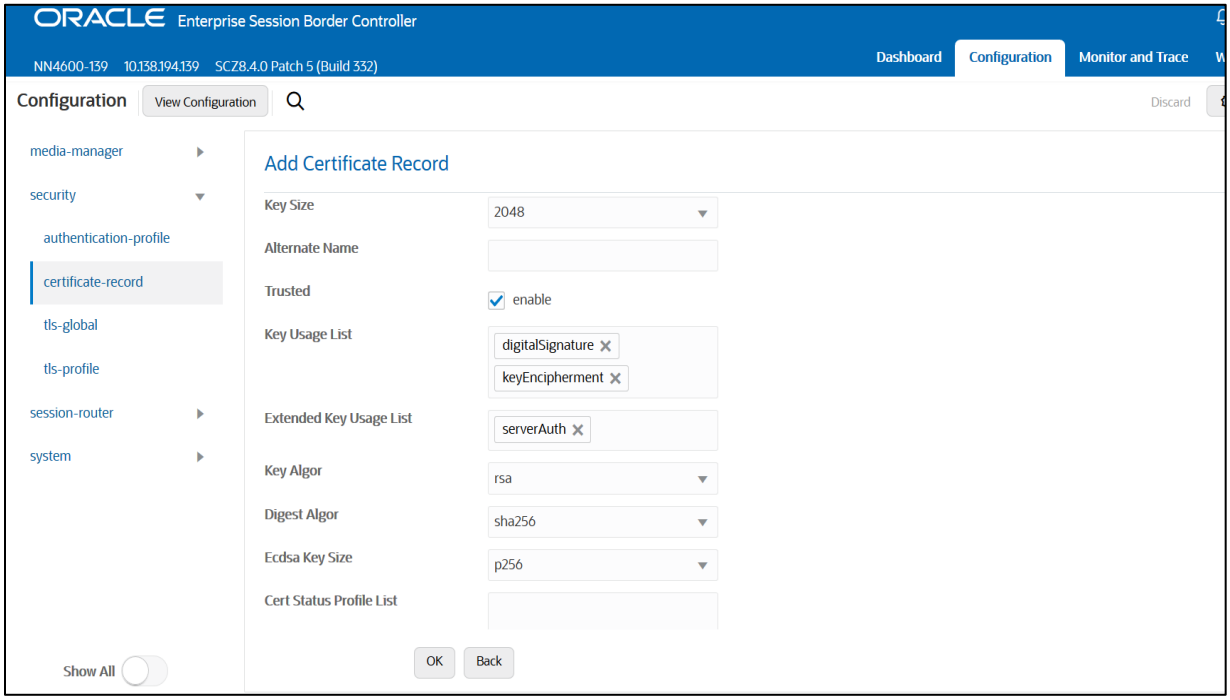
2) Deploy the SBC and Root certificates on the SBC

### Step 1 – Creating the certificate record

Twilio Elastic SIP Trunking uses certificates from a CA (Certificate Authority) for establishing the TLS connections from SBC's for SIP traffic, and SRTP for media traffic. It is important that you add the following root certificate to establish TLS connection from the link given below:

https://www.twilio.com/docs/sip-trunking#rootCA



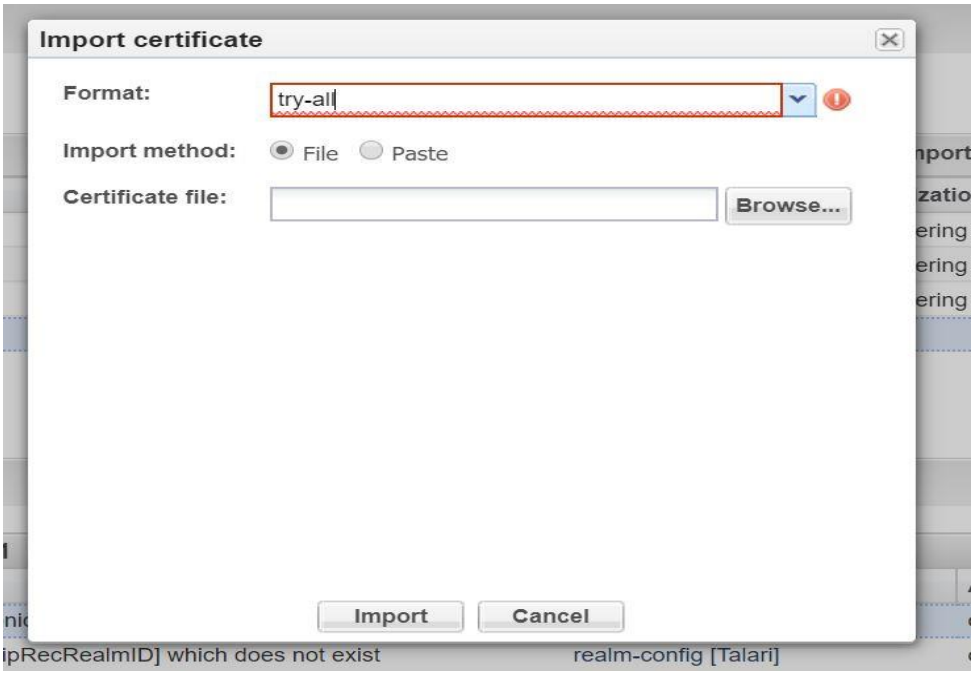



The table below specifies the parameters required for certificate configuration.
Modify the configuration according to the certificates in your environment.

| Config Parameter | DigiCert Root CA |
|---|---|
| Common Name | DigiCert Global Root CA |
| Key Size | 2048 |
| Key-Usage-List | digitalSignature<br>keyEncipherment |
| Extended Key Usage List | serverAuth |
| Key algor | rsa |
| Digest-algor | Sha256 |

## Step 2 – Deploy SBC & root certificates

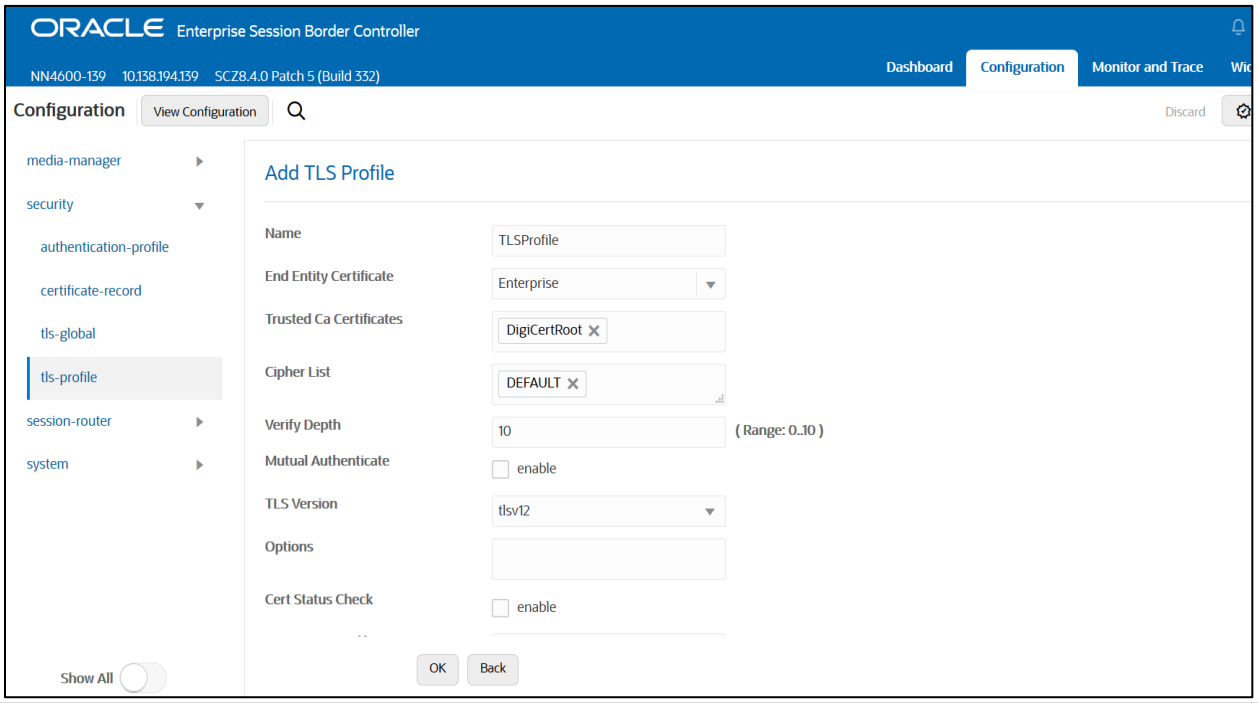
Once certificate record has been created – import the signed certificate to the SBC.
Please note – all certificates including root certificates are required to be imported to the SBC.
Once done, issue save/activate from the WebGUI




Repeat these steps to import all the root certificates into the SBC:
**At this stage all the required certificates have been imported to the SBC for Twilio Elastic SIP Trunk**.

## 6.10. TLS-Profile

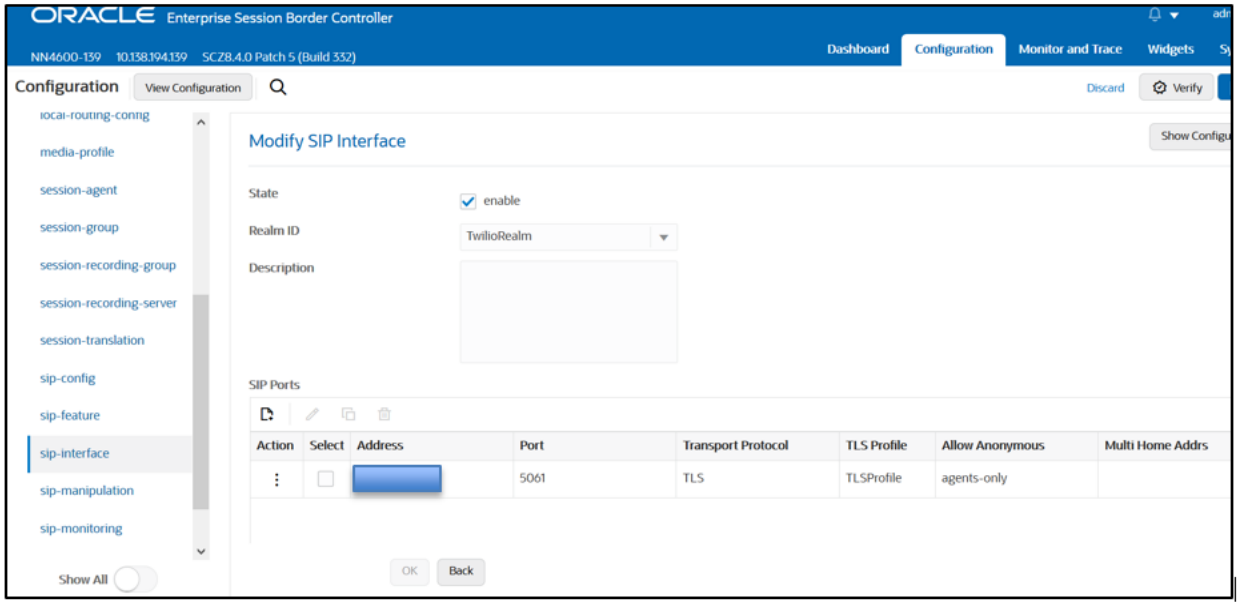
A TLS profile configuration on the SBC allows for specific certificates to be assigned.
Go to security-> TLS-profile config element and configure the tls-profile as shown below
The below is the TLS profile configured for the Twilio Elastic SIP Trunk side:



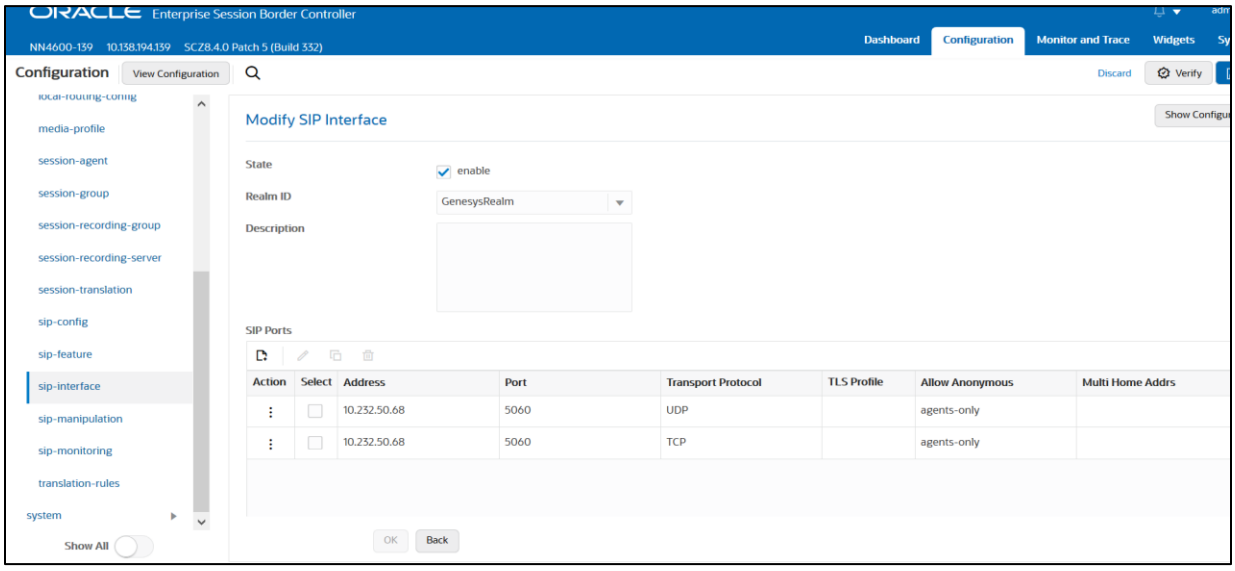
## 6.11. Configure SIP Interfaces

Navigate to sip-interface under session-router and configure the sip-interface as shown below. Please Configure sip-interface for the Twilio Elastic SIP Trunk side with below settings:

- Tls-profile needs to match the name of the tls-profile previously created
- Set allow-anonymous to agents-only to ensure traffic to this sip-interface only comes from the particular Session agents added to the SBC.




Similarly, Please Configure sip-interface for the Genesys side as below:



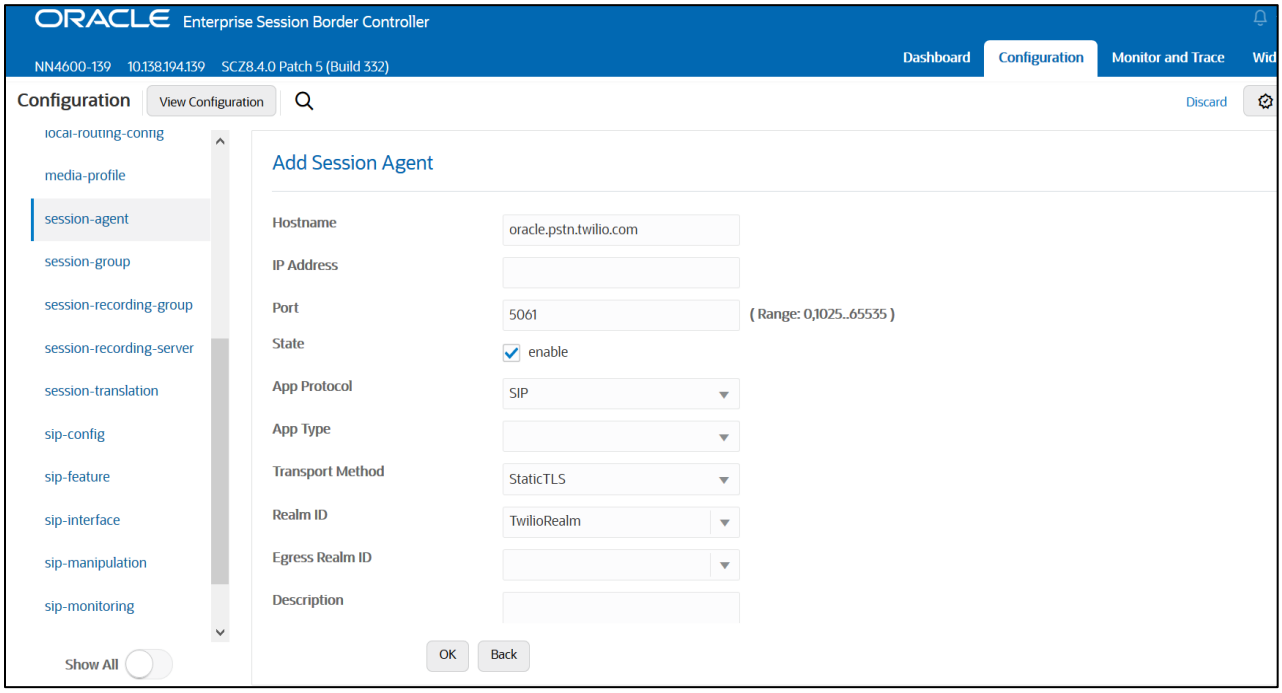

Once sip-interface is configured – the SBC is ready to accept traffic on the allocated IP address. **Like Realm**, **We can use the same sip-interface for Genesys Remote worker config too (Discussed in later part)**

## 6.12. Configure session-agent

Session-agents are config elements which are trusted agents who can send/receive traffic from the SBC with direct access to trusted data path. Session-agents are config elements which are trusted agents who can send/receive traffic from the SBC with direct access to trusted data path.

Go to session-router->Session-Agent and Configure the session-agents for the Twilio Elastic SIP Trunk

- Host name to “oracle.pstn.twilio.com”, port to 5061
- realm-id – needs to match the realm created for the Twilio Elastic SIP Trunk
- transport set to “staticTLS”

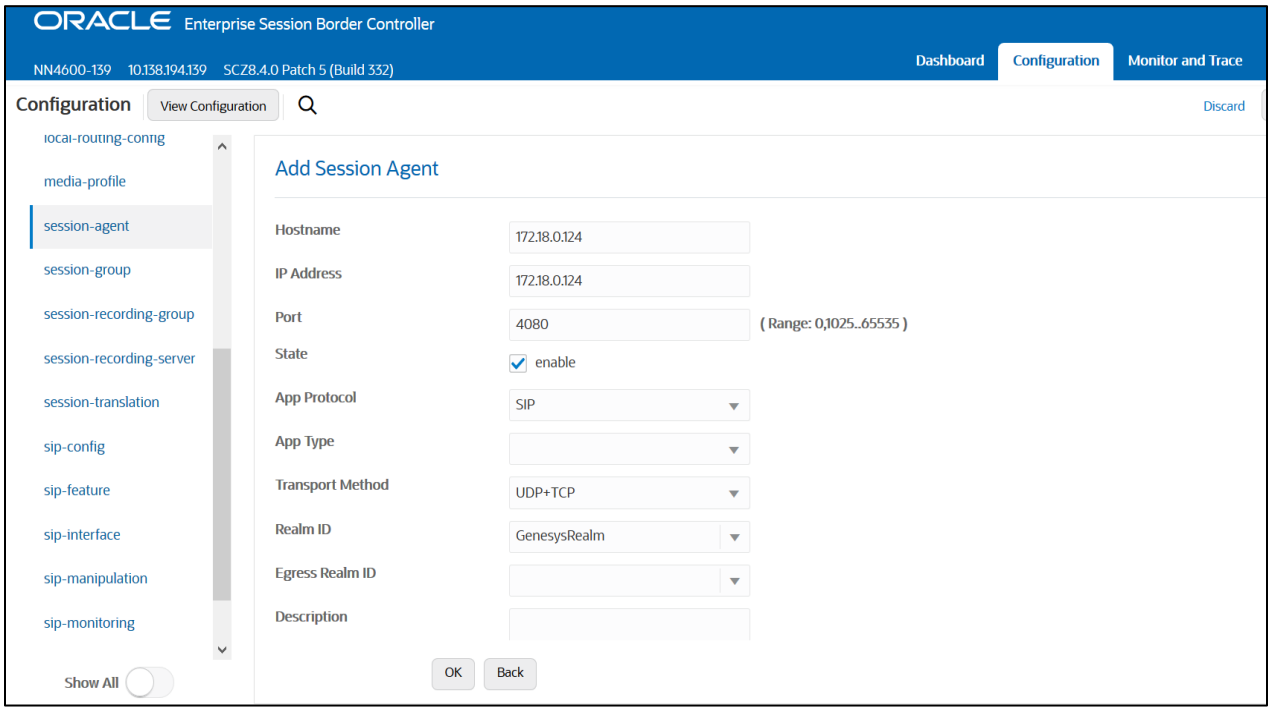



****NOTE: Connection to Twilio Elastic SIP Trunking is available in multiple geographic edge locations. If you wish to manually connect to a specific geographic edge location that is closest to the location of your communications infrastructure, you may do so by pointing your communications infrastructure to any of the following localized Termination SIP URIs:**

- {example}.pstn.ashburn.twilio.com (North America Virginia)
- {example}.pstn.umatilla.twilio.com (North America Oregon)
- {example}.pstn.dublin.twilio.com (Europe Ireland)
- {example}.pstn.frankfurt.twilio.com (Europe Frankfurt)
- {example}.pstn.singapore.twilio.com (Asia Pacific Singapore)
- {example}.pstn.tokyo.twilio.com (Asia Pacific Tokyo)
- {example}.pstn.sao-paulo.twilio.com (South America São Paulo)
- {example}.pstn.sydney.twilio.com (Asia Pacific Sydney)

Click here for more information on Twilio Elastic SIP Trunking IP Address

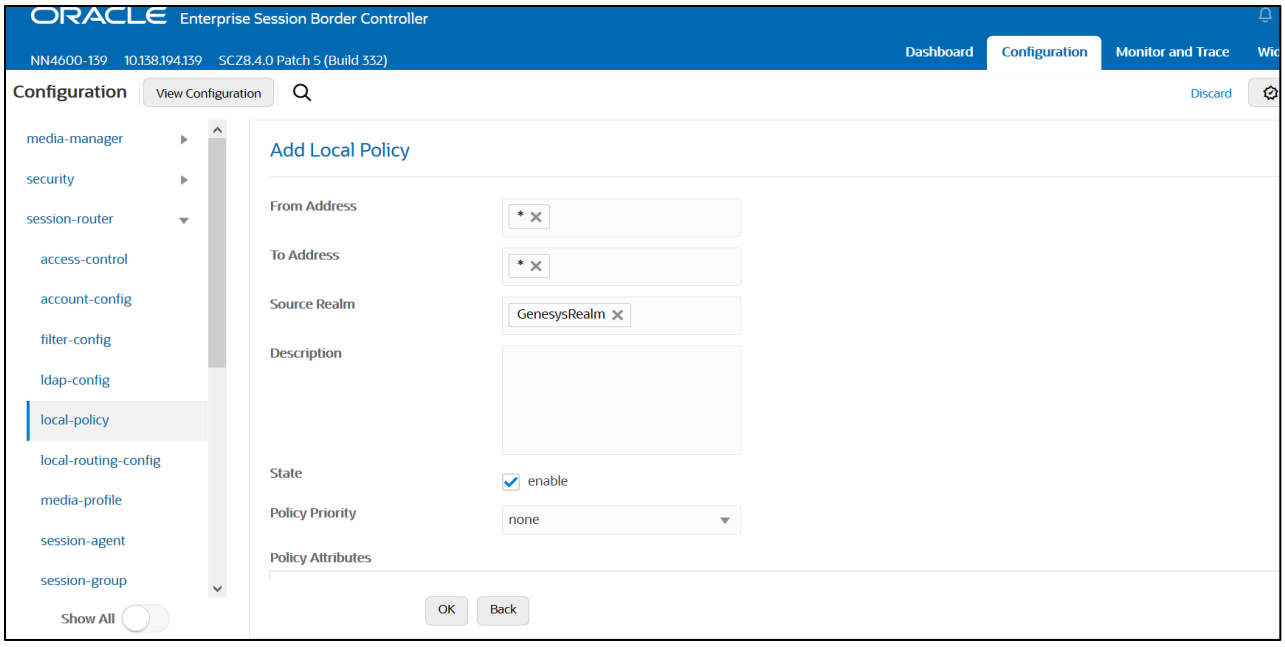
Similarly, configure the session-agents for the Genesys Side as below:

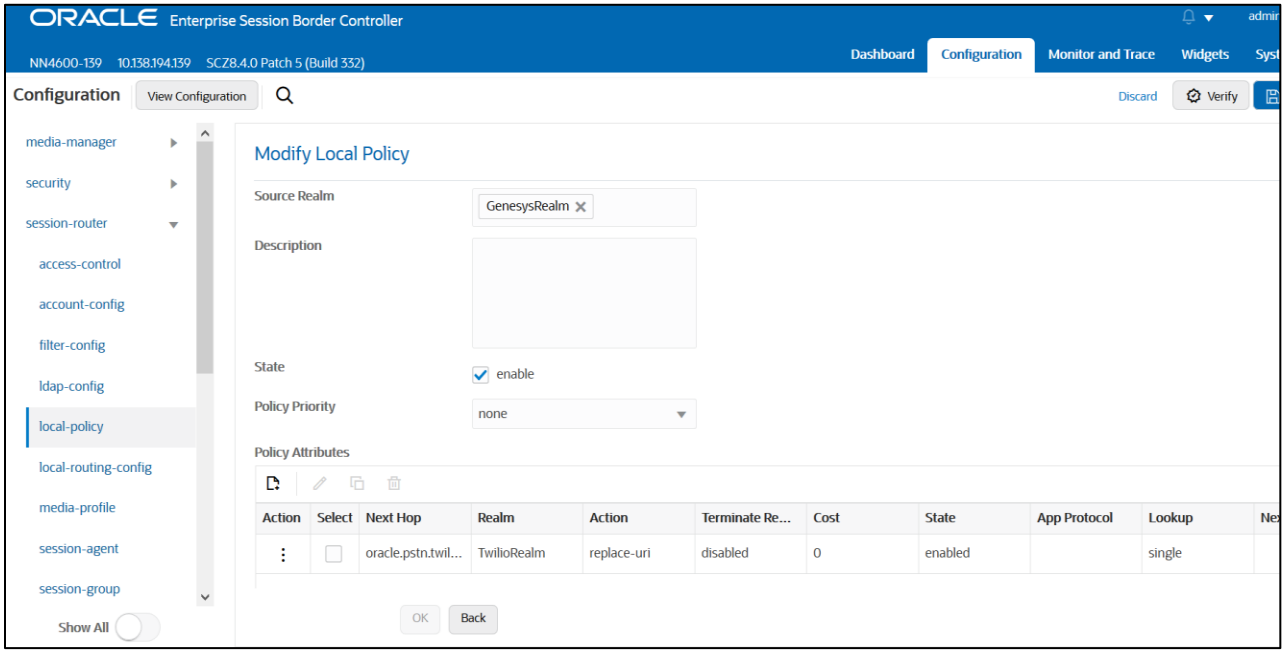



## 6.13. Configure local-policy

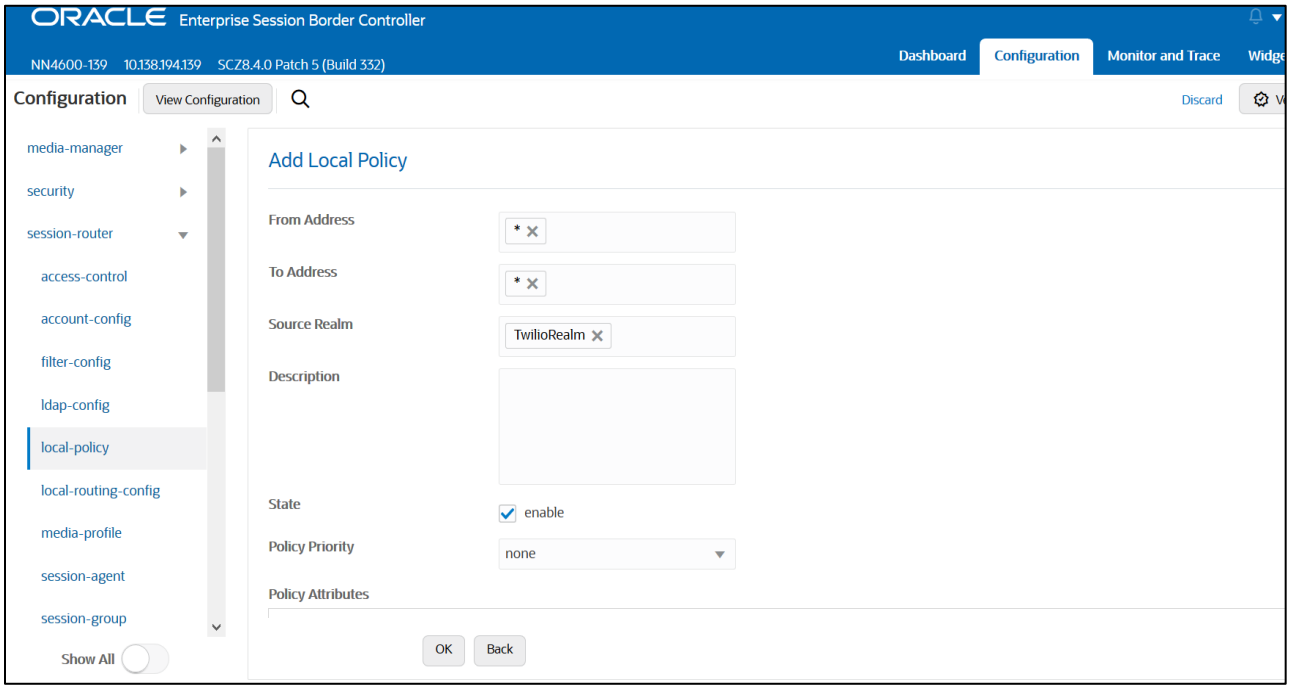
Local policy config allows for the SBC to route calls from one end of the network to the other based on routing criteria. To configure local-policy, go to Session-Router->local-policy.

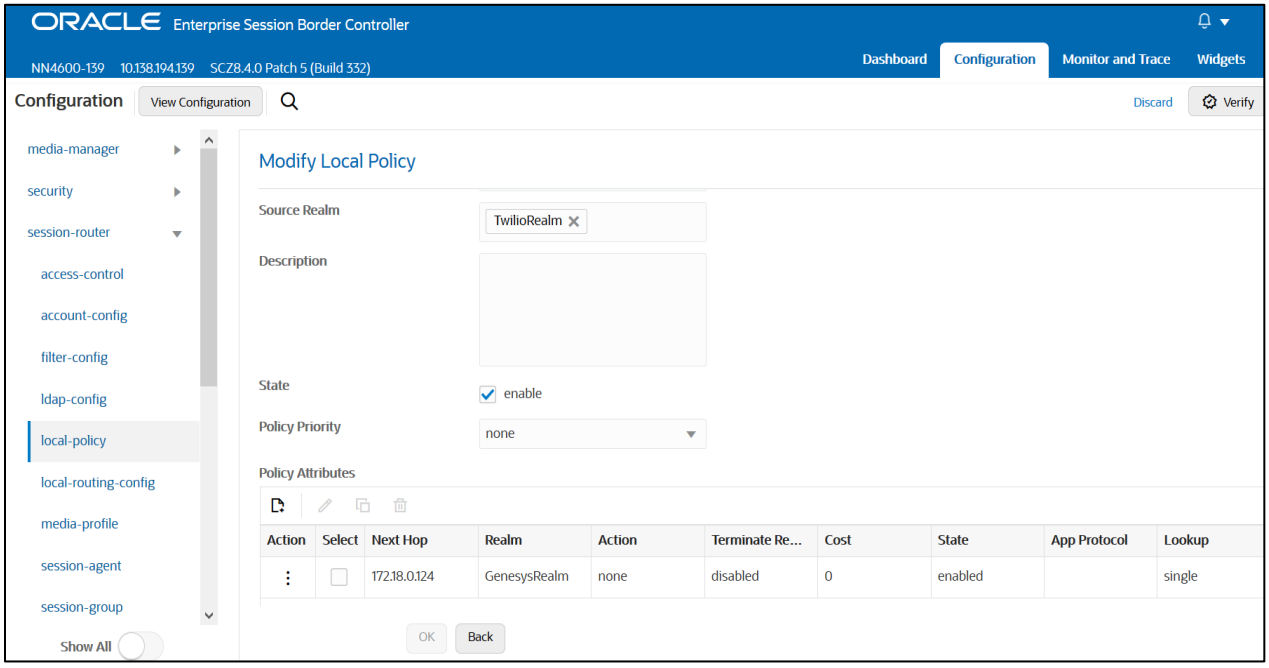
To route the calls from Genesys side to Twilio side, Use the below local –policy






To route the calls from the Twilio Elastic SIP Trunk side to Genesys side, Use the below local –policy

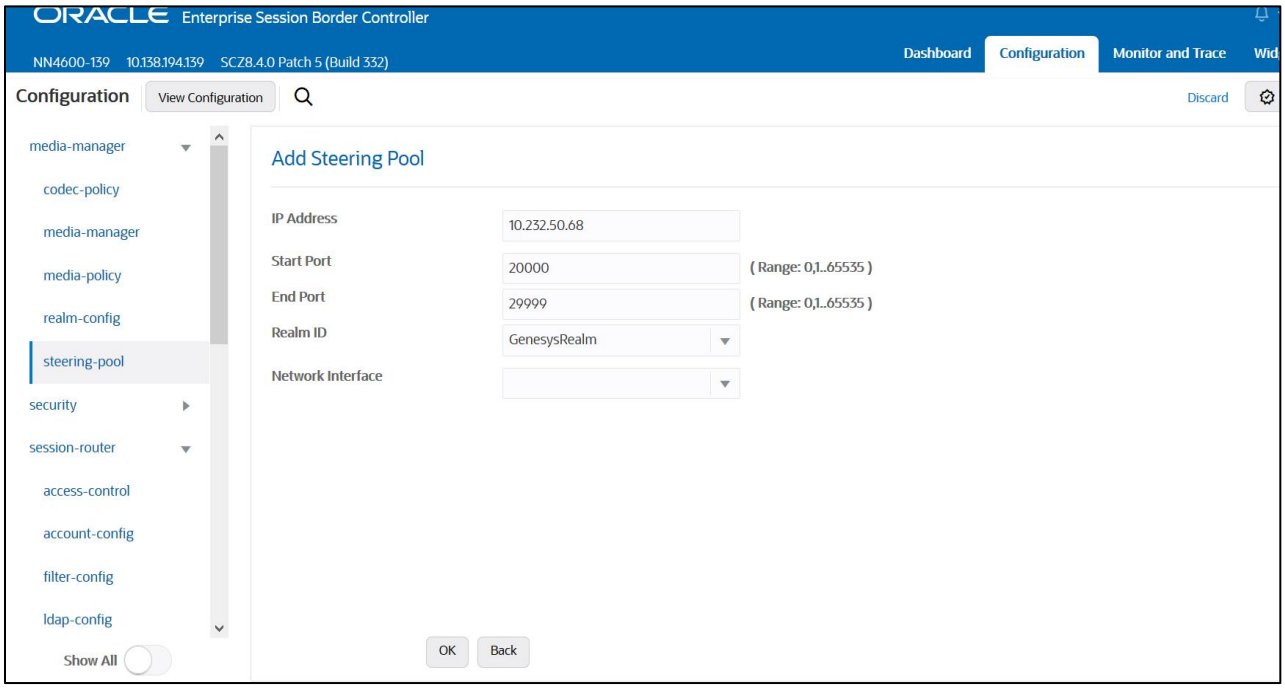




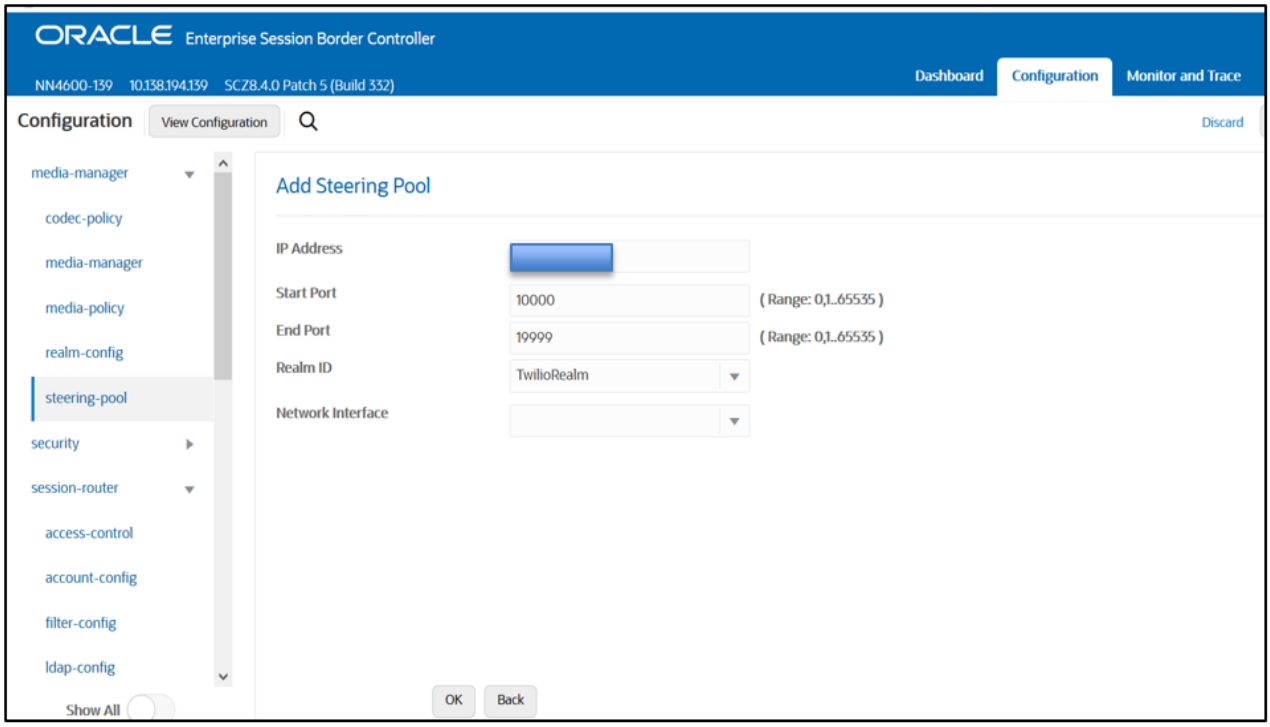

## 6.14. Configure steering-pool

Steering-pool config allows configuration to assign IP address(es), ports & a realm.

Genesys side steering pool.



Twilio side steering pool.

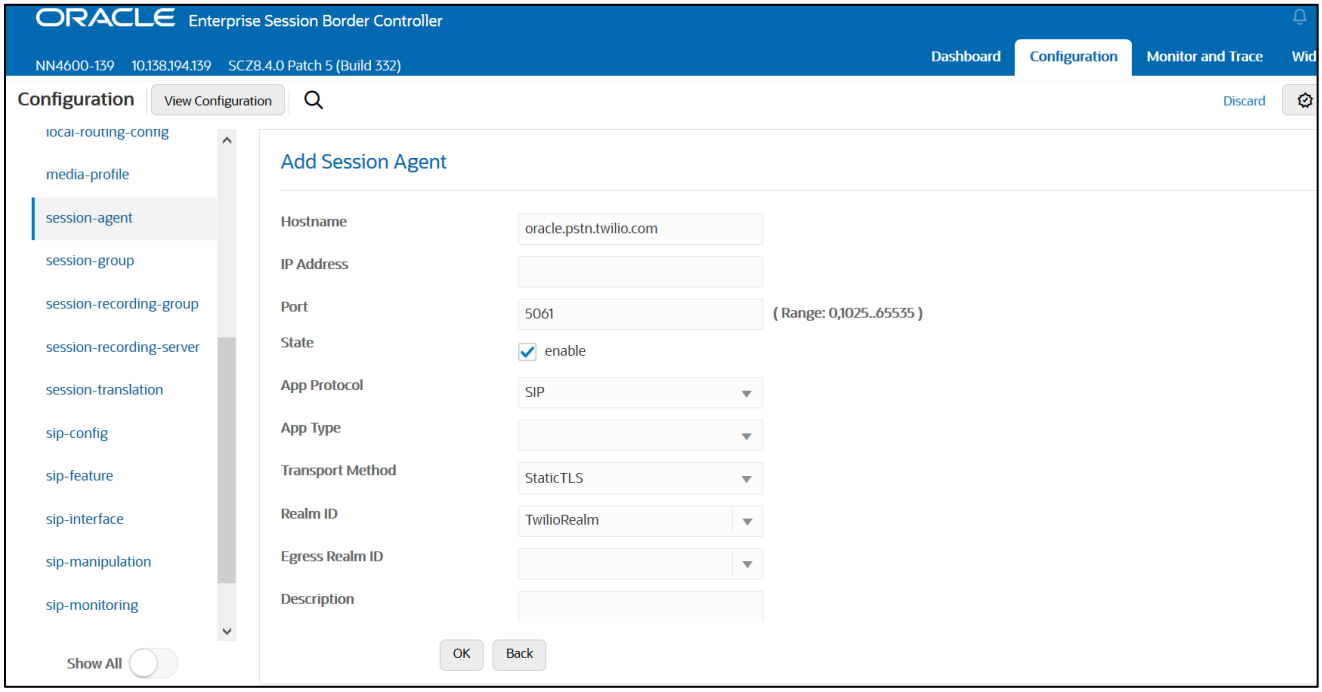


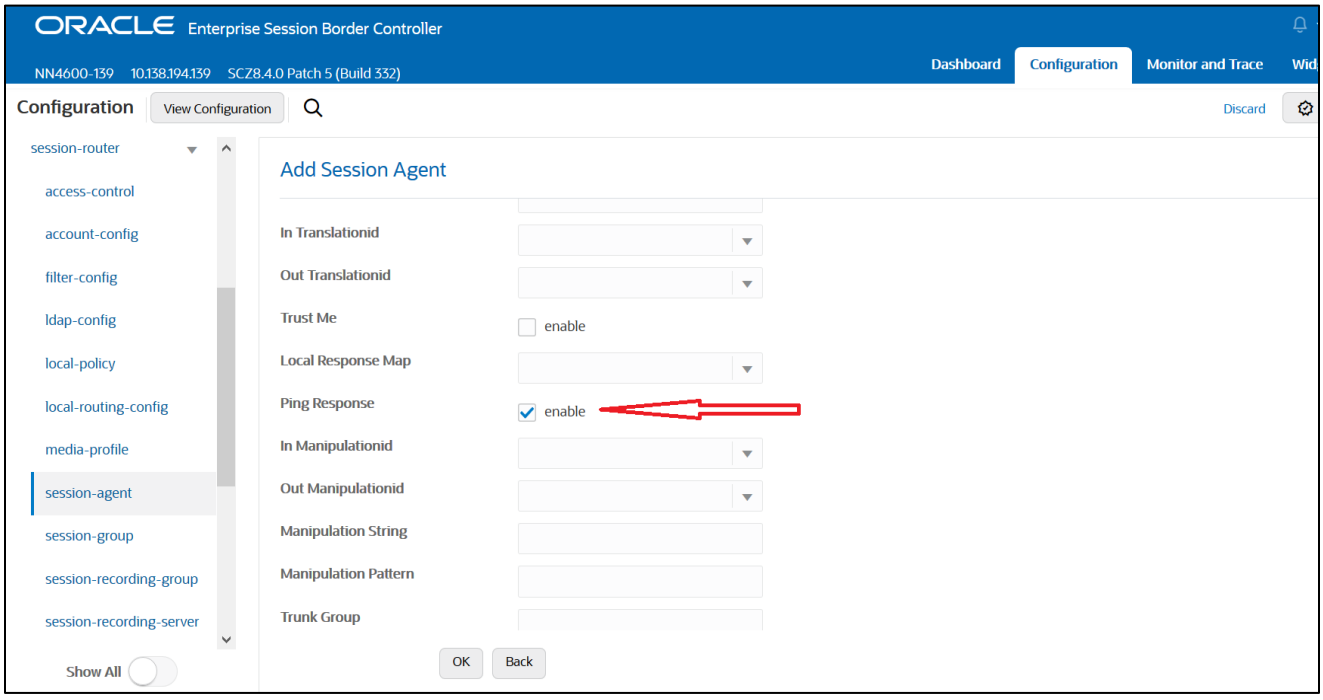

## 6.15. Configure Ping Response

To simplify the ORACLE SBC configuration, from GA Release SCZ830m1p7, there is a new parameter introduced under the **Session agent** configuration element. The parameter name is **Ping response**.

**Ping Response:**

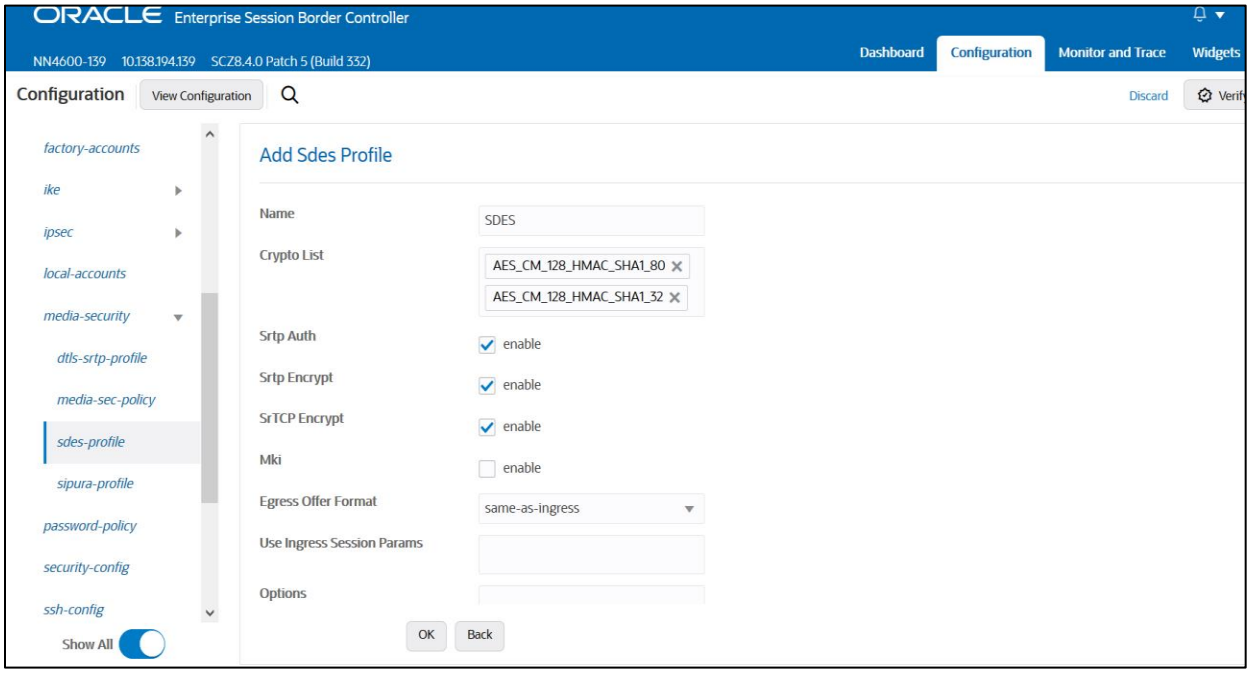
When this parameter is enabled, the SBC responds with a 200 OK to all Sip Options Pings it receives from trusted agents. This takes the place of the current Sip Manipulation, RepondOptions.


ORACLE Enterprise Session Border Controller
NN4600-139 10.138.194.139 SCZ8.4.0 Patch 5 (Build 332)
Dashboard
Configuration
Monitor and Trace
Configuration
View Configuration
Discard
local-routing-config
media-profile
session-agent
session-group
session-recording-group
session-recording-server
session-translation
sip-config
sip-feature
sip-interface
sip-manipulation
sip-monitoring
Show All
Add Session Agent
Hostname
oracle.pstn.twilio.com
IP Address
Port
5061
( Range: 0,1025..65535 )
State
enable
App Protocol
SIP
App Type
Transport Method
StaticTLS
Realm ID
TwilioRealm
Egress Realm ID
Description
OK
Back


ORACLE Enterprise Session Border Controller
NN4600-139 10.138.194.139 SCZ8.4.0 Patch 5 (Build 332)
Dashboard
Configuration
Monitor and Trace
Configuration
View Configuration
Discard
session-router
access-control
account-config
filter-config
ldap-config
local-policy
local-routing-config
media-profile
session-agent
session-group
session-recording-group
session-recording-server
Show All
Add Session Agent
In Translationid
Out Translationid
Trust Me
enable
Local Response Map
Ping Response
enable
In Manipulationid
Out Manipulationid
Manipulation String
Manipulation Pattern
Trunk Group
OK
Back

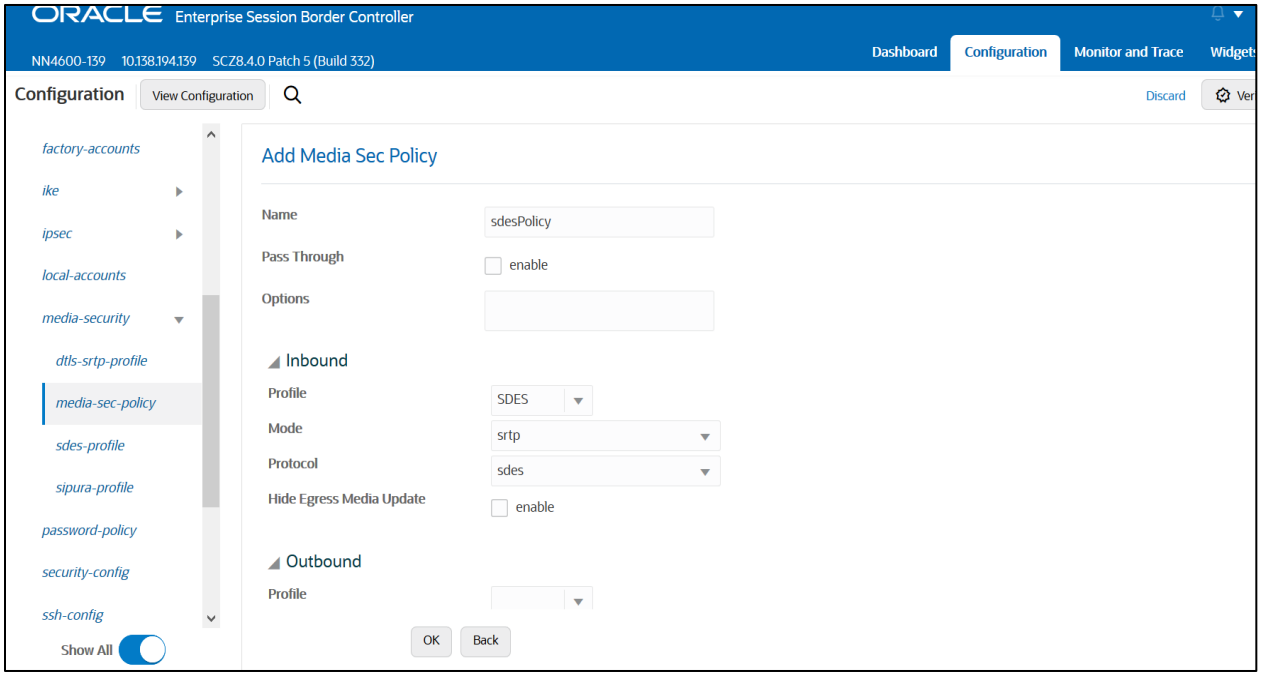
## 6.16. Configure sdes profile

Please go to →Security → Media Security →sdes profile and create the policy as below.

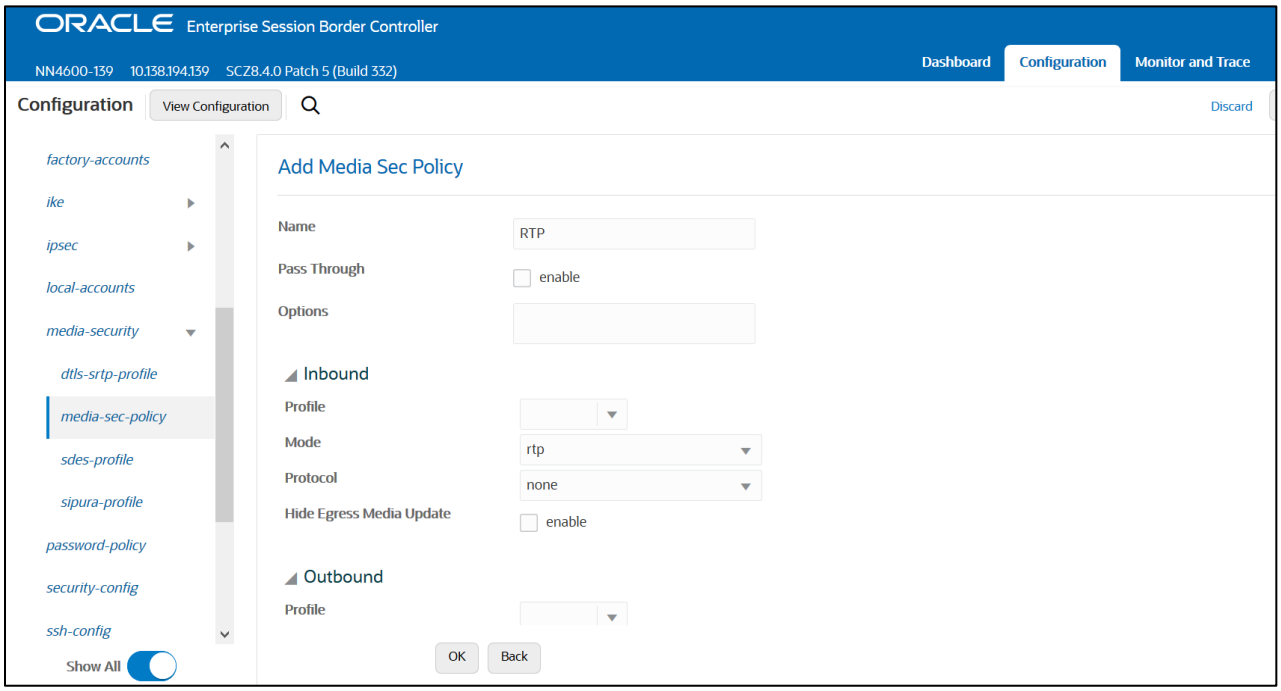



## 6.17. Configure Media Security Profile

Please go to →Security → Media Security →media Sec policy and create the policy as below:
Create Media Sec policy with name SDES which will have the sdes profile created above.
**Assign this media policy to Twilio Realm as it use TLS/SRTP**.

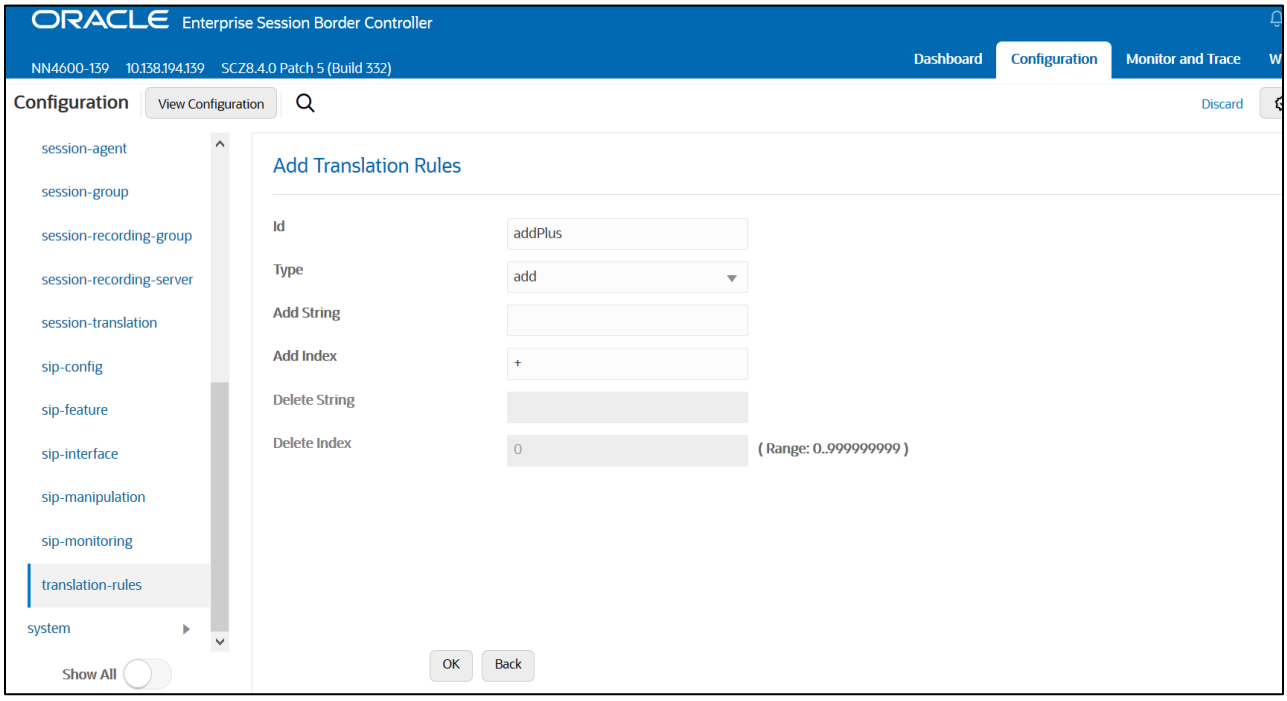


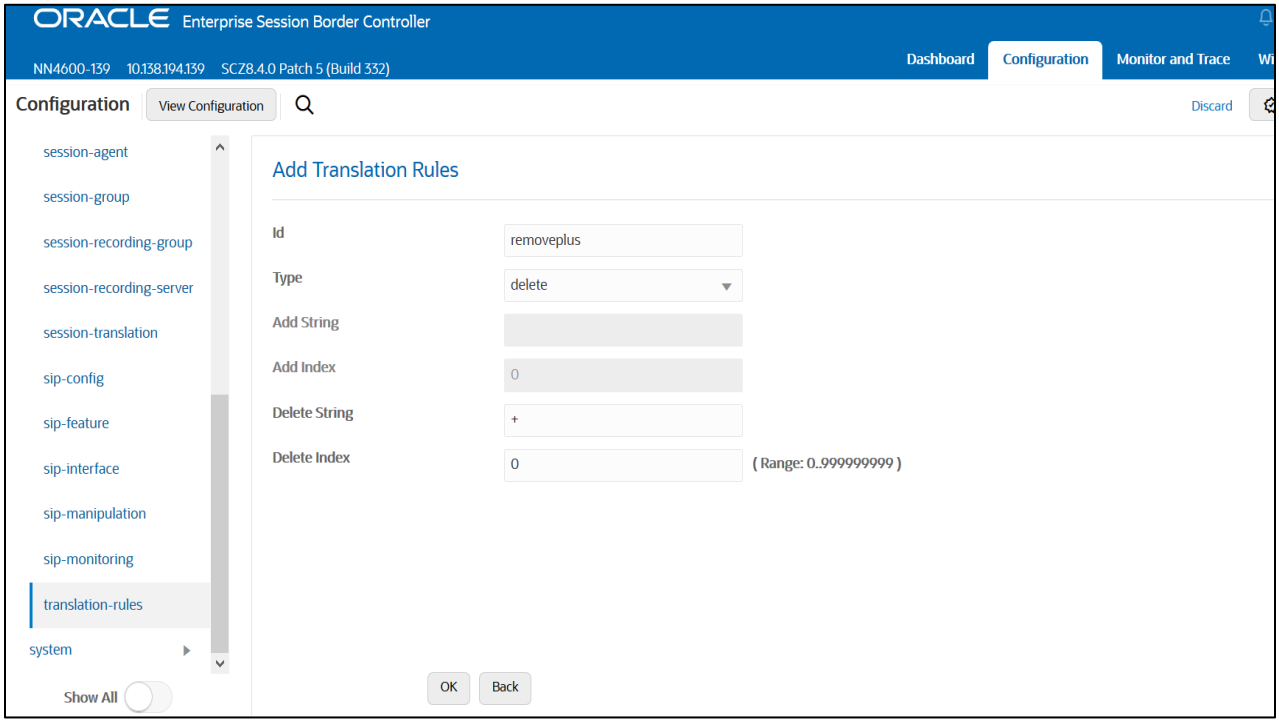
Similarly, Create Media Sec policy with name RTP to convert srtp to rtp for the Genesys side which will use only TCP/UDP as transport protocol. **Assign this media policy to the Genesys Realm.**




## 6.18. Configure Translation Rules

The translation rules sub-element is where the actual translation rules are created.
Go to Session router → translation-rules and create the below two rules.

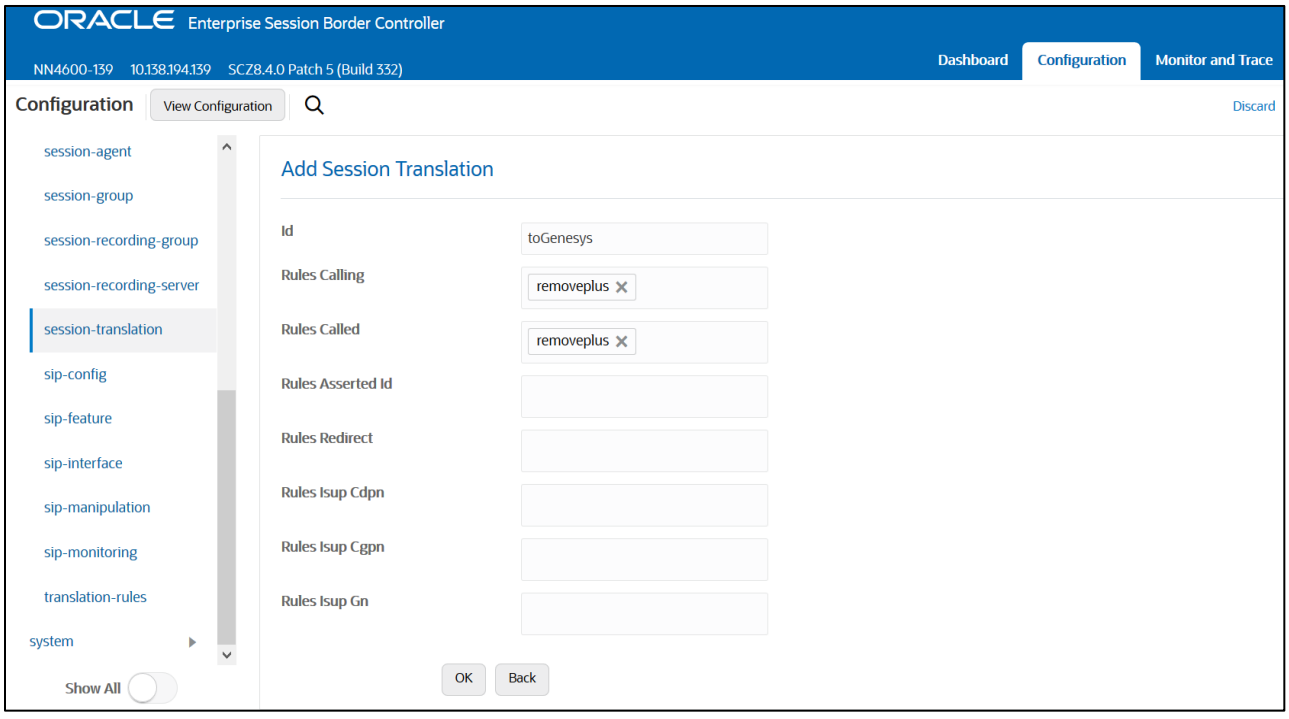




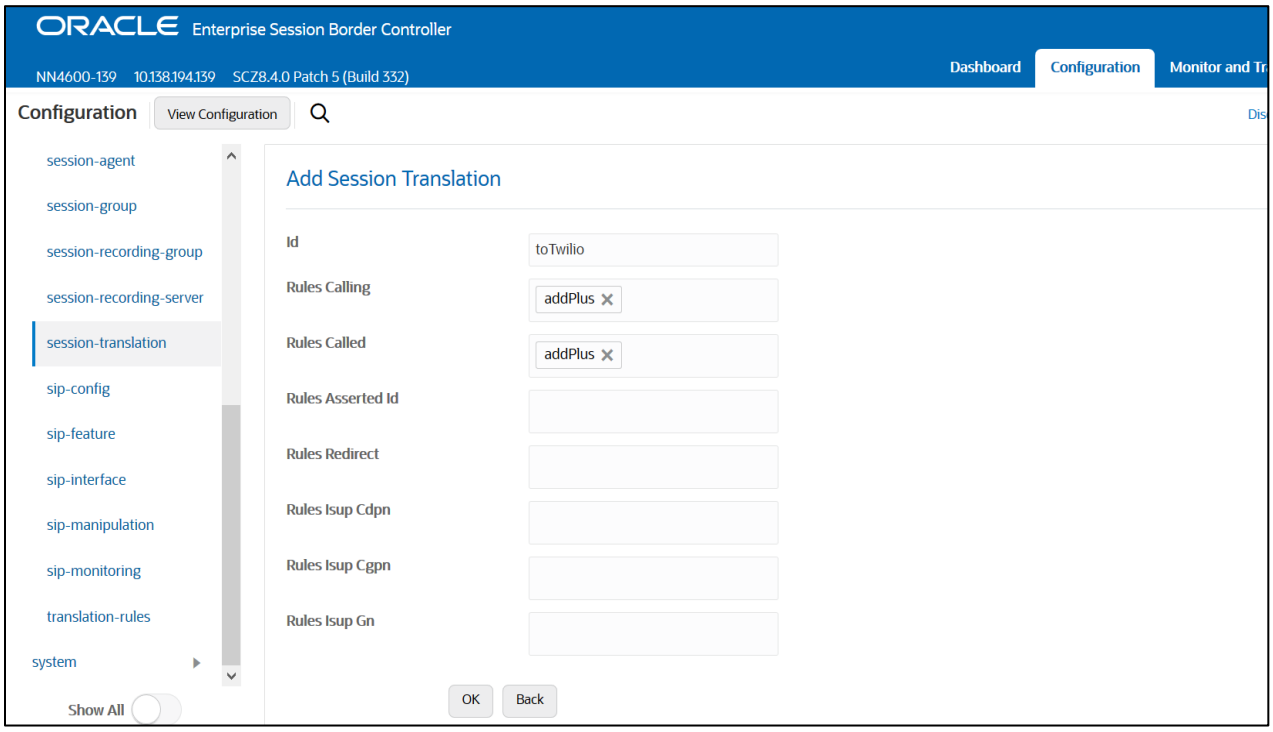

## 6.19. Configure Session Translation Rules

A session translation defines how translation rules are applied to calling and called numbers.
Go to Session Router → session-translation and configure the below translation rules.

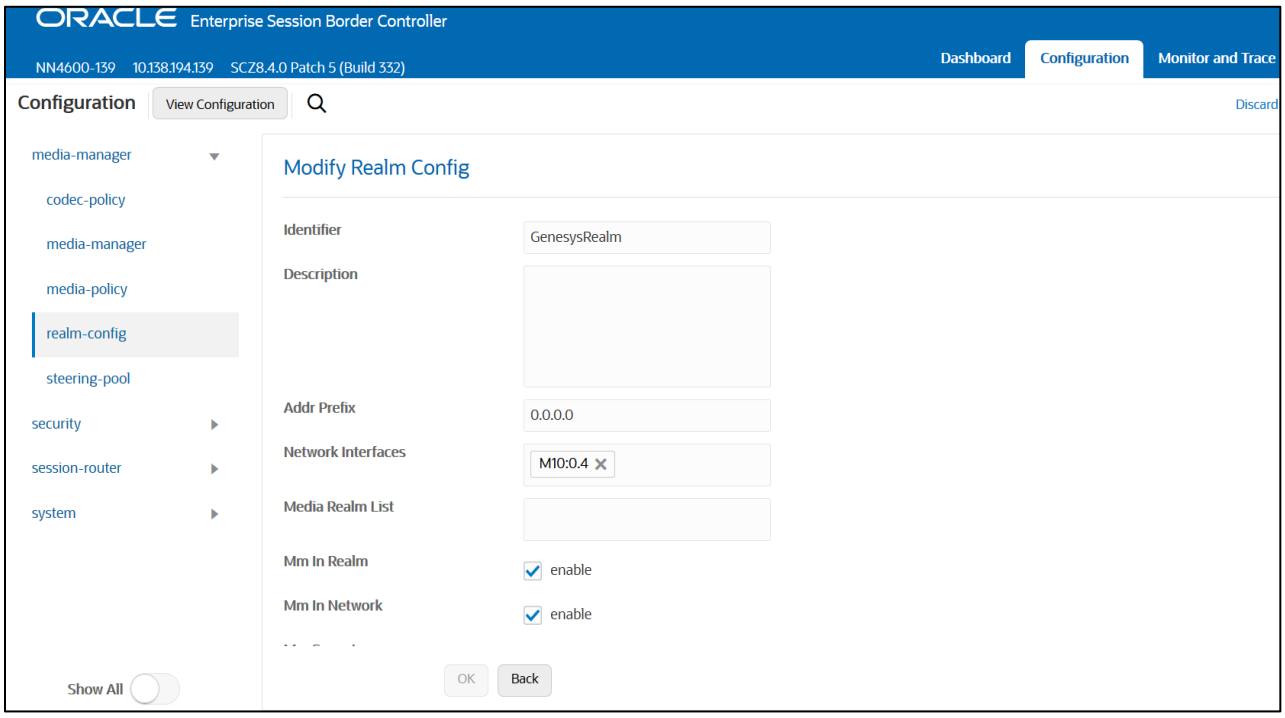
Add the below translation rule to Genesys side.

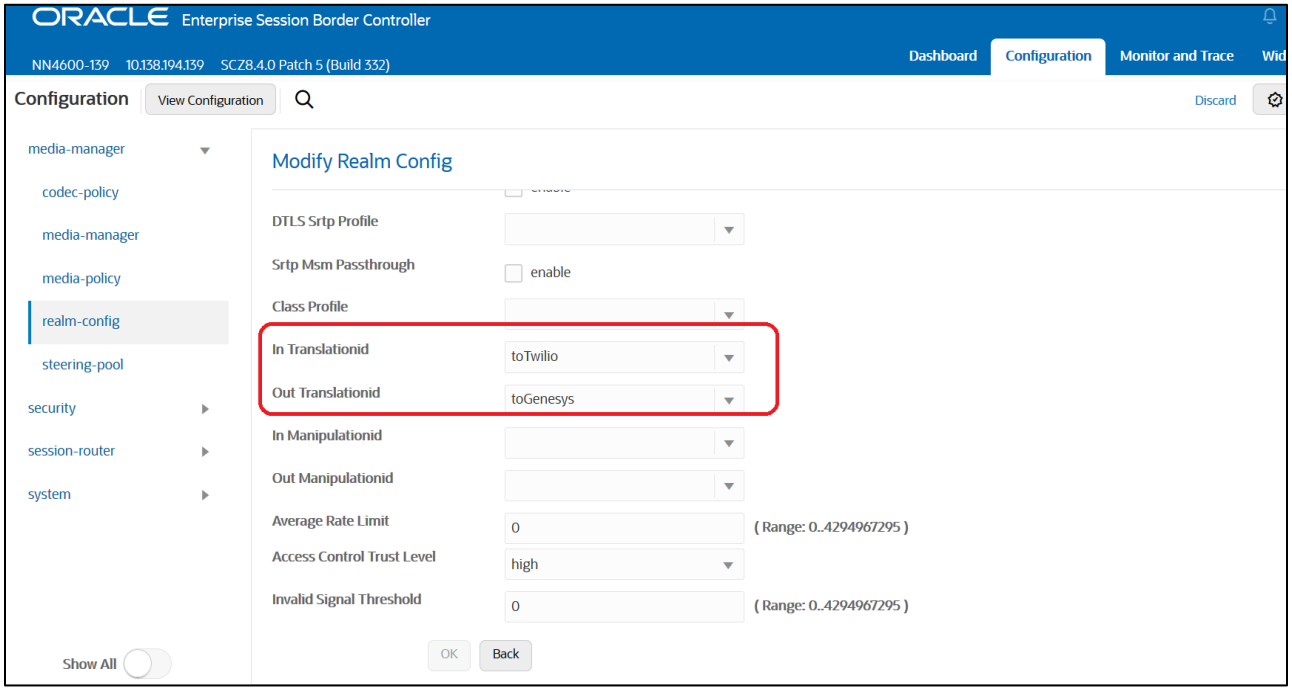


Add the below translation rule to Twilio side as PSTN expects call with + sign.




Please add the above session translation rules to Genesys realm as shown below






With this, SBC configuration is complete

# 7. SBC configuration for Genesys Remote Worker

This section of Genesys Remote Worker configuration is included for Genesys remote endpoints that register through the Oracle SBC to the Genesys SIP Server. This would require additional configuration to be configured on the Oracle SBC along with the SIP trunking config as mentioned in the earlier description of the test bed. To complete the particular testing we have configured Genesys endpoints which will register to Genesys SIP server through the SBC. SBC will handle the calls based on the registration information present in the cache. **Please note that Genesys Remote worker Access side is secured (TLS/SRTP) and Genesys Core side is unsecured (UDP or TCP/RTP)**

In order to achieve the requirement we have made below configuration on the Oracle SBC

Access Realm for Genesys Remote worker
Steering Pool associated with the Realm for Genesys Remote worker
Sip-interface associated with the Realm for Genesys Remote worker
(Optional) A local-policy to route the registration requests from this Realm to the SIP Server.

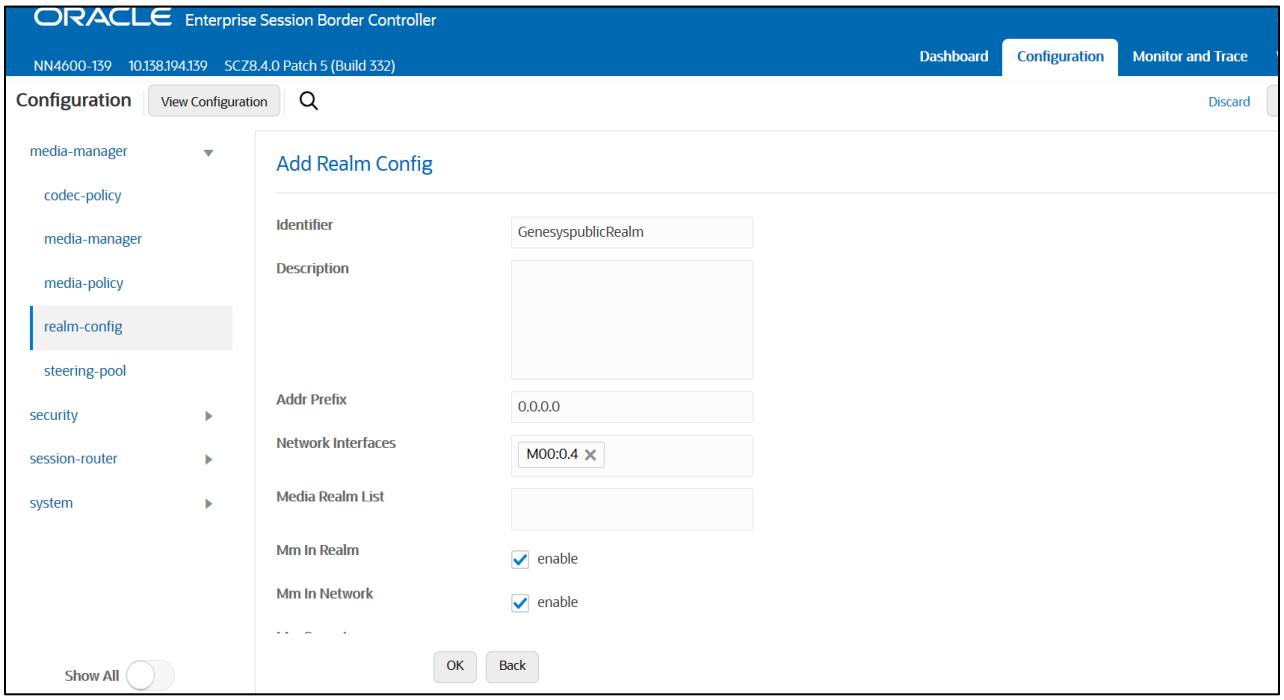
Note -The local-policy element is optional as we can enable the Route to registrar parameter on the sip-interface config to route the requests to the Registrar.

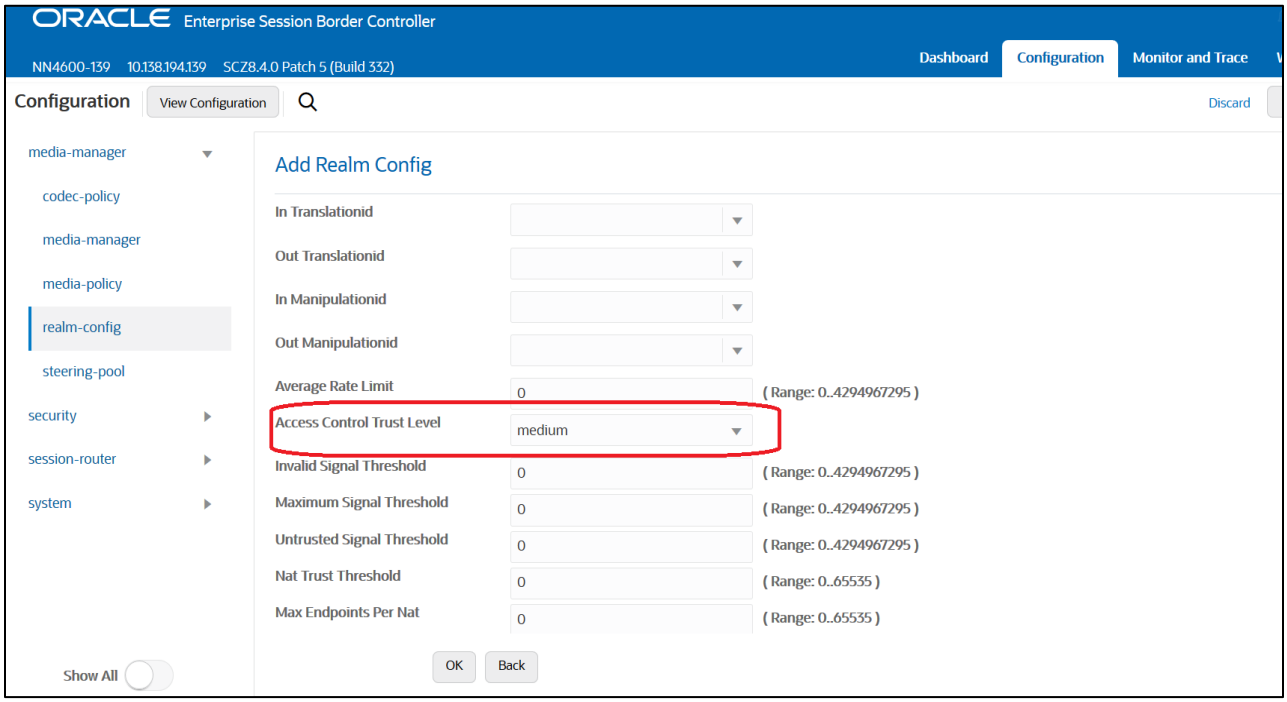
The registrar host and port is configured in the sip-config element on the SBC. The remote endpoint sends register requests from Genesys Access Realm onto the SBC and then SBC registers these endpoints onto the Genesys Core Realm maintaining the registration cache in its database to route inbound calls to these endpoint. Below are the snippets from the Oracle SBC Web GUI for the Remote worker configuration.

## 7.1. Configure Realms

Navigate to realm-config under media-manager and configure a realm as shown below
The name of the Realm can be any relevant name according to the user convenience.

In the below example, Realm name is given as GenesyspublicRealm for Genesys Access Side.
Please set the Access Control Trust Level as medium for this realm
**The core realm is same GenesysRealm which we have configured already in earlier section.**

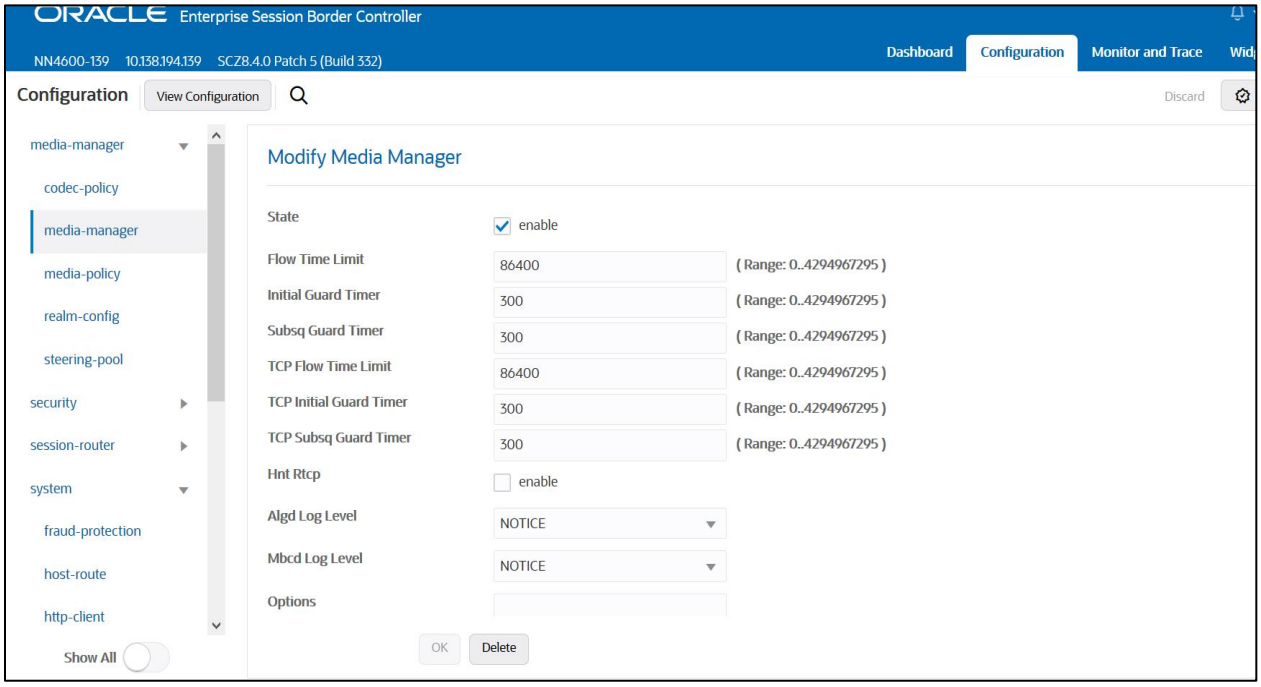


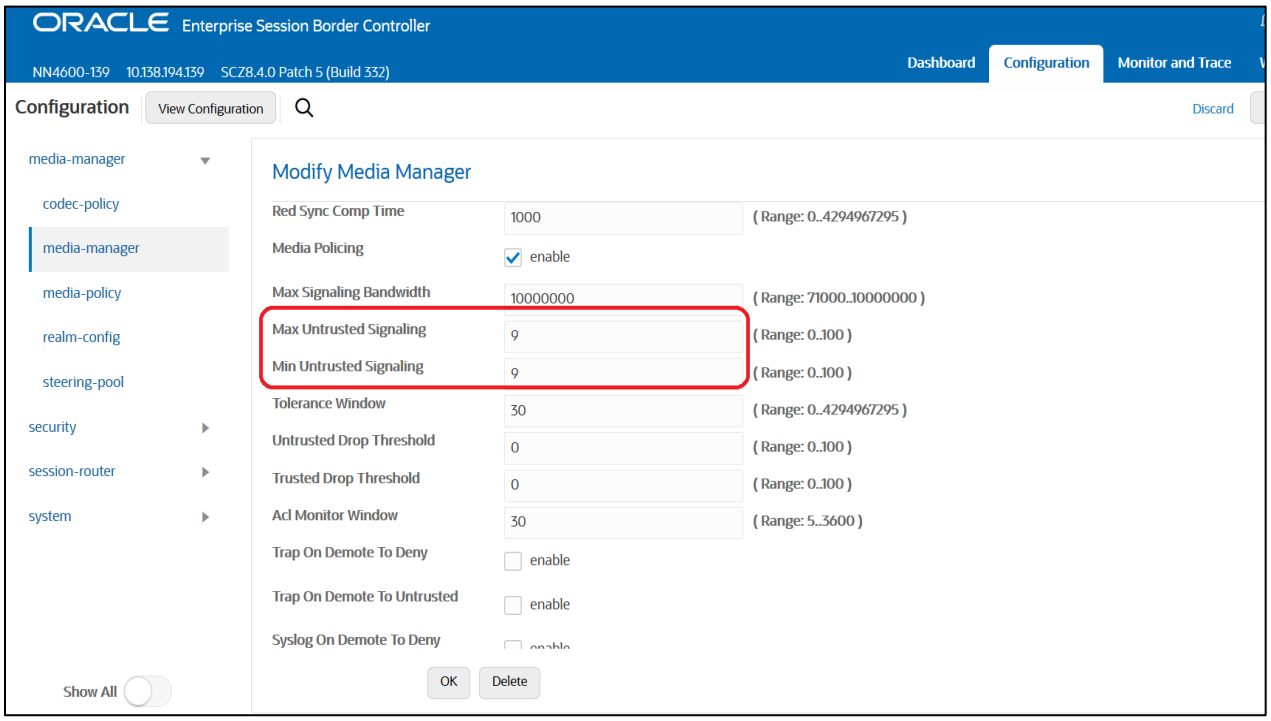



## 7.2. Enable media manager

Media-manager handles the media stack required for SIP sessions on the SBC. Enable the media manager option as below.

In addition to the above config, please set the max and min untrusted signaling values to 9 which takes care of Access Realm.  Go to Media-Manager->Media-Manager

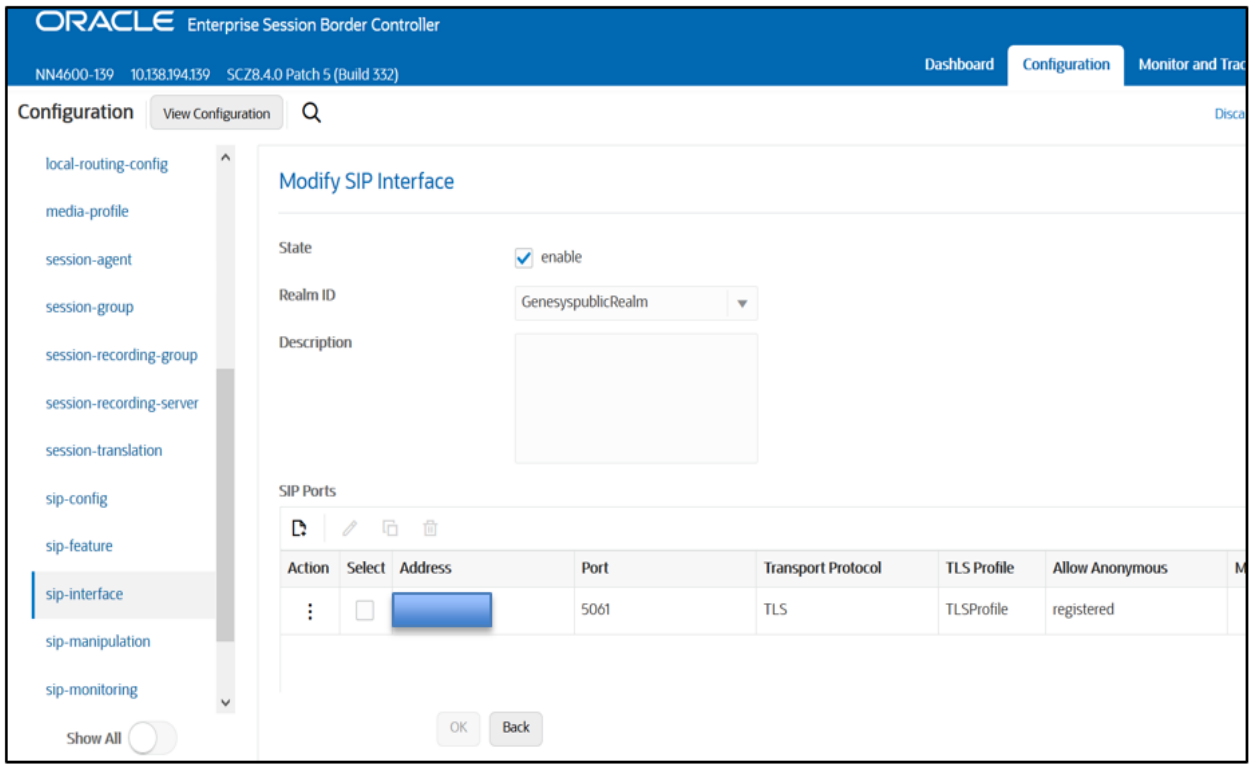


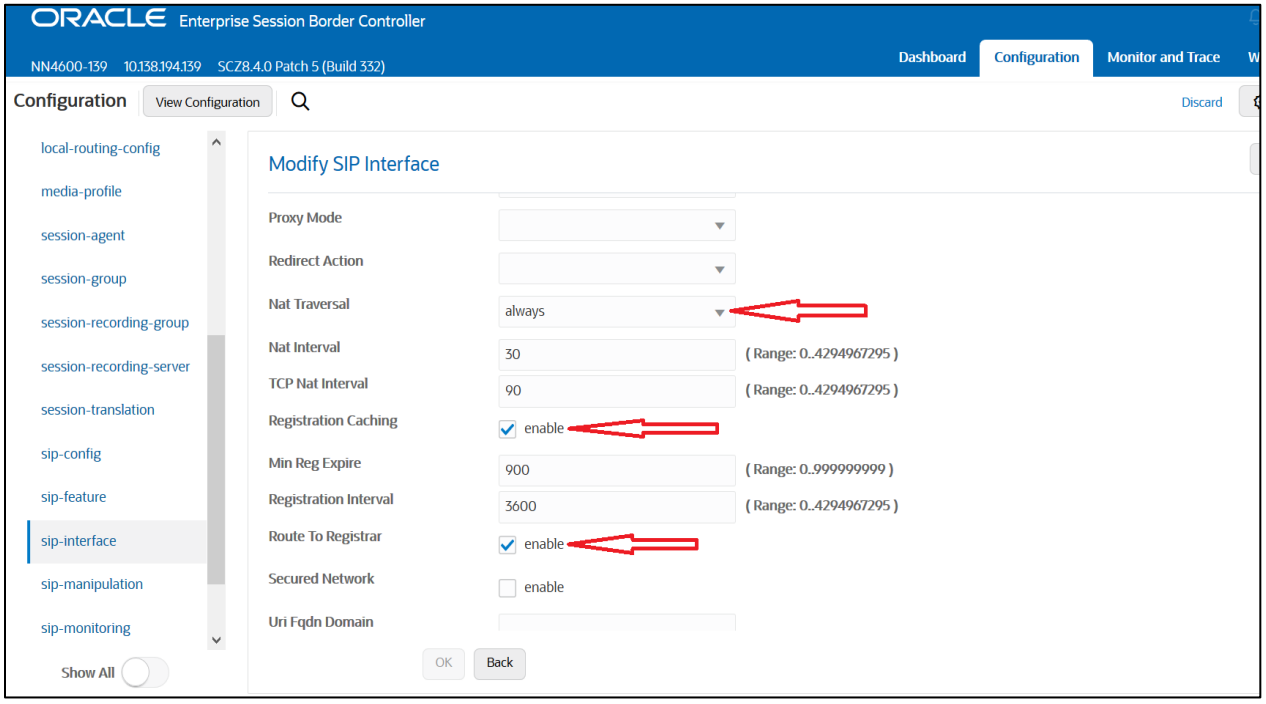



## 7.3. Configure SIP Interfaces

Navigate to sip-interface under session-router and configure the sip-interface as shown below. Please Configure sip-interface for the for Genesys Access side as below:

- Tls-profile needs to match the name of the tls-profile created earlier.
- Set allow-anonymous to Registered to ensure traffic to this sip-interface only comes from the registered user.
- Set NAT traversal to always for the remote workers to register.
- Enable Registration Caching and Route to Register



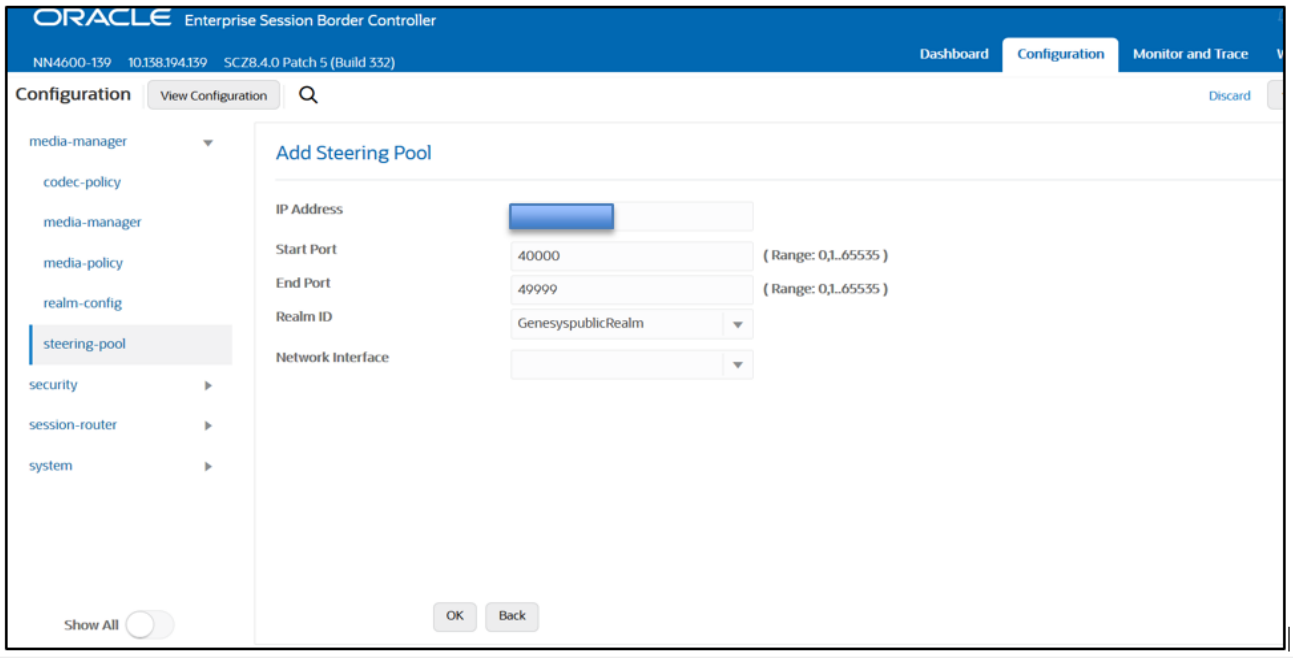



**The sip-interface created for Genesys side in earlier section can be used as Genesys Core side Interface**. Once sip-interface is configured – the SBC is ready to accept traffic on the allocated IP address.

## 7.4. Configure steering-pool

Steering-pool config allows configuration to assign IP address(es), ports & a realm.

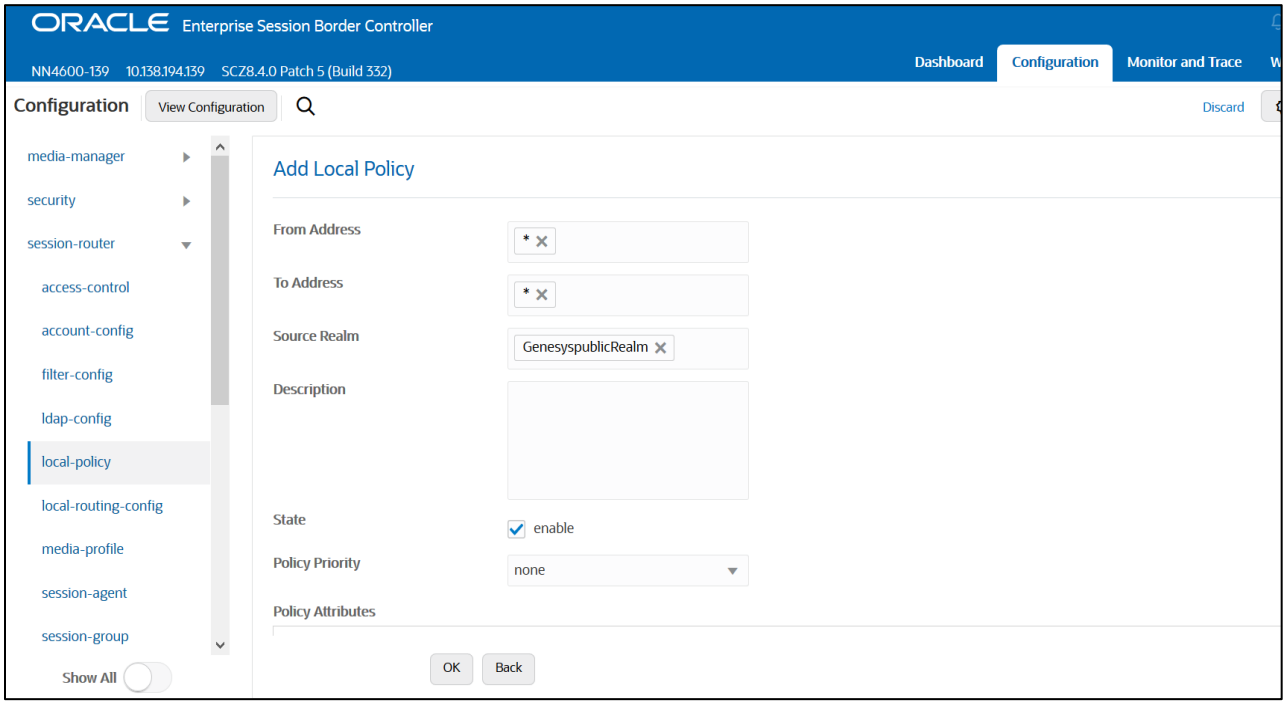
Genesys Access side steering pool.

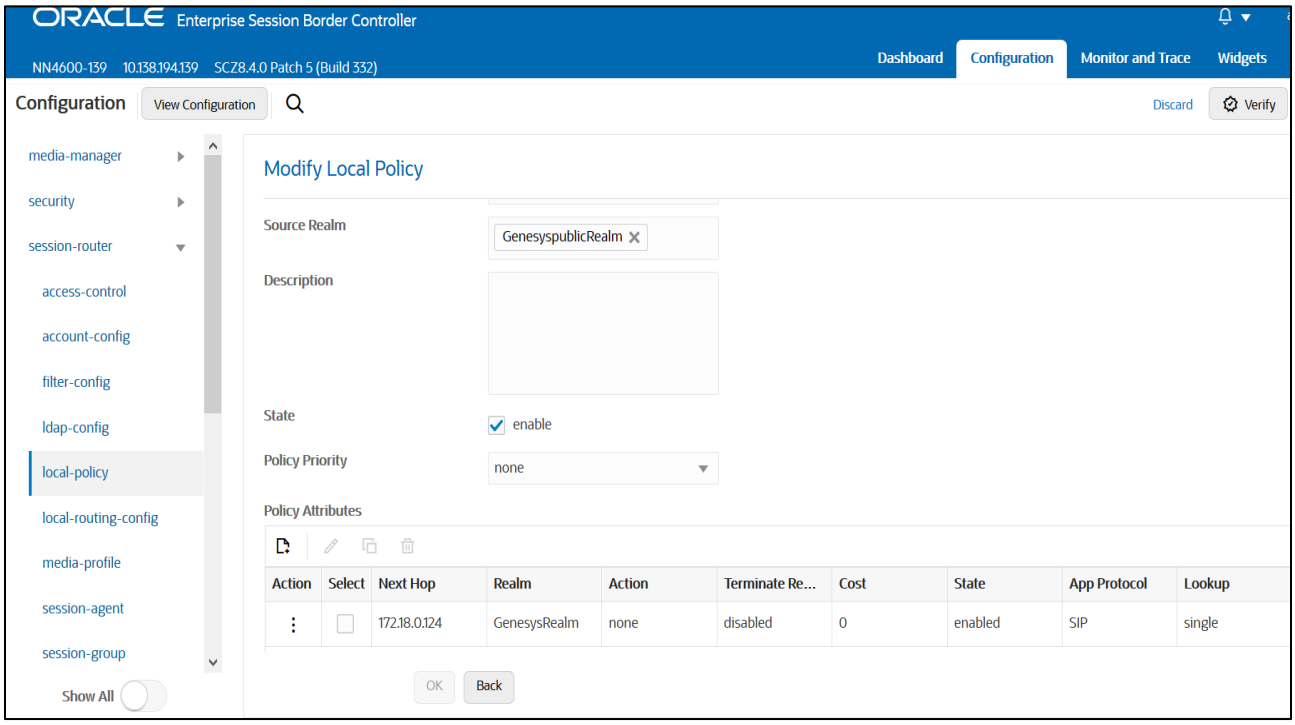


## 7.5. Configure local-policy (Optional)

Local policy config allows for the SBC to route calls from one end of the network to the other based on routing criteria. To configure local-policy, go to Session-Router->local-policy.

To route the calls from Genesys Access side to Core side and vice versa, Use the below local –policy



# 8. New SBC config/Deployment Using Configuration Assistant

When you first log on to the E-SBC, the system requires you to set the configuration parameters necessary for basic operation. To help you set the initial configuration with minimal effort, the E-SBC provides the Configuration Assistant. The Configuration Assistant, which you can run from the Web GUI or the Acme Command Line Interface (ACLI), asks you questions and uses your answers to set parameters for managing and securing call traffic. You can use the Configuration Assistant for the initial set up to make to the basic configuration. Please check "Configuration Assistant Operations" in the Web GUI User Guide and "Configuration Assistant Workflow and Checklist" in the ACLI Configuration Guide

Please note, applying a configuration to the SBC via the Configuration Assistant will overwrite any existing configuration currently applied to the SBC. **We highly recommend this only be used for initial setup of the SBC. This feature is not recommended to be used to make changes to existing configurations.**

## 8.1. Section Overview and Requirements

This section describes how to use our Configuration Assistant feature as a quick and simple way to configure the Oracle SBC for integration with Genesys PureEngage and Twilio Elastic SIP Trunking. The pre-requisite are given below.

- SBC running release SCZ840p7 or later which will have this template package by default added to the SBC code.
- TLS certificate for the SBC preferably in PKCS format, or CSR is generated by the SBC. For Twilio side, list of supported CA's can be found here

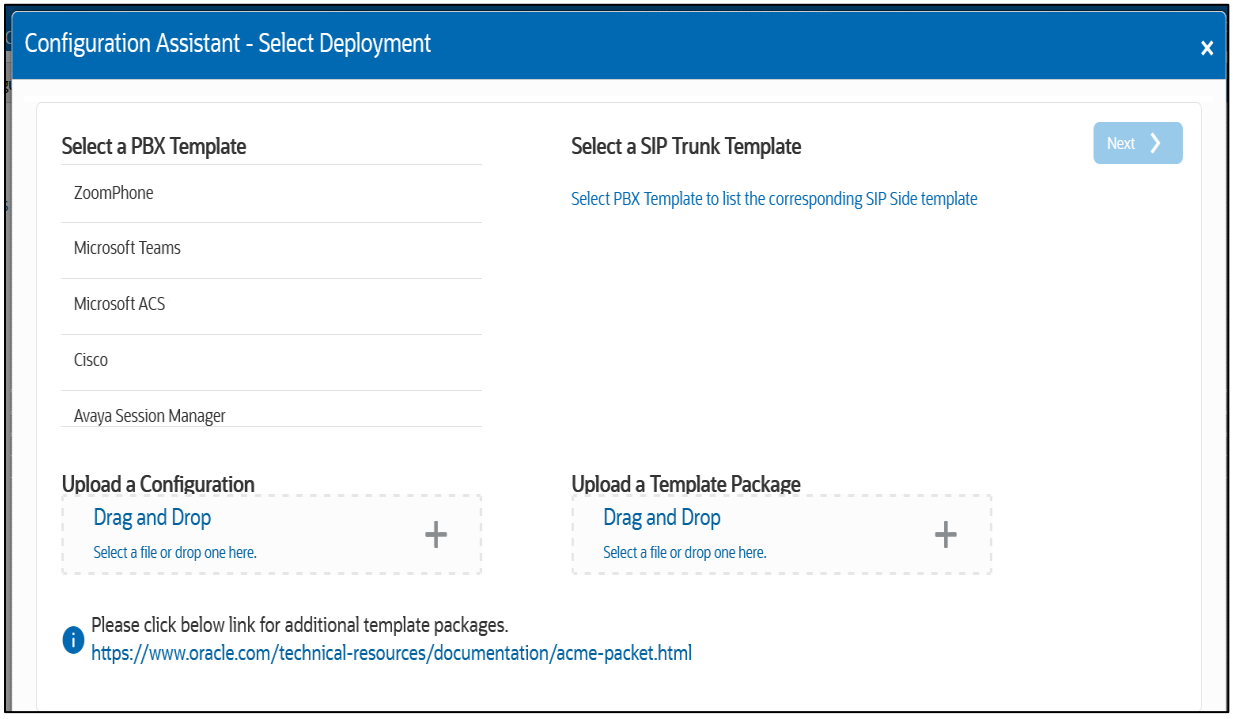
The following outline assumes you have established initial access to the SBC via console and completed the following steps:

- Configured boot parameters for management access
- Setup Product
- Set Entitlements
- Configured HTTP-Server to establish access to SBC GUI

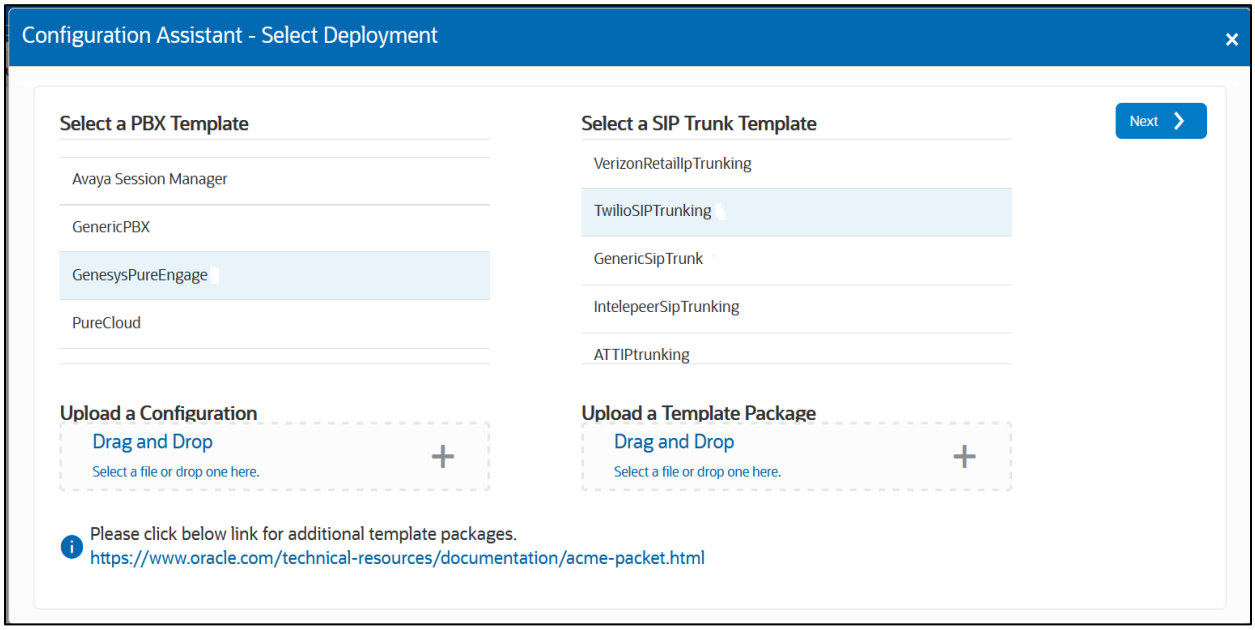
## 8.2. Initial GUI Access

The Oracle SBC WebGui can be accessed by entering the following in your web browser: http(s)://<SBC Management IP>.

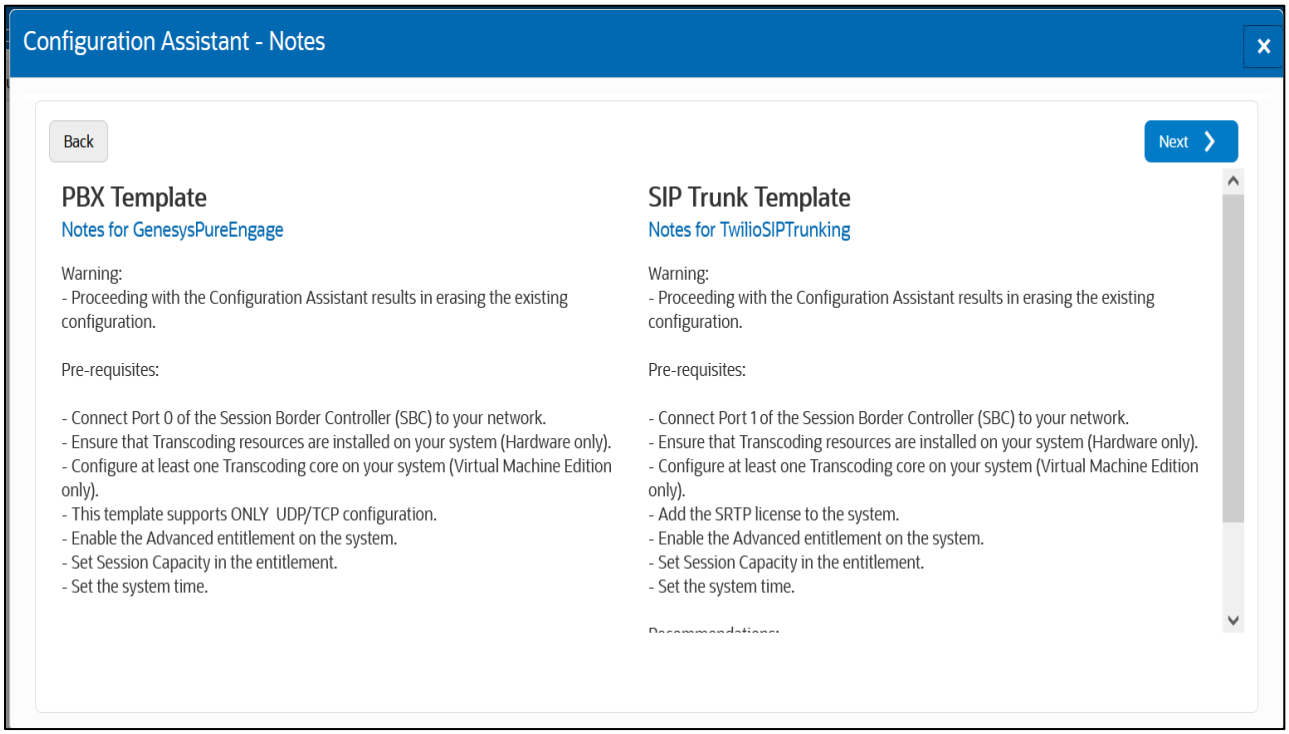
The username and password are the same as that of the CLI.
If there is no configuration on the SBC, the configuration assistant will show immediately upon login to the SBC GUI as shown below



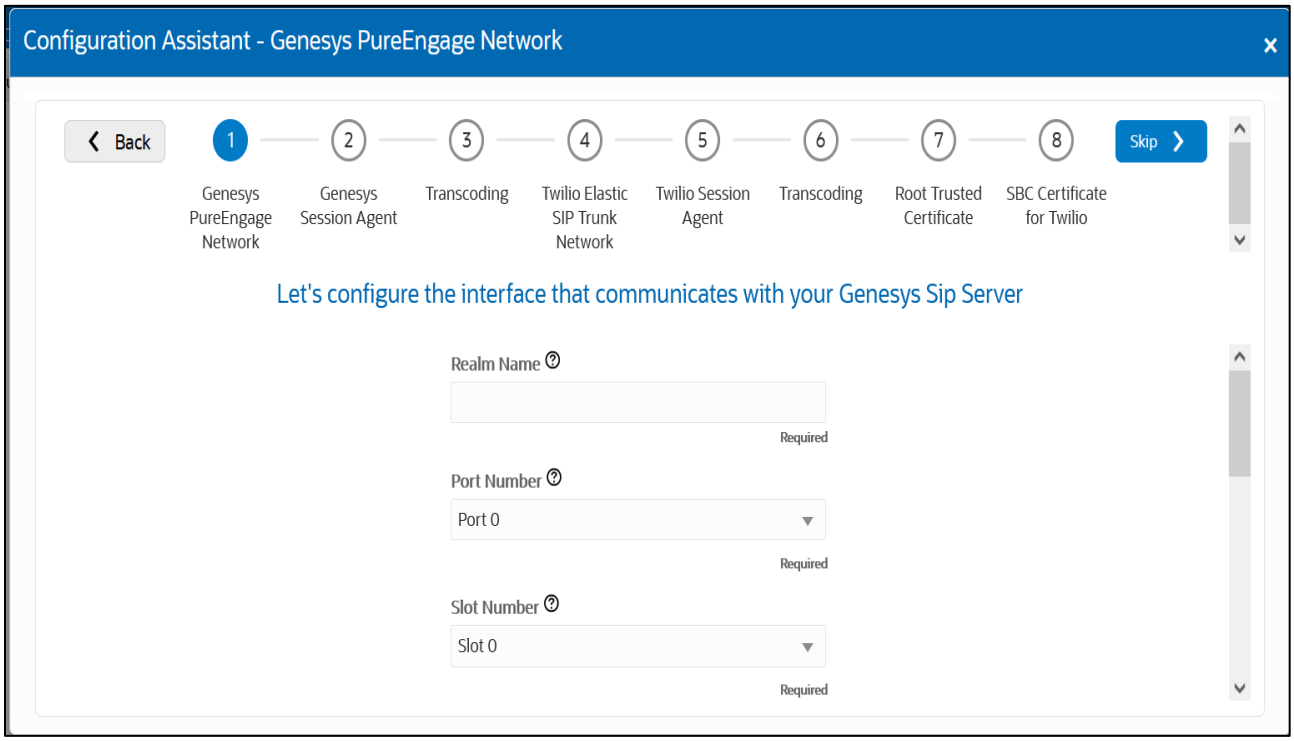

As we can see, there are some templates of PBX populated in the template and we can select the PBX template that we want to use with our Twilio trunk and for this document, we have selected Genesys PureEngage template and once we select that, it asks us to select the SIP trunk template. After we select Twilio trunk template, the Next option would be enabled.



Click *Next*: The following “Notes” will be displayed related to pre-requisite



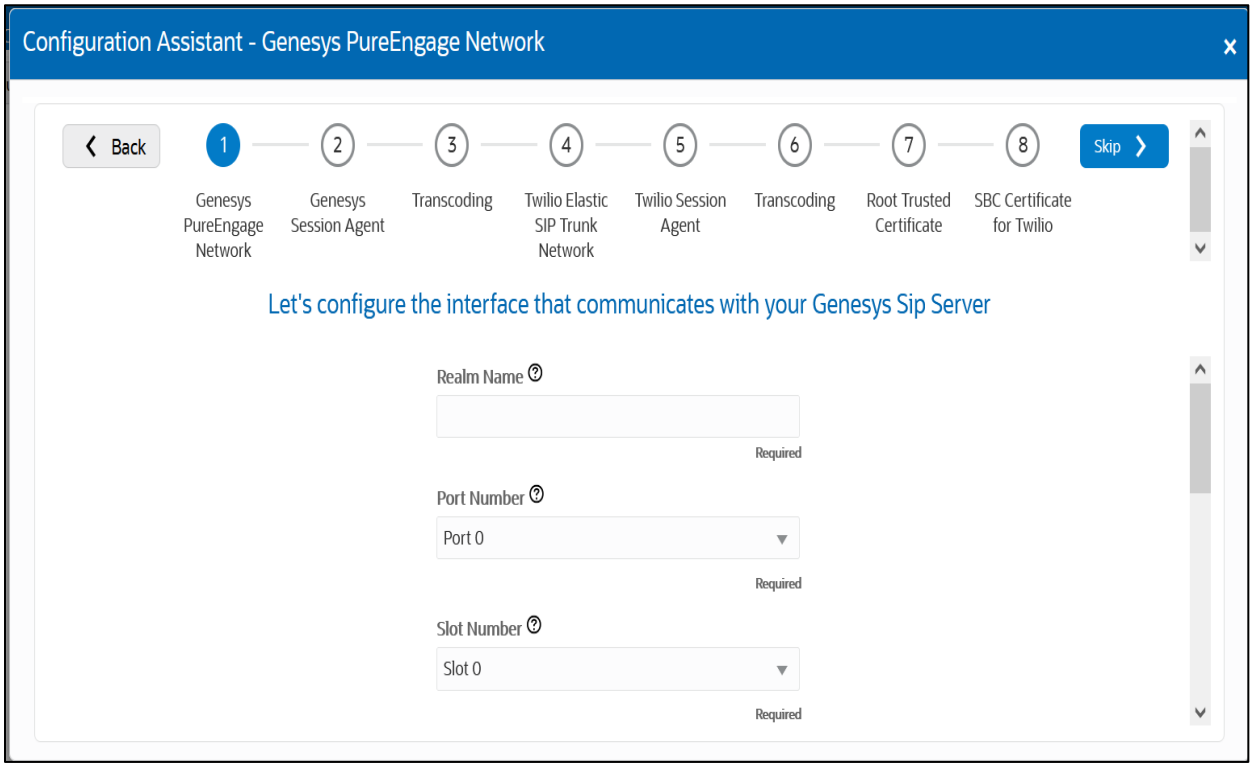

Click *Next* and we get the below screen where we need to enter the details for SBC configuration.



## 8.3. Configuration Assistant Template Navigation

### 8.3.1. Page 1-Genesys PureEngage Network

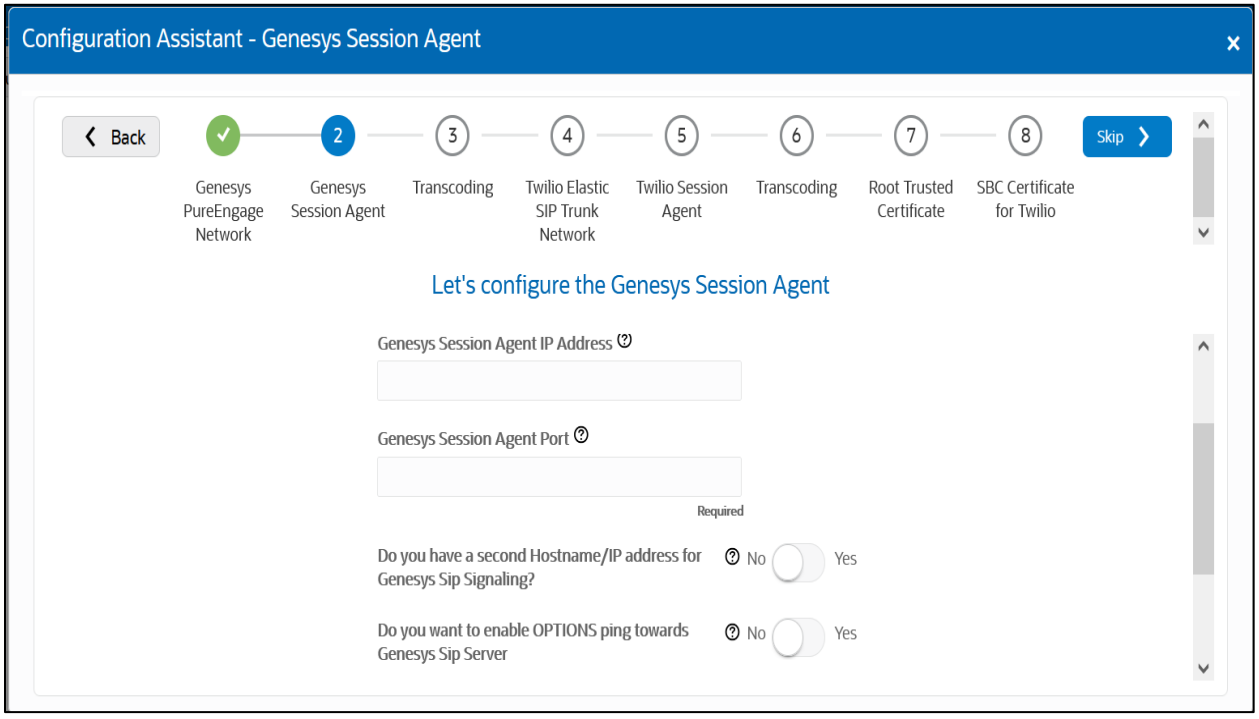
Page 1 of the template is where you will configure the network information to connect to Genesys PureEngage Side




Next to each field is a help icon. If you hover over the icon, you will be provided with a description or definition of each filed. Also, pay close attention to which fields are listed as “required”.

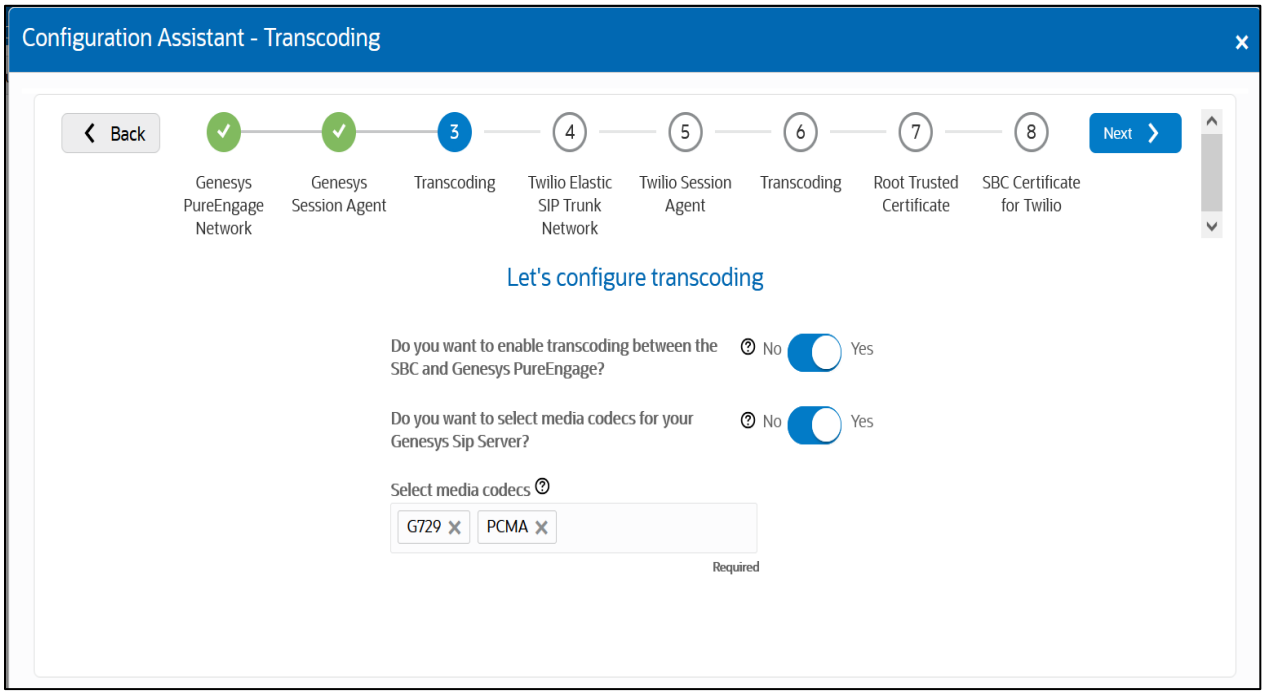
### 8.3.2. Page 2-Genesys Session agent

Page 2 of the template is where you will configure the Genesys PureEngage Session Agent details where you will enter the next hop IP address and port for sip signaling to and from your Genesys PureEngage Session Agent. Please fill the required fields and click Next.



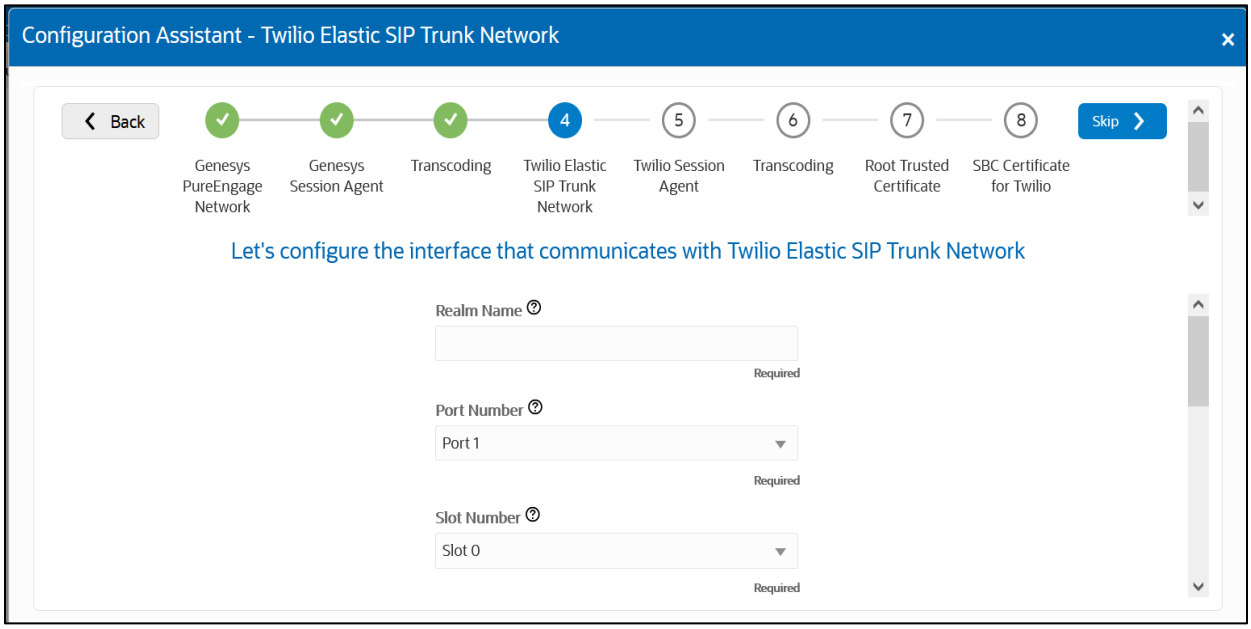

#### 8.3.3. Page 3 -Genesys side Transcoding

Page 3 is where you will be able to configure transcoding between the SBC and Genesys PureEngage. Once transcoding features is set to “yes”, you will then have an option to select additional media codecs you want included in offers/answers towards Genesys Side. If you select Yes to either question regarding media codecs, you will be presented with a required drop down. You can select as many codecs from the list presented.



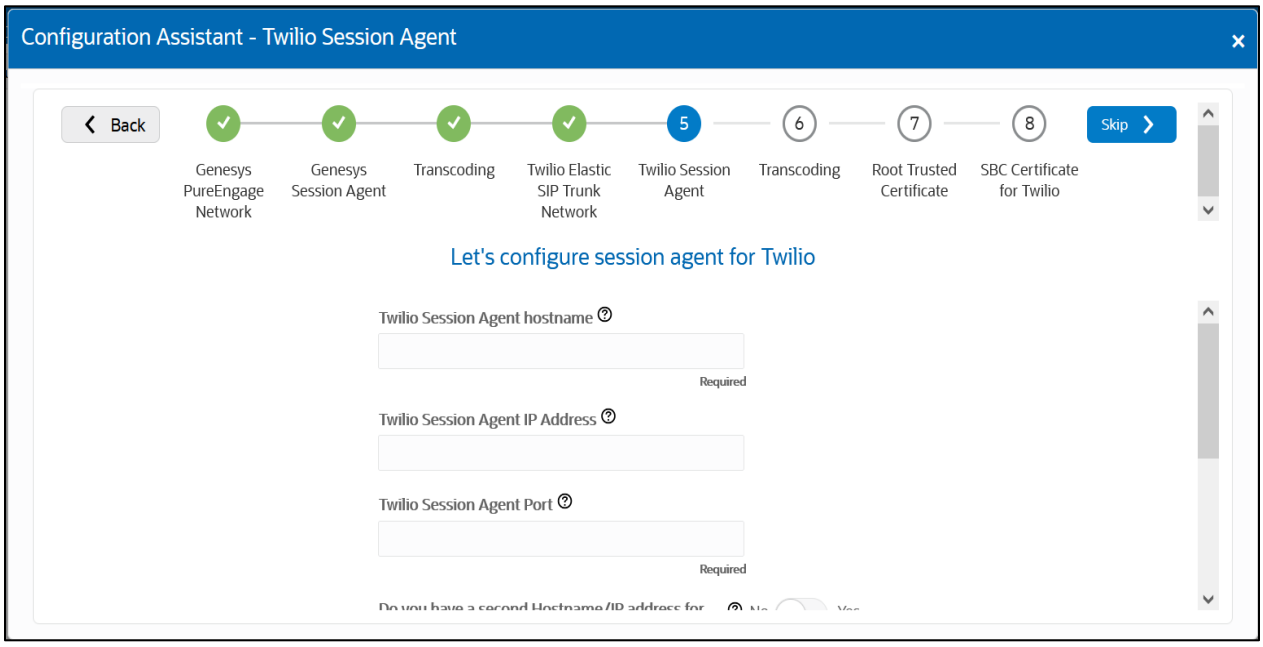
#### 8.3.4. Page 4 - Twilio Elastic SIP Trunk Network

Page 4 of the template is where you will configure the network information to connect to Twilio Elastic SIP trunk Network. Please fill the required fields and Press Next.



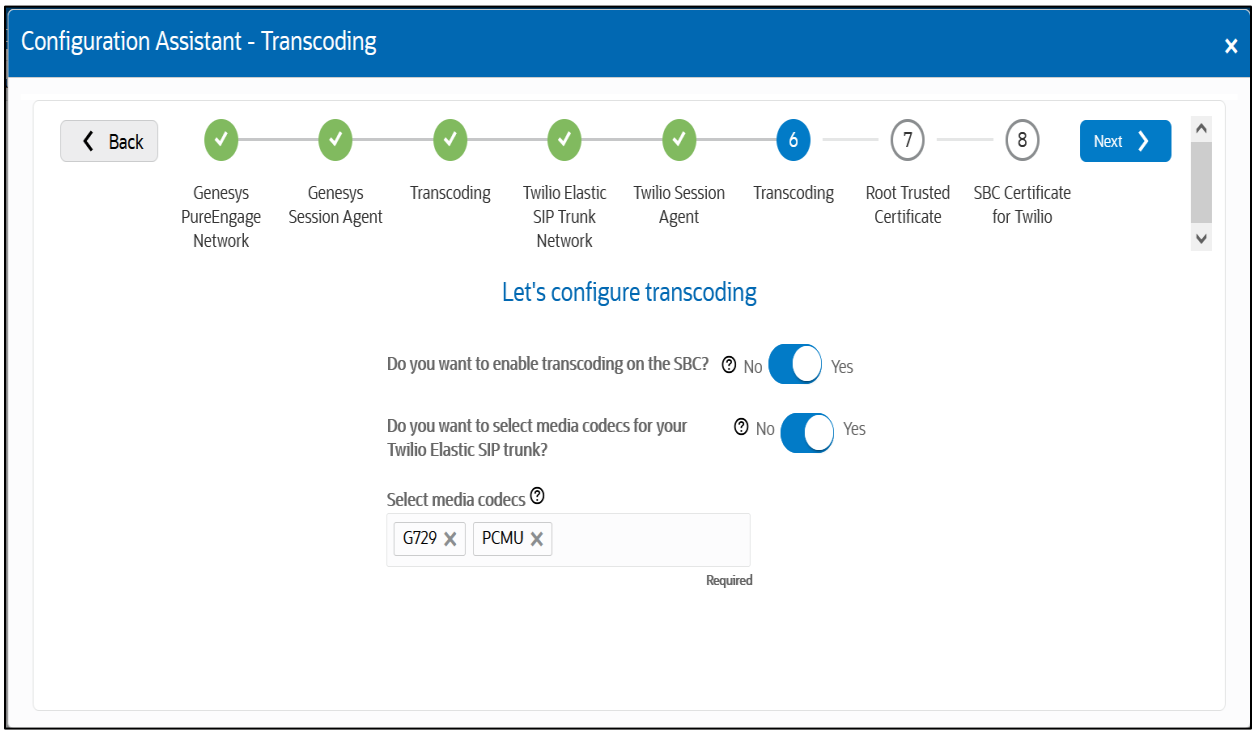

#### 8.3.5. Page 5 - Twilio Session Agent

Page 5 of the template is where you will configure the Twilio Session Agent details where you will enter the next hop IP address and port for sip signaling to and from your Twilio Elastic SIP trunk. Please fill the required fields and click Next.



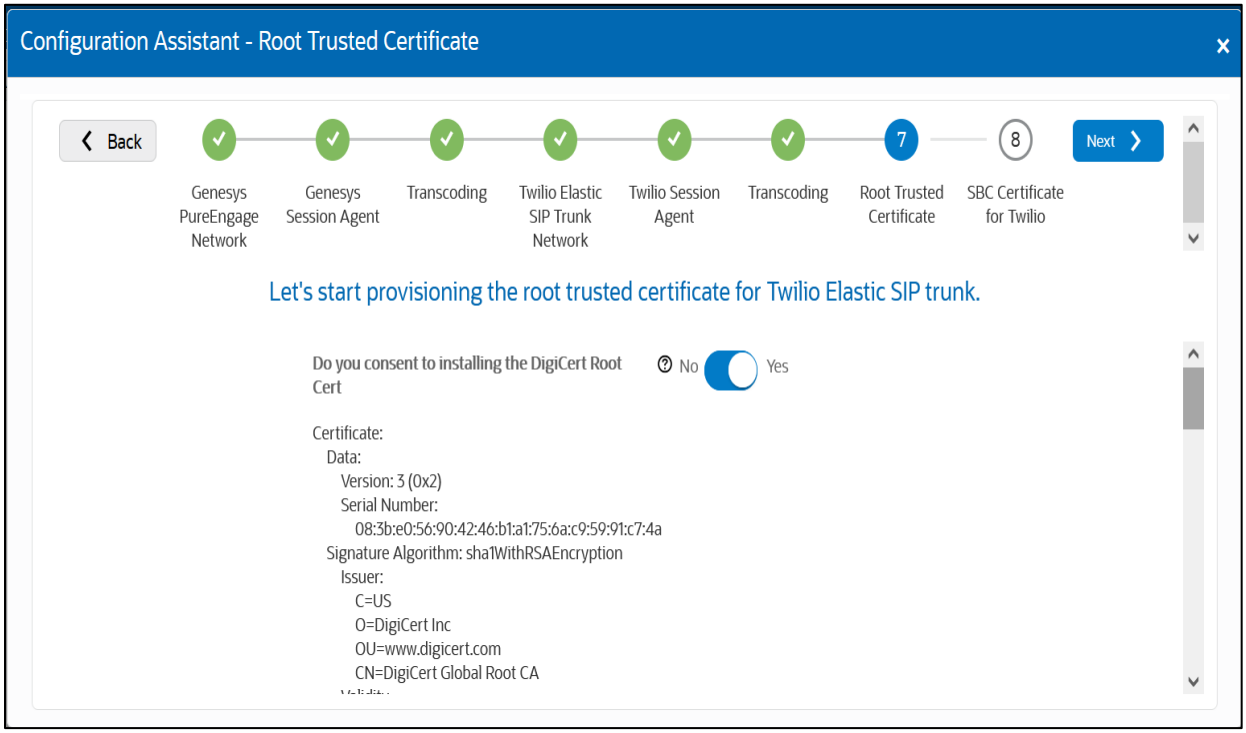
#### 8.3.6. Page 6 - Twilio side Transcoding

Page 6 is where you will be able to configure transcoding between the SBC and Twilio Trunk. Once transcoding features is set to “yes”, you will then have an option to select additional media codecs you want included in offers/answers toward Twilio trunk. If you select yes to either question regarding media codecs, you will be presented with a required drop down.  You can select as many codecs from the list presented.




#### 8.3.7. Page 7 - Import Digi Cert Root CA Certificate for Twilio Side

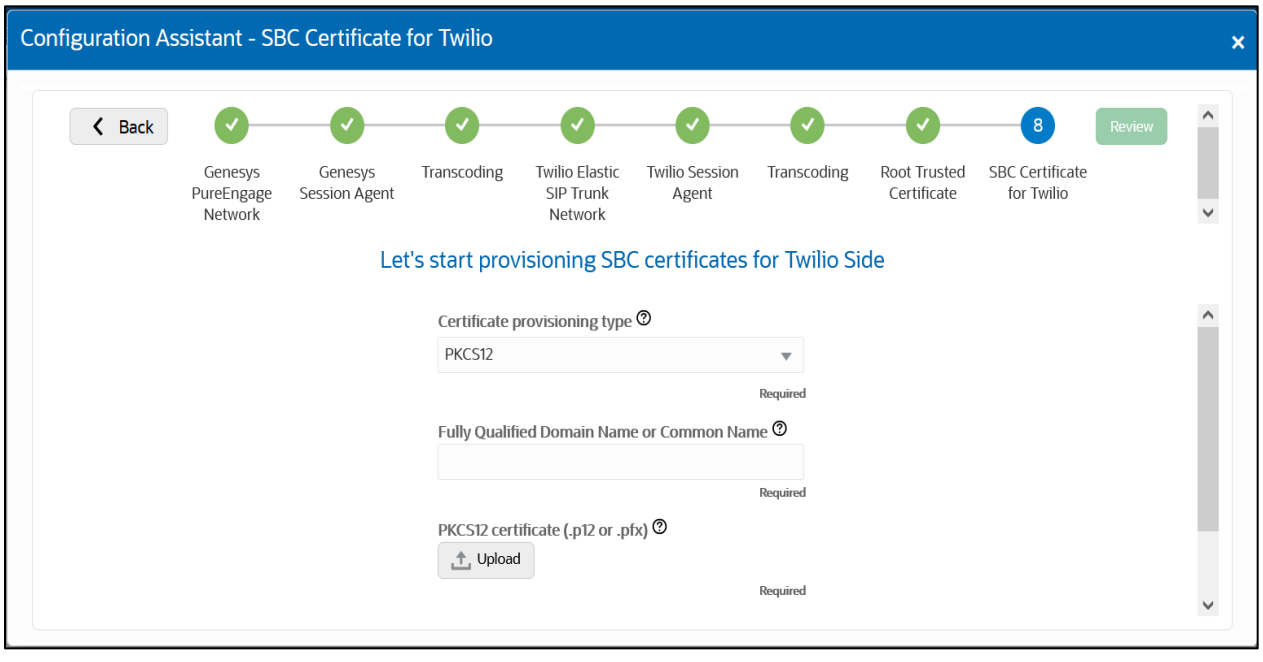
Page 7 of this template is where the SBC will import the DigiCert Root CA certificate, which Twilio uses to sign the certs it presents to the SBC during the TLS handshake. Importing the DigiCert Root CA certs is enabled by default.




### 8.3.8. Page 8 - SBC Certificates for Twilio side

**PKCS12 Import**

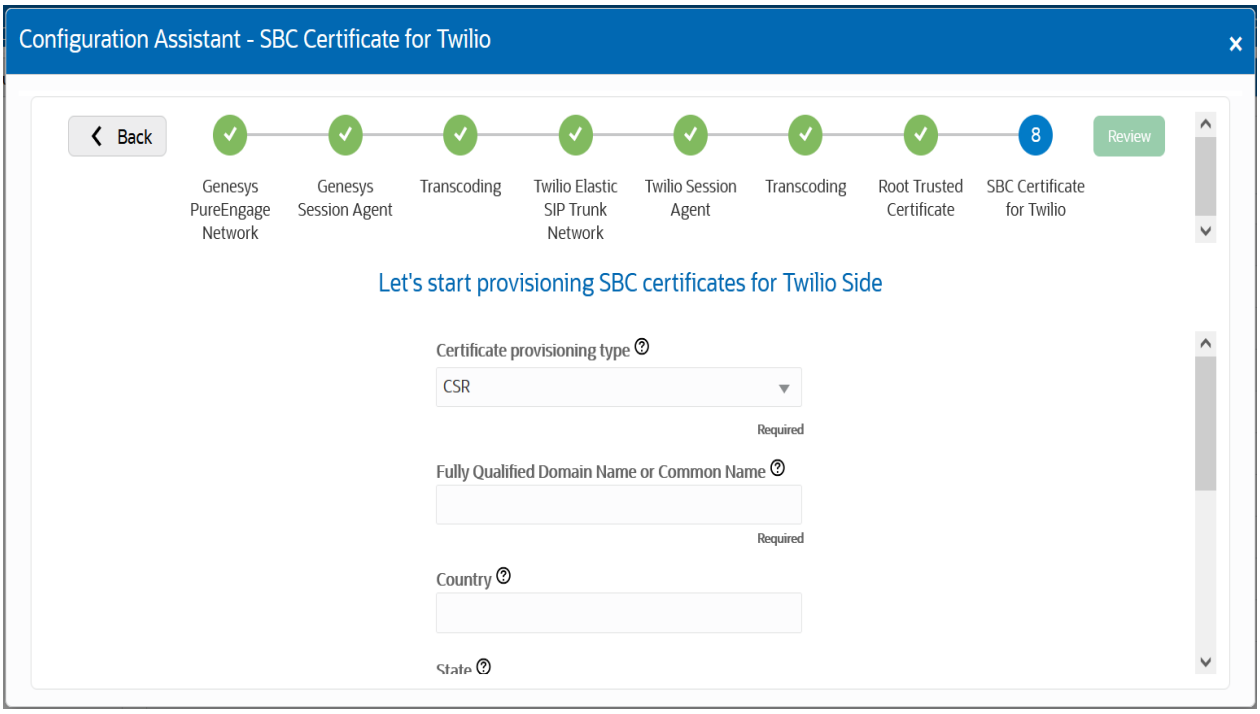
By default, the SBC is set to import a certificate in PKCS 12 format. This is the simplest and recommended way to add a certificate to the Oracle SBC. Using this method, you will add the SBC's hostname under "FQDN or Common Name" field, upload a certificate from a supported CA, and enter the certificates password.



**Certificate Signing Request (CSR)**

The alternative to importing a PKCS12 certificate to the SBC is to configure a certificate and generate a certificate signing request that you will have signed by a supported CA

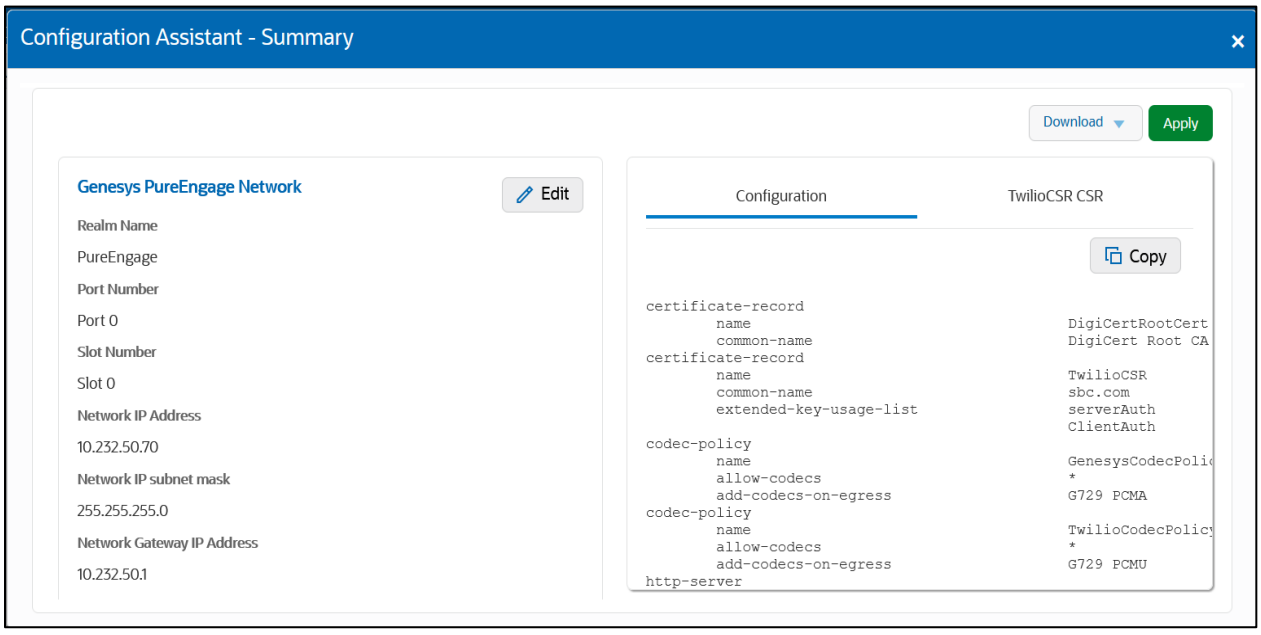
Same as PKCS12, you will enter the SBC's hostname under "FQDN or Common Name" and "Country" field (required) and answer the remaining question presented on this page (optional).




## 8.4. Review

At the end of the template, you will notice in the top right, a "*Review*" tab. If all 8 pages presented across the top are showing green, indicting there are no errors with the information entered, click on the "Review" tab.

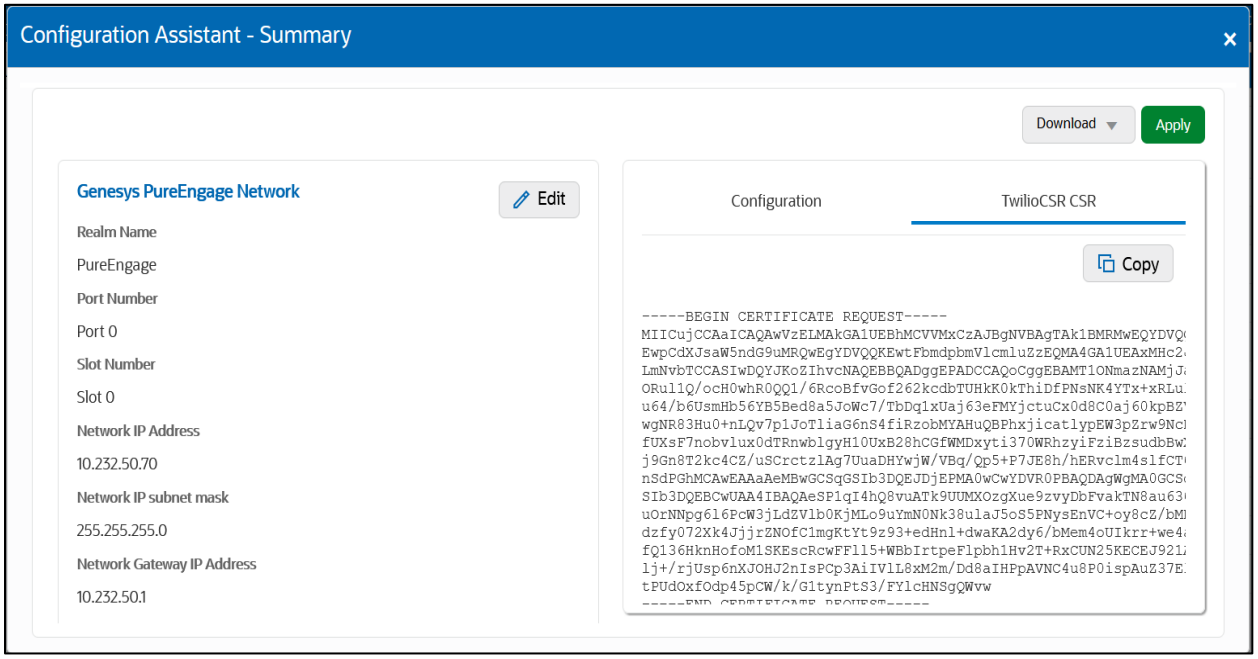

The screen looks like below after clicking the Review Tab.




On the left side of the review contains the entries for each page. Each page has an "*Edit*" tab that can be used to make changes to the information entered on that specific page without having to go through the entire template again.

On the right side of the review page, under the "*Configuration*" tab is the ACLI output from the SBC. This is the complete configuration of the SBC based on the information entered throughout the template. Also on the right side of the review page you may see another tab, "*TwilioCSR CSR*".

On Page 8 of the template, if you chose CSR from the drop down menu instead of PKCS, the SBC configures a certificate record and generates a certificate signing request for you as shown below.

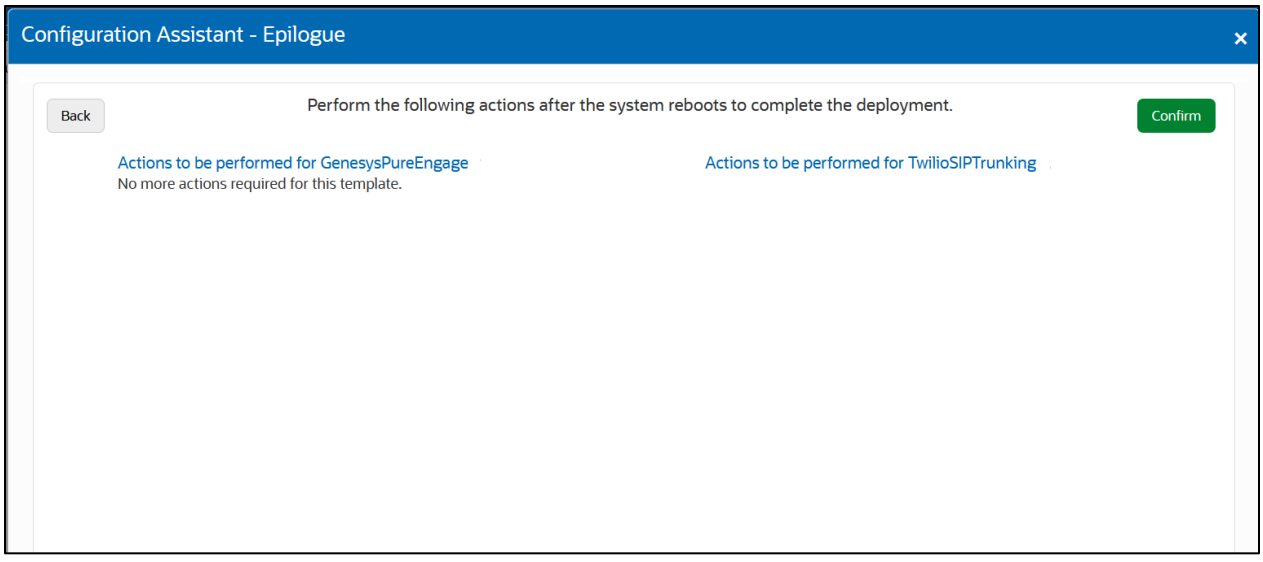



Click the copy button under the CSR, and paste the output into a text file. Next, provide the txt file to your CA for signature. Once the certificate is signed by a Twilio supported CA, you will need to import that certificate into the SBC manually, either via ACLI or through the GUI.

*Note: if you chose to import a certificate in PKCS12 format on page 8, the CSR tab will not be present under review.*

## 8.5. Download and/or Apply

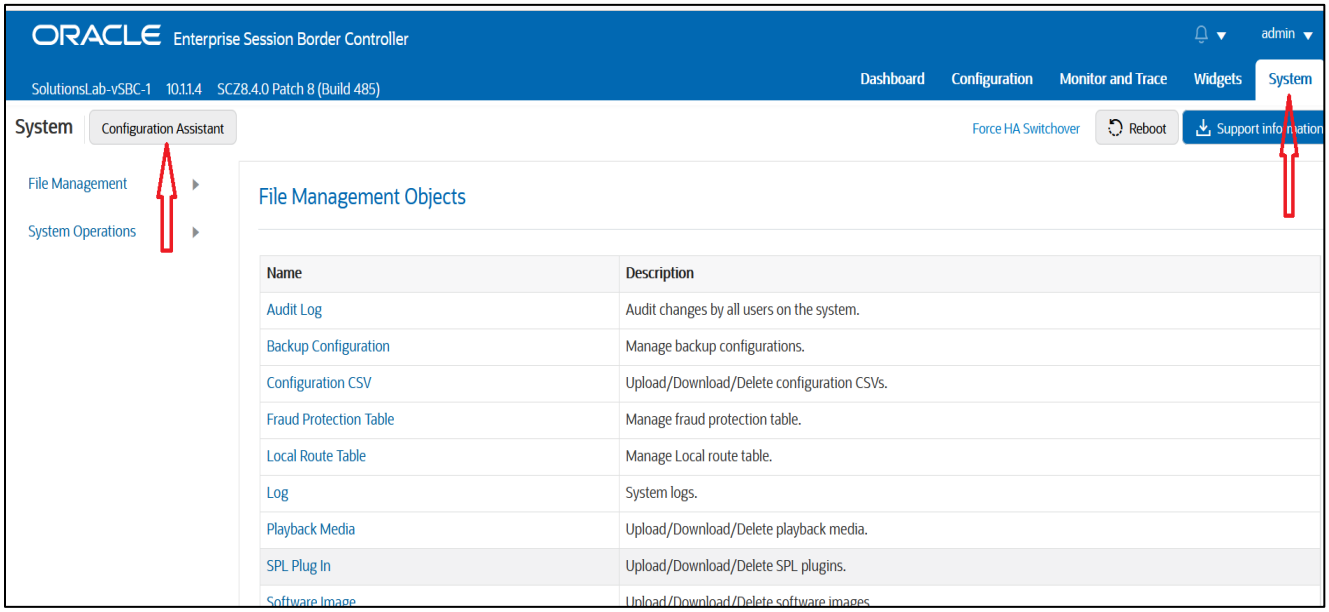
Now that the entries provided throughout the template have been reviewed, and the CSR has been copied into a text file (optional), the template provides you with the ability to "Download" the config by clicking the "*Download*" tab on the top right. Next, click the "*Apply*" button on the top right, and you will see the following pop up box appear.



Now you can click "*Confirm*" to confirm you want to apply the configuration to the SBC. The SBC will reboot. When it comes back up, the SBC will have a basic configuration in place for Genesys PureEngage with Twilio SIP trunking.

### 8.6. Configuration Assistant Access

Upon initial login, if the Configuration Assistant Template does not immediately appear on the screen, you can access by clicking on the "*SYSTEM*" tab, top right of your screen. After that, click on the "*Configuration Assistant*" tab, top left. This allows end users to access the Configuration Assistance at any time through the SBC GUI.




# 9. Existing SBC configuration

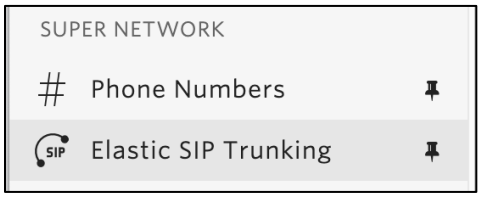
If the SBC being used is an existing SBC with functional configuration, following configuration elements are required:

- New realm-config
- Configuring a certificate for SBC Interface
- TLS-Profile
- New sip-interface
- New session-agent
- New steering-pools
- New local-policy
- SDES Profile
- Media-sec-Policy
- New Translation Rules
- Session Translation Rules

Please follow the steps mentioned in the above chapters to configure these elements.

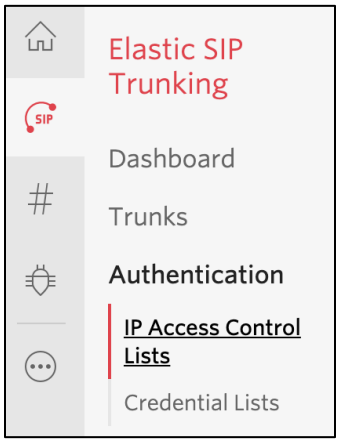
# 10. Twilio Elastic SIP Trunking Configuration

From your Twilio Console, navigate to the Elastic SIP Trunking area (or click on the SIP icon on the left vertical navigation bar).

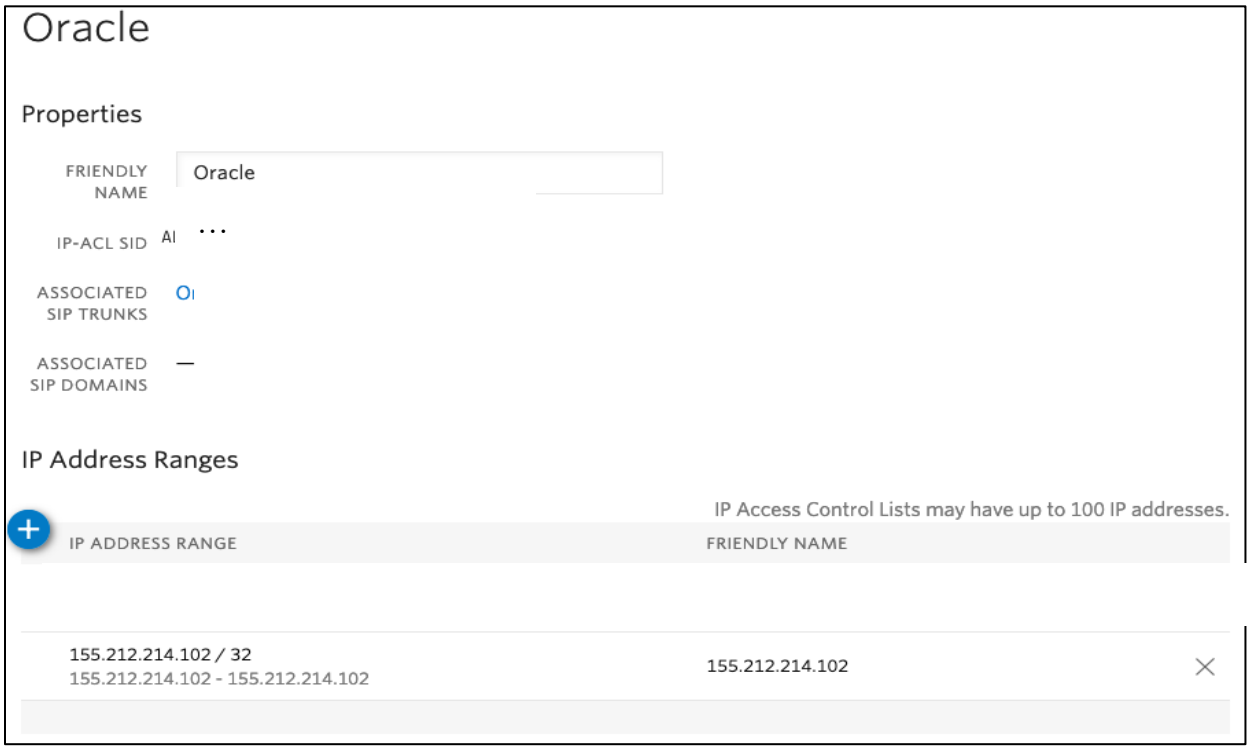



## 10.1. Create an IP-ACL rule

Click on Authentication in the left navigation, and then click on IP Access Control Lists.



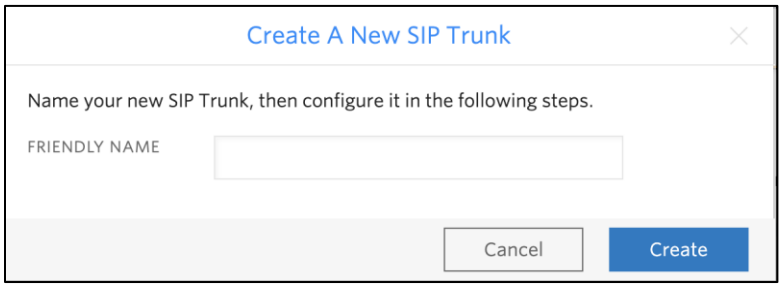
Create a new IP-ACL, for example call it "Oracle" and add your SBCs IP addresses.



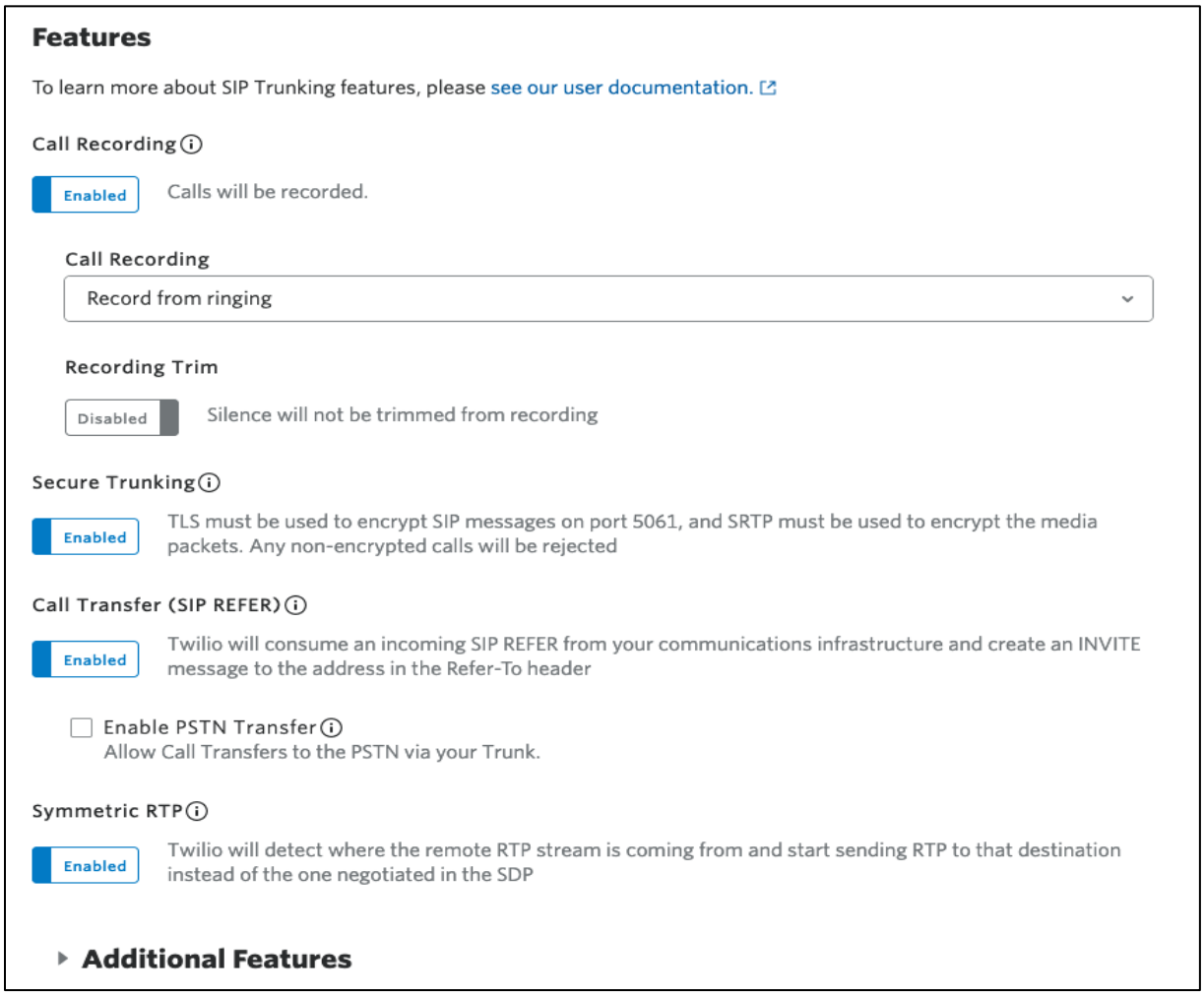

## 10.2. Create a new Trunk

For each geographical region desired (e.g., North America, Europe), create a new Elastic SIP Trunk.

Now click on Trunks again on the left vertical navigation bar, and create a new Trunk.



Under the **General Settings** you can enable different features as desired.

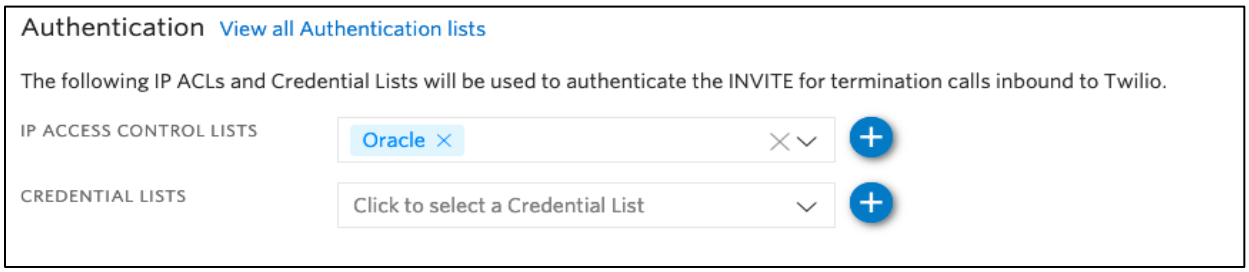



In the **Termination** section, select a Termination SIP URI.

Click on "Show localized URI's" and copy and paste this information as you will use this on your SBC to configure your Trunk.

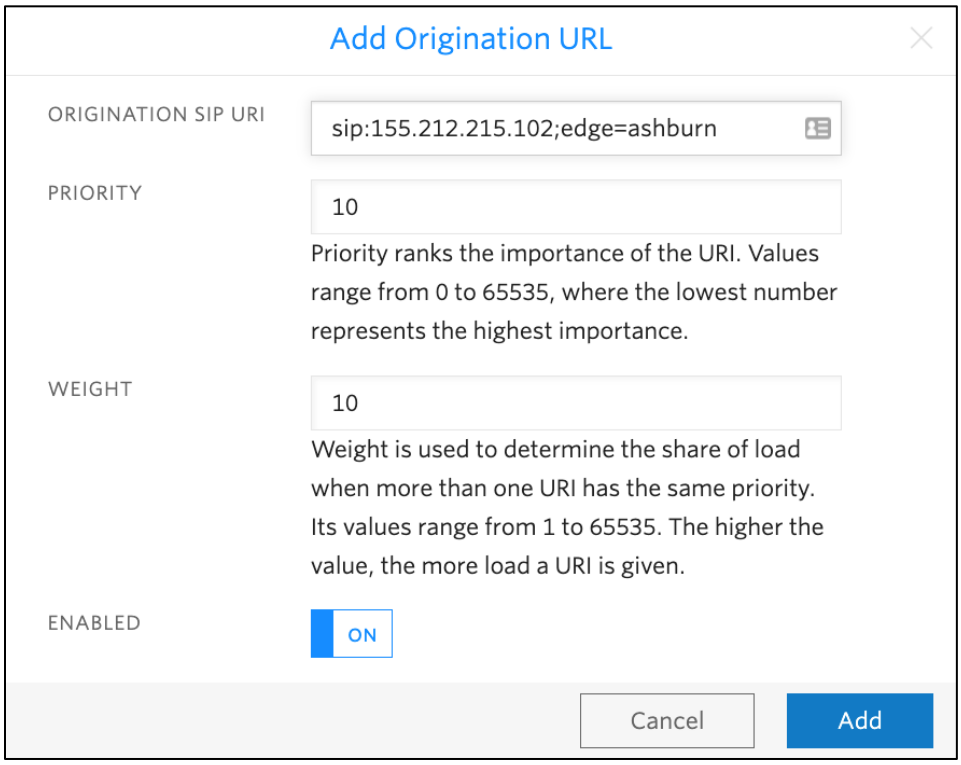

or

Assign the IP ACL ("Oracle") that you created in the previous step.

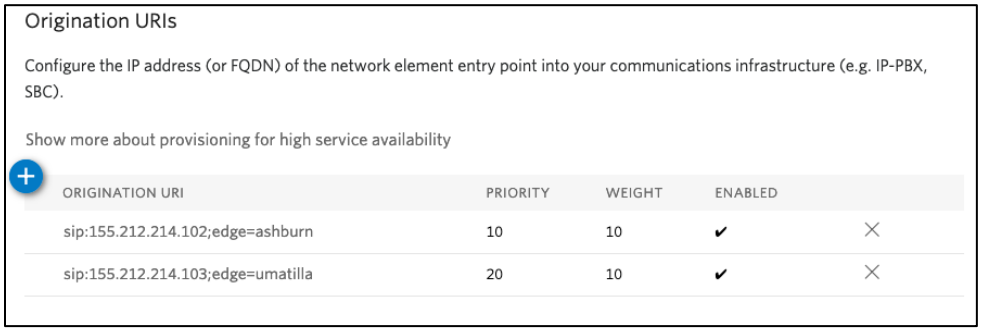



In the **Origination** section, we'll need to add Origination URI's to route traffic towards your Oracle SBC. The recommended practice is to configure a redundant mesh per geographic region (in this context a region is one of North America, Europe, etc.). In this case, we configure two Origination URIs, each egressing from a different Twilio Edge.

Click on ‘Add New Origination URI’, we'll depict the configuration for North America:



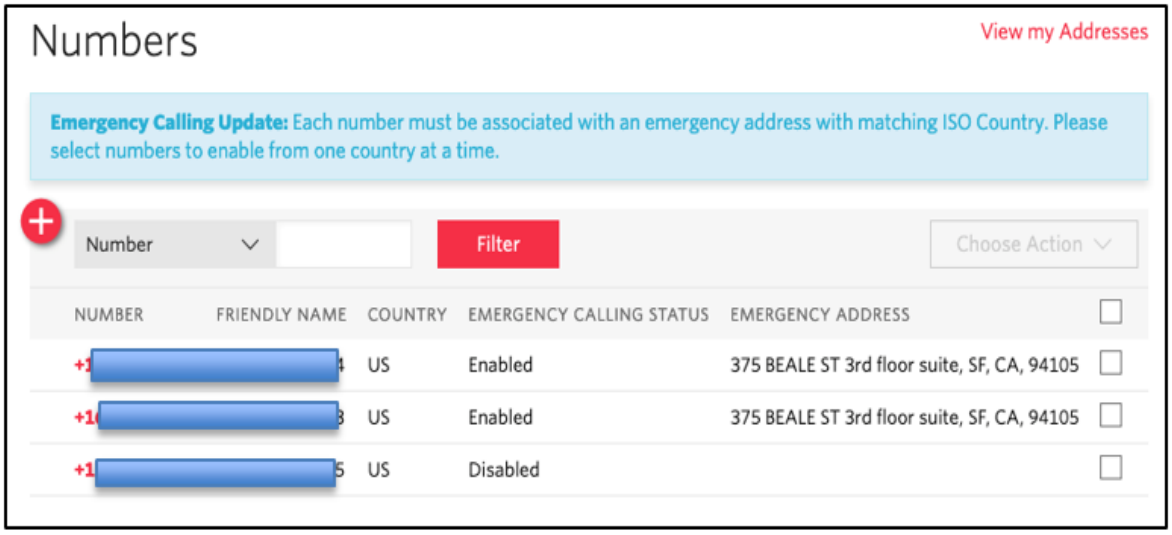

Continue to add the other Origination URIs, so you have the following configuration:




In this example, Origination traffic is first routed via Twilio’s Ashburn edge, if that fails then we'll route from Twilio’s Umatilla edge.

## 10.3. Associate Phone Numbers on your Trunk

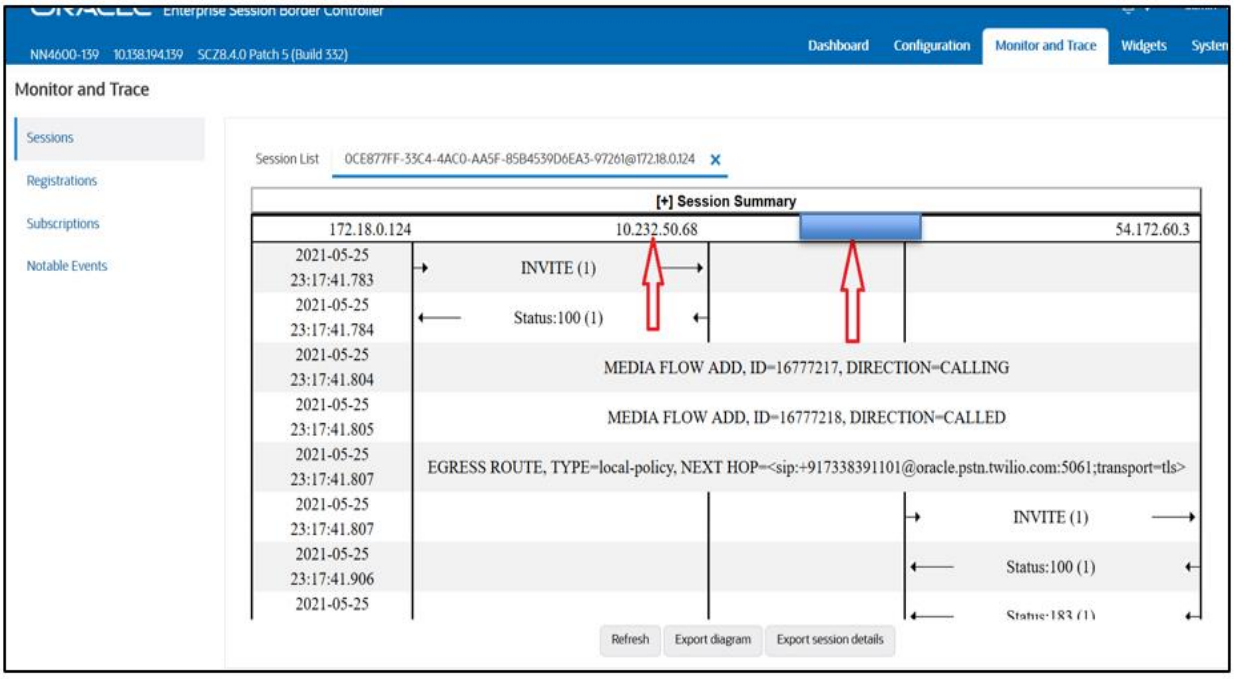
In the **Numbers** section of your Trunk, add the Phone Numbers that you want to associate with each Trunk. Remember to associate the Numbers from a given country in the right Trunk. For example, associate US & Canada Numbers with the North American Trunk and European Numbers with the European Trunk etc.

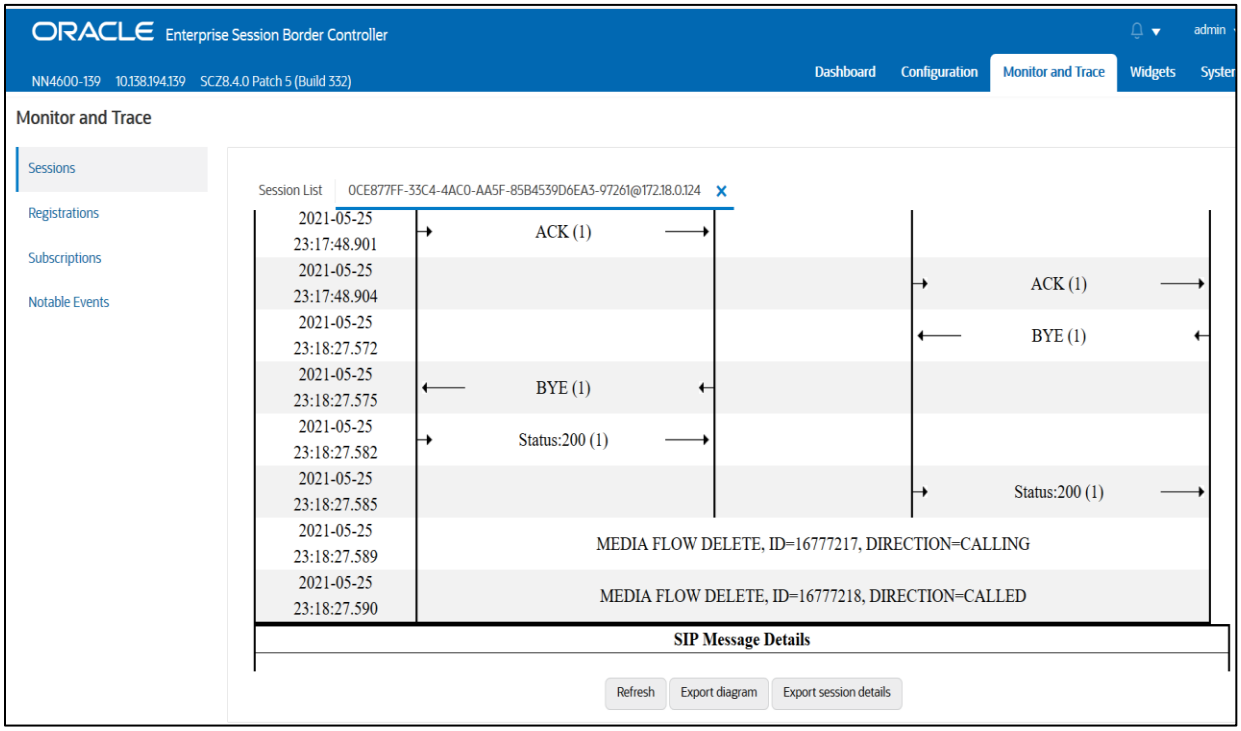


# 11. Verification of Sample Call flows

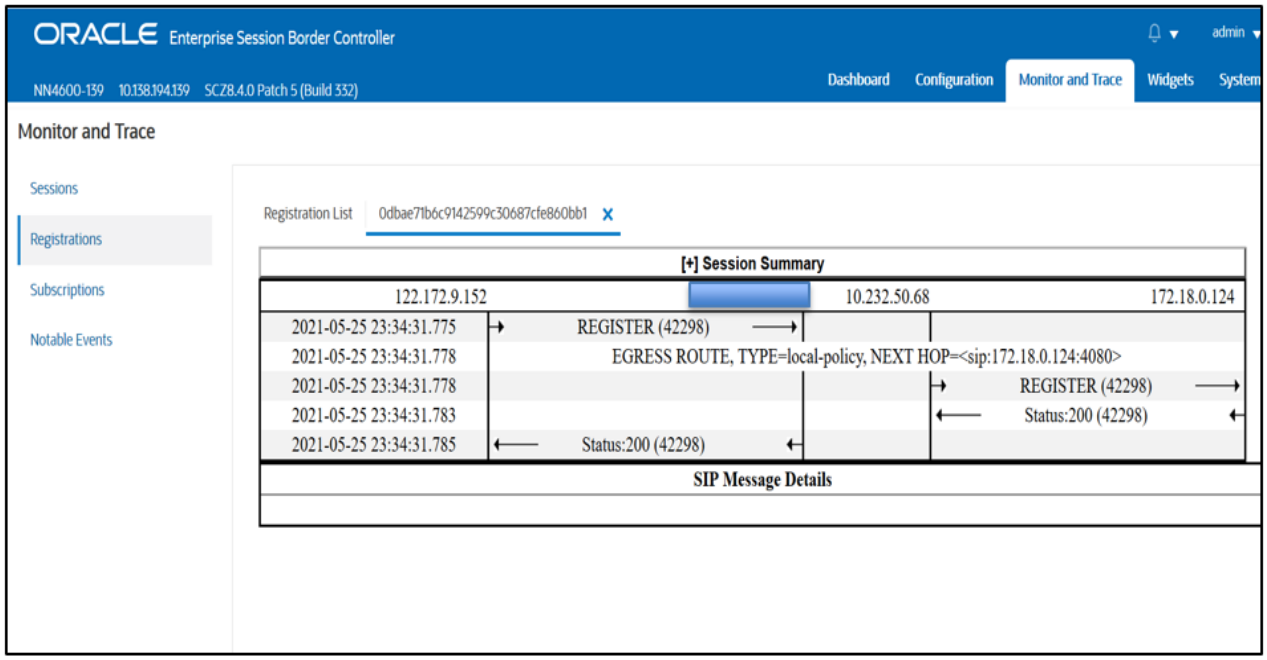
Once the configuration is complete, we can try making sample calls and can check the signaling path between Twilio Elastic Sip Trunk (PSTN Users) and Genesys Users

1. Make Call from Genesys user to the Twilio Elastic Sip Trunk and check the call flow. The calls flow from Genesys SIP Interface to Twilio Elastic SIP Trunking Interface and to Twilio Session Agent and the call reaches the PSTN user after that.

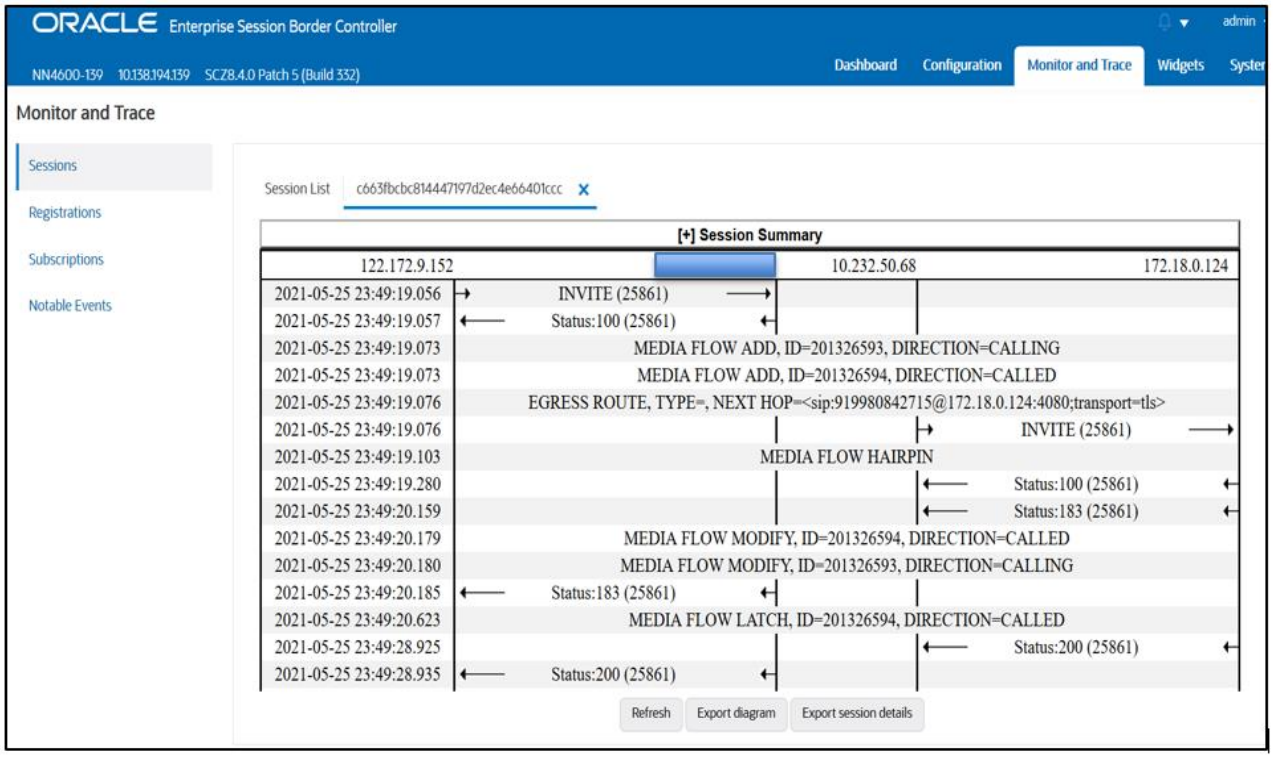


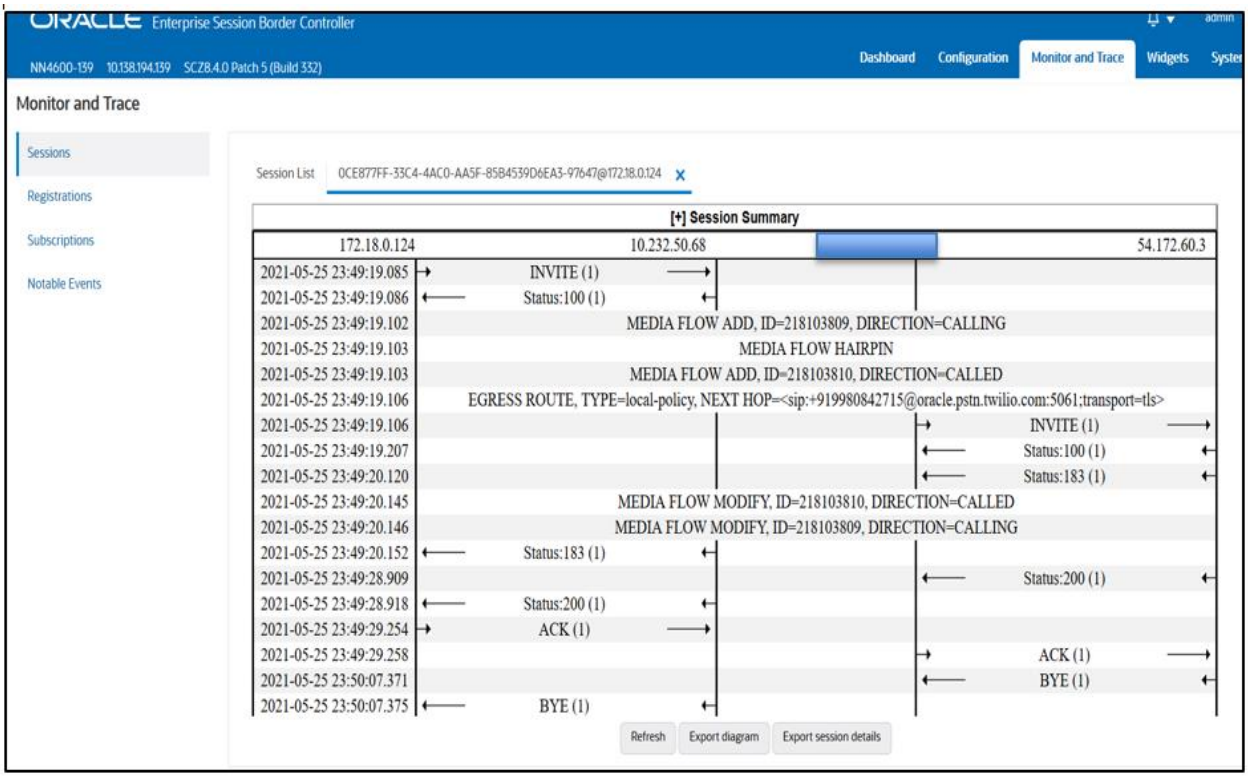



2. When we register Genesys Remote Worker, we can see the registration happening through Oracle SBC to Pure Engage as given below.

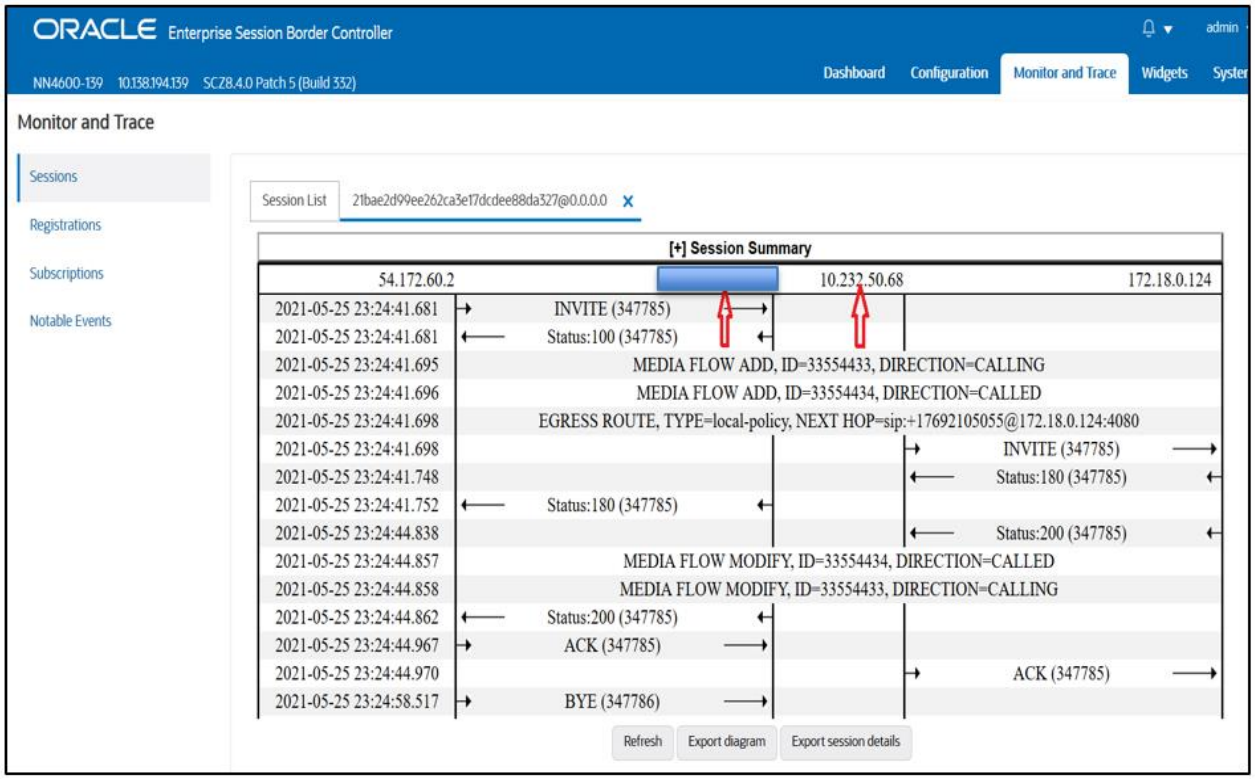



3. Make Call from Genesys Remote user to the Twilio Elastic Sip Trunk user and check the call flow. Now, there will be 2 call legs (hair pinned call) as the call reaches Genesys first and then reaches Twilio trunk user after that as given below.

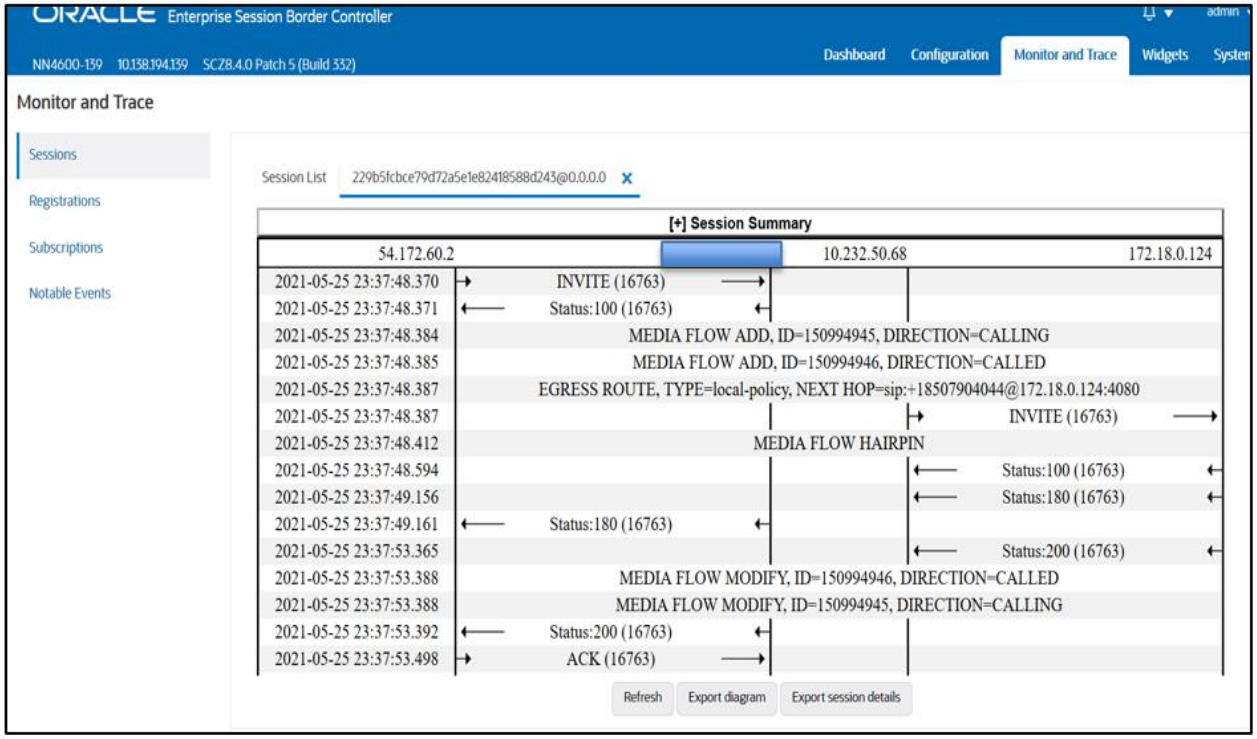


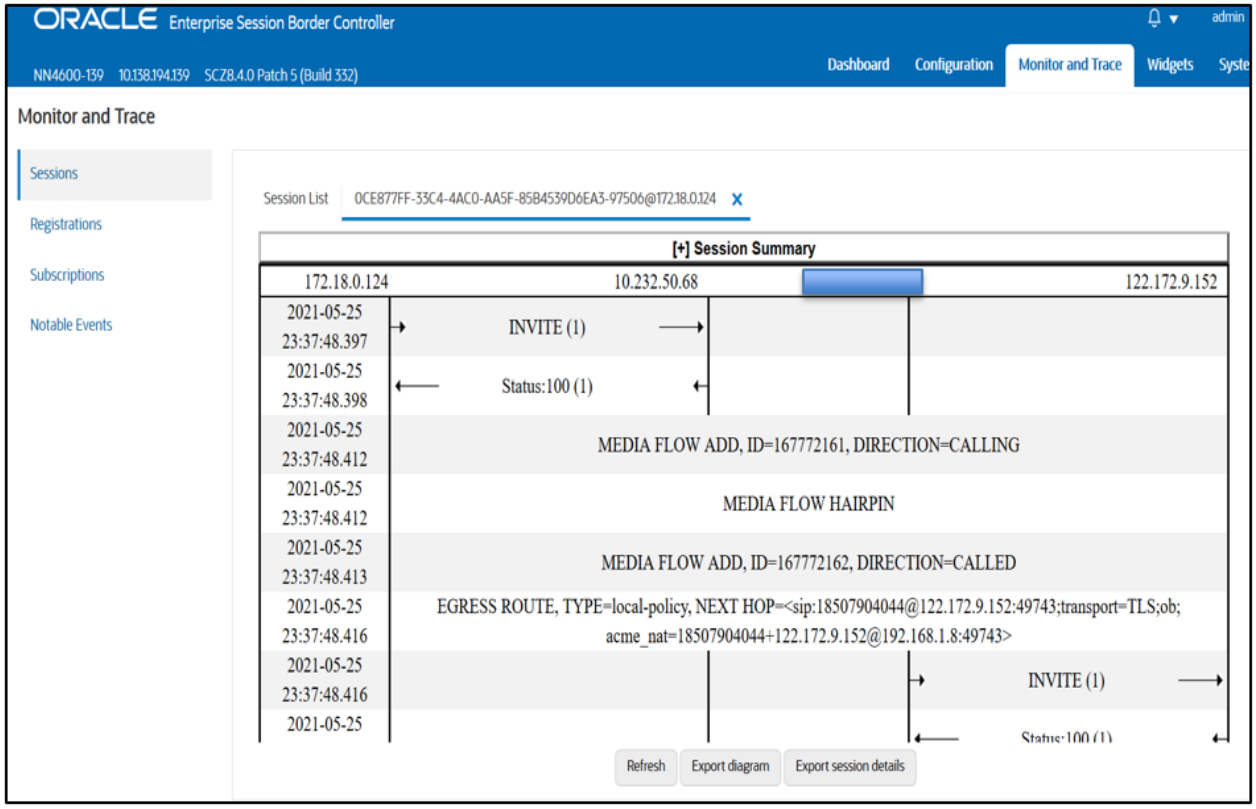



4. Make Call from the Twilio Elastic Sip Trunk to Genesys User and check the call flow. The calls flow from Twilio Elastic SIP Trunking Interface to Genesys SIP Interface and the call reaches the Genesys user after that.



5. Make Call from Twilio Elastic Sip Trunk user to Genesys Remote user and check the call flow. Now, there will be 2 call legs (hair pinned call) as the call reaches Genesys first and then reaches Genesys Remote user after that as given below.



## Appendix A

Following are the test cases that are executed between Genesys User with the Twilio Elastic SIP Trunk (PSTN user). **Please note that Genesys User here refers both Genesys User inside Enterprise network as well as Genesys Remote worker.**

| Serial Number | Test Cases Executed | Result |
|---|---|---|
| 1 | Genesys user disconnects an inbound connected call | Pass |
| 2 | Genesys user disconnects an outbound connected call | Pass |
| 3 | Twilio Elastic SIP Trunk user disconnects an inbound connected call | Pass |
| 4 | Twilio Elastic SIP Trunk User disconnects an outbound connected call | Pass |
| 5 | Genesys user places inbound call from Twilio Elastic SIP Trunk user on hold and then resumes | Pass |
| 6 | Genesys user makes outbound call to Twilio Elastic SIP Trunk user and put that call on hold and then resumes | Pass |
| 7 | Twilio Elastic SIP Trunk user places inbound call from Genesys user on hold and then resumes | Pass |
| 8 | Twilio Elastic SIP Trunk user makes outbound call to Genesys user and put that call on hold and then resumes | Pass |
| 9 | Genesys user places inbound call from Twilio Elastic SIP Trunk user on hold for over 15/30 minutes and then resumes | Pass |
| 10 | Genesys user makes outbound call to Twilio Elastic SIP Trunk user and places the call on hold for over 15/30 minutes and then resumes | Pass |
| 11 | Inbound Twilio Elastic SIP Trunk call to Genesys blind transferred to second Genesys/ PSTN User | Pass |
| 12 | Outbound Twilio Elastic SIP Trunk call from Genesys user blind transferred to second Genesys/ PSTN User | Pass |
| 13 | Inbound Twilio Elastic SIP Trunk Call to Genesys consultatively transferred to Genesys/ PSTN User | Pass |
| 14 | Outbound Twilio Elastic SIP Trunk call from Genesys user consultatively transferred to Genesys/ PSTN User | Pass |
| 15 | Genesys user makes outbound call to Twilio Elastic SIP Trunk user and makes a conference call by adding another Genesys/ PSTN user. | Pass |

| | | |
|---|---|---|
| 16 | Twilio Elastic SIP Trunk user makes outbound call to Genesys user and Genesys user makes a conference call by adding another Genesys/ PSTN user. | Pass |
| 17 | Genesys user mutes inbound call from Twilio Elastic SIP Trunk user and then unmutes | Pass |
| 18 | Genesys user mutes outbound call made to Twilio Elastic SIP Trunk user and then unmutes | Pass |
| 19 | Twilio Elastic SIP Trunk user mutes inbound call from Genesys user and then unmutes | Pass |
| 20 | Twilio Elastic SIP Trunk user mutes outbound call made to Genesys user and then unmutes | Pass |
| 21 | Twilio Elastic SIP Trunk User disconnects outbound call to Genesys user before it is answered | Pass |
| 22 | Genesys user disconnects outbound call to Twilio Elastic SIP Trunk user before it is answered | Pass |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