



ORACLE

Configuring Oracle SBC with Genesys SIP Server

Technical Application Note

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COMMUNICATIONS

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Revision History

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Table of Contents

| | |
|---|-----------|
| 1. INTENDED AUDIENCE | 5 |
| 2. DOCUMENT OVERVIEW | 5 |
| 3. INTRODUCTION | 5 |
| 3.1. AUDIENCE..... | 5 |
| 3.2. REQUIREMENTS..... | 6 |
| 3.3. ARCHITECTURE | 6 |
| 3.4. LAB CONFIGURATION | 7 |
| 4. DEPLOY THE ORACLE SBC | 8 |
| 4.1. IN SCOPE..... | 8 |
| 4.2 OUT OF SCOPE | 8 |
| 4.3 BOOTING THE SBC..... | 9 |
| 4.5. INITIAL CONFIGURATION | 11 |
| 5. CONFIGURING SBC USING WEBGUI | 12 |
| 5.1 SIP TRUNKING CONFIGURATION FOR THE ORACLE SBC..... | 13 |
| 5.2 CONFIGURE SYSTEM ELEMENT VALUES..... | 14 |
| 5.3 CONFIGURE PHYSICAL ELEMENT VALUES | 15 |
| 5.4 CONFIGURE NETWORK INTERFACE | 16 |
| 5.5 ENABLE MEDIA MANAGER | 18 |
| 5.6. ENABLE SIP CONFIG | 20 |
| 5.7 CONFIGURE REALMS..... | 21 |
| 5.8 CONFIGURE STEERING POOL..... | 24 |
| 5.9 CONFIGURE SIP-INTERFACE | 25 |
| 5.10 CONFIGURE SESSION-AGENTS | 27 |
| 5.11 CONFIGURE LOCAL-POLICY..... | 28 |
| 5.12. HEADER MANIPULATION RULE. | 30 |
| 5.13 SESSION TRANSLATION RULE..... | 33 |
| 6. ENABLING REMOTE WORKER (FOR REMOTE WORKERS REGISTERING INTO GENESYS SIP SERVER VIA THE ORACLE SBC) | 34 |
| 6.1 REALM 'REMOTEWORER' | 36 |
| 6.2. STEERING POOL ASSOCIATED WITH REALM REMOTEWORER. | 37 |
| 6.3 SIP-INTERFACE ASSOCIATED WITH REALM REMOTEWORER..... | 38 |
| 6.4 LOCAL-POLICY | 39 |
| 7. TEST CASES REQUIRING AUTHENTICATION. | 40 |
| 8. TEST PLAN EXECUTED | 41 |
| 8.1 EQUIPMENT REQUIREMENTS..... | 41 |
| 8.2 DEFAULT SIP SERVER OPTIONS | 42 |
| 8.3 SAMPLE EPIPHONE CONFIGURATION..... | 42 |
| 8.3 TEST PLAN EXECUTED..... | 44 |
| 9. ENABLING REMOTE WORKER (FOR REMOTE WORKERS REGISTERING INTO GENESYS SIP SERVER VIA THE ORACLE SBC OVER SECURE CONNECTION) | 45 |
| 9.1 SIGNALING SECURITY CONFIGURATION..... | 46 |
| 9.1.1 CERTIFICATE RECORDS | 46 |
| 9.1.2 GENERATE CERTIFICATE SIGNING REQUEST..... | 51 |
| 9.1.3 IMPORT CERTIFICATES TO SBC | 53 |

| | |
|---|-----------|
| 9.1.4 TLS PROFILE..... | 54 |
| 9.2 MEDIA SECURITY CONFIGURATION | 55 |
| 9.2.1 SDES-PROFILE | 55 |
| 9.2.2 MEDIA SECURITY POLICY..... | 56 |
| 9.3 CHANGES TO SBC CONFIGURATION..... | 57 |
| 9.3.1. CHANGE TO THE SIP-INTERFACE CONFIGURATION OBJECT | 58 |
| 9.3.2 CHANGE TO THE REALM-CONFIG CONFIGURATION OBJECT | 60 |
| 9.3.3 CHANGE TO THE SESSION-AGENT CONFIGURATION OBJECT..... | 64 |
| 9.3.4 LOCAL-POLICY..... | 65 |
| 9.5 GENESYS SIDE CONFIGURATION..... | 66 |
| 9.5.1 PREREQUISITES. | 66 |
| 9.5.2 GENERATE CERTIFICATE..... | 67 |
| 9.5.3 GENESYS SIP SERVER CONFIGURATION..... | 68 |
| 9.5.4 TRUNK CONFIGURATION | 70 |
| 9.5.5 SRTP BETWEEN AGENT AND SBC..... | 70 |
| 10.CAVEATS | 70 |



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 Session Border Controller (SBC). It is assumed that the reader is familiar with basic operations of the Oracle Session Border Controller.

2. Document Overview

In this document we will provide the steps to navigate the Oracle SBC configuration and to configure relevant sections through the webGUI interface.

Understanding the basic concepts of TCP/UDP, IP/Routing, and SIP/RTP is necessary to be able to utilize the document in the intended manner.

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. This reduces the cost and complexity of extending an enterprise's telephony system outside its network borders.

Oracle Session Border Controllers (Oracle SBCs) play an important role in SIP trunking as they are used by many ITSPs and Enterprises as part of their SIP trunking infrastructure.

This application note has been prepared as a means of ensuring that SIP trunking between Genesys SIP Server, Oracle SBCs and IP Trunking services are configured in the optimal manner.

3. Introduction

3.1. Audience

This is a technical document intended for telecommunications engineers with the purpose of configuring the Oracle Session Border Controller and the Genesys SIP Server. There will be steps that require navigating the Oracle SBC WebGUI.

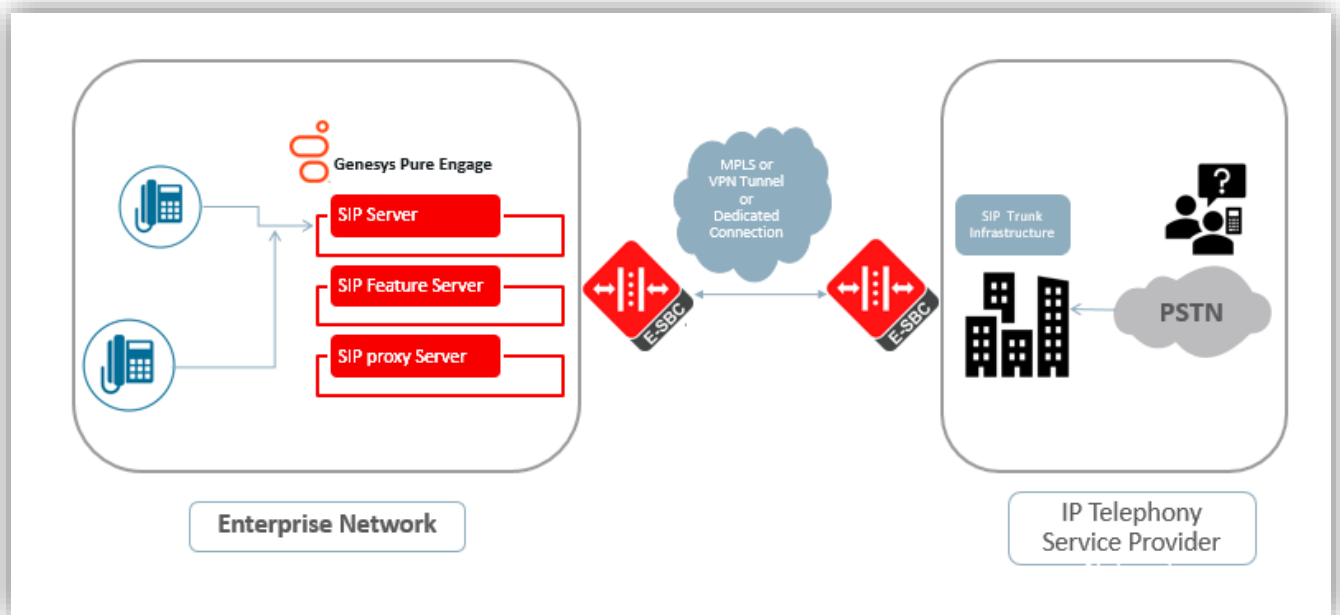
Understanding the basic concepts of TCP/UDP, IP/Routing, and SIP/RTP are also necessary to complete the configuration and for troubleshooting, if necessary.

3.2. Requirements

Fully functioning Genesys SIP Server deployment, including Media Server, SIP Proxy and SIP Feature Server. Testing is performed as per below product release version.

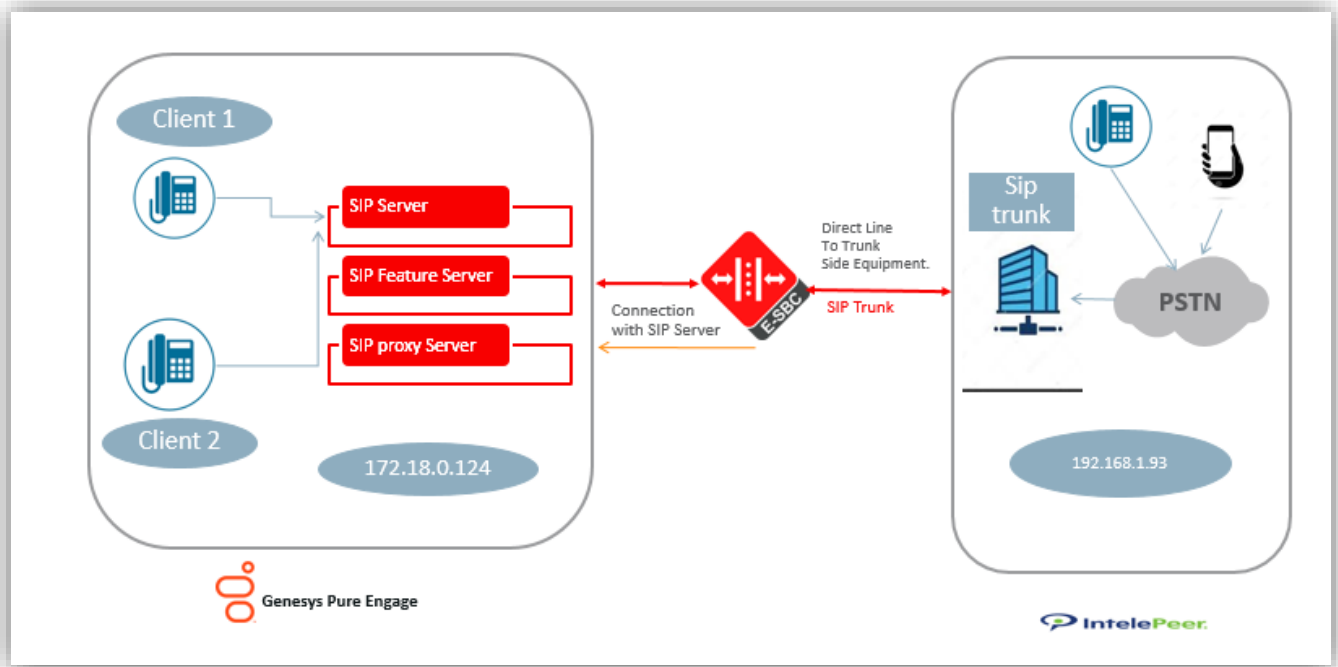
- Genesys SIP Server, Version 8.1.1
- Genesys Media Control Platform, Version 9.0.013.61
- Genesys SIP Proxy Server, Version 8.1.100.76
- Genesys SIP Feature Server, Version 8.1.202.11
- Oracle Enterprise Session Border Controller – All Oracle SBC models including Virtual Machine Edition,4600,1100,3900,6300,6350,3950,4950 platform running SCZ900p3 or above

3.3. Architecture



The Genesys SIP Server and the Oracle SBC are the edge components that form the boundary of the SIP trunk. The configuration, validation and troubleshooting of the Oracle SBC to work with the Genesys SIP Server will be described in this document.

3.4. Lab Configuration



The following diagram, similar to the Reference Architecture described earlier in this document, illustrates the lab environment created to facilitate certification testing.

All network parameters, ip addresses, hostnames etc. are specific to Oracle Labs, and cannot be used outside of the Oracle Lab environment. They are for example purposes only!!!

As per the Test Bed the connections made is as below -

- s0p3 – Connection to SIP Trunk
- s0p0 – Connection to Genesys SIP Server

In the setup the Oracle SBC sits in between the Genesys SIP Server and the SIP Trunk.

Client 1 and Client 2 are softphones registered on the SIP Server. The calls are made from PSTN Network which land onto the endpoints registered on Genesys SIP Server via the SBC.

We also have remote endpoints which register onto the SIP Server via the SBC which is not illustrated in the Diagram and is covered in another [section](#) of the documentation.

Calls made from Genesys Internal endpoints to external world are directed to SBC which then sends the call to the Trunk to terminate on PSTN Network.



4. Deploy the Oracle SBC

In this section we describe the steps for configuring an Oracle Session Border Controller, formally known as the Acme Packet Net-Net Session Director ("SBC"), for use with Genesys SIP Server in a SIP Trunking scenario.

4.1. In Scope

The following guide configuring the Oracle SBC assumes that this is a newly deployed device dedicated to a single customer. If a service provider currently has the Oracle SBC deployed and is adding SIP Server customers, then all the mentioned configuration may not be necessary and only the relevant sections must be configured.

Below are the Links to the Oracle Session Border Controller Configuration Guide which can be used as a reference point for configuring the Oracle SBC.

Web GUI User Guide

https://docs.oracle.com/en/industries/communications/enterprise-session-border-controller/8.3.0/webgui/Oracle_SBC_scz830_webgui.pdf

ACLI Configuration Guide

https://docs.oracle.com/en/industries/communications/enterprise-session-border-controller/8.3.0/configuration/Oracle_SBC_scz830_configuration.pdf

Note that Oracle offers several models of Oracle SBCs. This document covers the setup for Oracle SBC 4600 platform running SCZ900p3 or later. If instructions are needed for other Oracle SBC models, please contact your Oracle representative.

4.2 Out of Scope

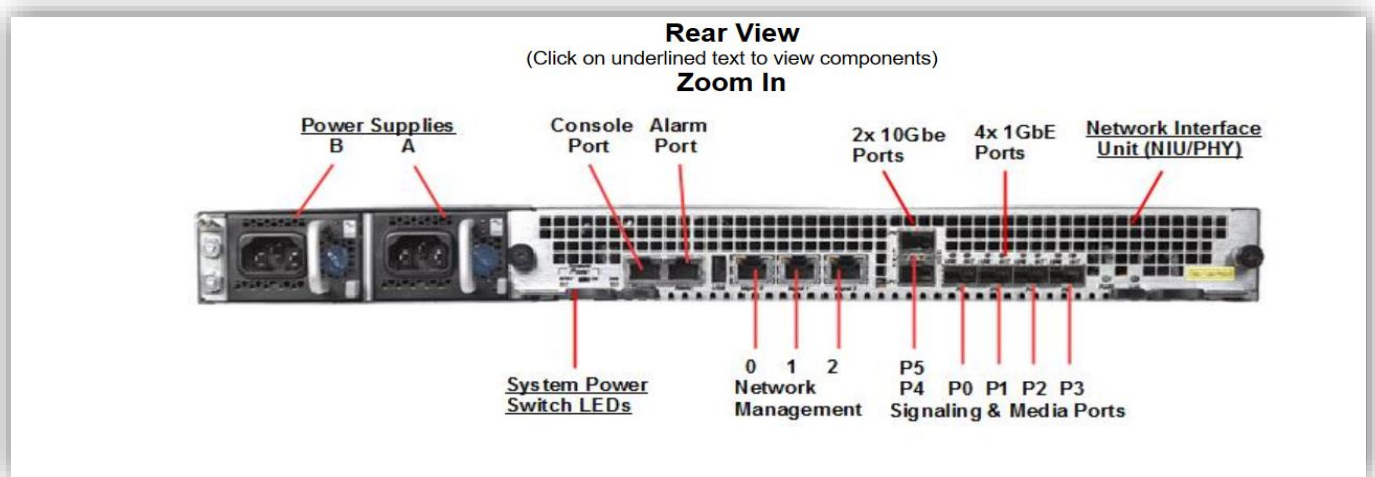
Configuration of Network management including SNMP and RADIUS

4.3 Booting the SBC

Once the Oracle SBC is racked and the power cable connected, you are ready to set up physical network connectivity.

In the Lab environment we have setup the 4600 SBC and the below Figure illustrates the Rear view of the SBC which is used to setup Physical Connectivity of management and media cables.

The port layout may differ depending upon the SBC model being used and must be configured accordingly.

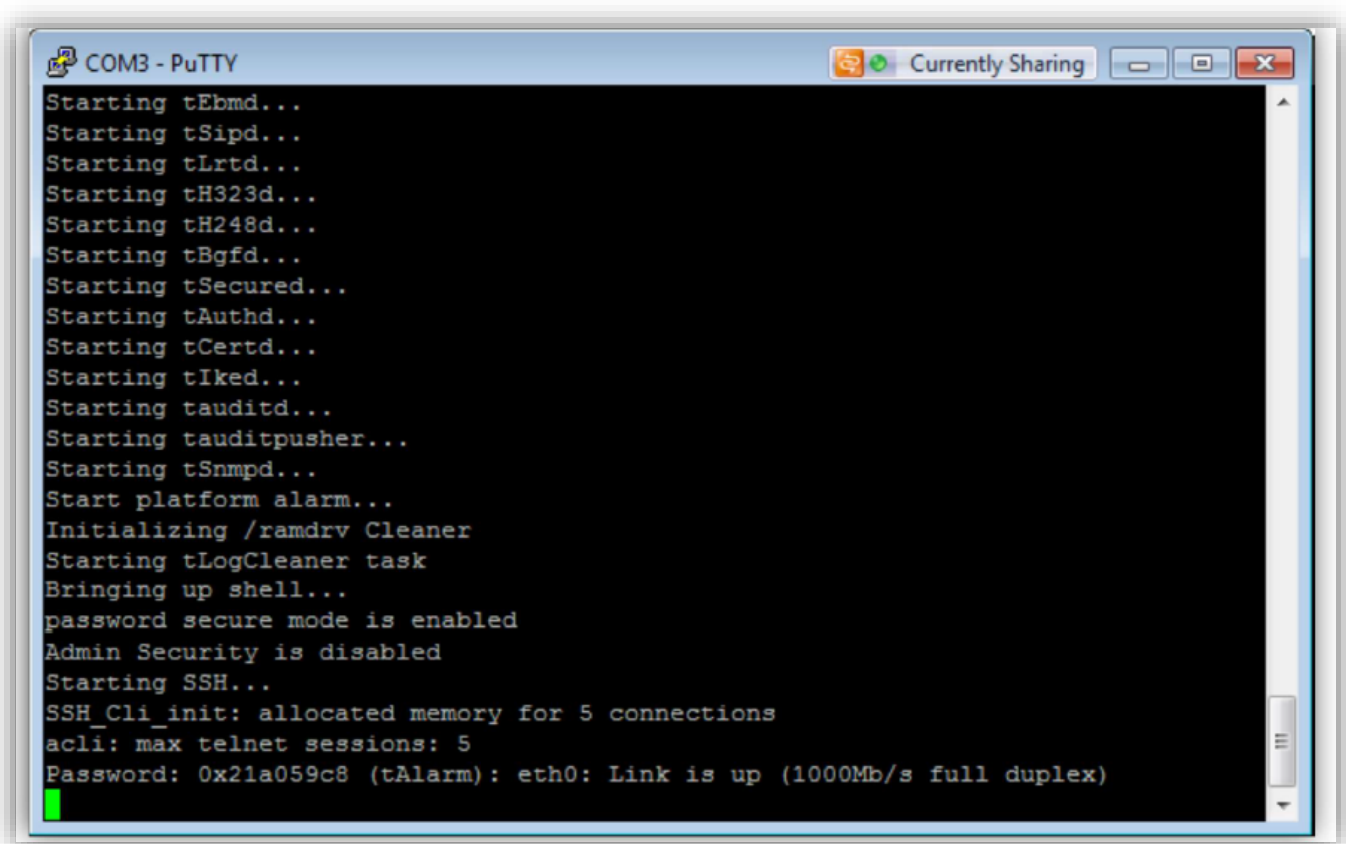


To access the console port:

Connect the serial console cable to the Oracle SBC to 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 Oracle SBC and confirm that you see the following output from the bootup sequence.



```
COM3 - PuTTY
Starting tEbmd...
Starting tSipd...
Starting tLrtd...
Starting tH323d...
Starting tH248d...
Starting tBgfd...
Starting tSecured...
Starting tAuthd...
Starting tCertd...
Starting tIked...
Starting tauditd...
Starting tauditpusher...
Starting tSnmpd...
Start platform alarm...
Initializing /ramdrv Cleaner
Starting tLogCleaner task
Bringing up shell...
password secure mode is enabled
Admin Security is disabled
Starting SSH...
SSH_Cli_init: allocated memory for 5 connections
acli: max telnet sessions: 5
Password: 0x21a059c8 (tAlarm): eth0: Link is up (1000Mb/s full duplex)
```

Enter the following commands to login to the Oracle SBC and move to the configuration mode. Note that the default Oracle SBC password is “acme” and the default super user password is “packet”.

```
Password: acme
```

```
Oracle SBC-Genesys > enable
```

```
Password: packet
```

```
Oracle SBC-Genesys # configure terminal
```

```
Oracle SBC-Genesys (configure) #
```

You are now in the global configuration mode.

4.5. Initial Configuration

i) Assigning the management Interface an IP address

To assign an IP address, one has to configure the bootparams on the Oracle SBC by going to

Oracle SBC-Genesys #configure terminal --- >bootparams

```
NN4600-138# conf t
NN4600-138(configure)# bootparam
'.' = clear field; '-' = go to previous field; q = quit
Boot File           : /boot/nnsCZ830m1p2.bz
IP Address          : 10.138.194.138
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         : NN4600-138
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.
```

A reboot is required if changes are made to the existing boot parameters.

Once you have gained access to the SBC you can further configure the system through the WEB-GUI Interface.

5. Configuring SBC using WEBGUI

There are two methods for configuring the Oracle SBC, ACLI, or GUI.

For the purposes of this note, we'll be using the Oracle SBC GUI for all configuration examples.

The WebGUI can be accessed through the url :-

http://<SBC_MGMT_IP>

web-server-config is enabled by default on the Oracle SBC. If not then one can make the web-server-config on the SBC by navigating to **system> web-server-config**

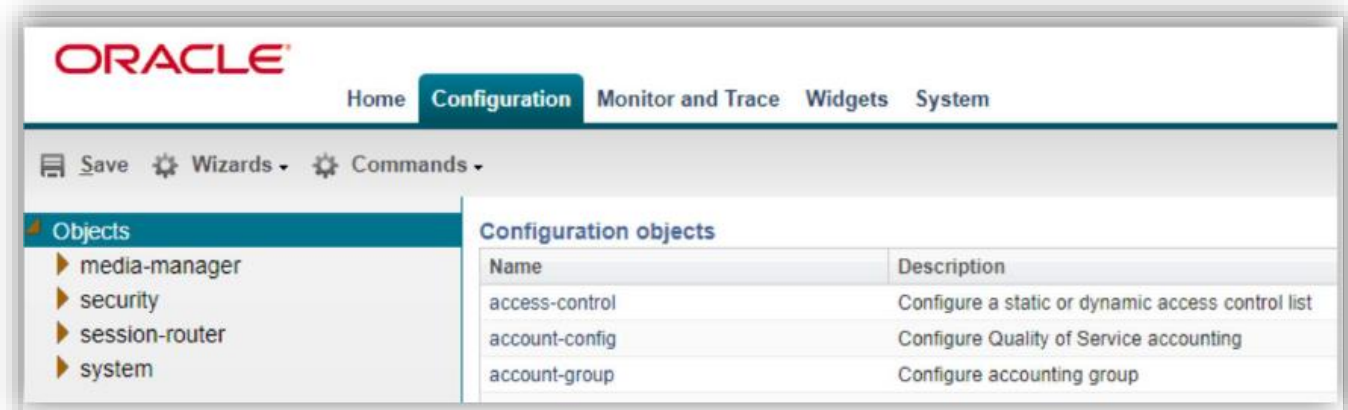
```
web-server-config
state                enabled
inactivity-timeout   5
http-state           enabled
http-port            80
https-state          disabled
https-port           443
http-interface-list
tls-profile
last-modified-by     admin@console
```

Please refer to the Web GUI Guide for more information.

https://docs.oracle.com/en/industries/communications/enterprise-session-border-controller/8.3.0/webgui/Oracle_SBC_scz830_webgui.pdf

The expert mode is used for configuration.

Once you have accessed the Oracle SBC, at the top, click the Configuration Tab. This will bring up the OCSBC Configuration Objects List on the left hand side of the screen.



You may now follow the further sections of the Document to configure the SBC as desired to Connect with Genesys Pure SIP Server.

5.1 SIP Trunking Configuration for the Oracle SBC

The following section shows the Oracle SBC configuration required to work with Genesys SIP Server and the SIP trunk. The protocol used between the Oracle SBC and SIP server is UDP for signaling and RTP for media; the SIP trunk is configured for UDP in this interop testing.

It is outside the scope of this document to include all the interoperability working information as it will differ in every deployment. The Document should be used as reference for the basic configuration objects required to interwork Oracle SBC with Genesys SIP Server.

5.2 Configure system element values

To configure system element values, use the system-config command under the system branch. Then enter values appropriate to your environment, including your default gateway IP address for your management Ethernet interface.

Here we have configured the SBC Hostname, Description and the Default Gateway. These can be used as minimal settings to configure the system-config element.

Save Wizards Commands

Objects

- media-manager
- security
- session-router
- system
- fraud-protection
- host-route
- network-interface
- ntp-config
- phy-interface
- redundancy-config
- snmp-community
- spl-config
- system-config**
- trap-receiver
- web-server-config

Modify System config

Hostname: GenesysSBC

Description: SBC that interacts with Genesys SIP Server

Location:

Mib system contact:

Mib system name:

Mib system location:

Syslog servers

| Add | Edit | Copy | Delete |
|---------|------|------|--------|
| Address | | | |

Default gateway: 10.138.194.129

Telnet timeout: 0 (Range: 0..65535)

Console timeout: 0 (Range: 0..65535)

Alarm threshold

Click the **OK** at the bottom of the screen.

5.3 Configure Physical element values

The phy-interface configuration element:

- Defines some Layers 1-2 properties (speed, half/full duplex, MAC address, and so on)
- Must be created for each physical connector that you plan to use.

To configure physical Interface values, navigate to **system->phy-interface** on the Oracle SBC Web GUI. Configure the physical interface for s0p0 and s1p0 for connectivity with the Trunk and the Genesys SIP Server Environment.

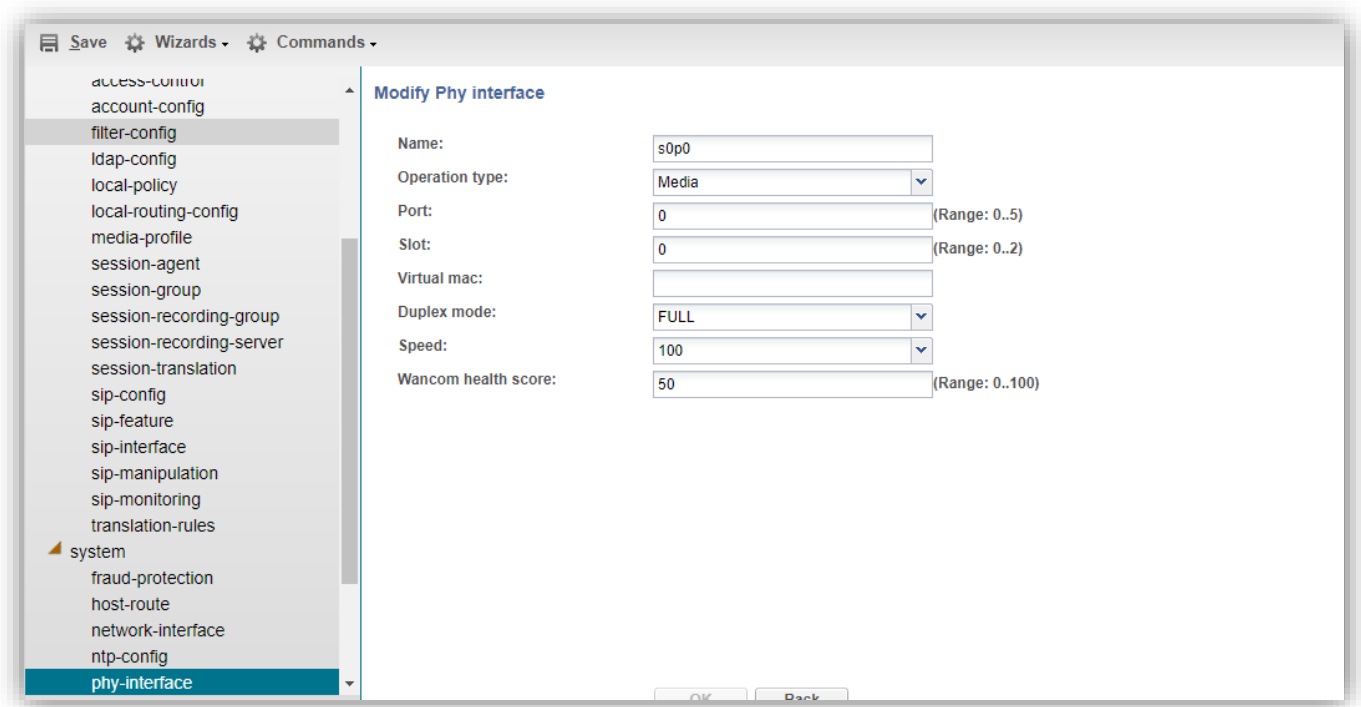
As per the Test Bed the connections made is as below -

- s0p3 – Connection to SIP Trunk
- s0p0 – Connection to Genesys SIP Server

The screenshot shows the Oracle SBC Web GUI interface. On the left is a navigation sidebar with a tree view containing various configuration categories. The 'system' category is expanded, and 'phy-interface' is selected. The main content area is titled 'Phy interface' and shows a table of configured physical interfaces. The table has columns for Name, Operation type, Port, Slot, Virtual mac, Admin state, and Auto negotiation. Three interfaces are listed: s0p0, s0p3, and s0p3.

| Name | Operation type | Port | Slot | Virtual mac | Admin state | Auto negotiation |
|------|----------------|------|------|-------------|-------------|------------------|
| s0p0 | Media | 0 | 0 | | enabled | enabled |
| s0p3 | Media | 3 | 0 | | enabled | enabled |

Sample physical interface configuration.



5.4 Configure Network Interface

The network-interface configuration element:

- Must be created and refers to a specific phy-interface
- Defines Layers 2-3 properties (VLAN, IP address, mask, default gateway, and so on)

To configure network-interface, navigate to **system->Network-Interface**. Configure two interfaces, one for PSTN Trunk and one for Genesys SIP Server.

Below is the example from test bed for the network-interface configuration.

Here 2 Network interfaces are configured where-

- s0p3 – Connection to SIP Trunk
- s0p0 – Connection to Genesys SIP Server

Save Wizards Commands 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
translation-rules
system
fraud-protection
host-route
network-interface
ntp-config

Network interface

Search Criteria: All

Add Edit Copy Delete Delete All Upload Download Search Search

| Name | Sub port id | Description | Hostname | IP address | Pri utility addr |
|------|-------------|-------------|----------|--------------|------------------|
| s0p0 | 0 | | | 172.18.0.129 | |
| s0p3 | 0 | | | 192.168.1.94 | |

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Home **Configuration** Monitor and Trace Widgets System

Save Wizards Commands

Objects
 media-manager
 security
 session-router
 system
 capture-receiver
 fraud-protection
 host-route
 http-client
 http-server
network-interface
 network-parameters
 ntp-config
 phy-interface
 redundancy-config
 snmp-address-entry
 snmp-community
 snmp-group-entry
 snmp-user-entry
 snmp-view-entry
 spl-config
 system-access-list
 system-config
 threshold-crossing-alert-group
 trap-receiver
 web-server-config

Modify Network interface

Name:

Sub port id: (Range: 0..4095)

Description:

Hostname:

IP address:

Pri utility addr:

Sec utility addr:

Netmask:

Gateway:

Gw heartbeat

State:

Heartbeat: (Range: 0..65535)

Retry count: (Range: 0..65535)

Retry timeout: (Range: 1..65535)

Health score: (Range: 0..100)

DNS IP primary:

DNS IP backup1:

DNS IP backup2:

DNS domain:

DNS timeout: (Range: 0..4294967295)

DNS max ttl: (Range: 30..2073600)

Signaling mtu: (Range: 0, 576..4096)

HIP IP list:

Add Edit Delete



5.5 Enable media manager

Media-manager handles the media stack required for SIP sessions on the SBC. Enable the media manager and configure the below option for generating rtcp reports.

To configure navigate to **Media-Manager->Media-Manager** and enable the configuration.

Below is the example from test bed for the Media-Manager configuration. Just Checking on State as Yes Is sufficient for SBC to enable the Media Manager configuration and handle media traffic (RTP)

Other parameters are not required but are relevant for settings like Latching, DDOS Protection etc. to be enabled on the SBC. These parameters are outside the scope of the document and are left to their default values.

Save Wizards Commands

Objects

- media-manager
 - codecs-policy
 - dns-alg-constraints
 - dns-config
 - ice-profile
 - media-manager**
 - media-policy
 - msrp-config
 - playback-config
 - realm-config
 - realm-group
 - rtcp-policy
 - static-flow
 - steering-pool
 - tcp-media-profile
- security
- session-router
- system
 - capture-receiver
 - fraud-protection
 - host-route
 - http-client
 - http-server
 - network-interface
 - network-parameters
 - ntp-config
 - phy-interface
 - redundancy-config
 - snmp-address-entry
 - snmp-community
 - snmp-group-entry
 - snmp-group-entry
 - snmp-user-entry
 - snmp-view-entry
 - spl-config
 - system-access-list
 - system-config
 - threshold-crossing-alert-group
 - trap-receiver
 - web-server-config

Modify Media manager

State:

Flow time limit: (Range: 0..4294967295)

Initial guard timer: (Range: 0..4294967295)

Subsq guard timer: (Range: 0..4294967295)

TCP flow time limit: (Range: 0..4294967295)

TCP initial guard timer: (Range: 0..4294967295)

TCP subsq guard timer: (Range: 0..4294967295)

Hnt rtop:

Algd log level: ▾

Mbcd log level: ▾

Options:

| Add | Edit | Delete |
|-----|------|--------|
| | | |

Red max trans: (Range: 0..50000)

Red sync start time: (Range: 0..4294967295)

Red sync comp time: (Range: 0..4294967295)

Media policing:

Max signaling bandwidth: (Range: 71000..10000000)

Max untrusted signaling: (Range: 0..100)

Min untrusted signaling: (Range: 0..100)

Tolerance window: (Range: 0..4294967295)

Untrusted drop threshold: (Range: 0..100)

Trusted drop threshold: (Range: 0..100)

Acl monitor window: (Range: 5..3600)

Trap on demote to deny:

Trap on demote to untrusted:

Syslog on demote to deny:

Syslog on demote to untrusted:

Anonymous sdp:

Reactive transcoding:

Translate non rfc2833 event:

Xcode fax max rate: ▾

OK Delete

Show advanced

5.6. Enable Sip Config

SIP config enables SIP handling in the SBC. Make sure the **home realm-id, registrar-domain and registrar-host are configured**. Also add the options to the sip-config as shown below.

To configure sip-config navigate to Session-Router->sip-config on the Oracle SBC Web GUI.

Below are the important parameters under sip-config that need to be configured.

- Registrar-host is the Genesys SIP Server IP.
- The domain is put as * as we have not specified any specific domain on the test bed.
- The Genesys SIP Server port is configured as the Registrar-port on the Oracle SBC.
- The options “max-udp-length=0” should be configured if the SIP messages are of larger size to avoid SBC failing the calls with “513 message too large”

Setting this option to zero (0) forces sipd to send fragmented UDP packets. Using this option, you override the default value of the maximum UDP datagram size (1500 bytes; sipd requires the use of SIP/TCP at 1300bytes). You can set the global SIP configuration’s max-udp-length=x option for global use in your SIP configuration, or you can override it on a per-interface basis by configuring this option in a SIP interface configuration

The screenshot shows the Oracle SBC Web GUI interface for configuring SIP settings. On the left, a sidebar lists various configuration objects under 'session-router', with 'sip-config' selected. The main area is titled 'Modify SIP config' and contains several fields: 'State' (checked), 'Home Realm ID' (genesys), 'Egress Realm ID' (empty), 'Nat mode' (None), 'Registrar domain' (*), 'Registrar host' (172.18.0.124), 'Registrar port' (4080, with a range of 0 to 65535), and 'Options' (max-udp-length=0). There is also a 'Refer src routing' checkbox which is checked. At the bottom right, there are 'OK' and 'Delete' buttons.

5.7 Configure Realms

A Ream

- Is a collection of VoIP entities residing in one or more networks.
- Typically maps to a service provider, enterprise, or end-user population environment.
- It is defined by a configuration element that contains many parameters that apply to the environment.
- Is considered as a “Layer 5” definition and a “container” of Resources.
- On the SBC, you configure realms (plus their associated configuration objects) to identify the interfaces, resources, and policies that apply to the signaling and media going through them.

To configure Realm Navigate to **realm-config under media-manager** and configure a realm as shown in the picture.

In this setup we have configured 3 Realms configured where –

‘**siptrunk**’ is the realm for the connection to PSTN Trunk and is configured on s1p0 network interface.
‘**genesys**’ is the Realm for connection to the to Genesys SIP Server and is configured on s0p0 network interface.

Another Realm ‘**remoteworker**’ is configured to register remote endpoints and is described in a different section on the document.

The screenshot shows the configuration interface for realms. The left sidebar lists various configuration objects, with 'realm-config' selected under 'media-manager'. The main area displays a table of configured realms.

| Identifier | Description | Addr prefix | Network interfaces | Mm | | |
|--------------|-------------|-------------|--------------------|----------|------------|---------|
| | | | | In realm | In network | Same ip |
| genesys | | 0.0.0.0 | s0p0:0 | enabled | enabled | enabled |
| remoteworker | | 0.0.0.0 | s0p0:0 | disabled | enabled | enabled |
| siptrunk | | 0.0.0.0 | s0p3:0 | disabled | enabled | enabled |

Modify Realm config

Objects

- media-manager
 - codec-policy
 - media-manager
 - media-policy
 - realm-config**
 - steering-pool
- security
- 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
 - session-translation
 - sip-config
 - sip-feature
 - sip-interface

Show advanced

Identifier:

Description:

Network interfaces:

Add | Edit | Delete

s0p0:0

Mm in realm:

QoS enable:

Media policy:

Class profile:

In translationid:

Out translationid:

In manipulationid:

OK Back

codec-policy

media-manager

media-policy

realm-config

steering-pool

security

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
- session-translation
- sip-config
- sip-feature
- sip-interface

Show advanced

Out manipulationid:

Access control trust level:

Refer call transfer:

Hold refer reinvite:

Dyn refer term:

Codec policy:

Codec manIP in realm:

RTCP policy:

Session recording server:

Monitoring filters:

Add | Edit | Delete

OK Back

Objects

- media-manager
 - codec-policy
 - media-manager
 - media-policy
 - realm-config**
 - steering-pool
- security
- 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
 - session-translation
 - sip-config

Modify Realm config

Identifier:

Description:

Network interfaces:

s0p3:0

Mm in realm:

QoS enable:

Media policy:

Class profile:

In translationid:

Out translationid:

realm-config

- steering-pool
- security
- 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
 - session-translation
 - sip-config
 - sip-feature
 - sip-interface

Show advanced

In manipulationid:

Out manipulationid:

Access control trust level:

Refer call transfer:

Hold refer reinvoke:

Dyn refer term:

Codec policy:

Codec manIP in realm:

RTCP policy:

Session recording server:

Monitoring filters:

5.8 Configure Steering Pool

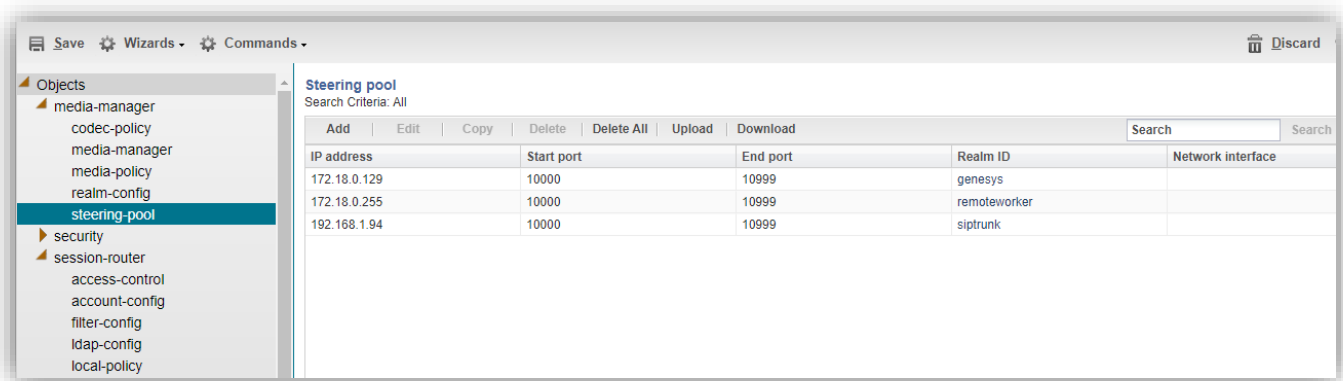
The steering-pool:

- Is the SBC's media interface (for a given realm)
- Receives and transmits RTP packets
- Defines a media IP address and a pool (range) of ports from which port(s) are dynamically allocated for every established session.
- Provides call admission control (CAC) by setting a limit of sessions going into and out of a realm
- A realm can have more than one steering-pool.

To configure steering pool navigate to **media-manager->steering pool**.

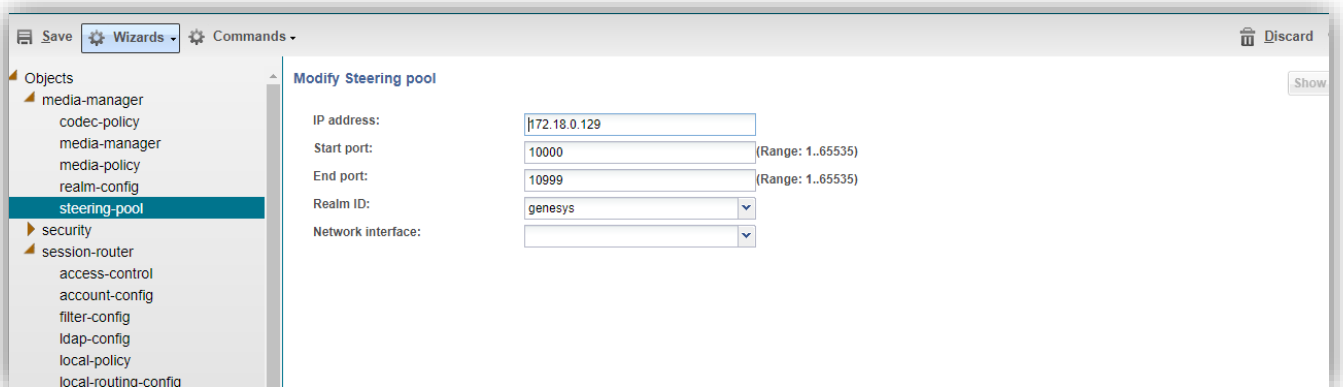
In this setup we have configured 3 steering pool against 3 Realms.

Below is the example from test bed for the steering-pool configuration.



The screenshot shows a management console interface with a sidebar on the left containing a tree view of objects. The 'steering-pool' object is selected. The main area displays a table titled 'Steering pool' with the following data:

| IP address | Start port | End port | Realm ID | Network interface |
|--------------|------------|----------|--------------|-------------------|
| 172.18.0.129 | 10000 | 10999 | genesys | |
| 172.18.0.255 | 10000 | 10999 | remoteworker | |
| 192.168.1.94 | 10000 | 10999 | siptrunk | |



The screenshot shows the 'Modify Steering pool' configuration form in the management console. The form fields are as follows:

- IP address: 172.18.0.129
- Start port: 10000 (Range: 1..65535)
- End port: 10999 (Range: 1..65535)
- Realm ID: genesys (dropdown menu)
- Network interface: (empty dropdown menu)

5.9 Configure sip-interface

The sip-interface:

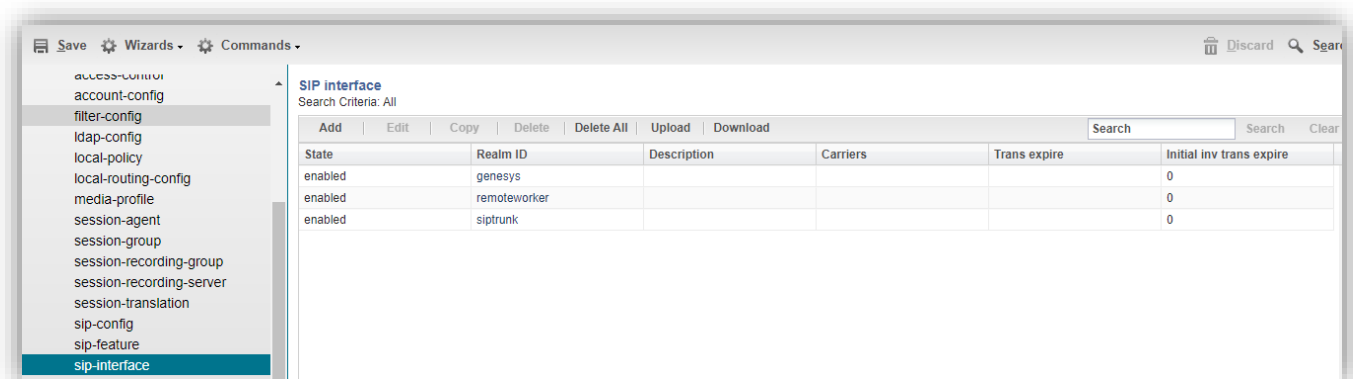
- Is the SBC's Edge Proxy Function
- Receives and transmits SIP signaling messages
- Provides a service pipe to the SIP daemon (sipd)
- Defines SIP signaling IP addresses, ports, transport protocols, and various SIP processing policies

To configure sip-interface, navigate to **session-router->sip-Interface**. Configure the interfaces for the PSTN and Genesys SIP Server.

Below is the example from test bed on the sip-interface configuration.

Three sip-interface are configured on the SBC where-

1. sip-interface 192.168.1.94 is configured with Realm siptrunk is to route inbound traffic from Trunk to the Genesys SIP Server. Registration caching is enabled in order for SBC to cache the registration data and Route to registrar parameter is enabled to send all requests that match cached registration to the destination defined for the registrar host.
2. sip-interface 172.18.0.129 is configured with Realm genesys to route the outbound traffic from Genesys SIP Server to the SIP Trunk.
3. 3. sip-interface **172.18.0.255** is configured with Realm **remoteworker** to route the registration from remote endpoint which register onto the SIP Server via the SBC. This is covered in detail another [section](#) of the document



Modify SIP interface

State:

Realm ID: siptrunk

Description:

SIP ports

| Add Edit Copy Delete | | | | |
|----------------------------|------|--------------------|-------------|-----------------|
| Address | Port | Transport protocol | TLS profile | Allow anonymous |
| 192.168.1.94 | 5060 | UDP | | all |
| 192.168.1.94 | 5060 | TCP | | all |

Nat traversal: none

Registration caching:

Route to registrar:

In manipulationid: Reject_OPTIONS

OK Back

Modify SIP interface

State:

Realm ID: genesys

Description:

SIP ports

| Add Edit Copy Delete | | | | |
|----------------------------|------|--------------------|-------------|-----------------|
| Address | Port | Transport protocol | TLS profile | Allow anonymous |
| 172.18.0.129 | 5060 | UDP | | agents-only |
| 172.18.0.129 | 5060 | TCP | | agents-only |

Nat traversal: none

Registration caching:

Route to registrar:

In manipulationid:

OK Back

5.10 Configure Session-agents

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

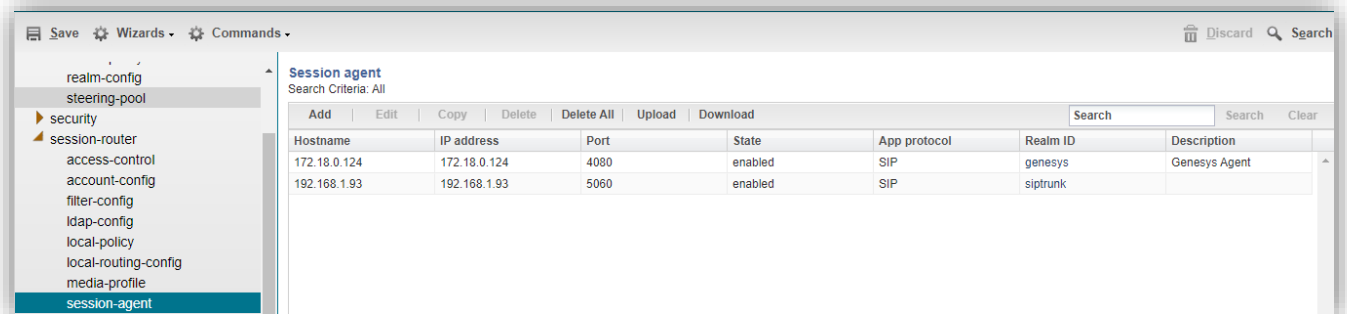
To Configure the session-agent for with the following parameters. Navigate to **session-router->Session-Agent**.

Below is the example from test bed for the session-agent configuration.

Here two session-agents are configured on the SBC for the trunk Side connection and other is for the Genesys SIP Server.

172.18.0.124 ----- Genesys SIP Server

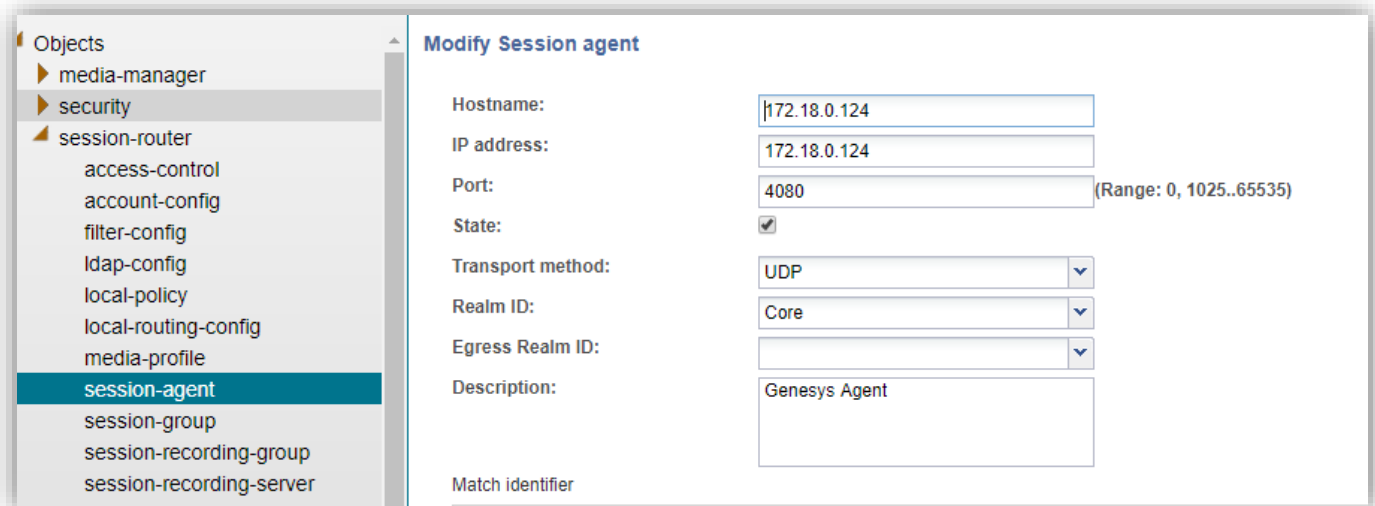
192.168.1.93 ----- PSTN SIP Trunk



The screenshot shows a management console interface with a sidebar on the left containing a tree view of configuration objects. The 'session-agent' object is selected. The main area displays a table titled 'Session agent' with search criteria set to 'All'. The table has columns for Hostname, IP address, Port, State, App protocol, Realm ID, and Description. Two rows are visible, representing the configured session agents.

| Hostname | IP address | Port | State | App protocol | Realm ID | Description |
|--------------|--------------|------|---------|--------------|----------|---------------|
| 172.18.0.124 | 172.18.0.124 | 4080 | enabled | SIP | genesys | Genesys Agent |
| 192.168.1.93 | 192.168.1.93 | 5060 | enabled | SIP | siptrunk | |

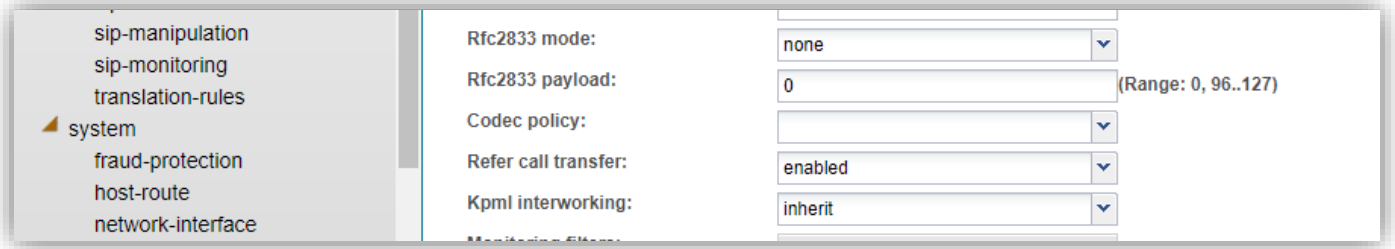
Below is the example for the session-agent configured for Genesys SIP-server.



The screenshot shows the 'Modify Session agent' configuration form. The sidebar on the left shows the configuration tree with 'session-agent' selected. The form fields are as follows:

- Hostname: 172.18.0.124
- IP address: 172.18.0.124
- Port: 4080 (Range: 0, 1025..65535)
- State:
- Transport method: UDP
- Realm ID: Core
- Egress Realm ID: (empty)
- Description: Genesys Agent
- Match identifier: (empty)

In the setup refer-call-transfer parameter is enabled on the SBC to locally handle the refer message for call transfer scenarios.



Certain [test scenarios](#) require handling of SIP Refer with replaces header. In order to complete those scenarios we also enabled option “refer-reinvite” on the session-agent to enable sip refer handling that contains replaces header.

The parameter should only be enabled when it is required by Oracle SBC to handle the ‘refer with replaces’ header and must not be configured for normal refer scenarios.

If, after the conclusion of static or dynamic REFER handling, the REFER is terminated and a new INVITE issued, users now specify a policy lookup behavior based upon either the source realm of the calling party (the INVITE originator), or the source realm of the referring party (the REFER originator).

Behavior is controlled by a ‘refer-src-routing’ parameter in the sip-config configuration element.

disabled, the default value, specifies that the Oracle SBC performs a policy lookup based on the source realm of the calling party.

enabled specifies that the Oracle Communications Session Border Controller performs a policy lookup based on the source realm of the referring party.

5.11 Configure Local-policy

- The Local Policy mechanism provides SIP signaling routing based on:

- Ingress realm
- Calling and/or called number pattern
- Route priority (cost and availability time)

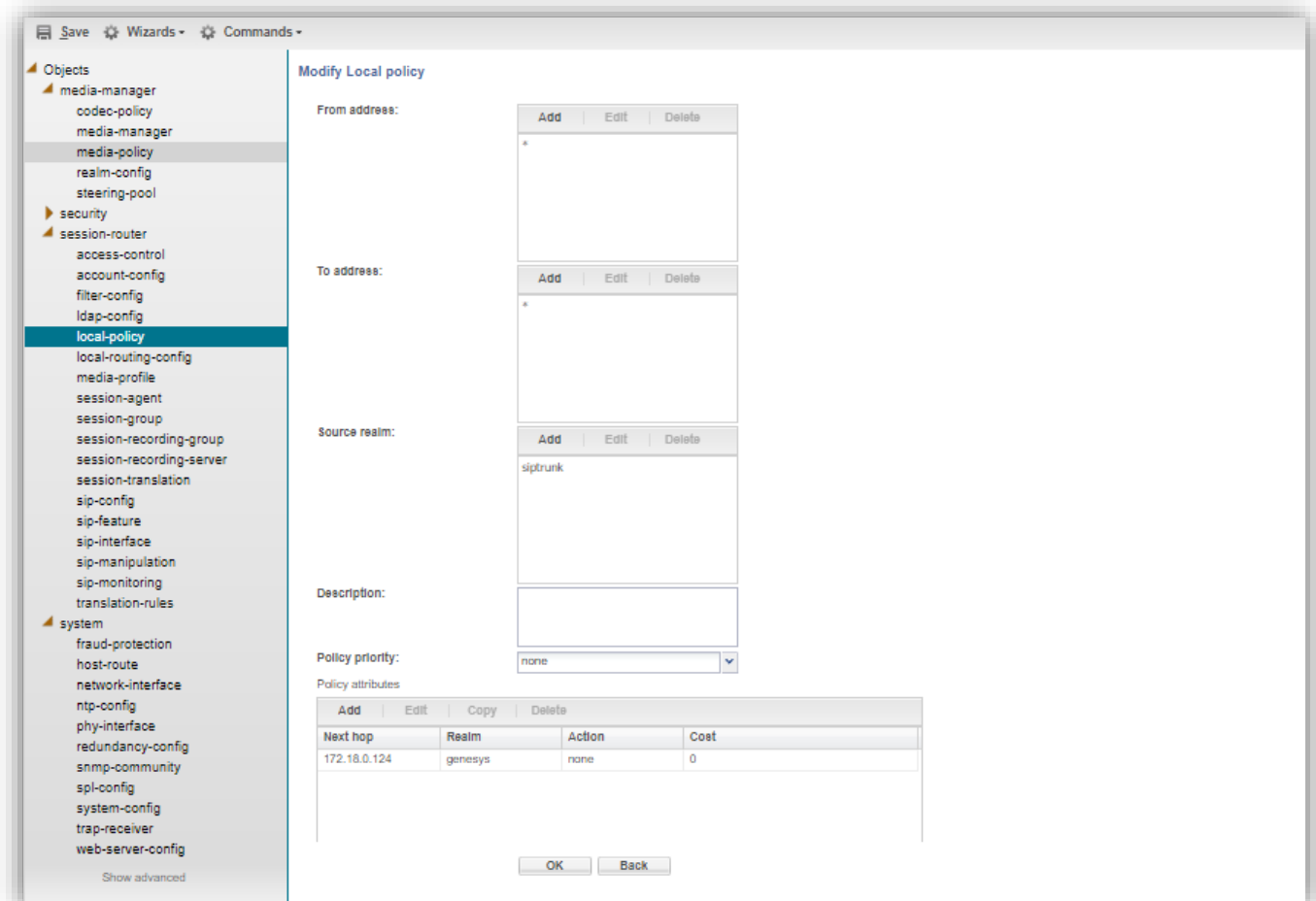
- Multiple local policies can be (and typically are) created.
- The Local Policy configuration element contains:

- Matching criteria

- Zero or more “policy-attributes” sub elements, each of which defines a “route”

To configure local-policy, navigate to **session-router->local-policy**. Configure the required local policy to route the calls.

Below is an example from the test bed for the local-policy configuration. Here From address and To address * denotes calls coming from any number to any called number should be forwarded to the mentioned destination in the next hop parameter.

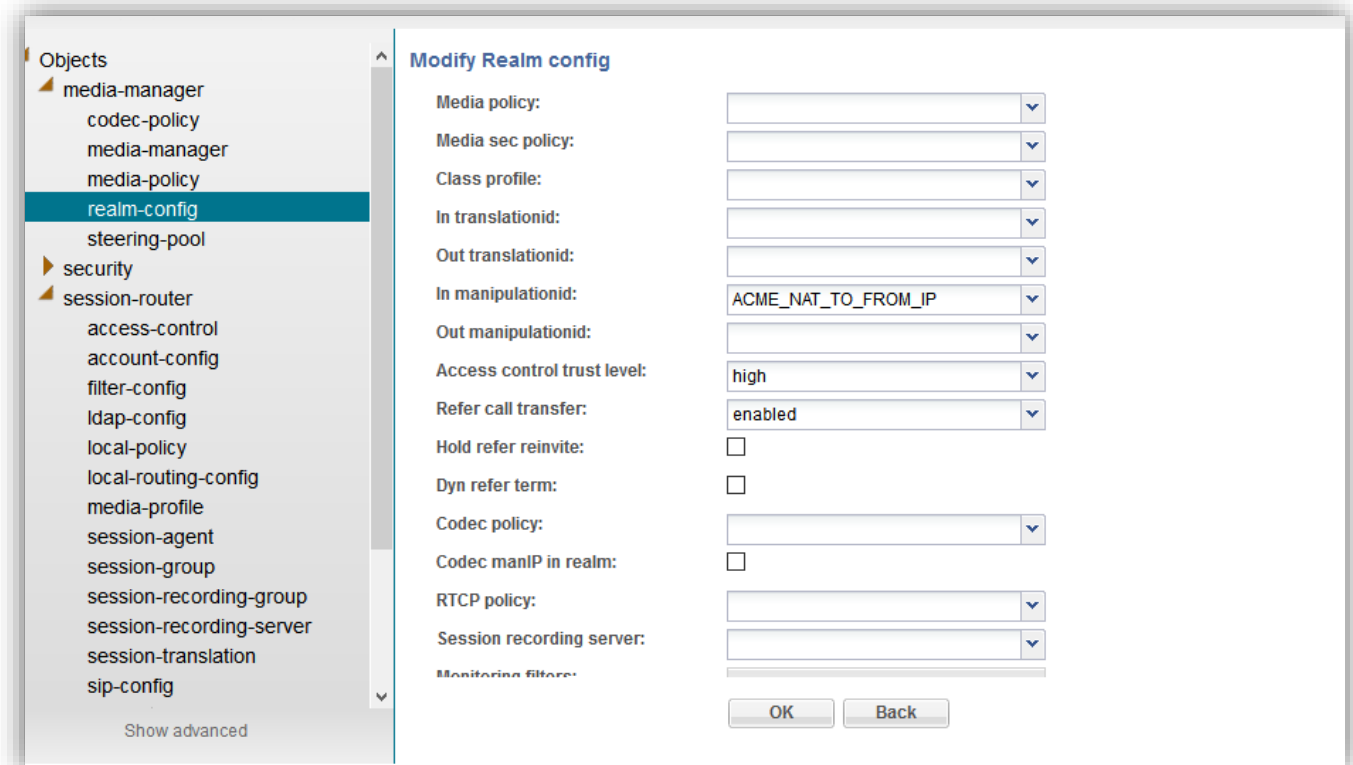
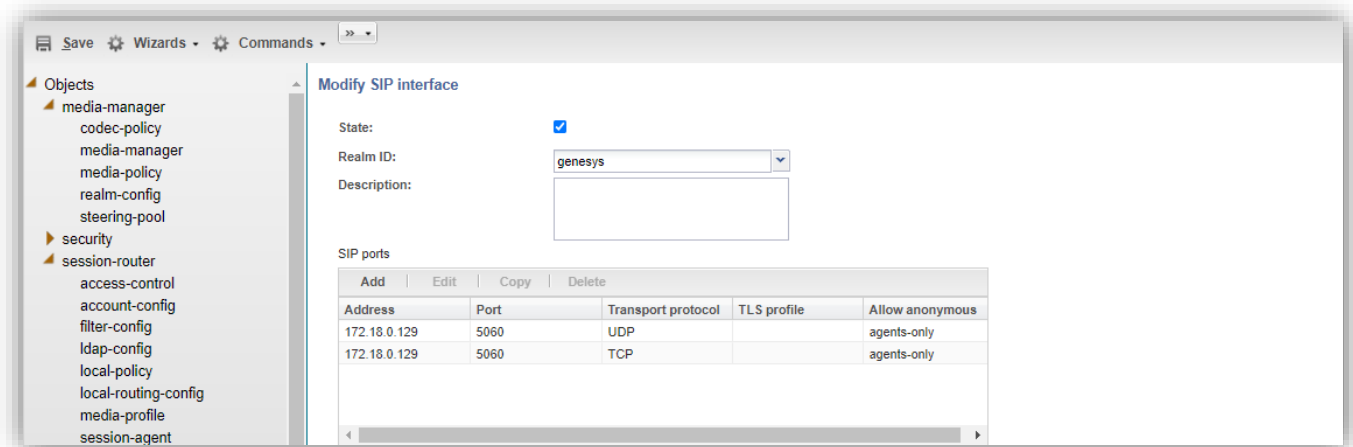


5.12. Header manipulation rule.

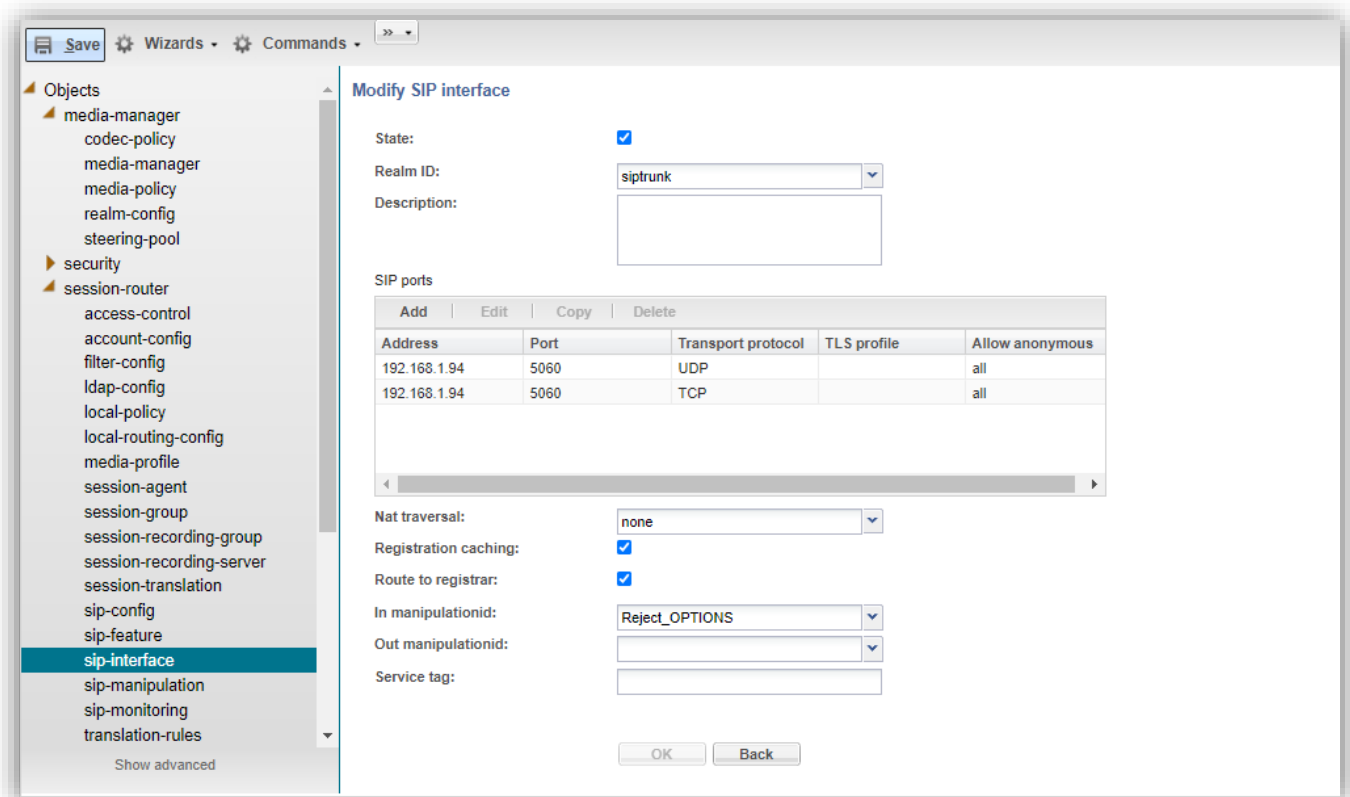
The following system-default Header manipulation rule is automatically applied on Genesys sip-interface involved in the test bed as an out-manipulationid.

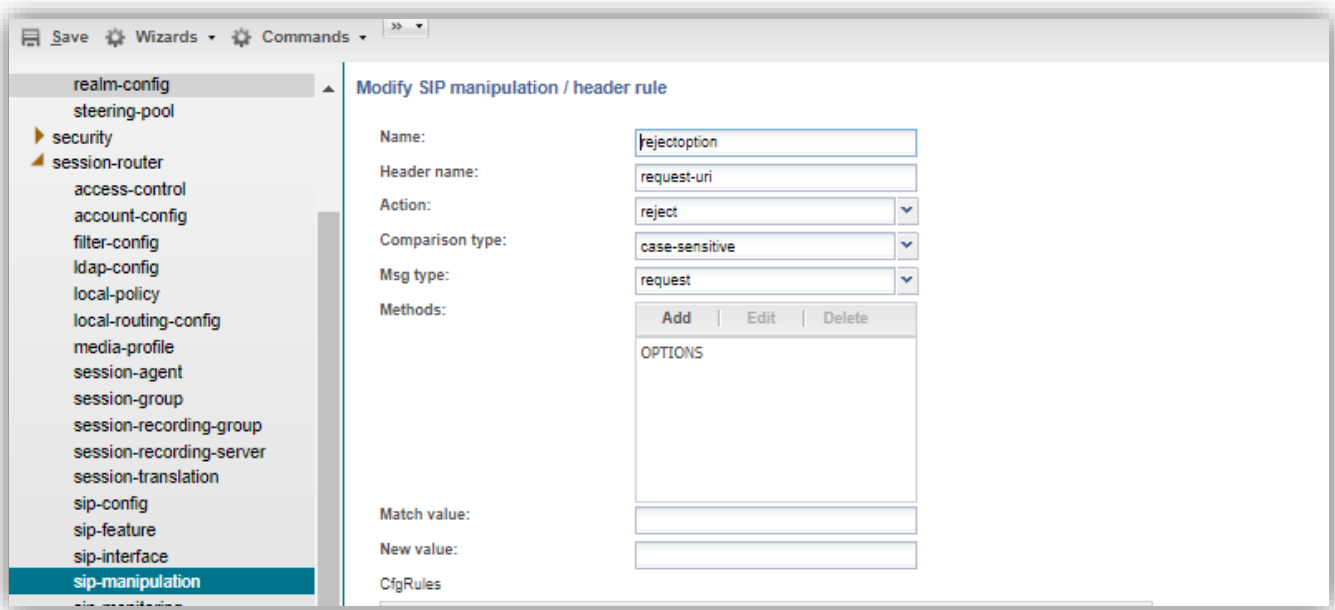
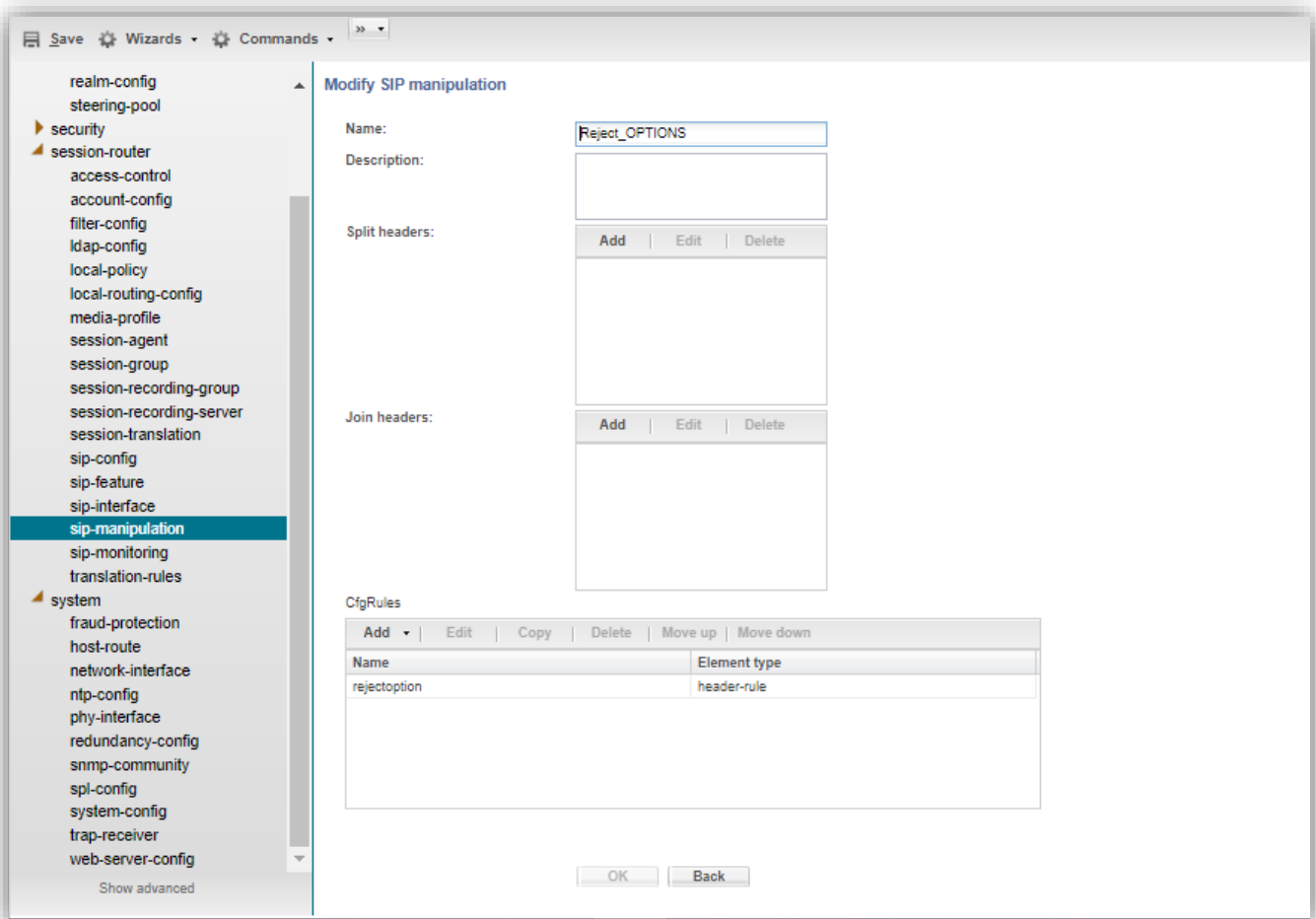
This HMR is used for topology hiding onto the SBC and it updates Contact and From host portion with SBC outside sip-interface IP address.

ACME_NAT_TO_FROM_IP



Another HMR Reject_OPTIONS is created and applied on the siptrunk sip-interface to locally respond to the SIP OPTIONS message with a 200 OK by the SBC rather than forwarding them to the Genesys SIP Server.

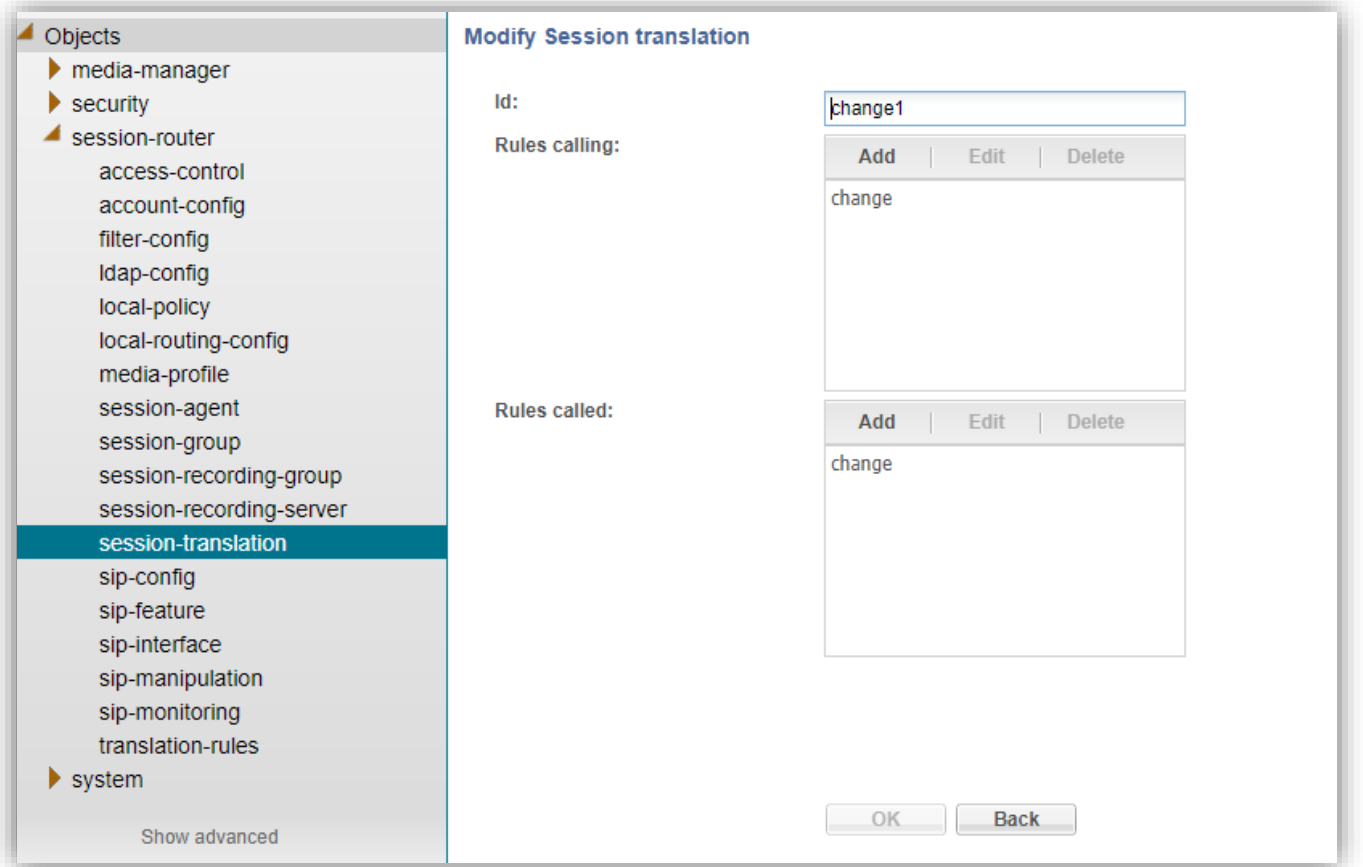
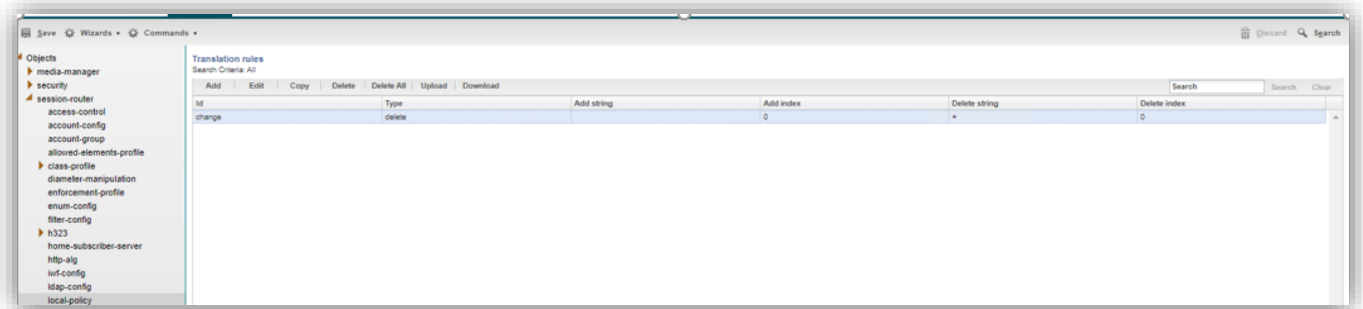




5.13 Session translation Rule

The following session-translation rule is configured on the SBC which strips the '+' from the called number of the request-uri as the numbers are defined without + on the SIP Server.

The session translation rule is applied as out-translationid on the genesys Realm.



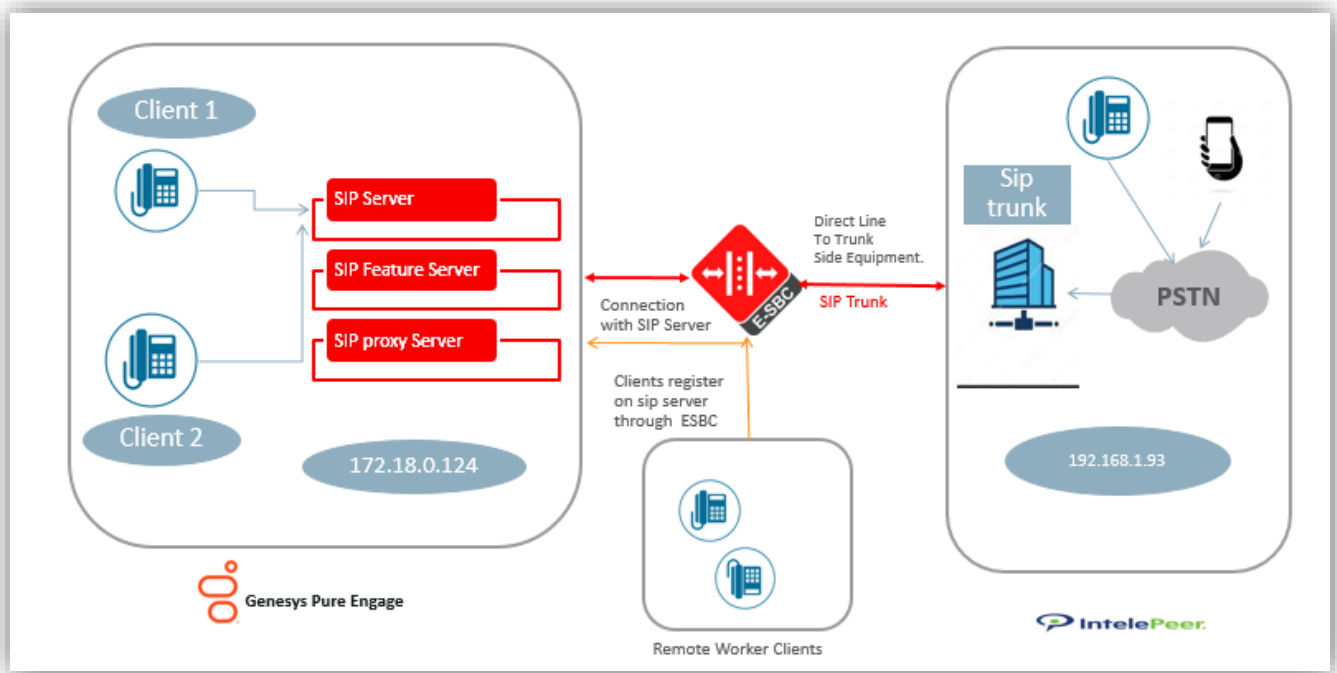
A basic configuration on the Oracle SBC to route calls to and from Genesys server environment is now complete. The following sections highlight some of the useful tips to configure the Oracle SBC in order to successfully resolve and overcome interoperability challenges in a SIP trunking environment between the Genesys SIP Server and Service provider network. It is outside the scope of this document to include all the interoperability working information as it will differ in every deployment.


6. Enabling Remote worker (for remote workers registering into Genesys SIP server via the Oracle SBC)

A section of the testing also included remote endpoints that register through the Oracle SBC to the 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 endpoints which register onto the SIP Server through the SBC. SBC terminates the call to the number based on the registration information present in the cache.

Below figure illustrates how remote workers register onto the SIP Server via the SBC





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

Realm – remoteworker

Steering Pool associated with the Realm remoteworker

Sip-interface associated with the Realm remoteworker

(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 Realm onto the SBC and then SBC registers these endpoints onto the SIP Server maintaining the registration cache in its database to route inbound calls to these endpoint. Below are the snippets from the Oracle SBC WebGUI for the remote worker configuration.

6.1 Realm 'remoteworker'

The screenshot displays a configuration window with a sidebar on the left and a main configuration area on the right. The sidebar, titled 'Objects', contains a tree view of configuration categories: media-manager, security, session-router, and system. The 'realm-config' item is selected and highlighted in blue. The main area is titled 'Modify Realm config' and contains the following fields:

- Identifier: remoteworker
- Description: (empty text box)
- Network Interfaces: A table with columns 'Add', 'Edit', and 'Delete'. It contains one entry: 's0p0:0'.
- Mm in realm:
- QoS enable:
- Media policy: (dropdown menu)
- Class profile: (dropdown menu)
- In translationid: (dropdown menu)
- Out translationid: (dropdown menu)
- In manipulationid: (dropdown menu)
- Out manipulationid: (dropdown menu)
- Access control trust level: none (dropdown menu)
- Refer call transfer: disabled (dropdown menu)
- Hold refer reinvite:
- Dyn refer term:
- Codec policy: (dropdown menu)
- Codec manIP in realm:
- RTCP policy: (dropdown menu)
- Session recording server: (dropdown menu)
- Monitoring filters: A table with columns 'Add', 'Edit', and 'Delete'. It is currently empty.

At the bottom of the main area are 'OK' and 'Back' buttons. The sidebar also includes a 'Show advanced' link at the bottom.

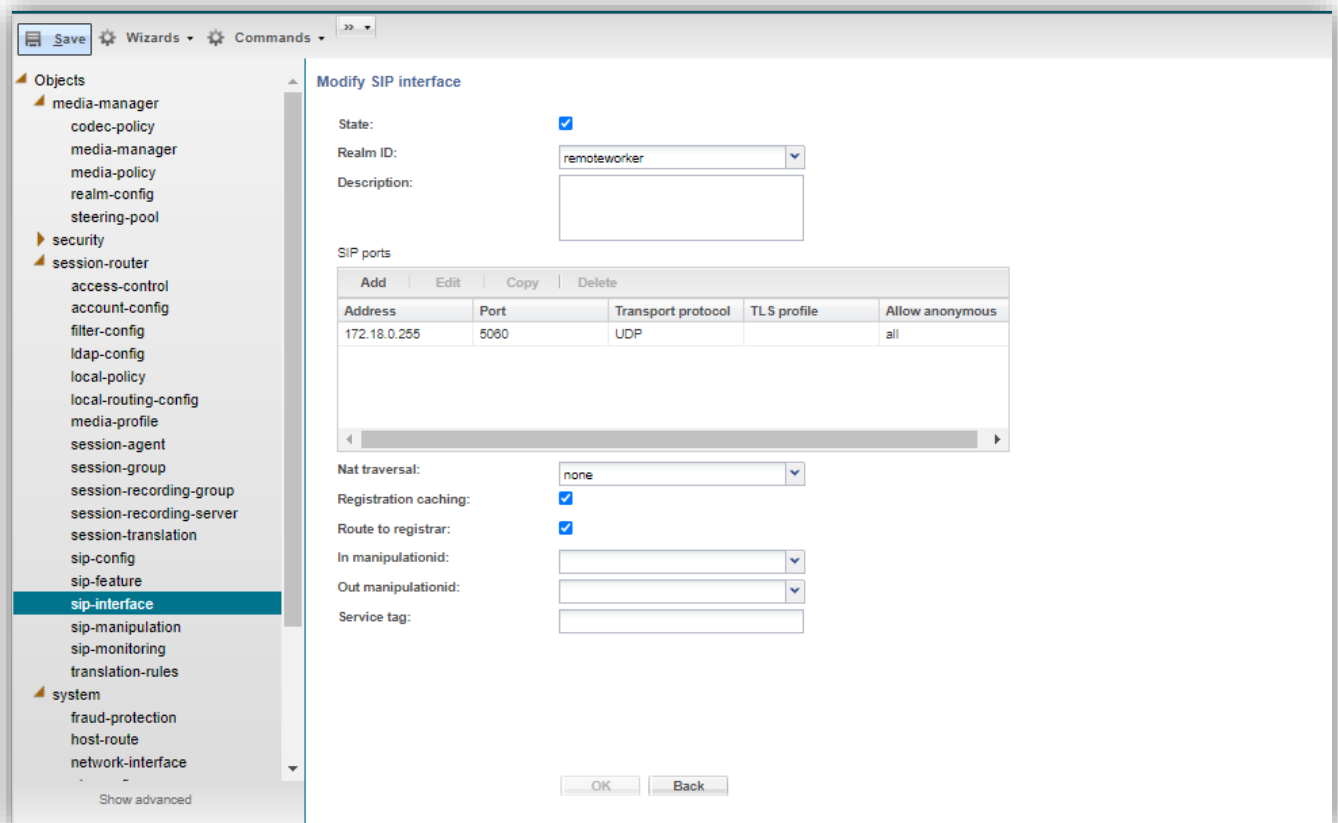
6.2. Steering Pool associated with realm remoteworker.

The screenshot displays the Oracle Configuration Assistant interface. The top navigation bar includes 'ORACLE', 'Home', 'Configuration', 'Monitor and Trace', 'Widgets', and 'System'. Below this, there are icons for 'Save', 'Wizards', and 'Commands'. The left sidebar shows a tree view of objects, with 'steering-pool' selected under the 'media-manager' category. The main content area is titled 'Modify Steering pool' and contains the following configuration fields:

| | |
|--------------------|--|
| IP address: | <input type="text" value="172.18.0.255"/> |
| Start port: | <input type="text" value="10000"/> (Range: 1..65535) |
| End port: | <input type="text" value="10999"/> (Range: 1..65535) |
| Realm ID: | <input type="text" value="remoteworker"/> |
| Network Interface: | <input type="text"/> |

6.3 Sip-interface associated with realm remoteworker.

Registration caching must be enabled on this sip-interface so that SBC caches the registration of the subscriber which register through this sip-interface.



6.4 Local-policy

The screenshot shows a configuration window titled "Modify Local policy". On the left is a tree view of configuration objects, with "local-policy" selected. The main area contains several fields:

- From address:** A text field containing an asterisk (*).
- To address:** A text field containing an asterisk (*).
- Source realm:** A text field containing "remoteworker".
- Description:** An empty text field.
- Policy priority:** A dropdown menu set to "none".
- Policy attributes:** A table with columns: Next hop, Realm, Action, and Cost.

| Next hop | Realm | Action | Cost |
|--------------|---------|--------|------|
| 172.18.0.124 | genesys | none | 0 |

At the bottom of the window are "OK" and "Back" buttons.

7. Test cases requiring authentication.

There are two test cases that require SIP Digest authentication.

[SIP Authentication for outbound calls](#)

[SIP Authentication for incoming calls](#)

The SIP Server is configured to challenge the identity of SBC when SBC sends a SIP INVITE to the SIP Server DN configured to demand authentication.

The inbound call made from PSTN to that DN. SIP Server send challenges to SBC by sending a 401 unauthorized message to the SBC. SBC further responds with a new INVITE based on the authentication attributes configured on the Session-agent. There is no configuration required for Outbound calls from Genesys SIP server.

In order to achieve the required configuration and pass the test scenarios we have configured below parameters onto the SBC for the SIP Trunk Session-agent.

Modify Session agent

Monitoring filters: Add | Edit | Delete

Auth attribute

| Auth realm | Username | Password | In dialog methods |
|------------|----------|----------|-------------------|
| Switch | user | ***** | Invite |

Session recording server:

Session recording required:

Hold refer reinvite:

Send TCP fin:

SIP recursion policy:

Sm icsi match for invite: Add | Edit | Delete

8. Test Plan Executed.

8.1 Equipment Requirements

Table below identifies equipment used for testing

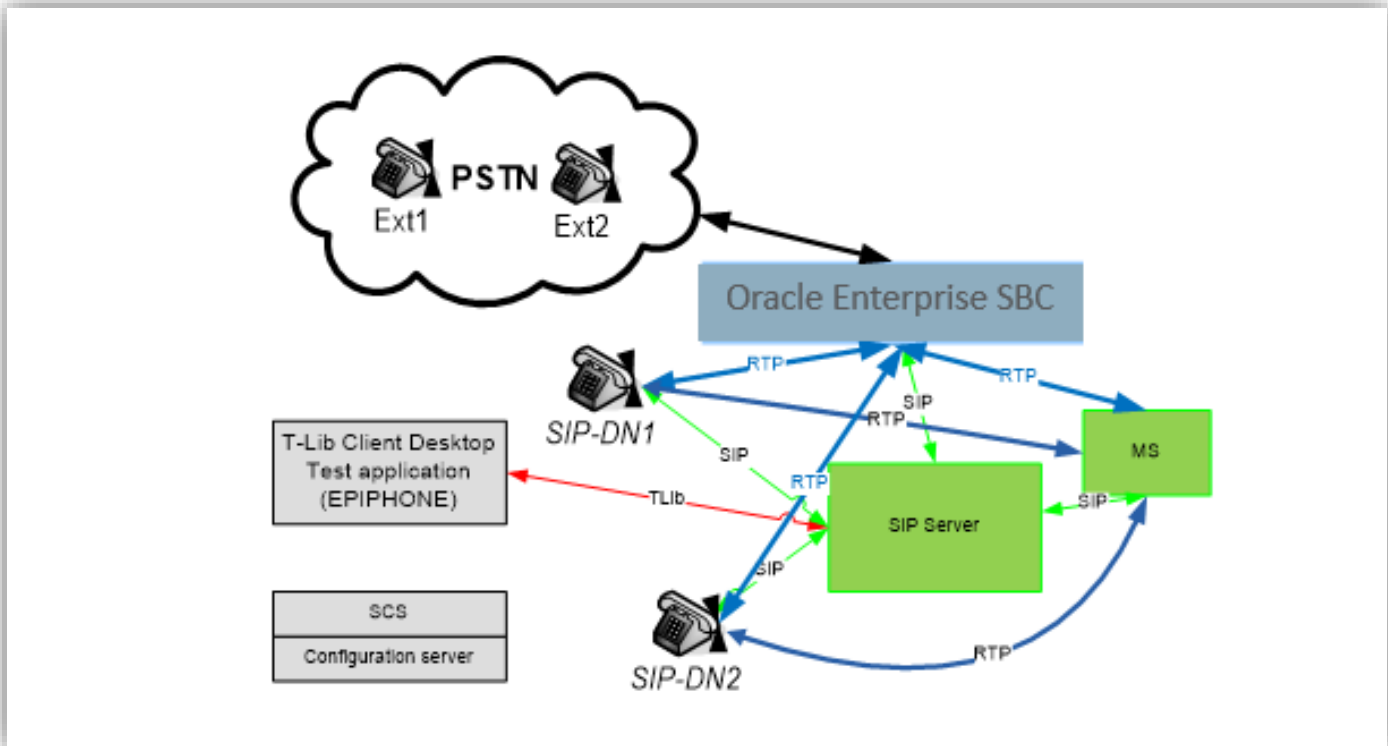
| Product | Version | Units | Notes |
|---------------------------------------|---------|-------|-----------------------|
| SIP Server | 8.1.1 | 1 | Standalone deployment |
| Resource manager (RM) | 9.0 | 1 | |
| Media Control Platform (MCP) | 9.0 | 1 | |
| Genesys Management Framework | 8.1 | 1 | |
| T-Lib Client Desktop Test application | | 1 | EpiPhone application |
| Oracle SBC SCZ900p3 or above | | 1 | |
| SIP End Point | | 3 | |
| PSTN phone | | 2 | |

Execution of test plan requires having PSTN phones and Oracle SBC to be configured with Genesys. Below figure illustrates the setup required for test bed.

Two PSTN phones representing external numbers has to be configured for accessing Genesys SIP Server through Oracle SBC, and be accessible as outbound destination from SIP Server.

2 SIP phones are configured with Sip Server as local Sip Endpoints. Genesys EpiPhone test application is configured to simulate Agent Desktops for 2 local Sip Endpoints.

Genesys EpiPhone is used to issue 3PCC Apply Treatment and Route requests. Internal SIP endpoints can be registered at SIP Server or provisioned. EpiPhone is a test tool for testing Genesys SIP Server. It provides functionality of Genesys T-Library GUI client with call/parties visualization and 3rd party call control. From EpiPhone GUI it is possible to perform all 3PCC requests required for execution of current test plan. This include Treatment request and Route requests, thus we don't need to include URS in the testing environment.



8.2 Default Sip Server Options

The default Sip Server Options configuration is as below. Configuration changes will be required on the Genesys SIP Server Trunk, DN objects as per the test case requirement in order to pass the test scenarios.

| SIP Server Application Options TServer section |
|--|
| SIP-hold-rtc3264=true router-timeout=30 default-dn= blind-transfer-enabled=true resource-management-by-rm=true msml-support=true sip-enable-moh=true |

8.3 Sample EPIphone configuration

Below is the sample EPIphone configuration from the Test Bed. Here the DN's and Route Points are configured for the SBC Trunk. Please note the below configuration is just for reference as it will change with respect to each environment.



[HOME]

server = (host="\${loc_host_ip}", port=\${loc_tserv_port})

sip-proxy = \${loc_host_ip}:\${loc_sip_port};transport=udp

sip-register = true

dn1 = 100001, sip-port = \${sip_port_dn1} , sip=simple, play=DN1, [AA] on-invite = 486

dn2 = 100011, sip-port = \${sip_port_dn2} , sip=simple, play=DN2

dn3 = 100021, sip-port = \${sip_port_dn3} , sip=simple, play=DN3

dn4 = 17814437266, sip-port = \${sip_port_dn4} , sip=simple, play=DN4

dn5 = 100041, sip-port = \${sip_port_dn5} , sip=simple, play=DN5

dn10 = 17814437285, pool="shared"

dn11 = 9001, pool="shared",script="annc=(PROMPT=("\1"=(INTERRUPTABLE=1,ID=1)))"

dn12 = 9002,

pool="shared",script="collect=(MAX_DIGITS=4,RESET_DIGITS=11,BACKSPACE_DIGITS=22,TOTAL_TIMEOUT=1000) annc=(PROMPT=(ID=1))"

8.3 Test Plan executed

The following Test Plan has been executed against this setup and results are documented below.

| Scenario | Supported |
|--|-----------|
| Inbound Call to Agent released by caller | Yes |
| Inbound Call to Agent released by agent | Yes |
| Inbound Calls rejected | Yes |
| Inbound Call abandoned | Yes |
| Inbound Call to Route Point with Treatment | Yes |
| Interruptible Treatment | Yes |
| IVR (Collect Digit) Treatment | Yes |
| Inbound Call routed by using 302 out of SIP Server signaling path | Yes |
| 1PCC Outbound Call from SIP Endpoint to external destination | Yes |
| 3PCC Outbound Call to external destination | Yes |
| 1PCC Outbound Call Abandoned | Yes |
| Caller is put on hold and retrieved by using RFC 2543 method | Yes |
| T-Lib-Initiated Hold/Retrieve Call with MOH using RFC 3264 method | Yes |
| 3PCC 2 Step Transfer to internal destination by using re-INVITE method | Yes |
| 3PCC Alternate from consult call to main call | Yes |
| 1PCC Unattended (Blind) transfer using REFER | Yes |
| 1PCC Attended Transfer to external destination | Yes |
| 3PCC Two Step Conference to external party | Yes |
| 3PCC (same as 1PCC) Single-Step Transfer to another agent | Yes |
| 3PCC Single Step Transfer to external destination using REFER | Yes |
| 3PCC Single Step Transfer to internal busy destination using REFER | Yes |
| Early Media for Inbound Call to Route Point with Treatment | Yes |
| Early Media for Inbound Call with Early Media for Routed to Agent | Yes |
| Inbound call routed outbound (Remote Agent) using INVITE without SDP | Yes |
| Call Progress Detection | Yes |
| Out of Service detection Checking MGW live status | Yes |
| SIP Authentication for outbound calls | Yes |
| SIP Authentication for incoming calls | Yes |
| T-Lib-Initiated Answer/Hold/Retrieve Call for Remote SIP endpoint which supports the BroadSoft SIP Extension Event Package | Yes |
| 3PCC Outbound Call from Remote SIP endpoint to external destination | Yes |
| 3PCC 2 Step Transfer from Remote SIP endpoint to internal destination | Yes |
| 1PCC Attended Transfer from Remote SIP endpoint to external destination | Yes |

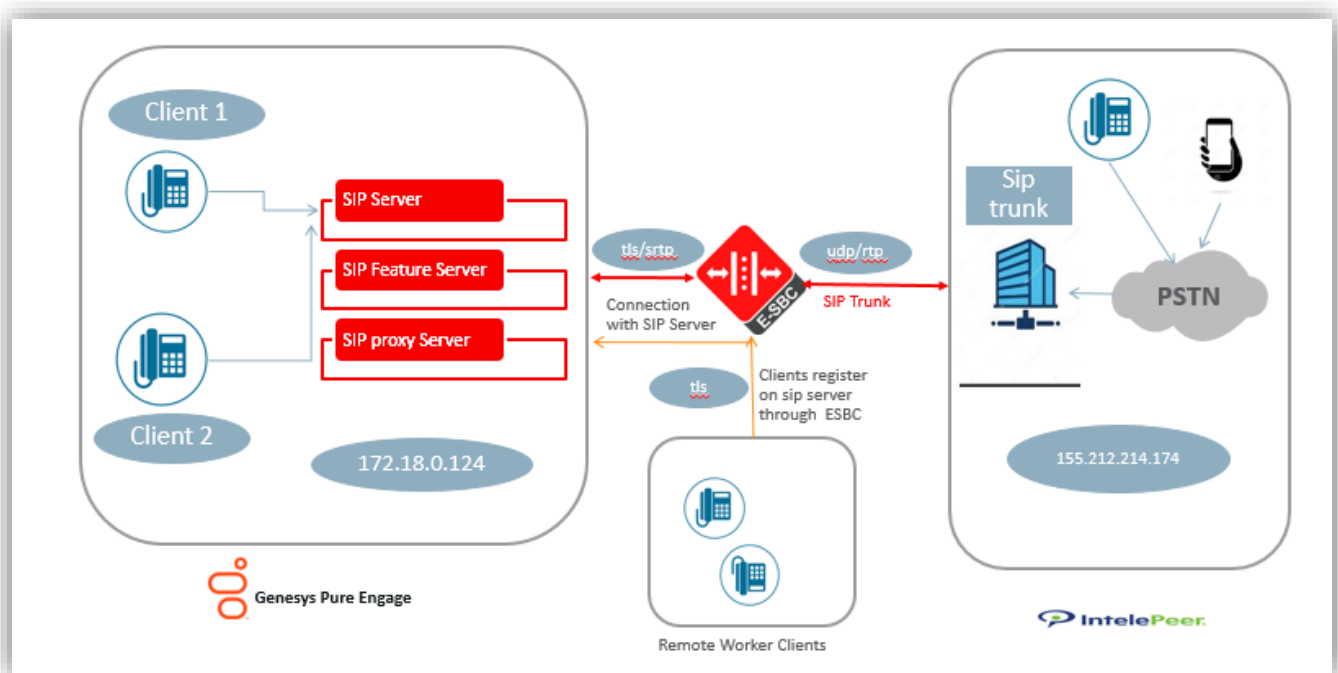
9. Enabling Remote worker (for remote workers registering into Genesys SIP server via the Oracle SBC over secure connection)


Testing is performed for Genesys remote Agents to connect to the Oracle SBC over a secure connection. Agents register and make calls over a secure connection through the Oracle SBC.

In order to perform the testing we have used TLS/SRTP protocol between the SIP server and the SBC. This requires additional configuration/configuration changes to the configuration mentioned in [section 6](#) of the document.

Below figure illustrates how remote workers register onto the SIP Server via the SBC over a secure connection.

Endpoints register onto SIP server via SBC over a TLS connection. The audio on inbound calls and outbound calls from the endpoints is secured via SRTP.





The following additional configuration objects are configured on the Oracle SBC to create a secured connection between Genesys side and the SBC.

- Signaling Security configuration
- Media Security configuration

9.1 Signaling Security configuration

9.1.1 Certificate Records

“**Certificate-records**” are configuration elements on Oracle SBC which captures information for a TLS certificate such as common-name, key-size, key-usage etc.

This section walks you through how to configure certificate records, create a certificate signing request, and import the necessary certificates into the SBC’s configuration.

GUI Path: security/certificate-record

ACL Path: config t->security->certificate-record

For the purposes of this application note, we’ll create three certificate records on the Oracle SBC. They are as follows:

SBC Certificate (end-entity certificate)
Genesys Endpoint Certificate
Root CA certificate

The SBC’s end entity certificate is what is presented to Genesys signed by your CA authority.

For Testing we have created a Certificate Authority (CA) on the Windows Server that is running the Genesys Framework components in our Lab Server. For the purpose of App note we have signed the SBC end entity certificate and the Genesys Endpoint Certificate from the same CA.

To configure the certificate record:

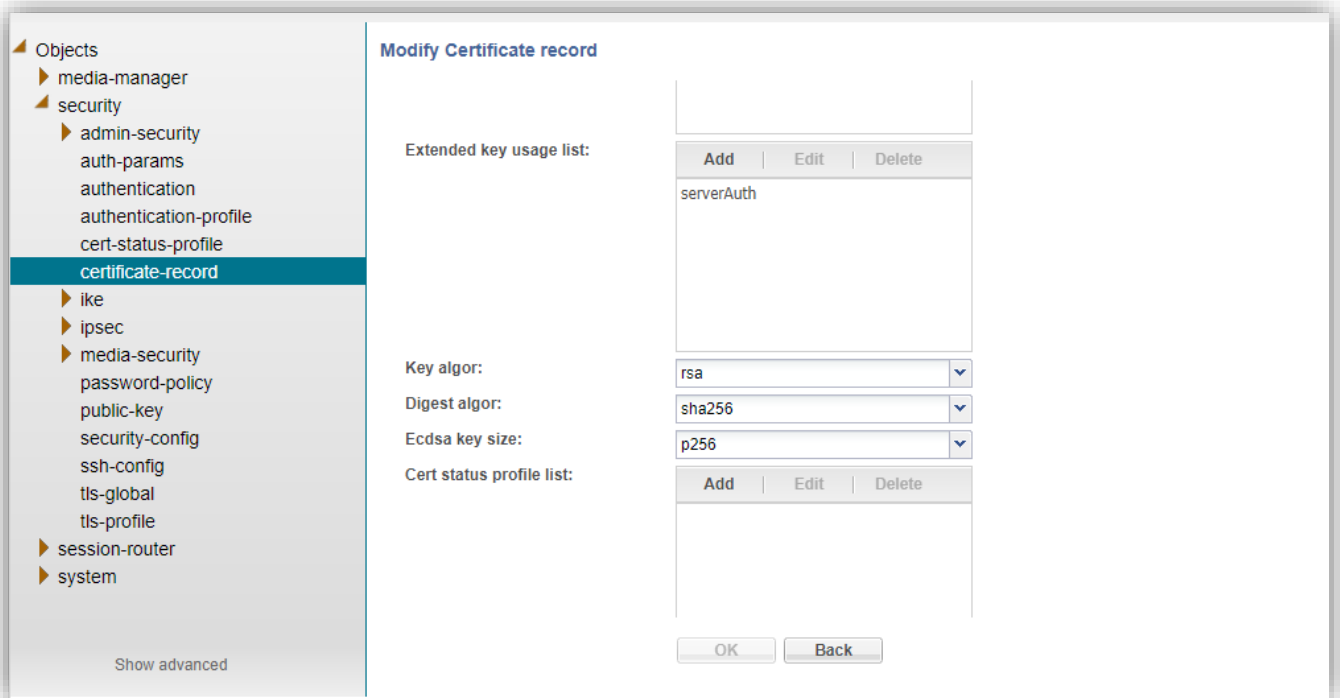
Click Add, and configure the SBC certificate as shown below:

tlscert – is the name of SBC endpoint certificate record created on the SBC.

The screenshot shows a configuration window titled "Modify Certificate record". On the left is a tree view of objects, with "certificate-record" selected. The main area contains the following fields:

- Name: tlscert
- Country: US
- State: california
- Locality: Redwood
- Organization: Engineering
- Unit: (empty)
- Common name: sbcinternal
- Key size: 2048
- Alternate name: (empty)
- Trusted:
- Key usage list: digitalSignature, keyEncipherment

Buttons for "Add", "Edit", and "Delete" are visible above the key usage list. At the bottom of the window are "OK" and "Back" buttons. A "Show advanced" link is located at the bottom left of the object tree.



Click **OK** at the bottom

Using this same procedure, configure certificate records for **Root CA** and **Genesys Endpoint Certificate**.

genesysep: - is the name of Genesys Endpoint Certificate which is created for communication between the SBC and Genesys Sip Server.

Save Wizards Commands

Objects

- media-manager
 - security
 - admin-security
 - auth-params
 - authentication
 - authentication-profile
 - cert-status-profile
 - certificate-record**
 - ike
 - ipsec
 - media-security
 - password-policy
 - public-key
 - security-config
 - ssh-config
 - tls-global
 - tls-profile
 - session-router
 - system

Show advanced

Modify Certificate record

| | | | | | | | | | | |
|------------------|---|--------|------|--------|------------------|--|--|-----------------|--|--|
| Name: | genesysep | | | | | | | | | |
| Country: | US | | | | | | | | | |
| State: | MA | | | | | | | | | |
| Locality: | Burlington | | | | | | | | | |
| Organization: | Engineering | | | | | | | | | |
| Unit: | | | | | | | | | | |
| Common name: | WINGENPE | | | | | | | | | |
| Key size: | 1024 | | | | | | | | | |
| Alternate name: | | | | | | | | | | |
| Trusted: | <input checked="" type="checkbox"/> | | | | | | | | | |
| Key usage list: | <table><tr><td>Add</td><td>Edit</td><td>Delete</td></tr><tr><td colspan="3">digitalSignature</td></tr><tr><td colspan="3">keyEncipherment</td></tr></table> | Add | Edit | Delete | digitalSignature | | | keyEncipherment | | |
| Add | Edit | Delete | | | | | | | | |
| digitalSignature | | | | | | | | | | |
| keyEncipherment | | | | | | | | | | |

OK Back

Objects

- media-manager
 - security
 - admin-security
 - auth-params
 - authentication
 - authentication-profile
 - cert-status-profile
 - certificate-record**
 - ike
 - ipsec
 - media-security
 - password-policy
 - public-key
 - security-config
 - ssh-config
 - tls-global
 - tls-profile
 - session-router
 - system

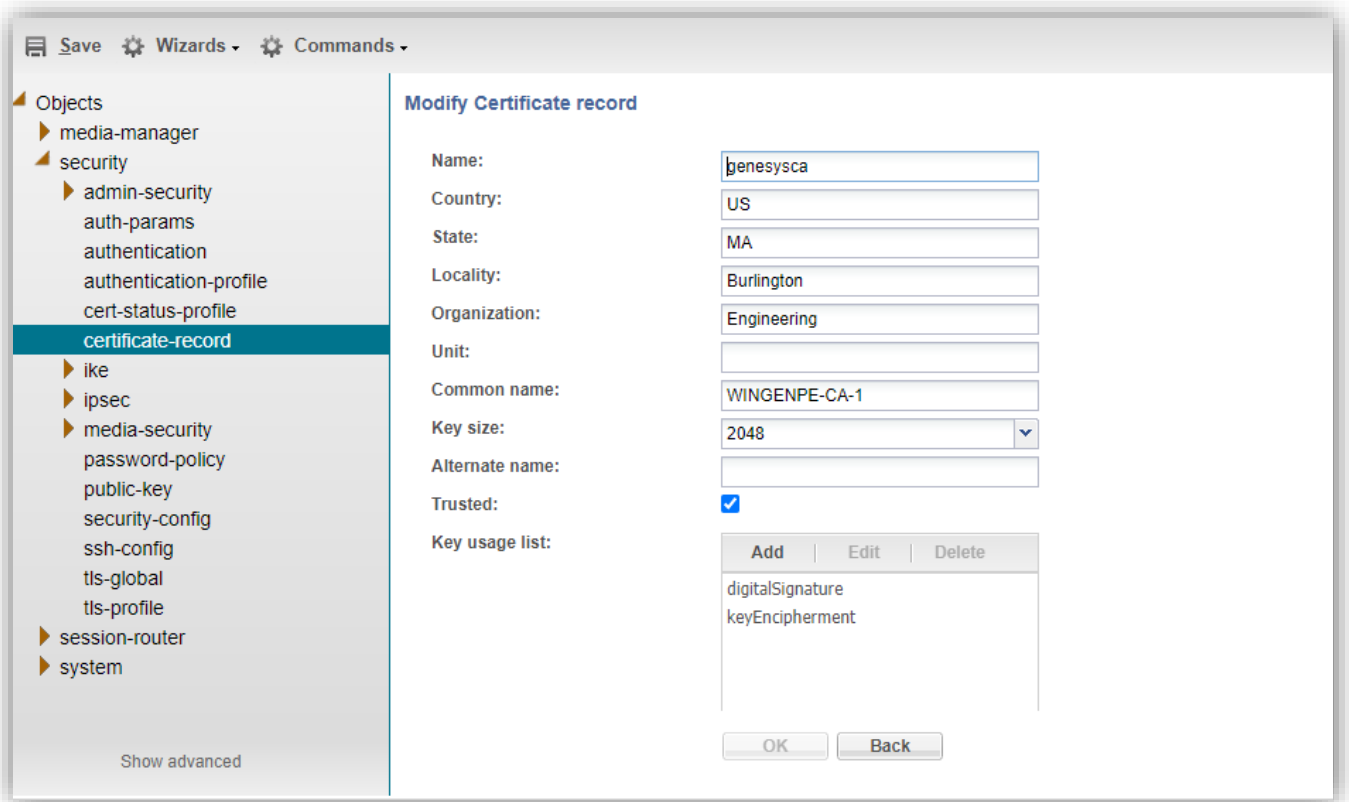
Show advanced

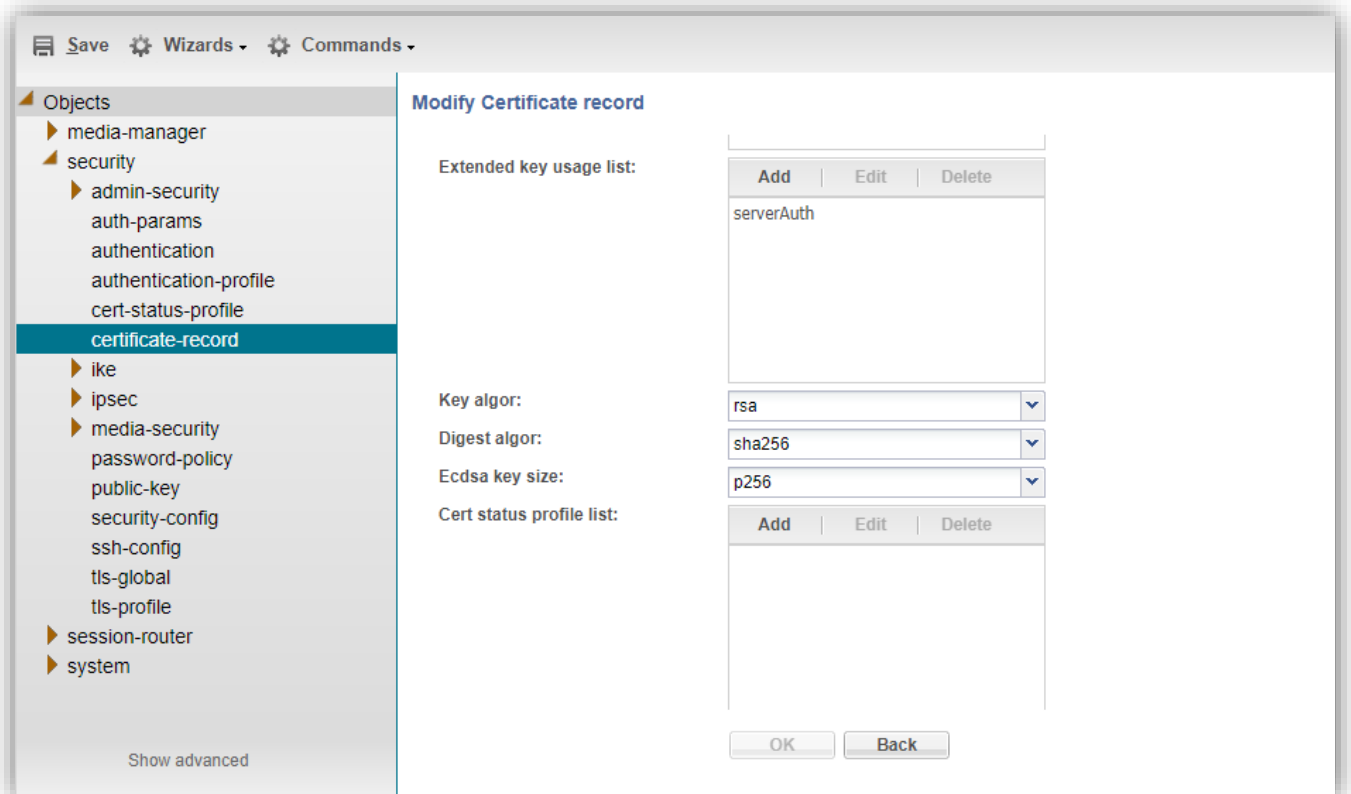
Modify Certificate record

| | | | | | | | | | | |
|---------------------------|--|--------|------|--------|------------|--|--|------------|--|--|
| Extended key usage list: | <table><tr><td>Add</td><td>Edit</td><td>Delete</td></tr><tr><td colspan="3">clientAuth</td></tr><tr><td colspan="3">serverAuth</td></tr></table> | Add | Edit | Delete | clientAuth | | | serverAuth | | |
| Add | Edit | Delete | | | | | | | | |
| clientAuth | | | | | | | | | | |
| serverAuth | | | | | | | | | | |
| Key algor: | rsa | | | | | | | | | |
| Digest algor: | sha1 | | | | | | | | | |
| Ecdsa key size: | p256 | | | | | | | | | |
| Cert status profile list: | <table><tr><td>Add</td><td>Edit</td><td>Delete</td></tr></table> | Add | Edit | Delete | | | | | | |
| Add | Edit | Delete | | | | | | | | |

OK Back

genesysca :- is the name of certificate record created for certificate authority which is used to sign the certificates.

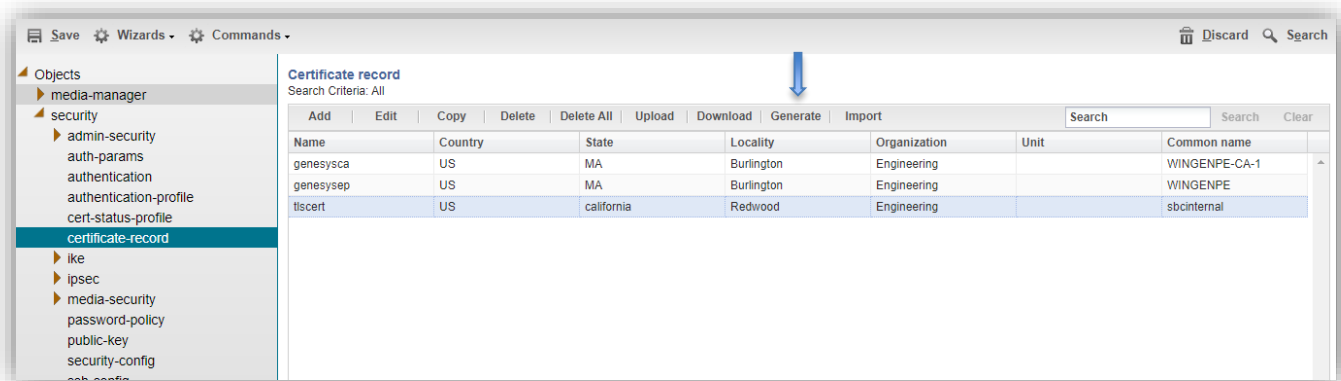




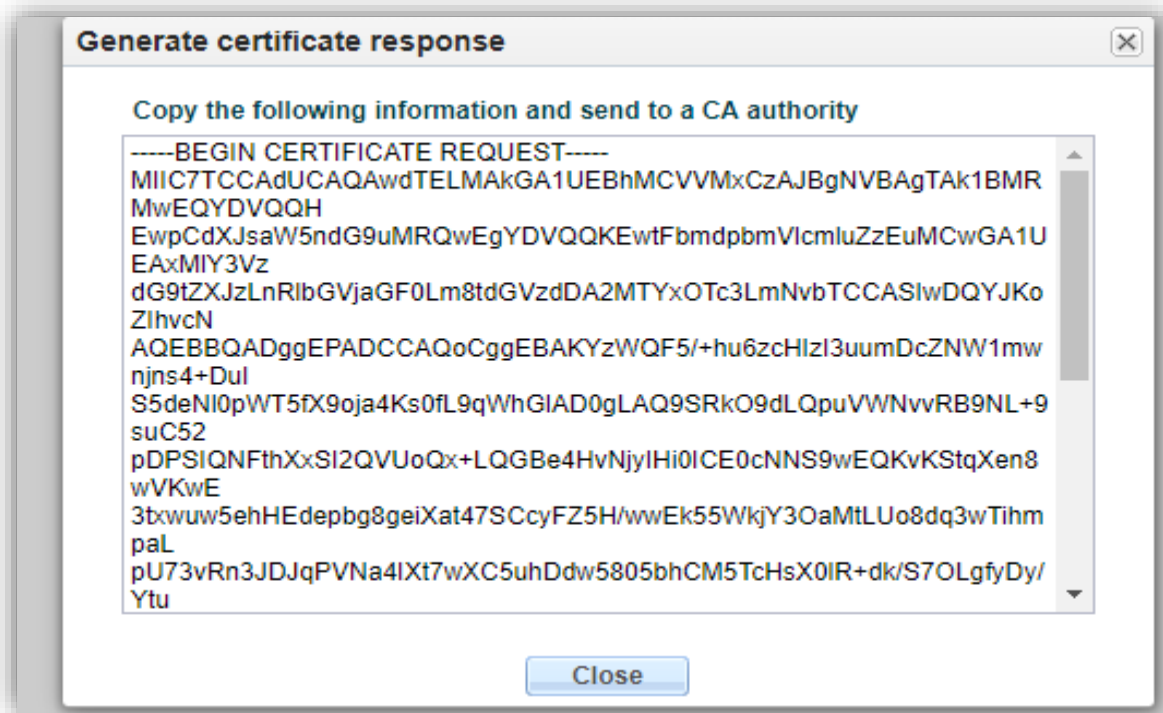
9.1.2 Generate Certificate Signing Request

Now that the SBC's certificate has been configured, create a certificate signing request for the SBC's end entity only. **This is not required for the Genesys Endpoint Certificate and the CA certificate that have been created.**

On the certificate record page in the Oracle SBC GUI, select the SBC's end entity certificate that was created above, and click the "generate" tab at the top:



A window as show below will pop up.



Copy/paste the text that gets printed on the screen as shown above and upload to your CA server for signature.

Also note, at this point, a save and activate is required before you can import the certificates to each certificate record created above.

9.1.3 Import Certificates to SBC

Once certificate signing request has been completed – import the signed certificate to the SBC. Please note – all certificates including **Root CA and Genesys Endpoint certificates** are required to be imported to the SBC.

Click import and that will open the window to import the certificate. You can either specify the certificate file path or copy the certificate contents and paste on the window.

Once all certificates have been imported, issue save/activate from the WebGUI.

The screenshot displays the WebGUI interface for managing certificates. The main window shows a table of certificate records under the 'Certificate record' section. A blue arrow points to the 'Import' button in the table's toolbar. An 'Import certificate' dialog box is open, allowing the user to specify the format and import method for the certificate.

| Name | Country | State | Locality | Organization | Unit | Common name |
|-----------|---------|------------|------------|--------------|------|---------------|
| genesysca | US | MA | Burlington | Engineering | | WINGENPE-CA-1 |
| genesysep | US | MA | Burlington | Engineering | | WINGENPE |
| tlscert | US | california | Redwood | Engineering | | sbcinternal |

Import certificate dialog box fields:

- Format: try-all
- Import method: File Paste
- Certificate file: Browse...
- Buttons: Import, Cancel

Displaying 1 - 3 of 3

9.1.4 TLS Profile

TLS profile configuration on the SBC allows for specific certificates to be assigned.

GUI Path: security/tls-profile

ACLI Path: config t->security->tls-profile

Click Add, use the example below to configure

Here **genesystls** is the name of the tls-profile that has been created for the use encryption with Genesys side.

The screenshot shows the 'Modify TLS profile' configuration page. The left sidebar contains a tree view with the following structure:

- Objects
 - media-manager
 - security
 - admin-security
 - auth-params
 - authentication
 - authentication-profile
 - cert-status-profile
 - certificate-record
 - ike
 - ipsec
 - media-security
 - password-policy
 - public-key
 - security-config
 - ssh-config
 - tls-global
 - tls-profile**
 - session-router
 - system

The main configuration area is titled 'Modify TLS profile' and contains the following fields:

- Name: genesystls
- End entity certificate: tiscert
- Trusted ca certificates: A list containing 'genesysca' and 'genesysep'. Above the list are buttons for 'Add', 'Edit', and 'Delete'.
- Cipher list: A list containing 'ALL'. Above the list are buttons for 'Add', 'Edit', and 'Delete'.
- Verify depth: 10 (Range: 0-10)

At the bottom of the configuration area are 'OK' and 'Back' buttons. A 'Show advanced' link is located at the bottom of the sidebar.

Click **OK** at the bottom

9.2 Media Security Configuration

This section outlines how to configure support for media security between the Oracle SBC and Sip Server/Agent Endpoints.

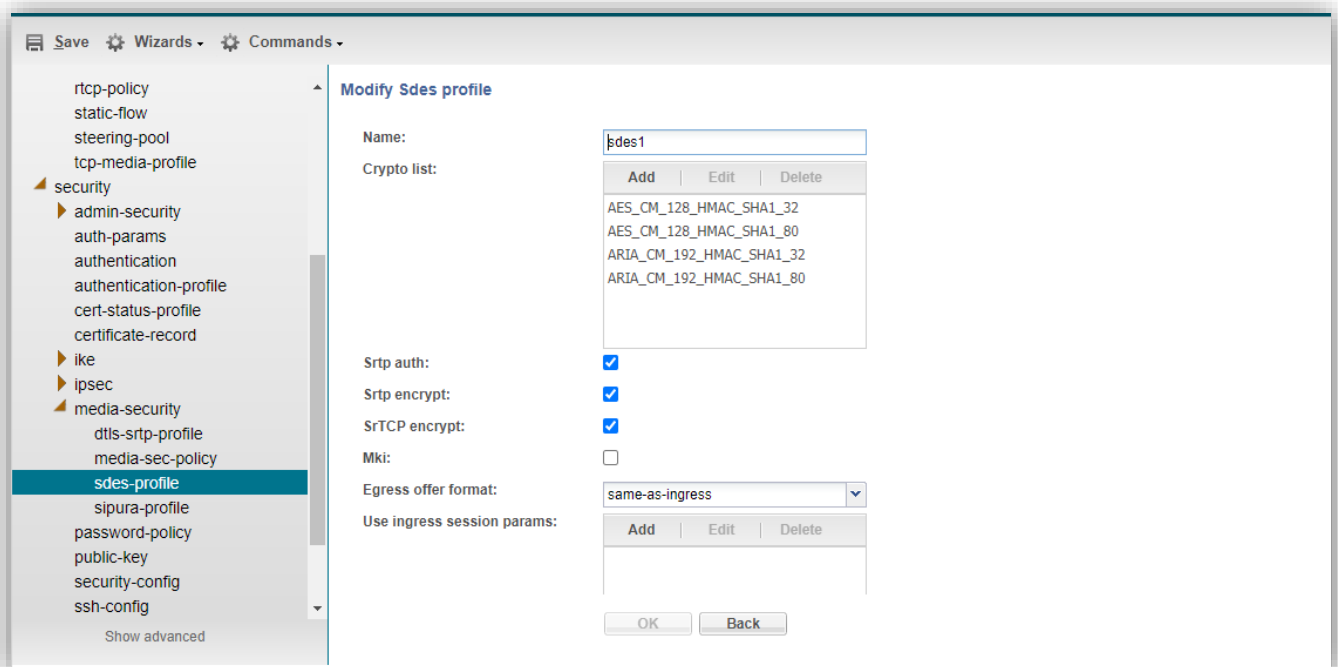
9.2.1 sdes-profile

This is the first element to be configured for media security, where the algorithm and the crypto's to be used are configured.

GUI Path: security/media-security/sdes-profile

ACL Path: config t->security->media-security->sdes-profile

Click Add, and use the example below to configure



Click **OK** at the bottom

9.2.2 Media Security Policy

Media-sec-policy instructs the SBC how to handle the SDP received/sent under a realm (RTP, SRTP or any of them) and, if SRTP needs to be used, the sdes-profile that needs to be used.

In this example, we are configuring two media security policies. One to secure and decrypt media toward Genesys side and other for non-secure media facing PSTN side.

GUI Path: security/media-security/media-sec-policy

ACL Path: config t->security->media-security->media-sec-policy

Click Add, use the examples below to configure.

mosp1 is the name of the media-sec-policy for the secured side.

The screenshot shows the 'Modify Media sec policy' configuration window. On the left is a tree view with 'media-sec-policy' selected. The main area is divided into 'Inbound' and 'Outbound' sections. The 'Inbound' section has a 'Name' field with 'mosp1', a 'Pass through' checkbox, and an 'Options' table with 'Add', 'Edit', and 'Delete' buttons. Below are 'Profile' (sdes1), 'Mode' (srtp), and 'Protocol' (sdes) dropdowns, and a 'Hide egress media update' checkbox. The 'Outbound' section has 'Profile' (sdes1), 'Mode' (srtp), and 'Protocol' (sdes) dropdowns. 'OK' and 'Back' buttons are at the bottom.

| Options: | |
|----------|---------------|
| Add | Edit Delete |

| Inbound | |
|---------------------------|--------------------------|
| Profile: | sdes1 |
| Mode: | srtp |
| Protocol: | sdes |
| Hide egress media update: | <input type="checkbox"/> |

| Outbound | |
|-----------|-------|
| Profile: | sdes1 |
| Mode: | srtp |
| Protocol: | sdes |

removecrypto is the name of the media-sec-policy for the non-secured side.

Modify Media sec policy

Name:

Pass through:

Options:

| Add | Edit | Delete |
|-----|------|--------|
|-----|------|--------|

Inbound

Profile:

Mode:

Protocol:

Hide egress media update:

Outbound

Profile:

Mode:

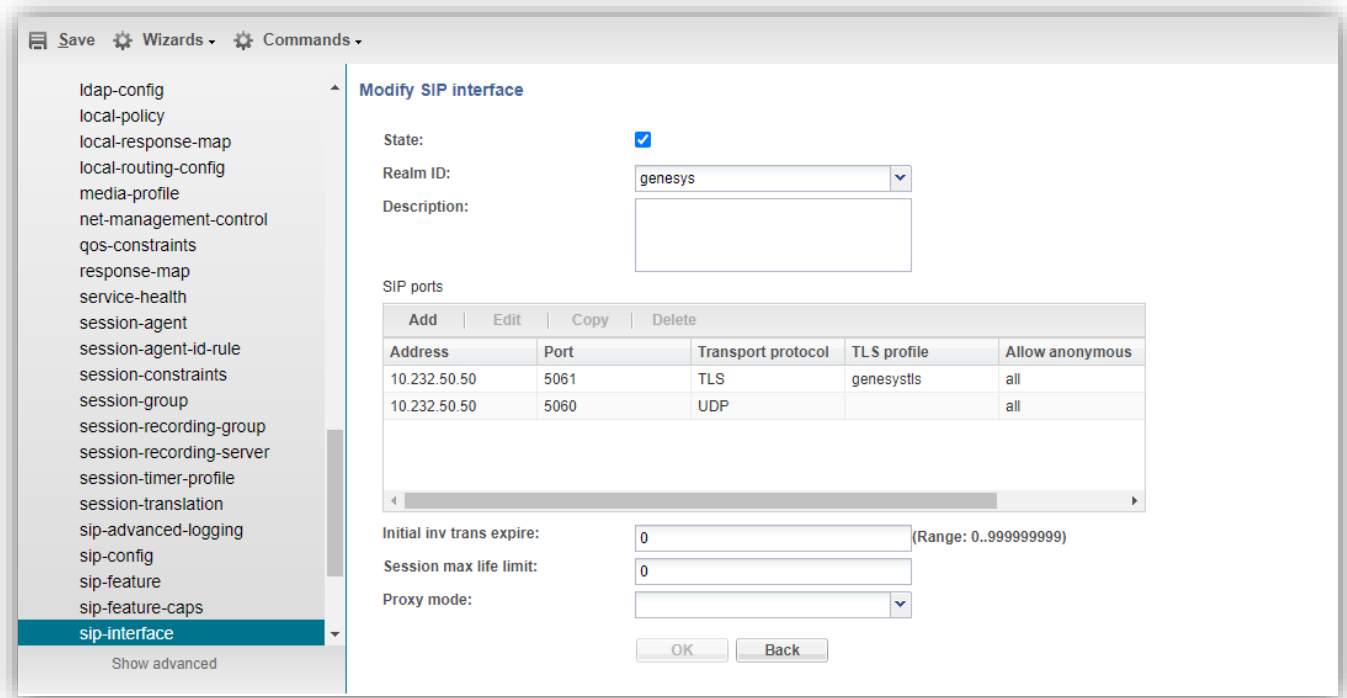
Protocol:

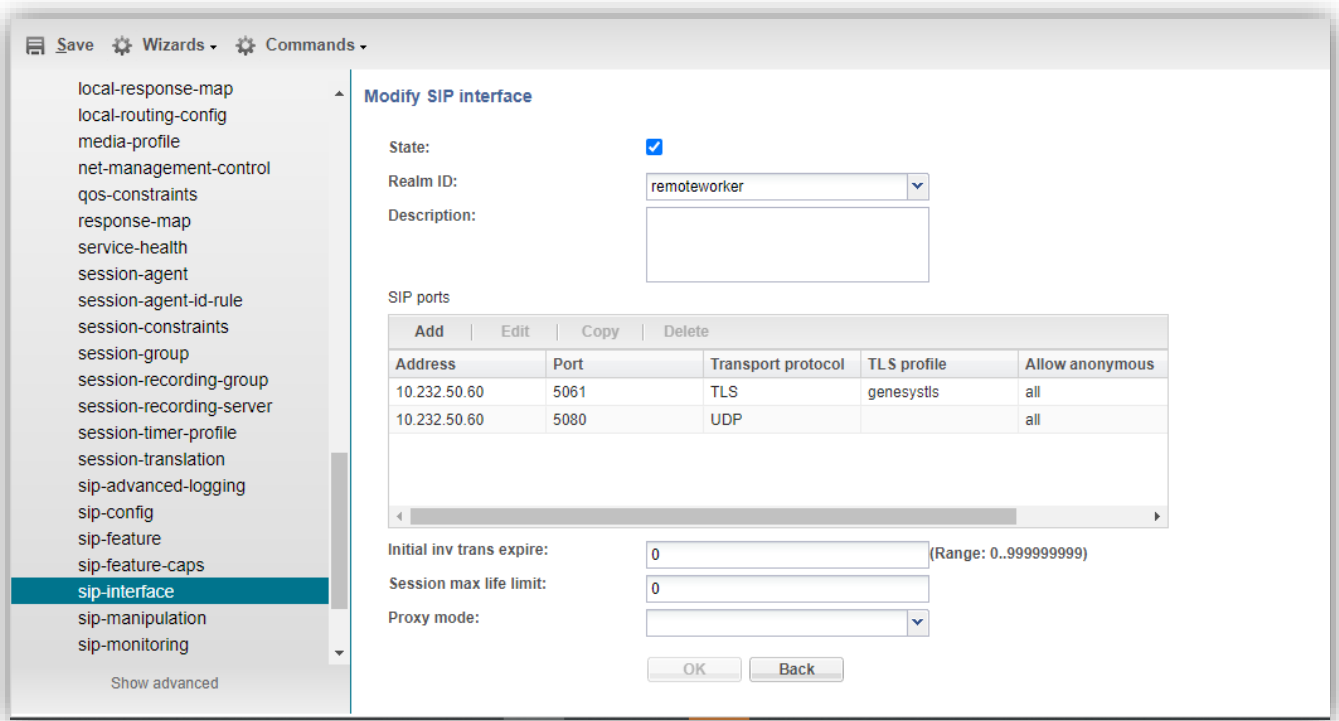
9.3 Changes to SBC configuration.

The following changes are made to the SBC to the SBC configuration objects to incorporate the tls/srtp related parameters functionality.

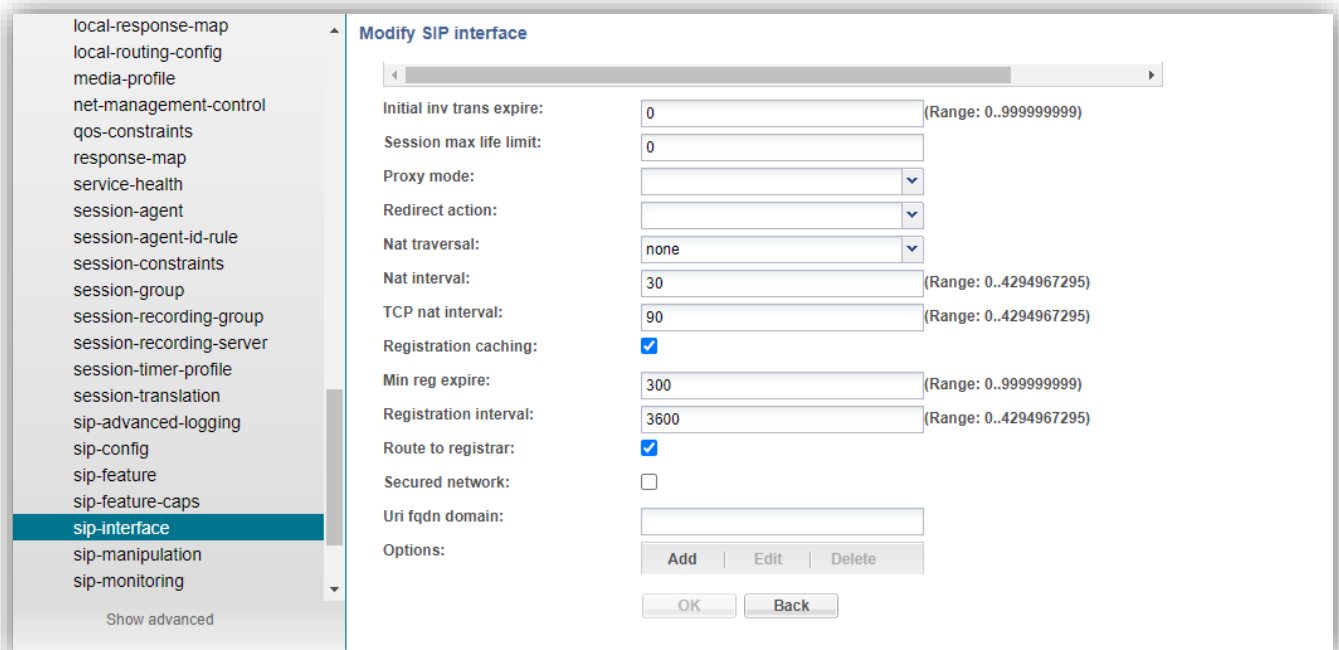
9.31. Change to the sip-interface configuration object

Sip-port '5061' for tls is added on the sip-interfaces facing the Genesys side.



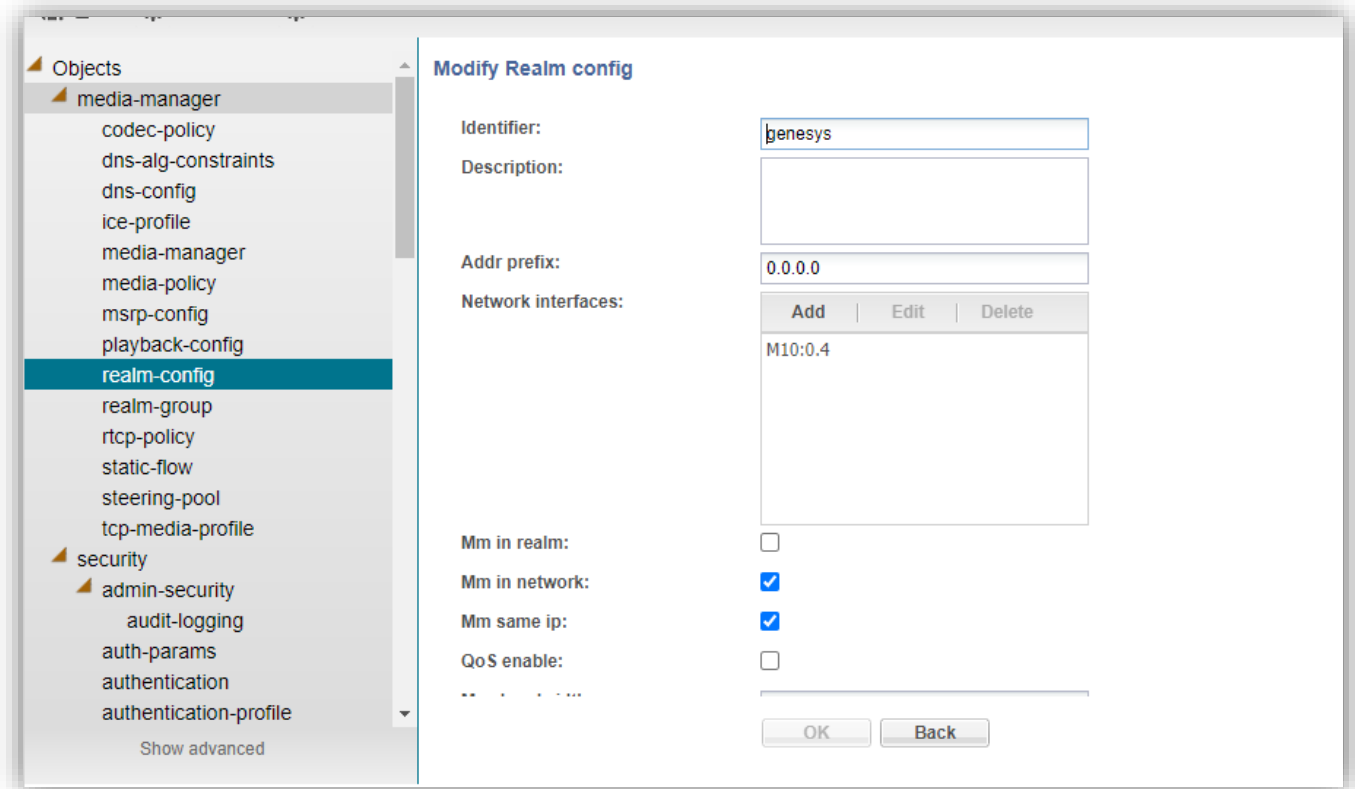


Registration caching must be enabled on the sip-interface associated with realm 'remoteworker'.



9.3.2 Change to the realm-config configuration object

Media-sec-policy **m_{sp}1** is added to the realms facing Genesys side to secure the media towards sip server. The policy is added on realms **genesys** and **remoteworker**.



Objects

- media-manager
 - codec-policy
 - dns-alg-constraints
 - dns-config
 - ice-profile
 - media-manager
 - media-policy
 - msrp-config
 - playback-config
 - realm-config
 - realm-group
 - rtcp-policy
 - static-flow
 - steering-pool
 - tcp-media-profile
- security
 - admin-security
 - audit-logging
 - auth-params
 - authentication
 - authentication-profile

Show advanced

Modify Realm config

Max bandwidth: (Range: 0..999999999)

Max priority bandwidth: (Range: 0..999999999)

Parent realm:

DNS realm:

Media policy:

Media sec policy:

RTCP mux:

Ice profile:

Teams fqdn:

Teams fqdn in uri:

SDP inactive only:

DTLS srtp profile:

Srtp msm passthrough:

Class profile:

In translationid:

Objects

- media-manager
 - codec-policy
 - dns-alg-constraints
 - dns-config
 - ice-profile
 - media-manager
 - media-policy
 - msrp-config
 - playback-config
 - realm-config
 - realm-group
 - rtcp-policy
 - static-flow
 - steering-pool
 - tcp-media-profile
- security
 - admin-security
 - audit-logging
 - auth-params
 - authentication

Modify Realm config

Identifier:

Description:

Addr prefix:

Network interfaces:

Add
Edit
Delete

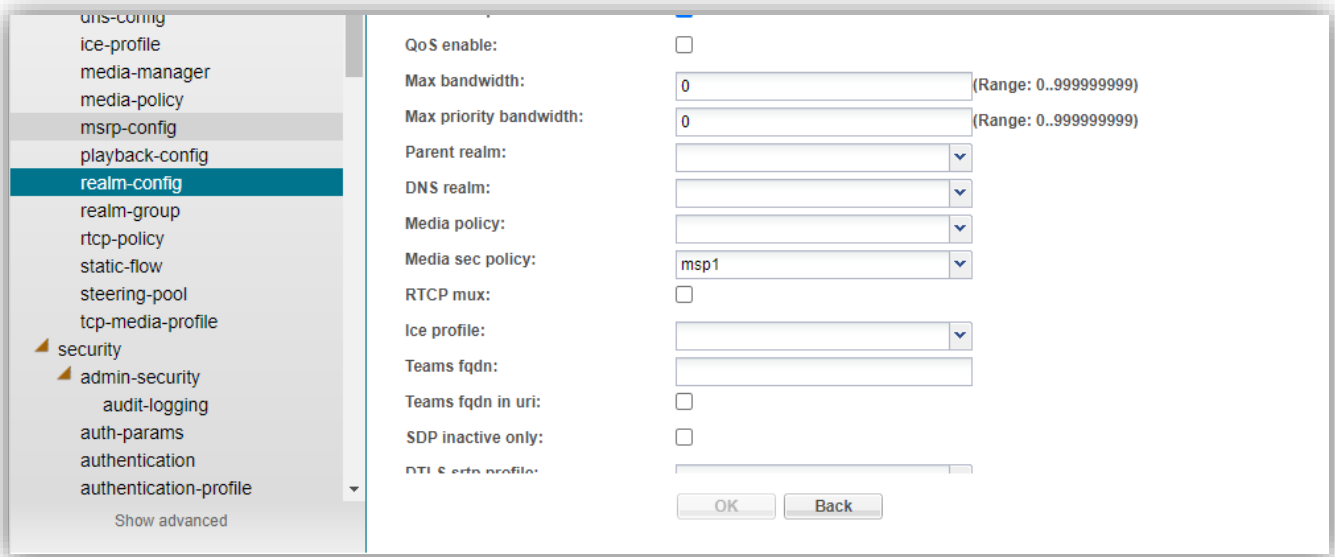
M10:0.4

Mm in realm:

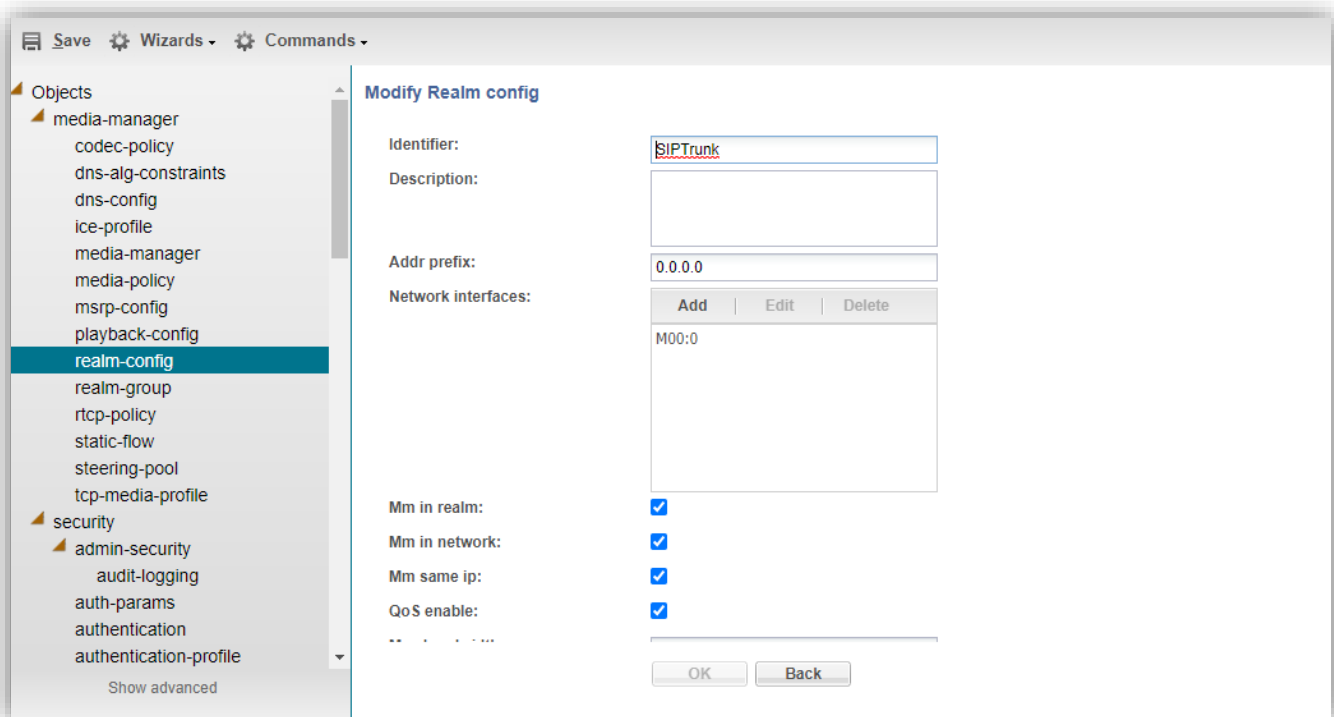
Mm in network:

Mm same ip:

QoS enable:



Media-sec-policy **removecrypto** is added to the realm facing the PSTN side **SIPtrunk** to remove the crypto attributes towards the PSTN side. This change is made because the sip trunk only supports UDP/RTP protocols.



- ▲ Objects
 - ▲ media-manager
 - codec-policy
 - dns-alg-constraints
 - dns-config
 - ice-profile
 - media-manager
 - media-policy
 - msrp-config
 - playback-config
 - realm-config
 - realm-group
 - rtcp-policy
 - static-flow
 - steering-pool
 - tcp-media-profile
 - ▲ security
 - ▲ admin-security
 - audit-logging
 - auth-params
 - authentication
 - authentication-profile
 - Show advanced

Modify Realm config

| | | |
|-------------------------|---|-----------------------|
| min in realm: | <input checked="" type="checkbox"/> | |
| Mm in network: | <input checked="" type="checkbox"/> | |
| Mm same ip: | <input checked="" type="checkbox"/> | |
| QoS enable: | <input checked="" type="checkbox"/> | |
| Max bandwidth: | <input type="text" value="0"/> | (Range: 0..999999999) |
| Max priority bandwidth: | <input type="text" value="0"/> | (Range: 0..999999999) |
| Parent realm: | <input type="text"/> | ▼ |
| DNS realm: | <input type="text"/> | ▼ |
| Media policy: | <input type="text"/> | ▼ |
| Media sec policy: | <input type="text" value="removencrypt"/> | ▼ |
| RTCP mux: | <input type="checkbox"/> | |
| Ice profile: | <input type="text"/> | ▼ |
| Teams fqdn: | <input type="text"/> | |
| Teams fqdn in uri: | <input type="checkbox"/> | |
| SDP inactive only: | <input type="checkbox"/> | |
| DTL Ssrp profile: | <input type="text"/> | |

OK Back

9.3.3 Change to the session-agent configuration object.

The session-agent configured for Genesys sip server is modified to reflect the tls port on the sip server and the transport protocol of tls.

The screenshot shows a management console window with a sidebar on the left containing a tree view of configuration objects. The 'session-agent' object is selected. The main area displays a table titled 'Session agent' with search criteria set to 'All'. The table has columns for Hostname, IP address, Port, State, App protocol, Realm ID, and Description. There are three rows of data.

| Hostname | IP address | Port | State | App protocol | Realm ID | Description |
|--------------|--------------|------|---------|--------------|----------|---------------|
| 172.18.0.124 | 172.18.0.124 | 5069 | enabled | SIP | genesys | Genesys Agent |
| 172.18.0.133 | 172.18.0.133 | 5060 | enabled | SIP | genesys | |
| 68.68.117.67 | 68.68.117.67 | 5060 | enabled | SIP | SIPTrunk | |

The screenshot shows the 'Modify Session agent' configuration form. The sidebar on the left shows the configuration tree with 'session-agent' selected. The form contains several fields for configuration: Hostname, IP address, Port, State, App protocol, App type, Transport method, Realm ID, Egress Realm ID, and Description. Below these fields is a 'Match identifier' section with a table for adding rules.

Hostnames and IP addresses are both set to 172.18.0.124. The Port is 5069. The State is checked. The App protocol is SIP. The Transport method is StaticTLS. The Realm ID is genesys. The Description is Genesys Agent.

| Identifier rule | Match value |
|-----------------|-------------|
|-----------------|-------------|

9.3.4 Local-policy

There is no change made to the local-policy and a local-policy like below is configured to route registrations from realm **remoteworker** to the sip server on realm **genesys**. Alternatively route-to-registrar parameter can also be used on the remoteworker sip-interface to route the register request to sip-server.

Modify Local policy

From address: Add | Edit | Delete
*

To address: Add | Edit | Delete
*

Source realm: Add | Edit | Delete
remoteworker

OK Back

local-policy

Description:

State:

Policy priority:

Policy attributes

| Next hop | Realm | Action | Terminate recursion | Cost |
|--------------|---------|--------|---------------------|------|
| 172.18.0.124 | genesys | none | disabled | 0 |

OK Back



9.5 Genesys side configuration.

The following configuration is required on the Genesys side for the successful implementation.

Note: All the Genesys components of the Lab are running on Windows Server 2012. The steps differ when the Genesys applications are running on Unix based systems. For the purpose of App note we have provided steps required to be configured for Windows based Genesys application. These steps may vary depending upon your implementation type and changes should be made accordingly to your setup. Steps below are for the use of simple TLS and additional steps need to be configured if mutual authentication is required.

9.5.1 Prerequisites.

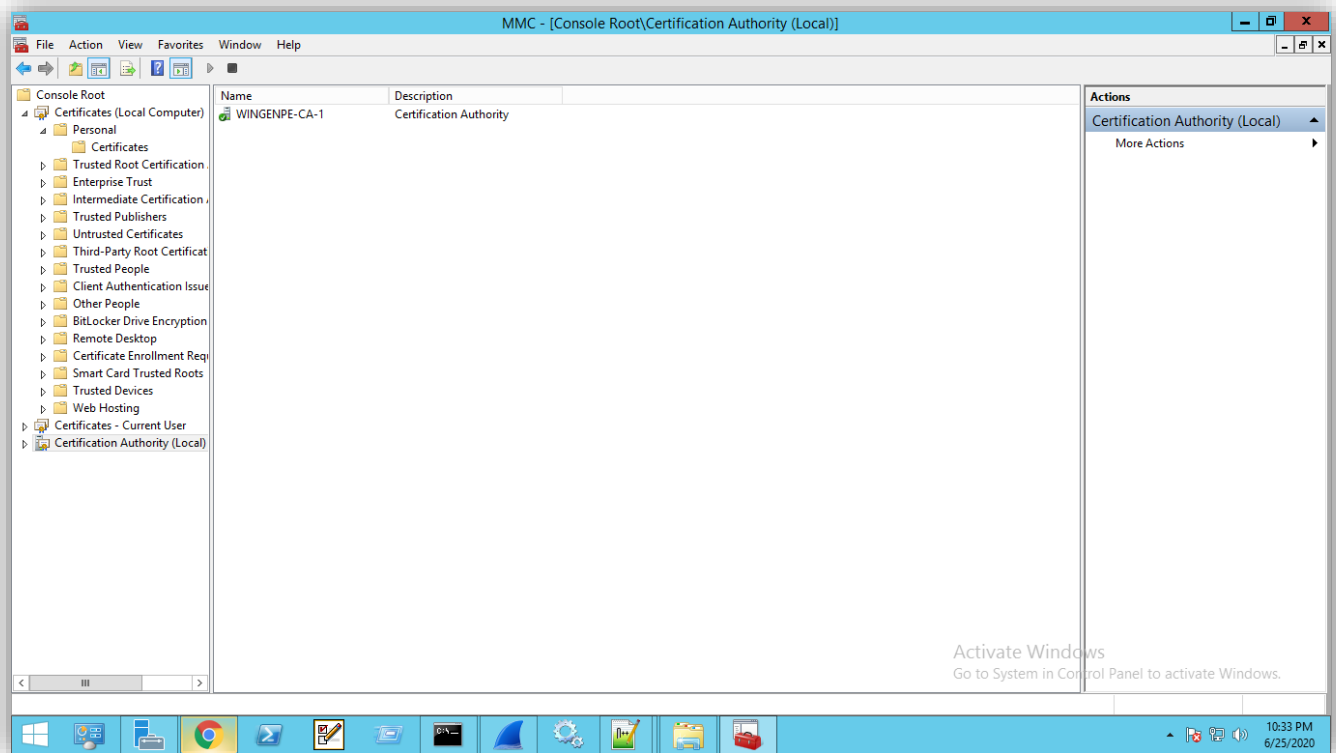
Before starting to configure your secure connections with TLS, you must have done the following:

Generated certificates, with associated private and public keys, and CRLs. Made certificates available for applications on hosts.

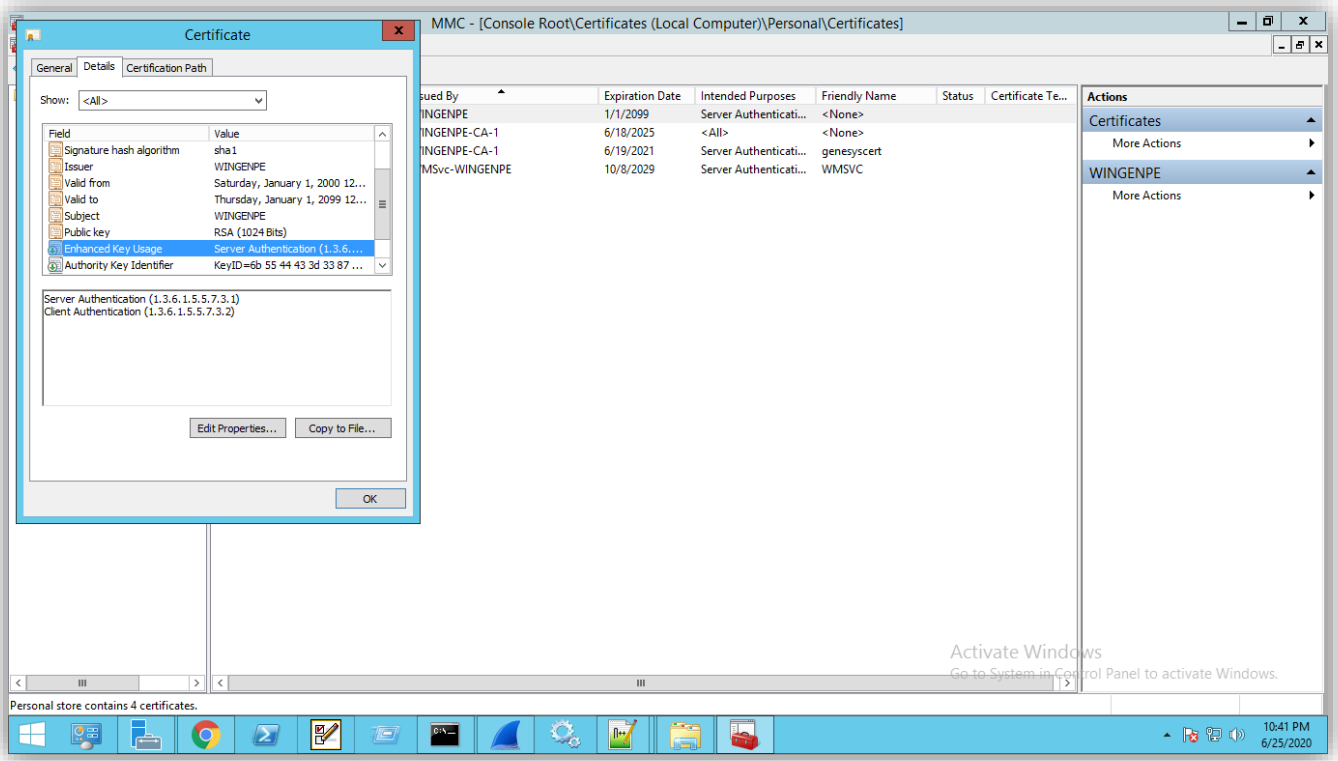
TLS certificates must be generated and installed appropriately on any host that runs Genesys applications that utilize TLS secure connections. A certificate is generated and signed using a certification authority (CA) entity, which is able and authorized to issue certificates signed with its own name.

9.5.2 Generate Certificate

Generate a certificate on a computer that is running the Windows Server operating system, and has Windows Certificate Services installed and configured. Configure your Windows Server to act as a certificate authority.



- Open a web browser, and enter the following URL:
http://<server-name>/certsrv
where <server-name> is the server that runs the Windows Server operating system, and on which Windows Certificate Services is installed and configured.
- On the Microsoft Certificate Services Welcome page, click Request a certificate.
- On the Request a Certificate page, click Advanced certificate request.
- Create a certificate signing request and submit the request to CA for approval. Make sure to include the following extended key attributes on your certificate request.
(Client Authentication and Server Authentication)



- After you submit the certificate request, the confirmation page appears, followed by the Certificate Issued page.
- On the Certificate Issued page, click Install this certificate.

9.5.3 Genesys sip server configuration.

The figure below illustrates the tls related configurations performed on the Genesys sip server.

sip-port-tls is the tls port configured for the Genesys Sip Server. We have used port 5069 for the tls communication.

sip-tls-cert – is the thumbprint of the certificate which is created for the use of tls on sip server. Since we are using simple TLS, **sip-tls-mutual** is set to false.

Microsoft Active Directory Certifi... Genesys Administrator, Server: w... +

← → ↻ Not secure | wingenpe/wcm/default.aspx#genadmin=navhist%3AmenuID%3DMENU_CONF_ENV_APPS_PROPERTY%26PTenantDBID%3D1%26OwnerDBID%3D1%26OwnerType...

Genesys Genesys Administrator Tenant: Environment New Window Log out

MONITORING PROVISIONING OPERATIONS

PROVISIONING > Environment > Applications > SIPServer

SIPServer - Started - Primary - \Applications\

Navigation Search Environment Alarm Conditions Scripts Application Templates Applications Hosts Solutions Time Zones Business Units/Sites Tenants Table Access Points Formats Fields Switching Routing/eServices Desktop Accounts Voice Platform Outbound Contact

Configuration Options Permissions Dependencies Alarms Logs

New Delete Export Import View: Advanced View (Options)

| Name | Section | Option | Value |
|-----------------------------------|---------|---------------------------|---|
| Filter | Filter | Filter | Filter |
| TServer (8 Items) | | | |
| TServer/sip-port-tls | TServer | sip-port-tls | 5069 |
| TServer/sip-tls-cert | TServer | sip-tls-cert | fa d8 e5 11 dd 74 f4 4c 96 7d d1 2a e3 3f 29 95 dd 32 82 0a |
| TServer/sip-tls-cert-key | TServer | sip-tls-cert-key | |
| TServer/sip-tls-cipher-list | TServer | sip-tls-cipher-list | |
| TServer/sip-tls-crt | TServer | sip-tls-crt | |
| TServer/sip-tls-mutual | TServer | sip-tls-mutual | false |
| TServer/sip-tls-target-name-check | TServer | sip-tls-target-name-check | no |
| TServer/sip-tls-trusted-ca | TServer | sip-tls-trusted-ca | |

Page 1 of 1

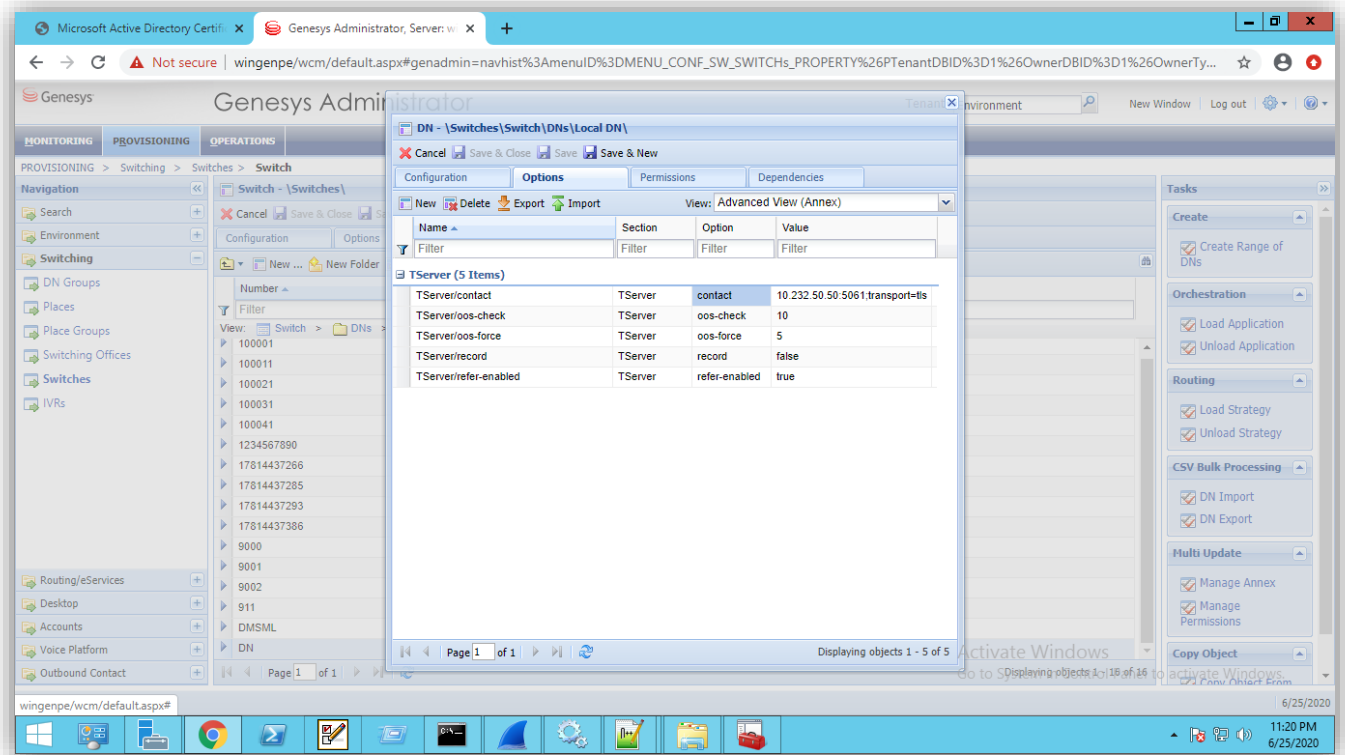
Activate Windows Go to System in Control Panel to activate Windows. Displaying objects 1 - 8 of 8

Ready 6/25/2020 10:47 PM 6/25/2020

9.5.4 Trunk configuration

On the SBC trunk the following options is modified for the use of tls on Sip server.

[TServer]/contact = <SBC-IP>:<tls_sip_port_of_SBC>;transport=tls



9.5.5 SRTP between Agent and SBC

From the SIP Server perspective there is no configuration required for SRTP for secured media to work. SRTP is negotiated like any other media is negotiated with other party you will be interfacing with.

So in this scenario SBC performs the SRTP SDP negotiation with the B party and secured media is sent based on negotiated information. SIP server only relays the information to the Agent

10.Caveats

Oracle SBC does not support CPD Call Progress Detection, The functionality is available on the Genesys SIP server where Media Server (Genesys) detects the CPD and sends the result to SIP Server.



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Integrated Cloud Applications & Platform Services

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