Oracle SBC with NICE Systems Recorder with Zoom and Genesys Environment

Technical Application Note

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Revision History

Version	Description of Changes	Date Revision Completed
1.0	Oracle SBC with NICE Systems Recorder with Zoom and Genesys Environment	31st August 2020
1.1	App note updated with minor changes (Removed Caveat section as the bug fix is working now)	31st March 2021

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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 Nice Recording Server Environment.

2. Document Overview

This document is intended for use as a guide for a successful integration of both NICE Systems Recorder and Oracle Communications Session Border Controller. It outlines the architecture design, Oracle SBC configuration, as well as test cases executed as part of the interoperability testing.

This document is divided into two sections where the first section covers the interop testing of Oracle SBC with Nice recorder in Zoom Environment and the second section covers the interop testing of Oracle SBC with Nice recorder in Genesys Environment. In both these scenarios, Teams side is used as common side to call zoom and Genesys and the calls are recorded using Nice Recorder.

The SBC supports the SIP Recording (SIPREC) standard as per RFC 6341 which is used for recording the call and sending the recorded stream to the NICE recorders. The SIPREC protocol is the protocol used to interact between a Session Recording Client (SRC - the role performed by Oracle SBC) and a Session Recording Server (SRS- Nice recorder).

NICE Interaction Management can record multiple media— digital and analog—in TDM, voice over IP (VoIP), session initiation protocol (SIP)-based and hybrid environments. The Nice Interactions Center receives the call status, monitors call events, and stores them in its databases for other system functions such as queries, reports, etc. and uses them when interaction-based recordings are implemented to determine whether to record a call.

The below componenets are part of Nice Recording solution:

NICE VoIP Logger: A Logger was setup for Active Recording and is used in an Active VoIP Recording environment. The NICE VoIP recording solution enables customers to effectively capture, evaluate, analyze and improve multimedia interactions taking place on an IP network. Once the VoIP audio is recorded, it can be saved, archived, queried, and played back as easily as analog or digital recorded audio.

Voice Recording SIP Proxy (VRSP): The VRSP functions as a SIP Proxy. It is used to set up SIP-based calls between the SBC and the NICE VoIP Logger. It is recommended to deploy VRSP redundancy in order to guarantee recording.

Please note that the IP address, FQDN, config name and its details given in this document is used as reference purpose only. The same details cannot be used in customer config and the end users 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 Oracle SBC to interop with the NICE Recorder, Zoom Server and Genesys Server for this testing. There will be steps that require navigating Oracle SBC GUI interface, understanding the basic concepts of TCP/UDP, IP/Routing, DNS server and SIP/RTP are also necessary to complete the configuration and for troubleshooting, if necessary.

3.2. Requirements

- Fully functioning Nice Recording Server.
- Oracle Enterprise Session Border Controller (hereafter Oracle SBC) running 8.3.0 version
- Genesys SIP server
- Zoom admin portal and client.

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

Oracle SBC with Nice Recorder in Zoom Environment:

Software Used	Nice Version	SBC Version	Zoom Client version
Revision 1	6.15	8.3.0	5.2.0

Oracle SBC with Nice Recorder in Genesys Environment:

Software Used	Nice Version	SBC Version	Genesys SIP Server
Revision 1	6.15	8.3.0	8.1

In Scope:

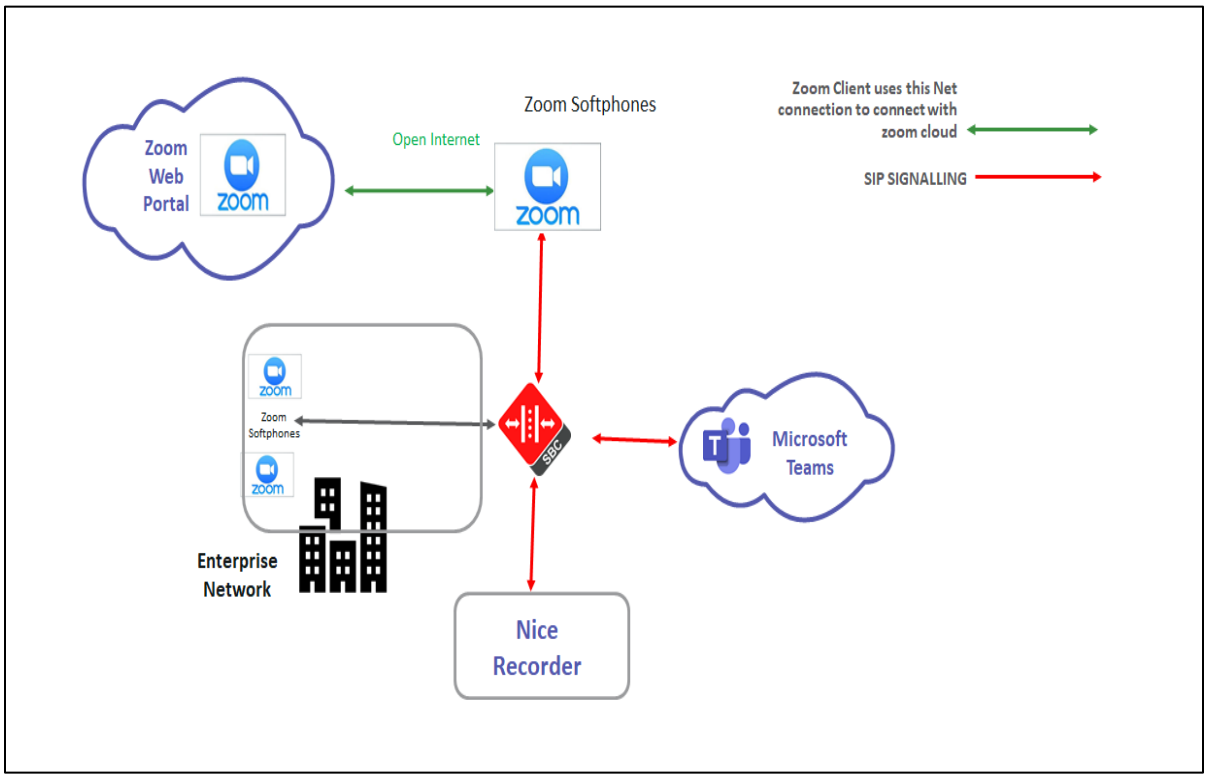
The following step-by-step guide configuring the Oracle SBC focus on the testing performed between Oracle SBC and Nice Recorder. The test cases focuses on recordings done with Zoom server and Genesys SIP server using Nice recorder.

Out of Scope:

- Configuration of Network management including SNMP and RADIUS
- Complete configuration of the Zoom side, Teams Side, Genesys Server side and the NICE recorder.

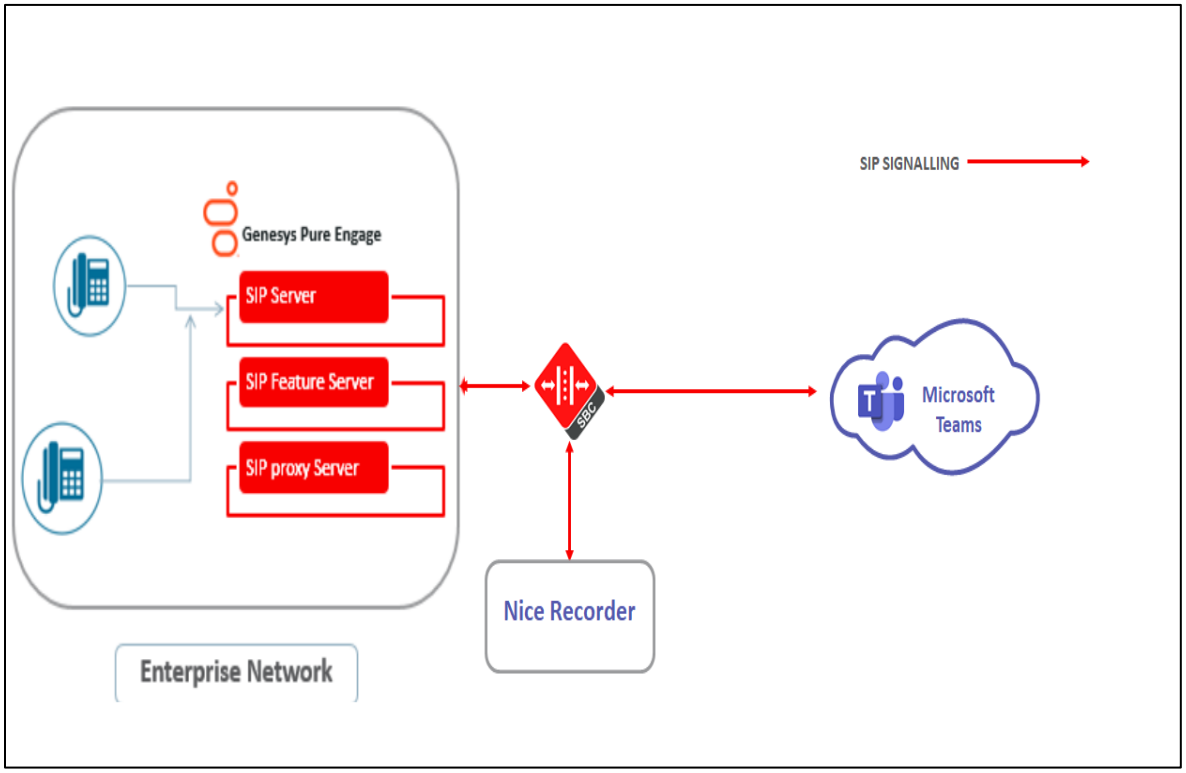
4. Configuring Oracle SBC with NICE Recorder for Zoom and Genesys Environment

4.1. Network Architecture for Zoom Side



As shown in the network diagram, the Oracle SBC is connected as an edge component in Zoom environment. For the purpose of this interop testing, the calls are made from Teams side to Zoom side and vice versa through the Oracle Communications SBC. The recording will be made in Zoom side and will be verified as part of this testing.

4.2. Network Architecture for Genesys Side



As shown in the network diagram, the SBC is connected as an edge component in a Genesys enterprise environment. The core side of the Enterprise consists of Genesys SIP server and two phones registered to it. For the purpose of this interop testing, the calls are made from Teams side to the Genesys side and vice versa through the Oracle Communications SBC. The recording will be made in Genesys side and will be verified as part of this testing.

The calls are recorded by a NICE recorder which is added to the SBC configuration using session-recording-server and session- recording-group. The session recorders are defined in the session-recording-group. Another field with reference to call recording in the realm-config is the session-recording-required. If session-recording-required = enabled, then the calls between the two parties will not go through unless the session recorder is ready and available to record. As a pre-requisite, we also configure SBC to send OPTIONS to Nice Server and it should be responded by the NICE recorder.

4.3. Validated Oracle SBC version

Oracle conducted tests with Oracle SBC 8.3 software – this software with the configuration listed below can run on any of the following products:

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

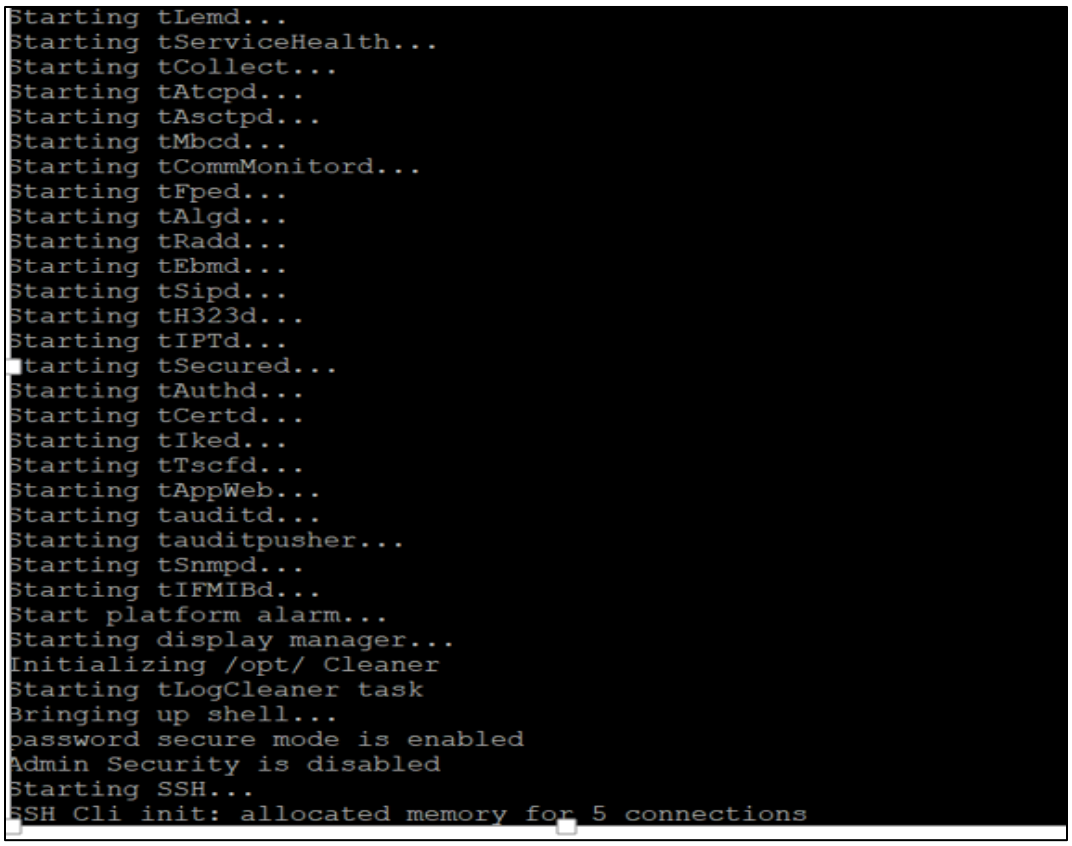
4.4. New SBC Configuration

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

4.5. 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.

```
Password:
%
% Only alphabetic (upper or lower case), numeric and punctuation
% characters are allowed in the password.
% Password must be 8 - 64 characters,
% and have 3 of the 4 following character classes :
%      - lower case alpha
%      - upper case alpha
%      - numerals
%      - punctuation
%
Enter New Password:
Confirm New Password:

Password is acceptable.
```

Now set the management IP of the SBC by setting the IP address in bootparam to access bootparam. Go to Configure terminal->bootparam.

Note: There is no management IP configured by default.

```
NN3900-101# conf t
NN3900-101(configure)# bootparam

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

Boot File               : /boot/nnSCZ830m1p2.bz
IP Address              : 172.18.255.101
VLAN                    : 0
Netmask                 : 255.255.0.0
Gateway                 : 172.18.0.1
IPv6 Address            :
IPv6 Gateway            :
Host IP                 :
FTP username            : vxftp
FTP password            : vxftp
Flags                   :
Target Name             : NN3900-101
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: 20)

NN3900-101(configure)#
```

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

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

```
NN3900-101# setup product

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

Last Modified 2019-06-04 11:51:56
----------------------------------------------------------------
 1 : Product       : Enterprise Session Border Controller

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

Enable the features for the ESBC using the setup entitlements command as shown

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->web-server-config.

Enable the web-server-config to access the SBC using Web GUI. Save and activate the config.

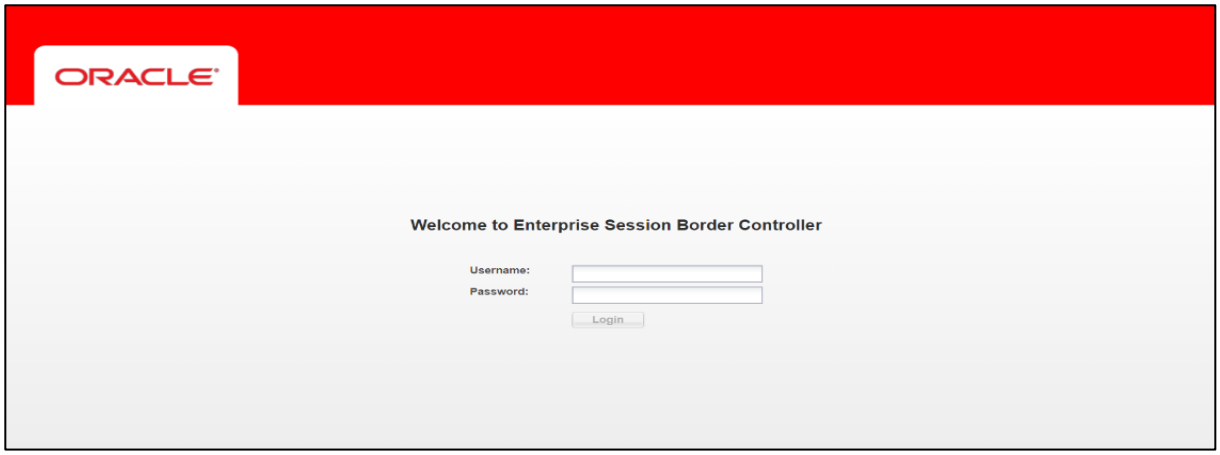
```
NN3900-101(web-server-config)# state enabled
NN3900-101(web-server-config)# done
web-server-config
        state                                   enabled
        inactivity-timeout                      5
        http-state                              enabled
        http-port                               80
        https-state                             disabled
        https-port                              443
        http-interface-list                     GUI
        tls-profile
        last-modified-by                        admin@172.18.0.130
        last-modified-date                      2020-02-20 02:46:51

**NN3900-101(web-server-config)# exit
**NN3900-101(system)# save
**NN3900-101(system)# exit
**NN3900-101(configure)# exit
**NN3900-101# save-config
checking configuration
-------------------------------------------------------------------------------
Results of config verification:
   4 configuration warnings
Run 'verify-config' for more details
-------------------------------------------------------------------------------
Save-Config received, processing.
waiting for request to finish
Request to 'SAVE-CONFIG' has Finished,
Save complete
Currently active and saved configurations do not match!
To sync & activate, run 'activate-config' or 'reboot activate'.
*NN3900-101# activate-config
Activate-Config received, processing.
waiting for request to finish
Request to 'ACTIVATE-CONFIG' has Finished,
Activate Complete
```

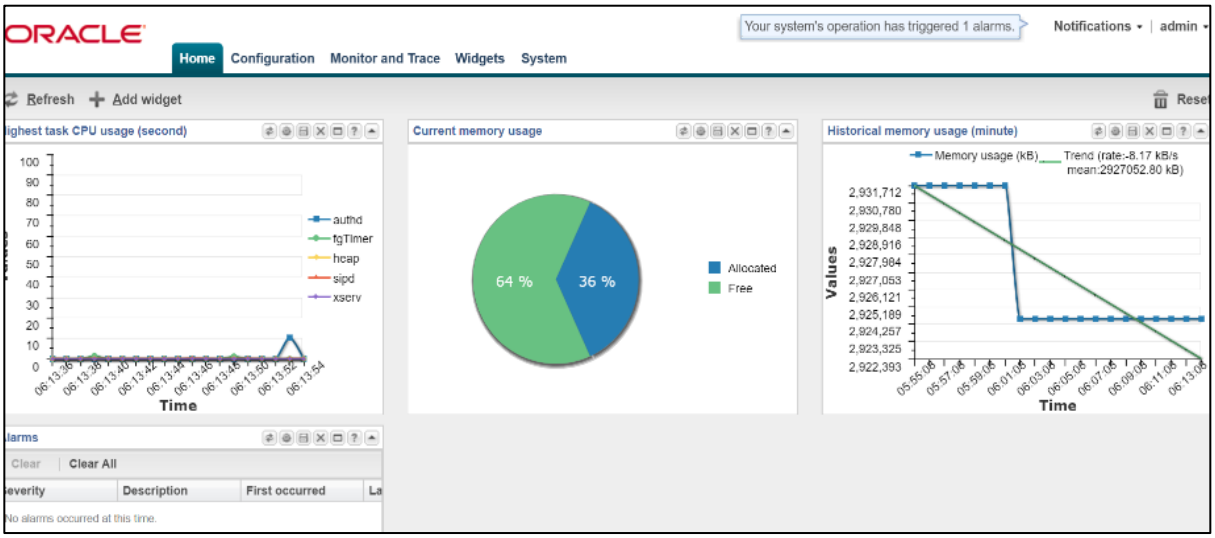
4.6. Configure SBC using Web GUI

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

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

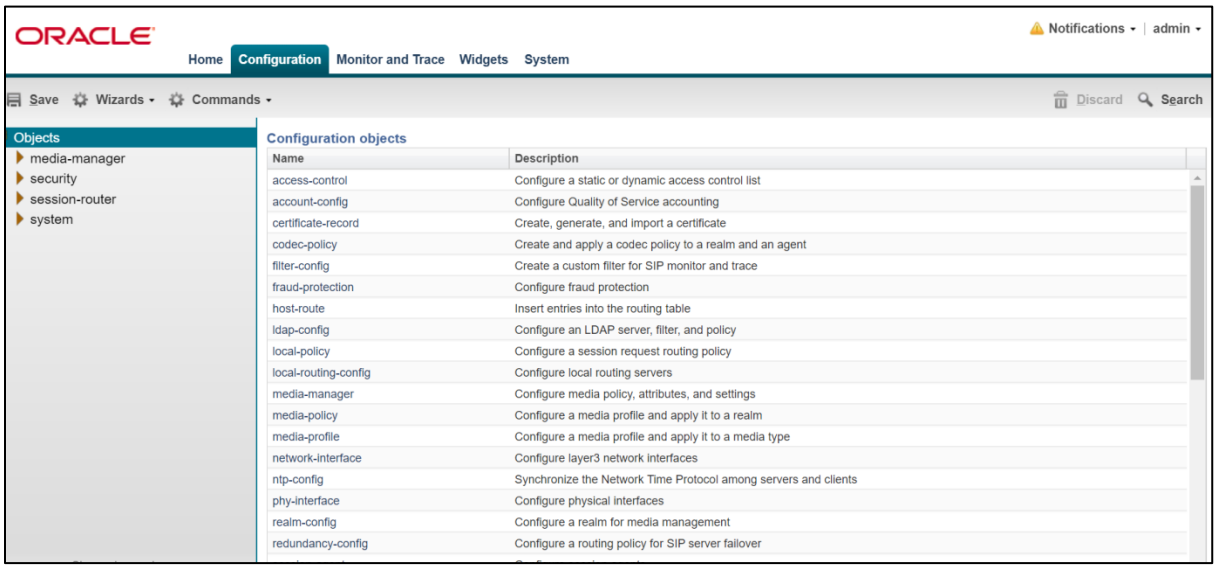


The username and password is the same as that of CLI.



Go to

Configuration as shown below, to configure the SBC.



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

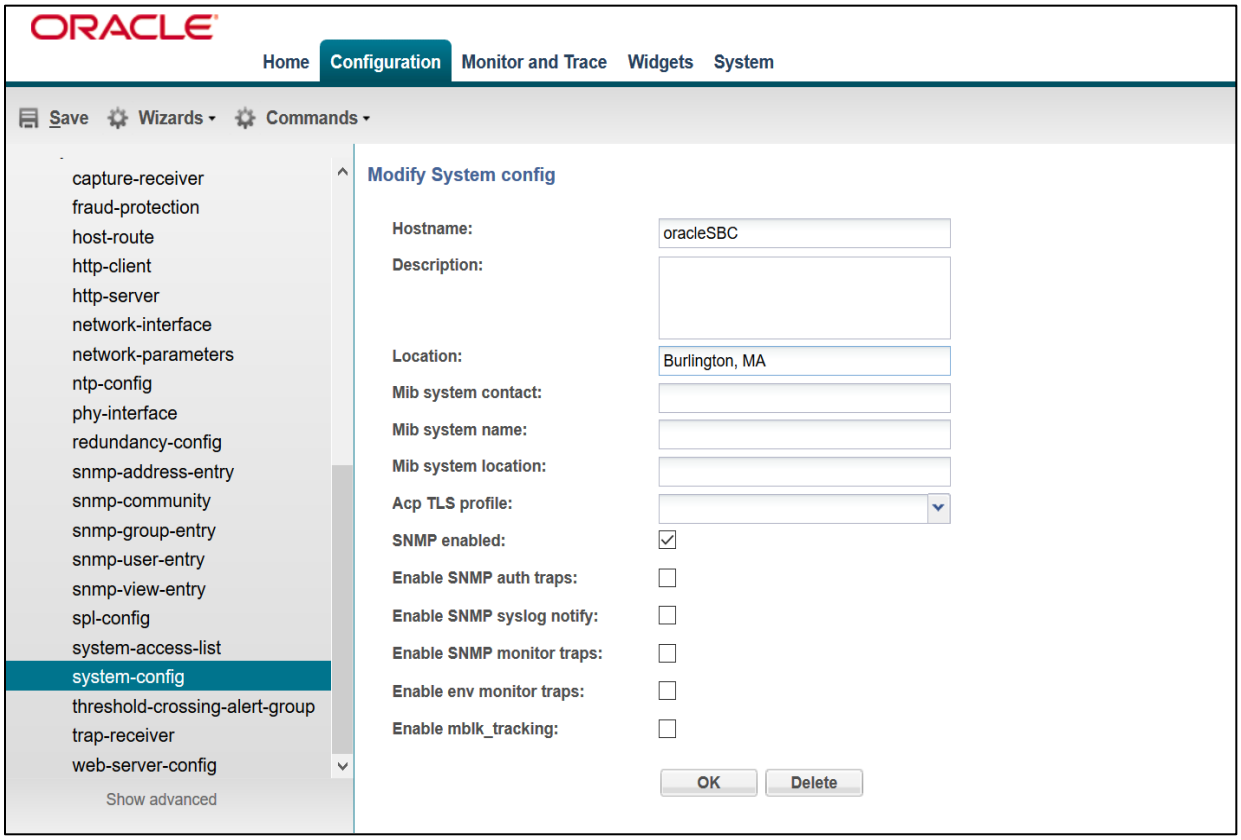
https://docs.oracle.com/cd/F13782_01/doc/esbc_scz830_webgui.pdf

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.

4.7. Configure system-config

Go to system->system-config



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

https://docs.oracle.com/cd/F13782_01/doc/esbc_scz830_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.

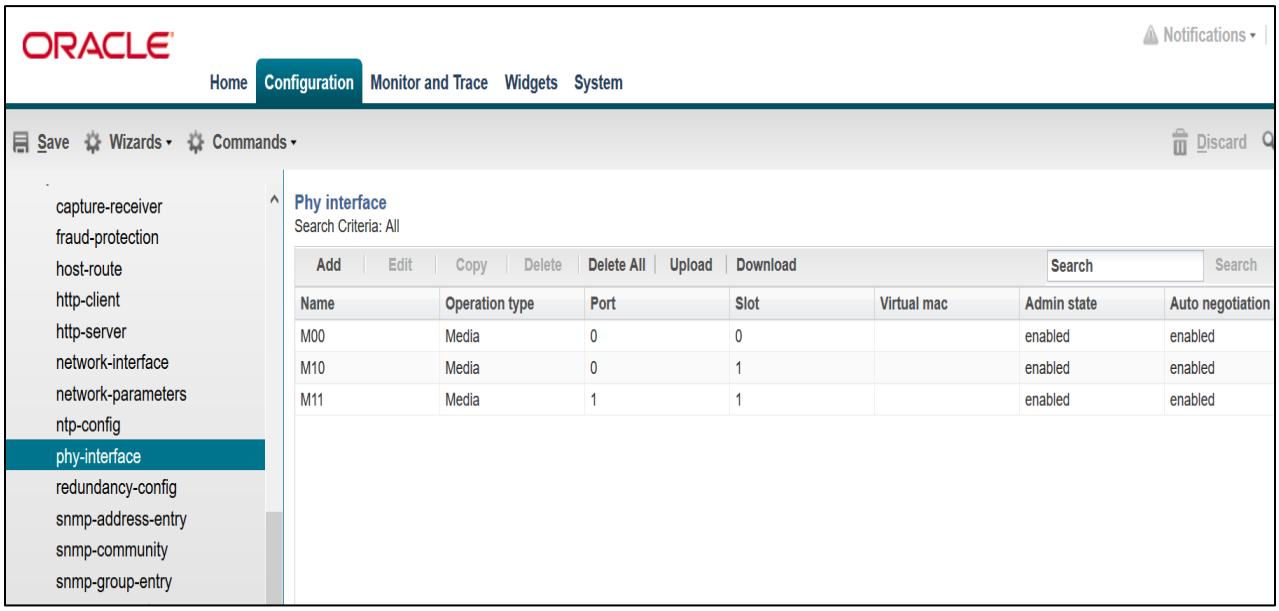
4.8. Configure Physical Interface values

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

We will create the physical interface as given below for our testing.
You will first configure the slot 0, port 0 interface designated with the name M00.
We also create slot M10 and M11 after that.

The below table lists the phy-interface created.

Parameter Name	M00	M10	M11
Slot	0	0	1
Port	0	1	1
Operation Mode	Media	Media	Media

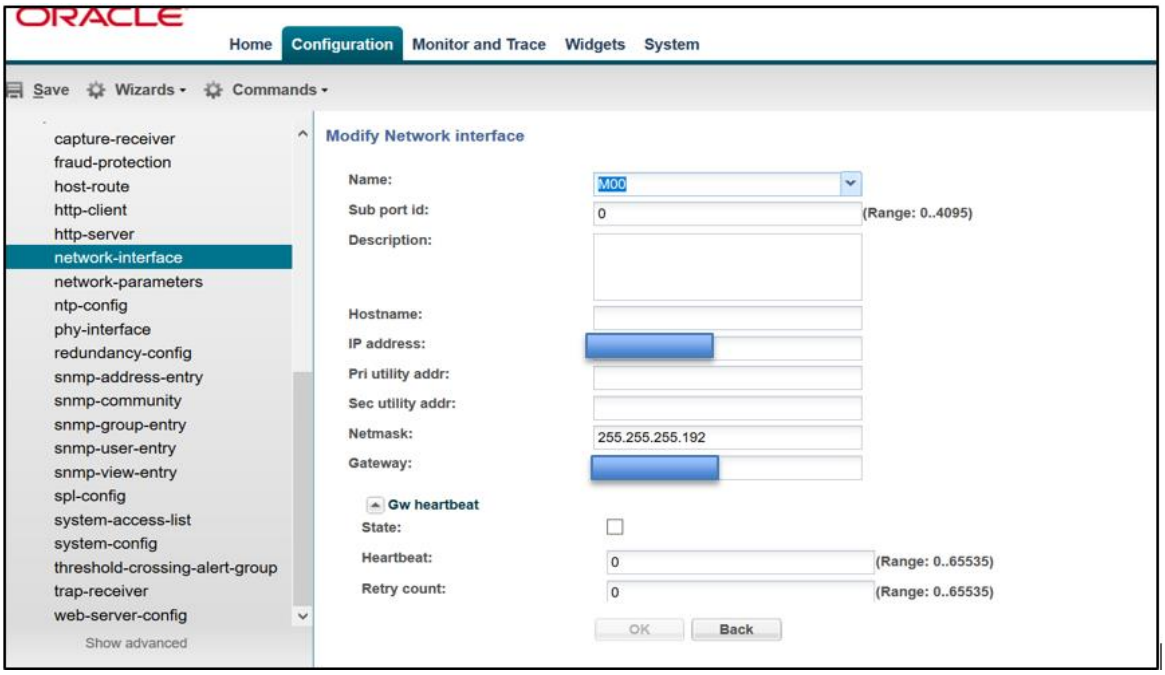


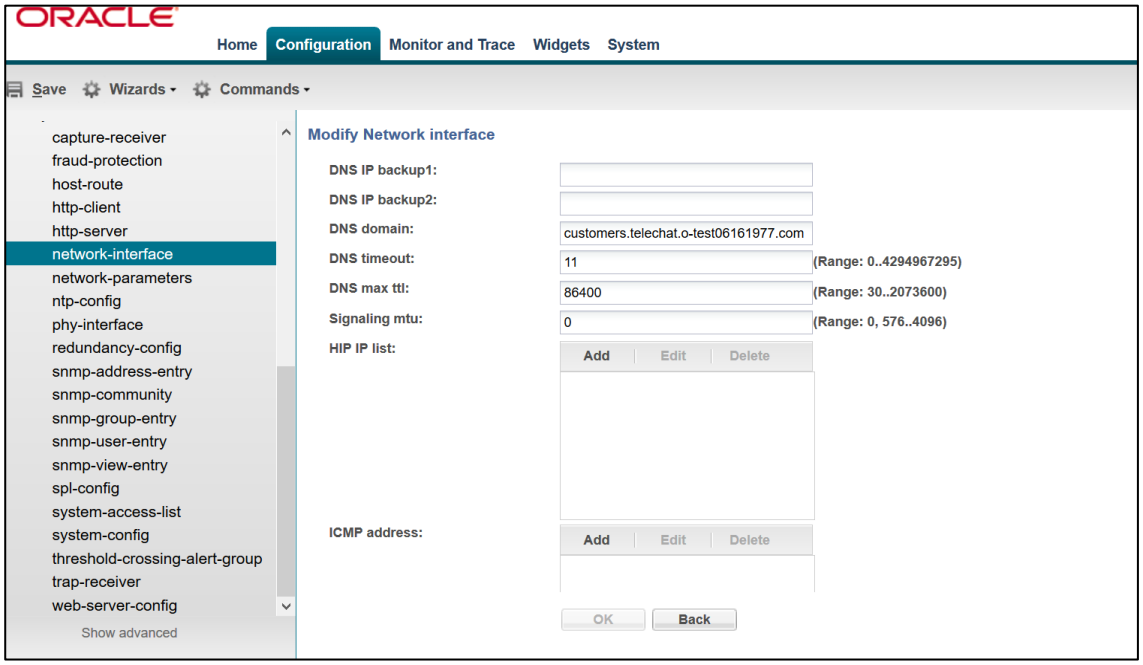
4.9. Configure Network Interface values

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

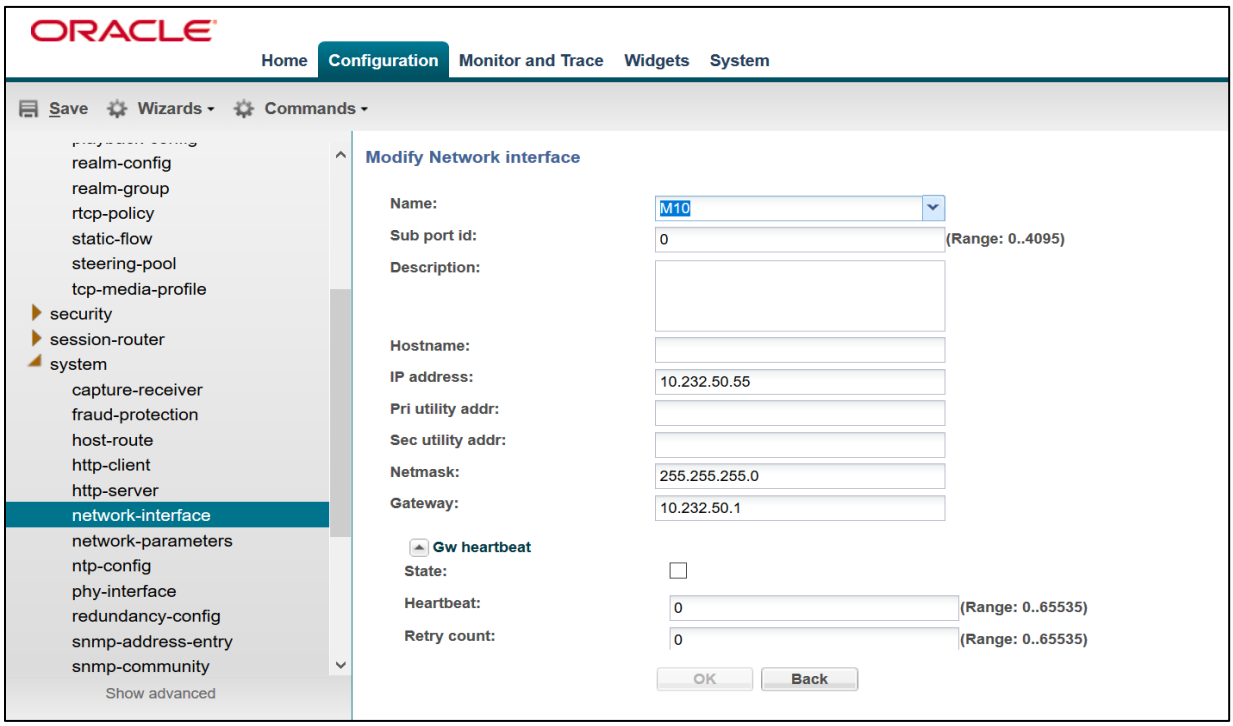
The public network interface is used for Teams and Zoom which is M00 interface.
The Genesys uses the network interface M10.
The network interface used for Nice Call Recording is M11.

Teams side and Zoom side

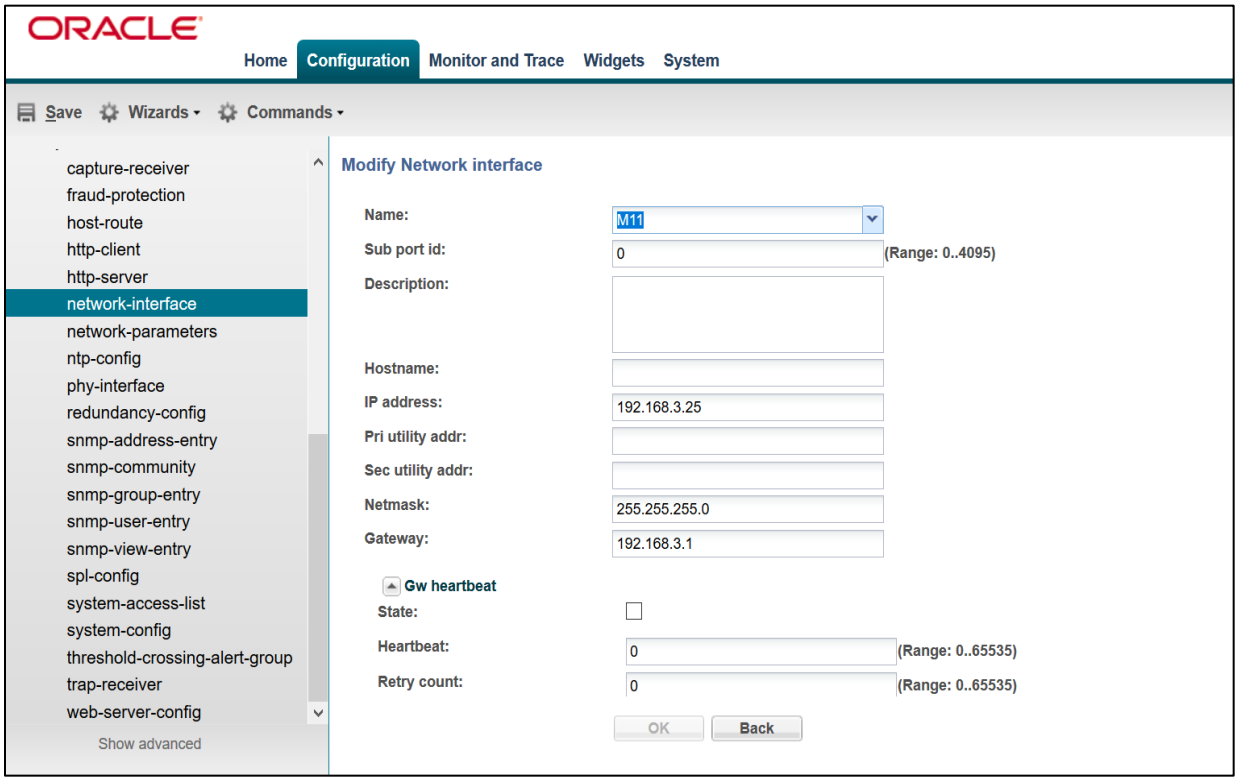




Genesys Side



Nice Side

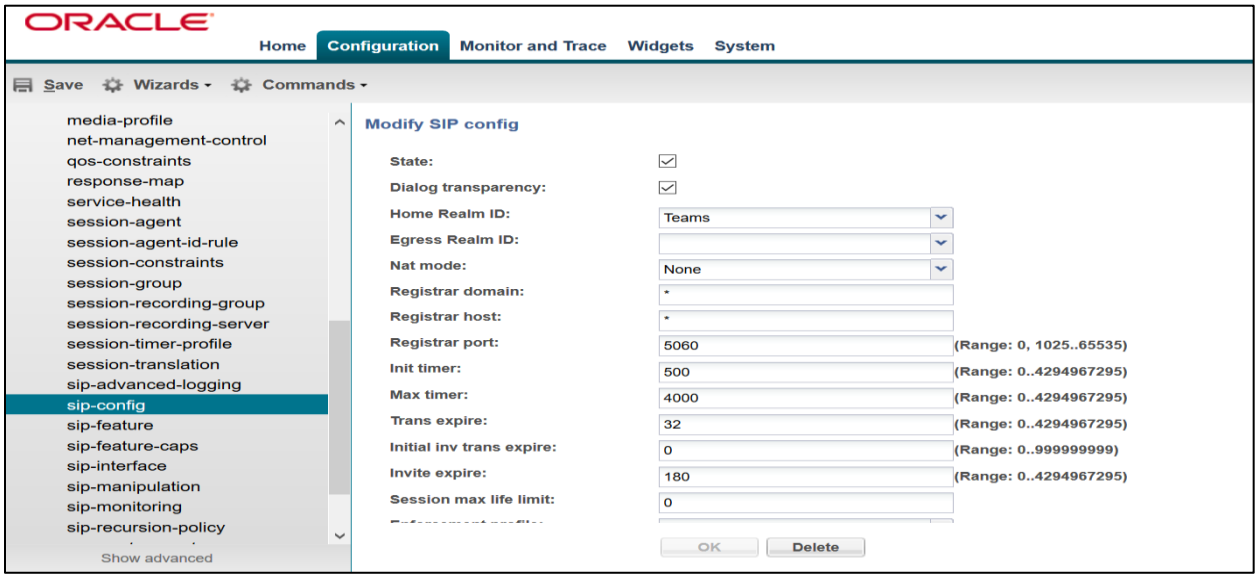


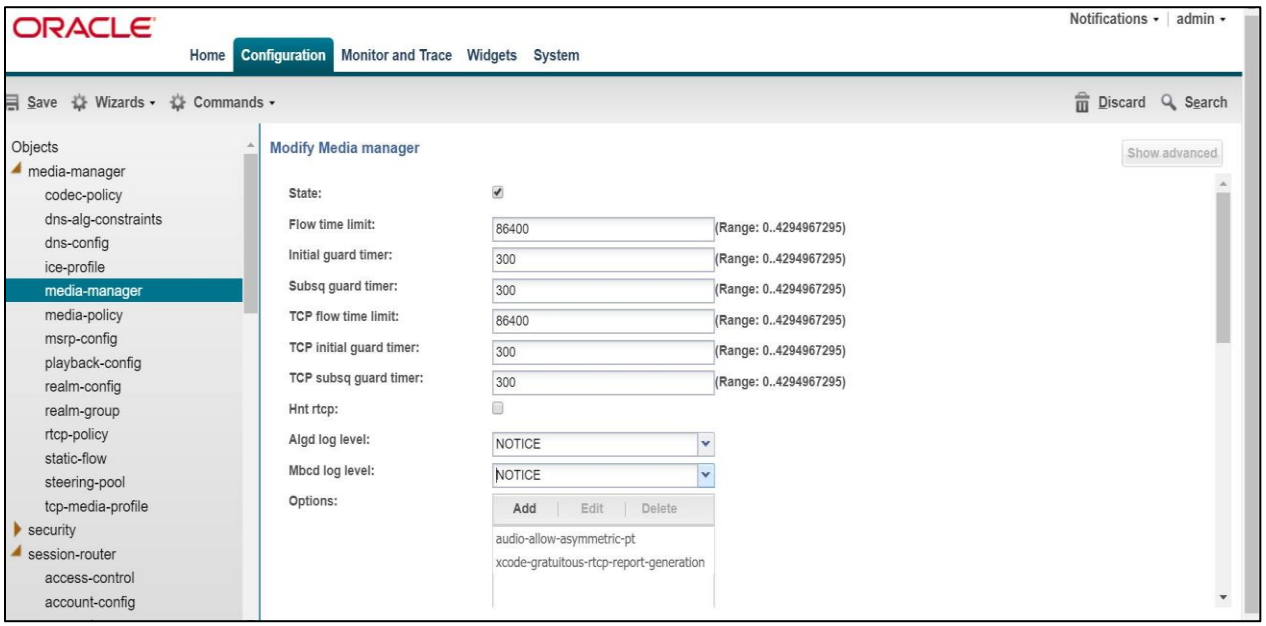
4.10. Enable media manager

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.

audio-allow-assymetric-pt
xcode-gratuitous-rtcp-report-generation

Go to Media-Manager->Media-Manager

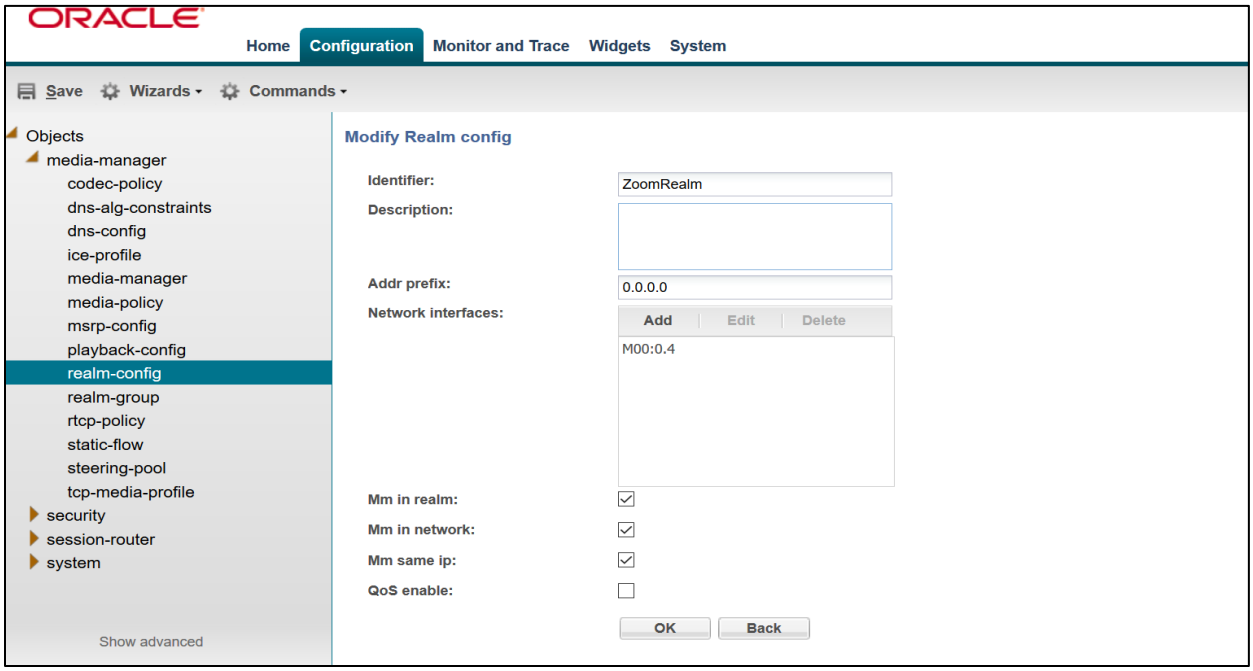




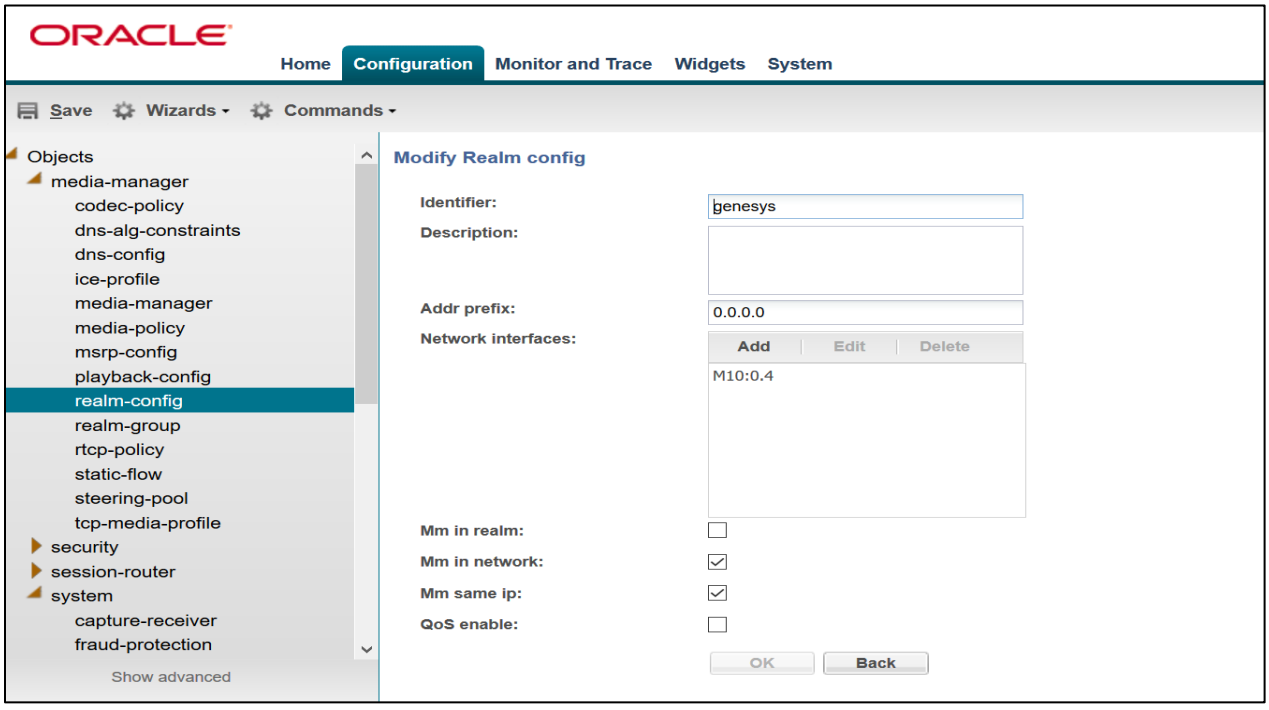
4.11. Configure Realms

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.

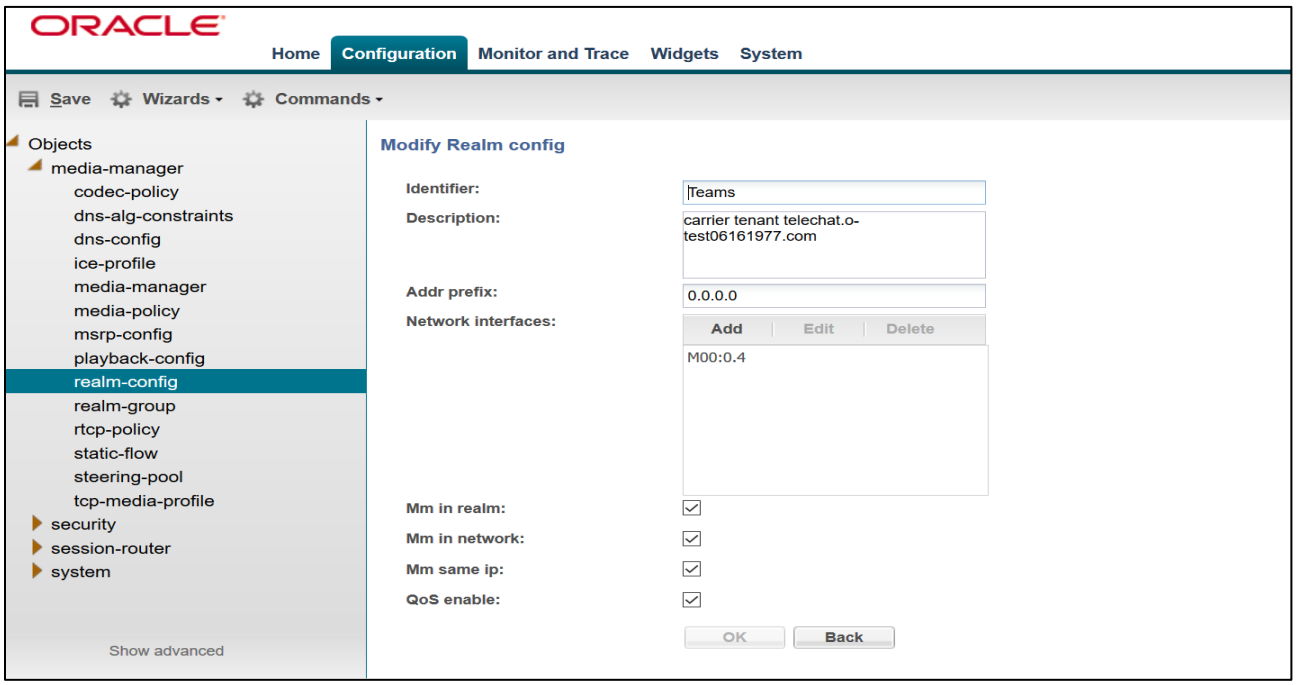
In the below scenarios, Realm name is given as ZoomRealm for Zoom side



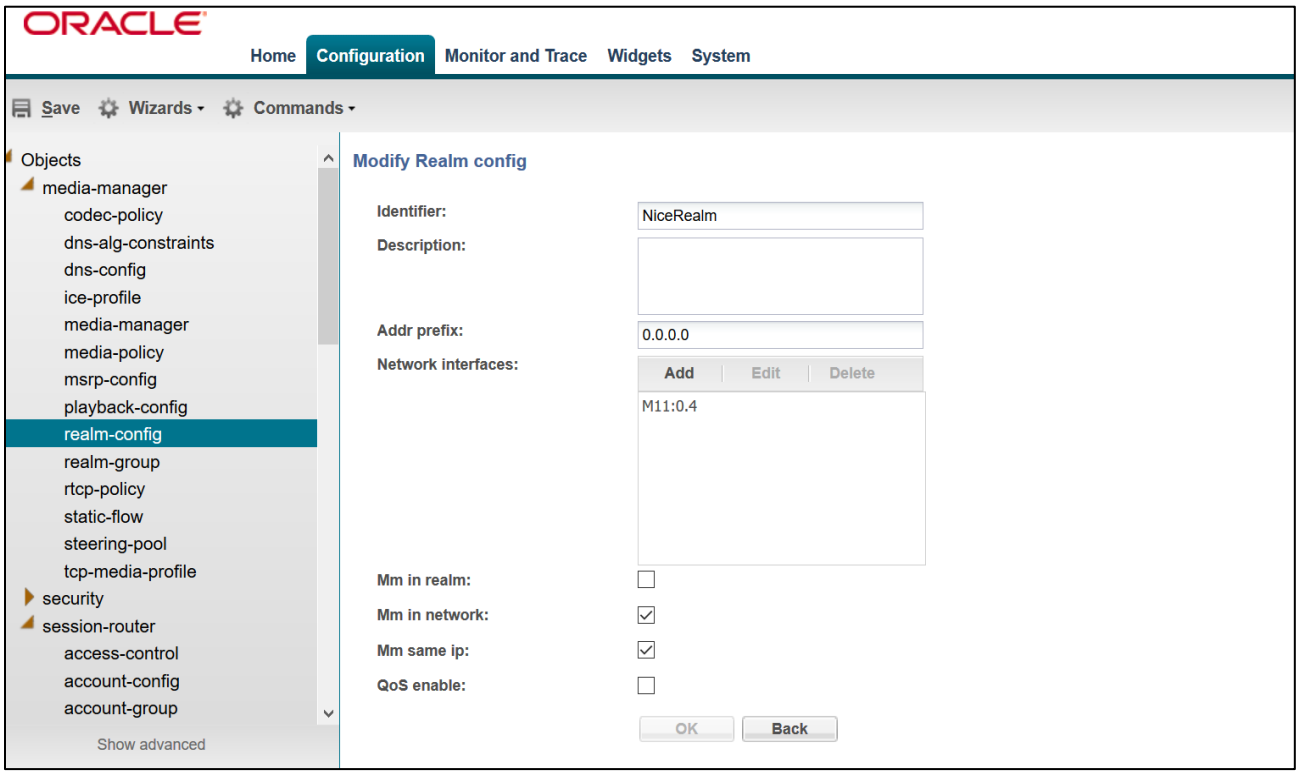
Similarly, relam name is given as genesys for Genesys side



The relam name is given as Teams for Teams side (used as common realm)



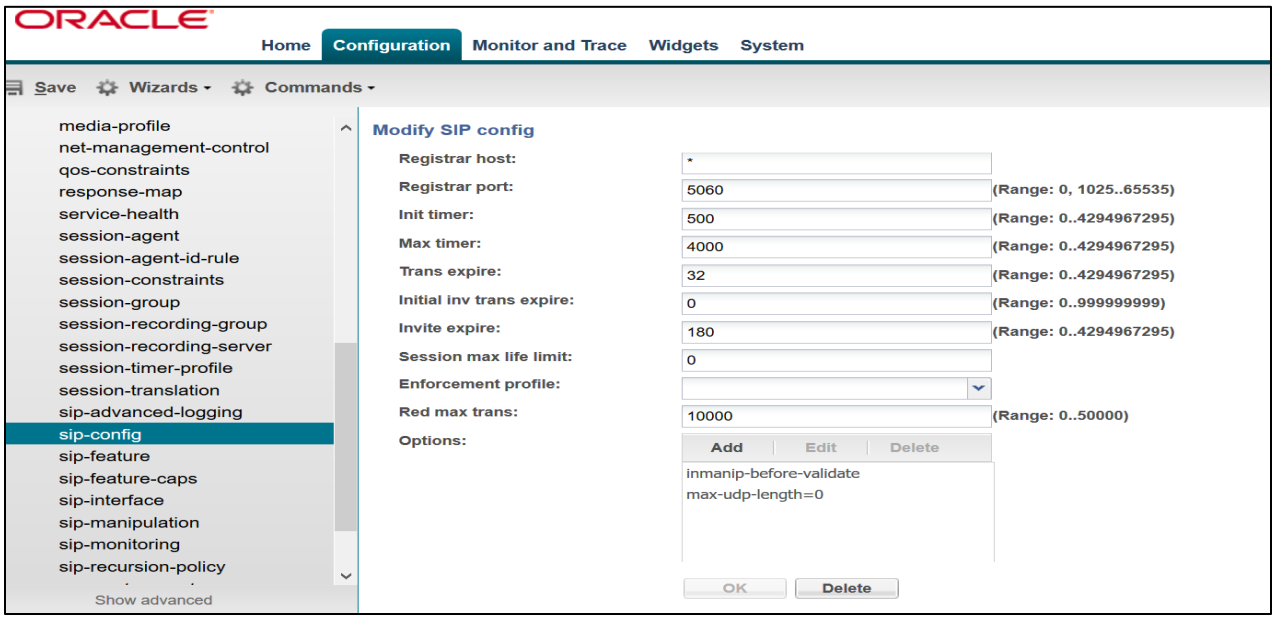
Similarly, Realm name is given as NiceRealm for Nice Recording Realm



4.12. Enable sip-config

SIP config enables SIP handling in the SBC.
Add the options to the sip-config as shown below.
To configure sip-config, Go to Session-Router->sip-config.

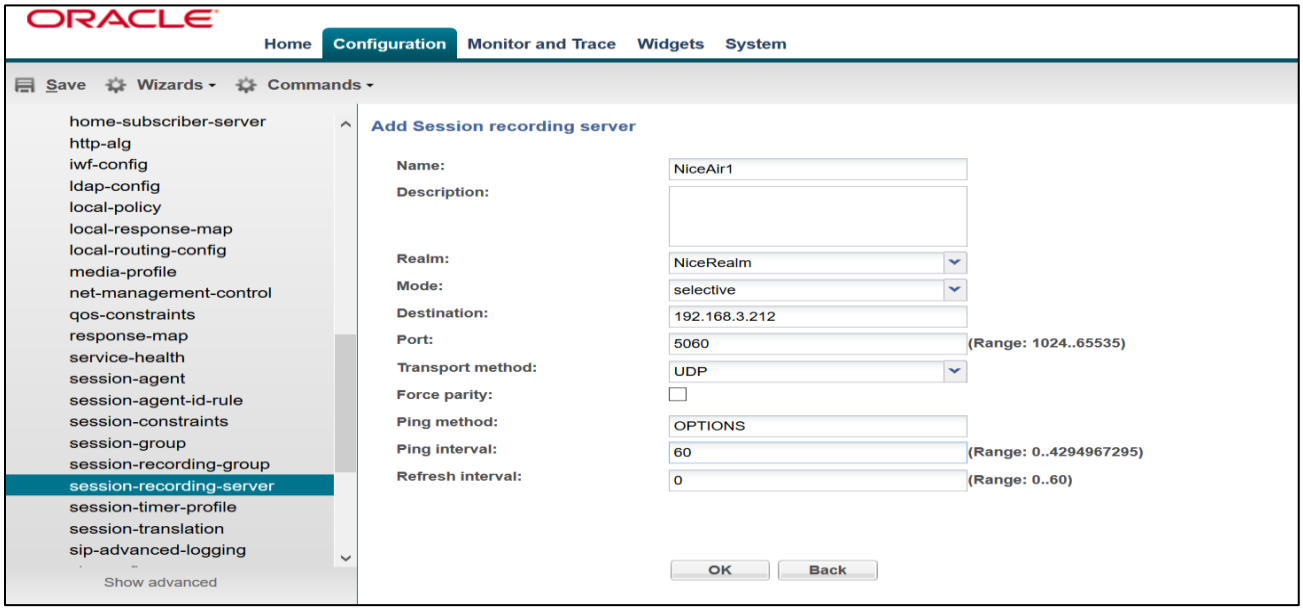
In options add max-udp-length =0.
inmanip-before-validate

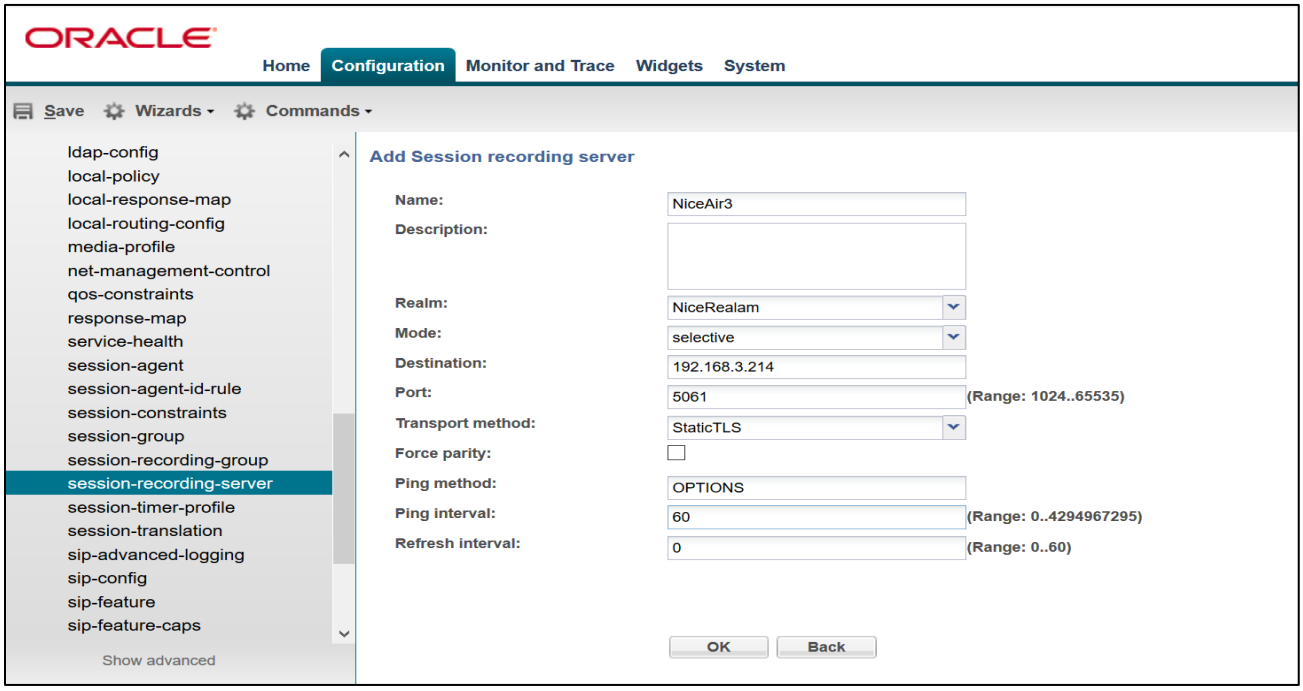


4.13. Enable Session recording server in SBC

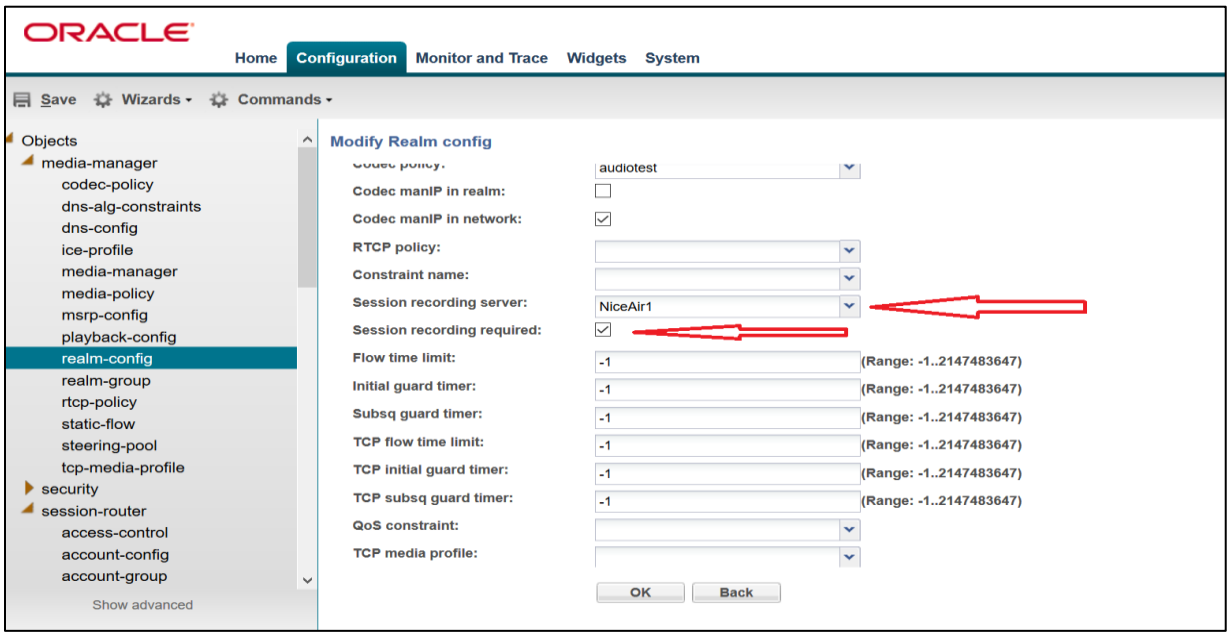
We need to add the Nice recording servers on the SBC so that we can enable the recording leg from the SBC to the Nice server. If we want Nice recorder to work in TLS mode, please select port as 5061 and Transport method to Static or Dynamic TLS while adding the recording server to the SBC.

To add the Nice servers, Go to Session Router ---->Session recording Server





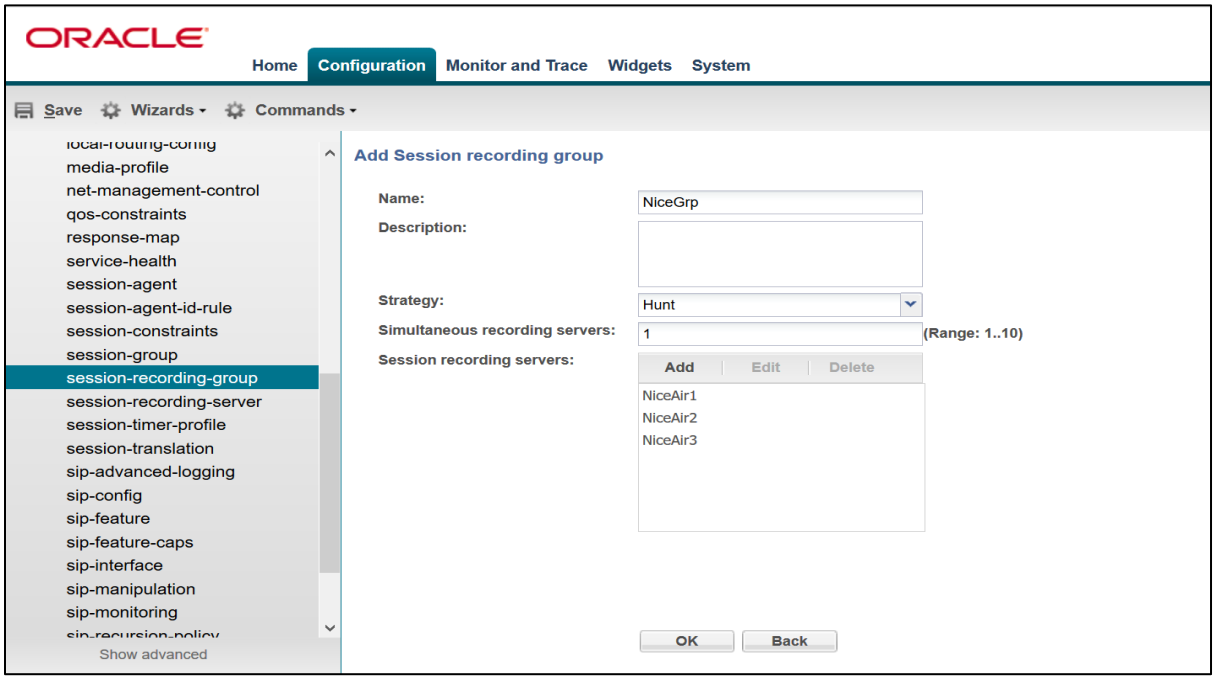
If we have more than one servers, we can add the same way like above. After adding recording server to SBC, Please assign the exact server to the zoom and genesys realm where the calls needs to be recorded as part of our testing. Session recording reqired is enabled to make sure session recorder is ready and available to record. We can also select the recorder based on whether we need normal or secure secording.



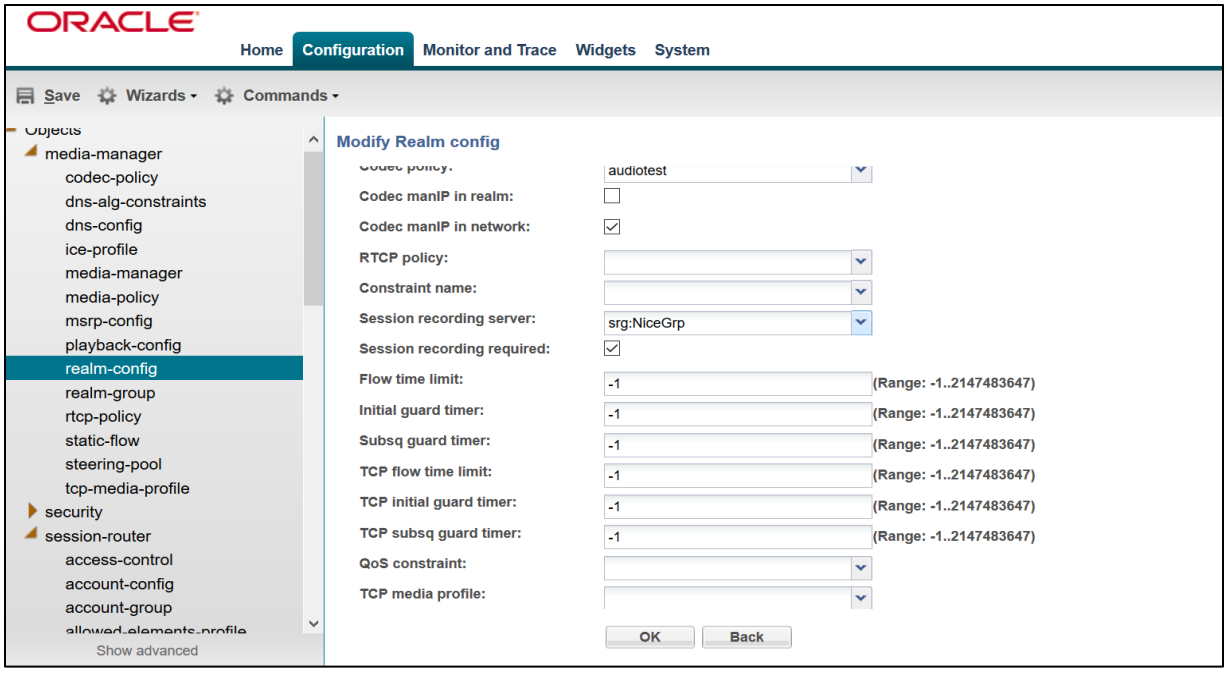
4.14. Enable Session recording group in SBC

We can also add session recording group in the SBC and assign the group to the realm.
The advantage of having recording group is that even one recorder of the group fails, we still have other servers to take care of the recording.

Go to Session Router ---->Session recording group



We can assign this group to the exact realm where the calls needs to be recorded for our testing.



4.15. Configuring a certificate for SBC

Nice Recording server also works in TLS/SRTP mode and it allows TLS connections from SBCs for SIP traffic with a self-signed certificate. We need to exchange the SBC certificate and Nice certificate so that we can use secure recording.

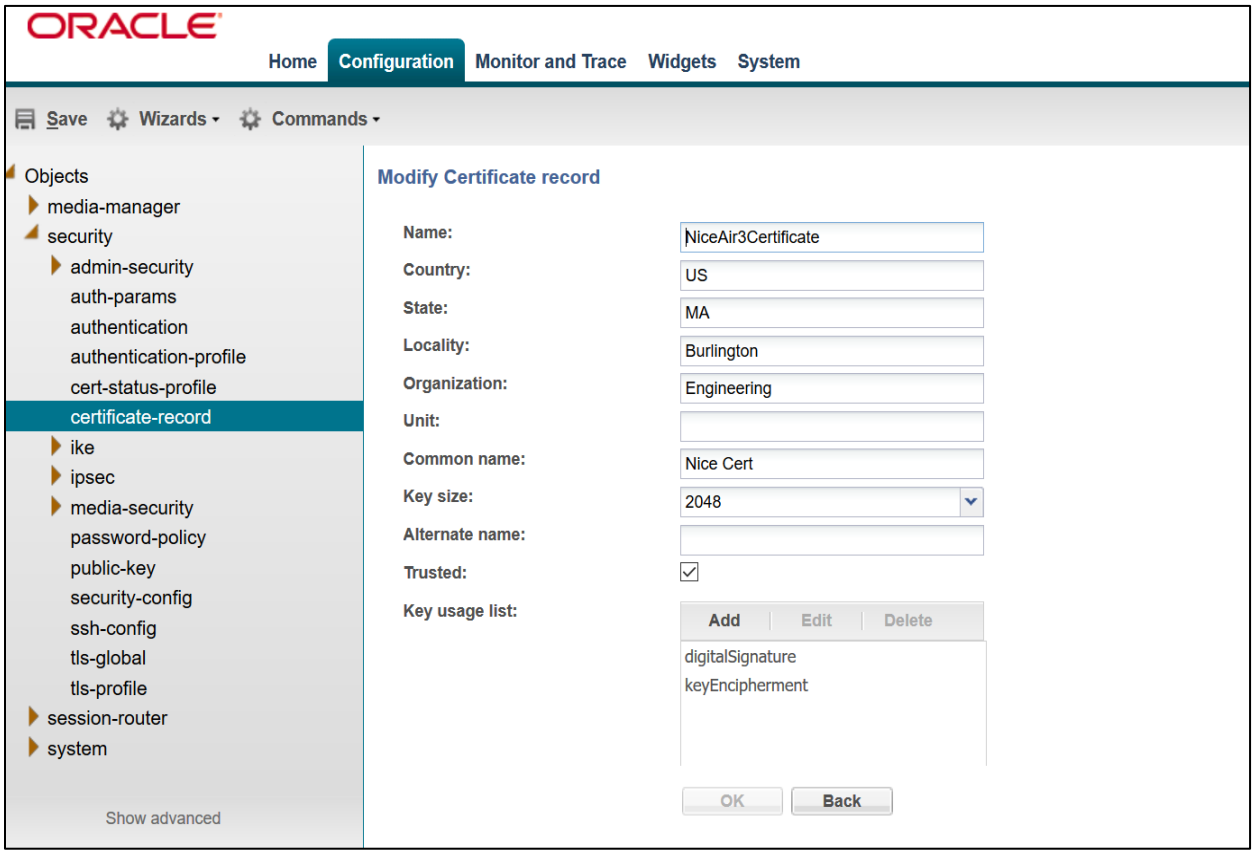
The step below describes how to import the Nice certificate to the SBC:

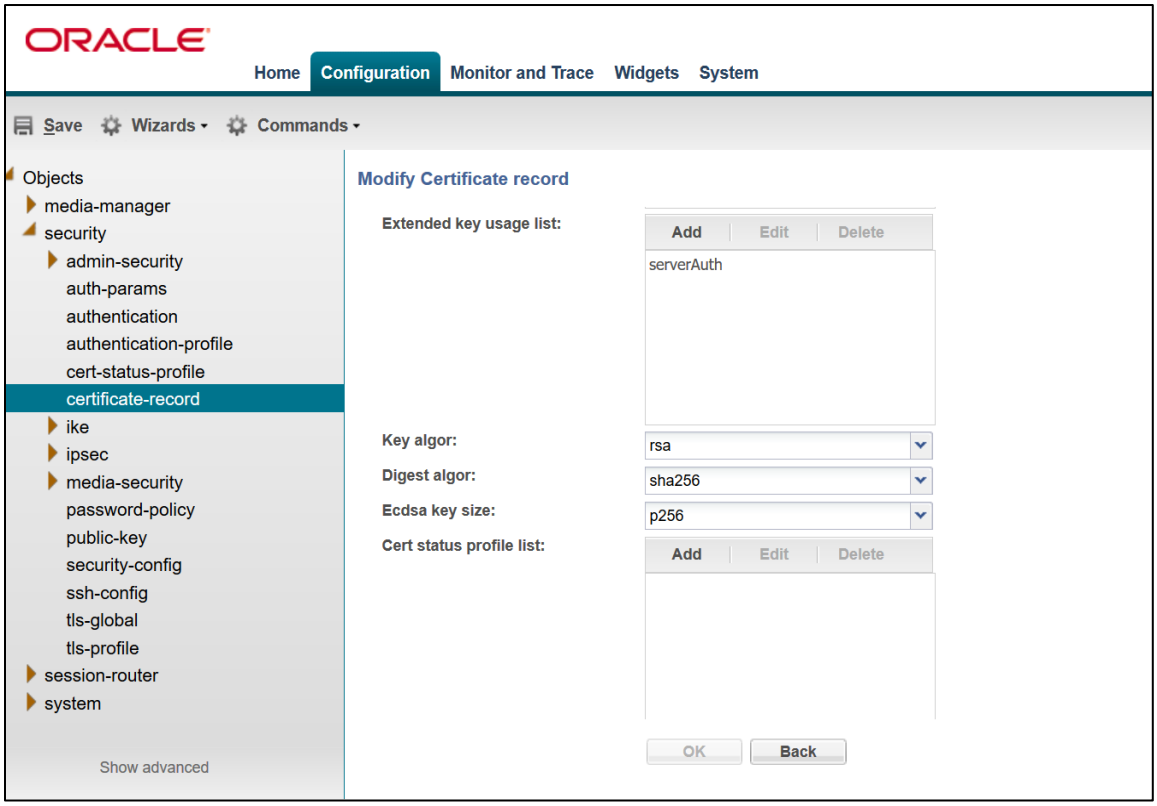
1) Create a certificate-record – “Certificate-record” are configuration elements on Oracle SBC which captures information for a TLS certificate – such as common-name, key-size, key-usage etc.

2) Import the Nice certificates on the SBC

Step 1 – Creating the certificate record

Go to security->Certificate Record and configure a certificate for SBC as shown below.



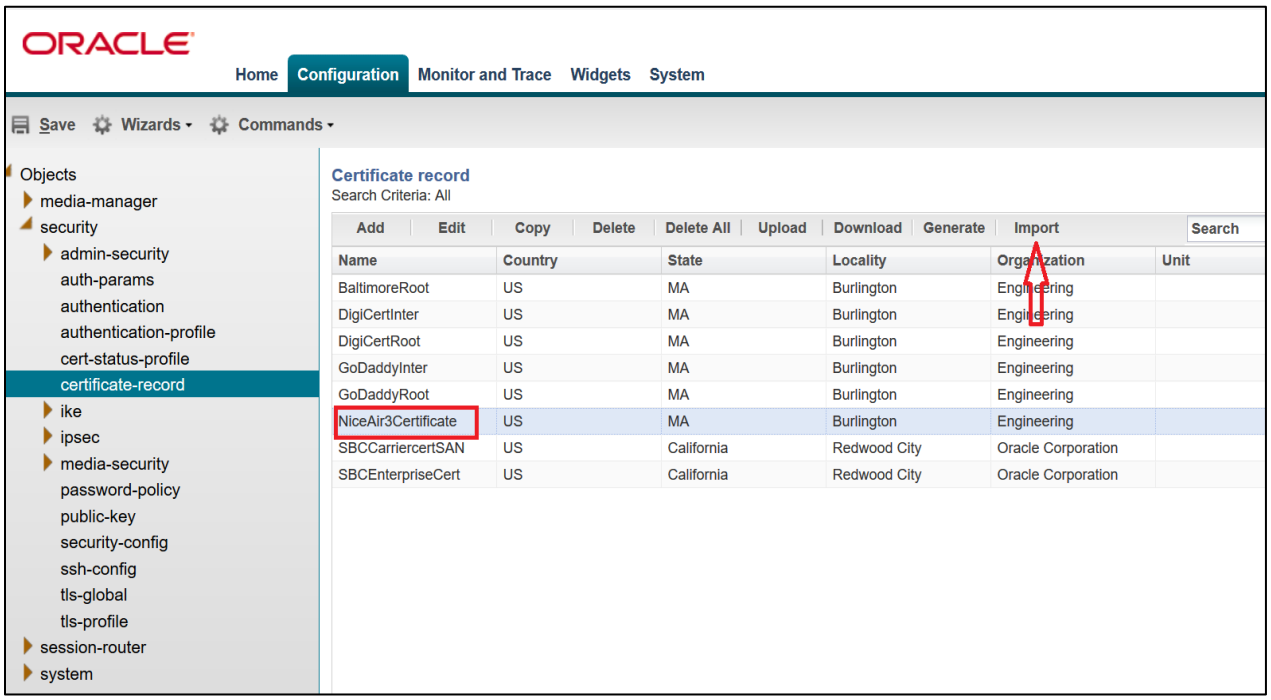


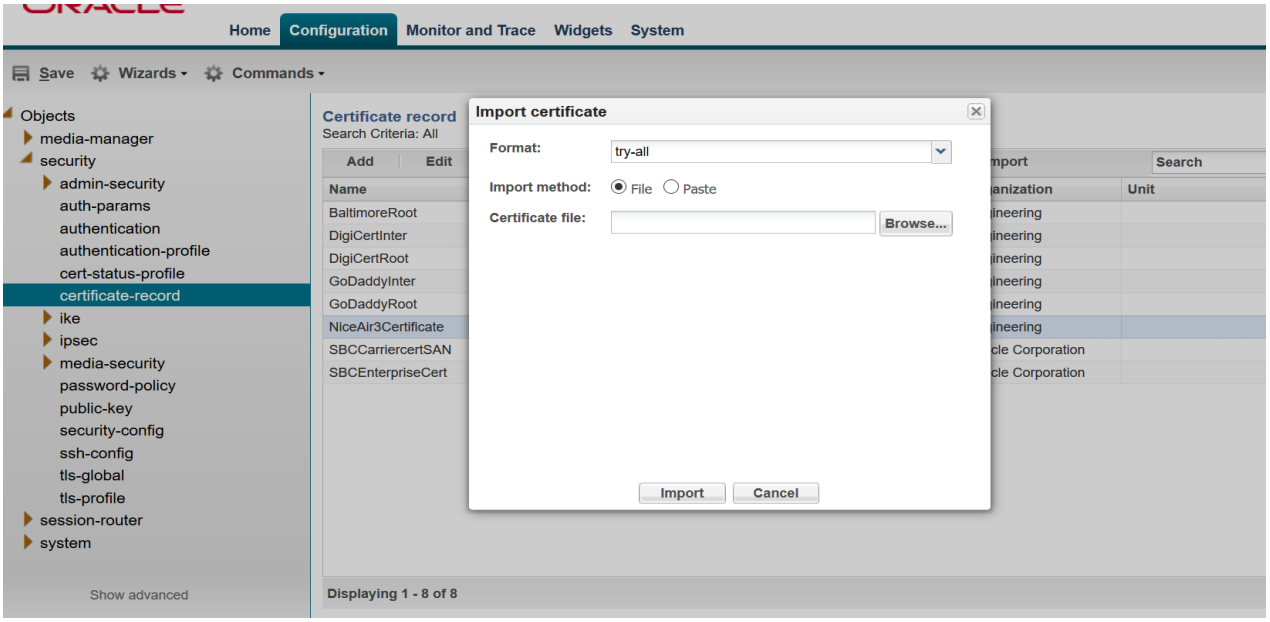
The table below specifies the parameters required for certificate configuration. Modify the configuration according to the certificates in your environment.

Parameter	BaltimoreRoot	DigiCertRoot
Common-name	Baltimore CyberTrust Root	DigiCert Global Root CA
Key-size	2048	2048
Key-usage-list	digitalSignature keyEncipherment	digitalSignature keyEncipherment
Extended-key-usage-list	serverAuth	serverAuth
key-algor	rsa	rsa
digest-algor	sha256	sha256

Step 2 – Import Nice certificates

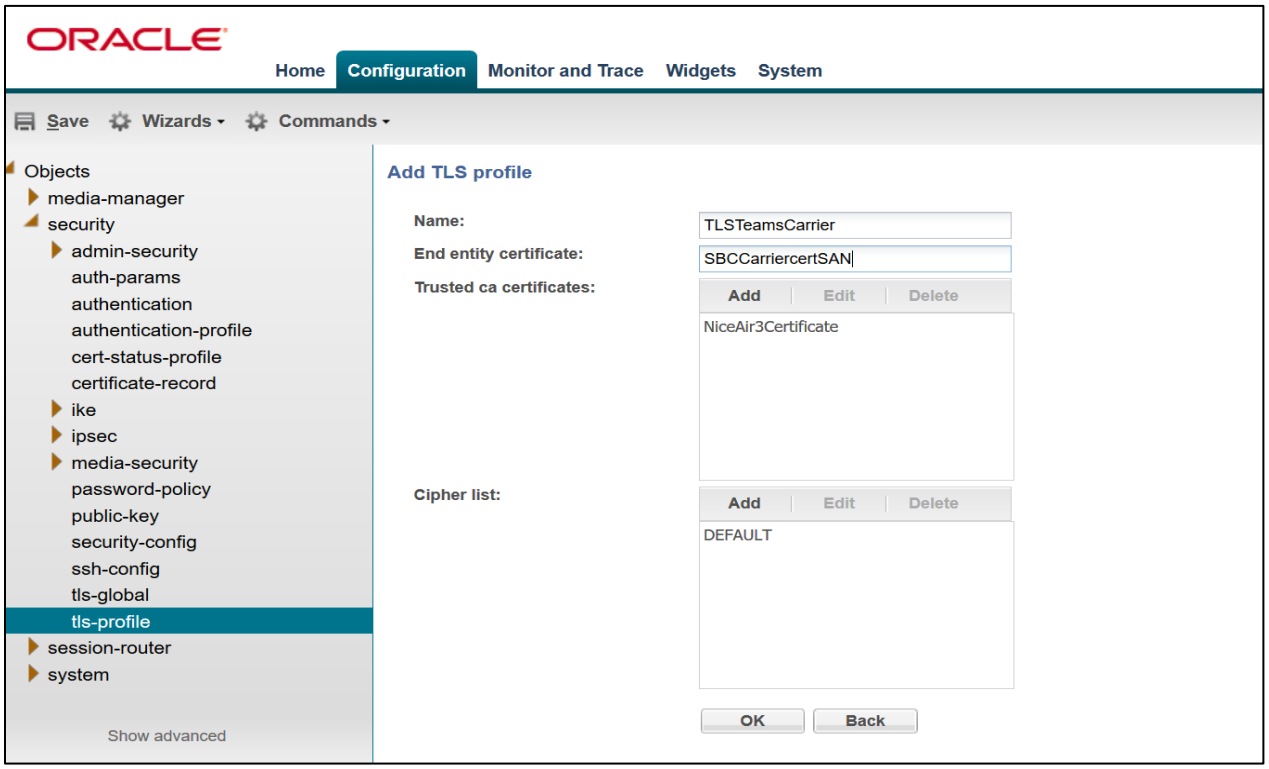
Once certificate record has been created – import the signed Nice certificate to the SBC.
Once done, issue save/activate from the WebGUI





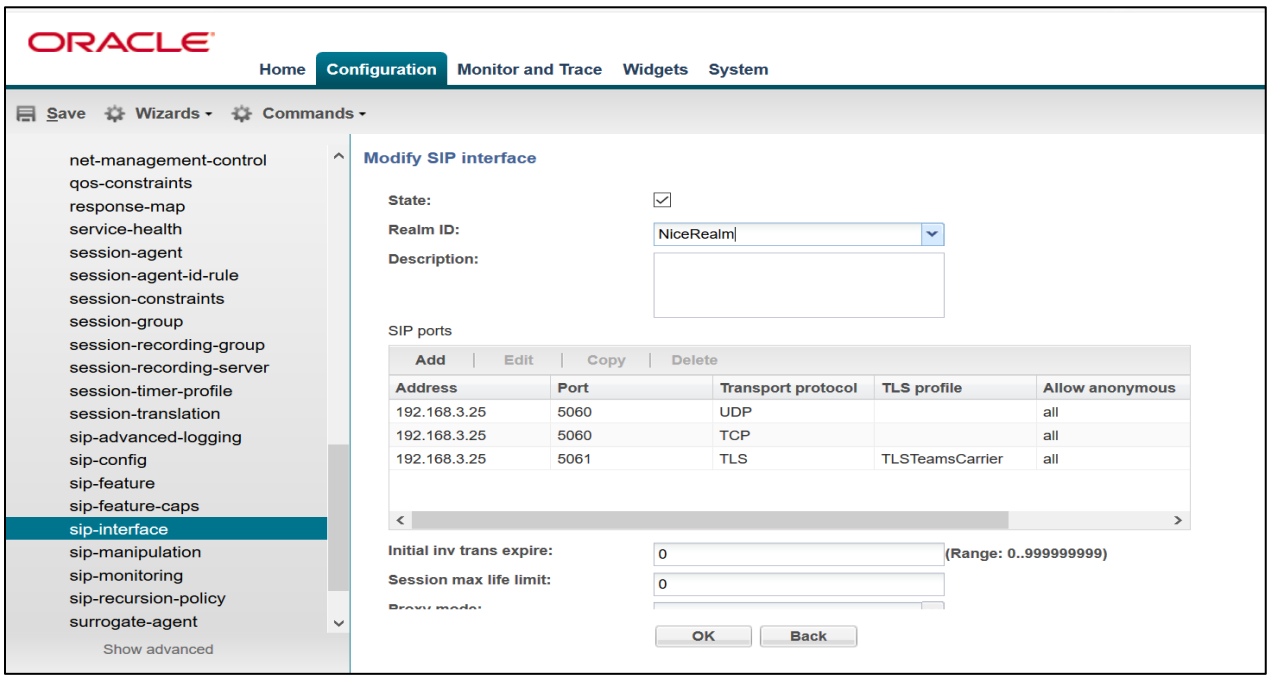
4.16. TLS-Profile

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
In our config, we have already TLS profile created as TLSteamsCarrier.
So, we just need to add our certificate record to it which is shown below



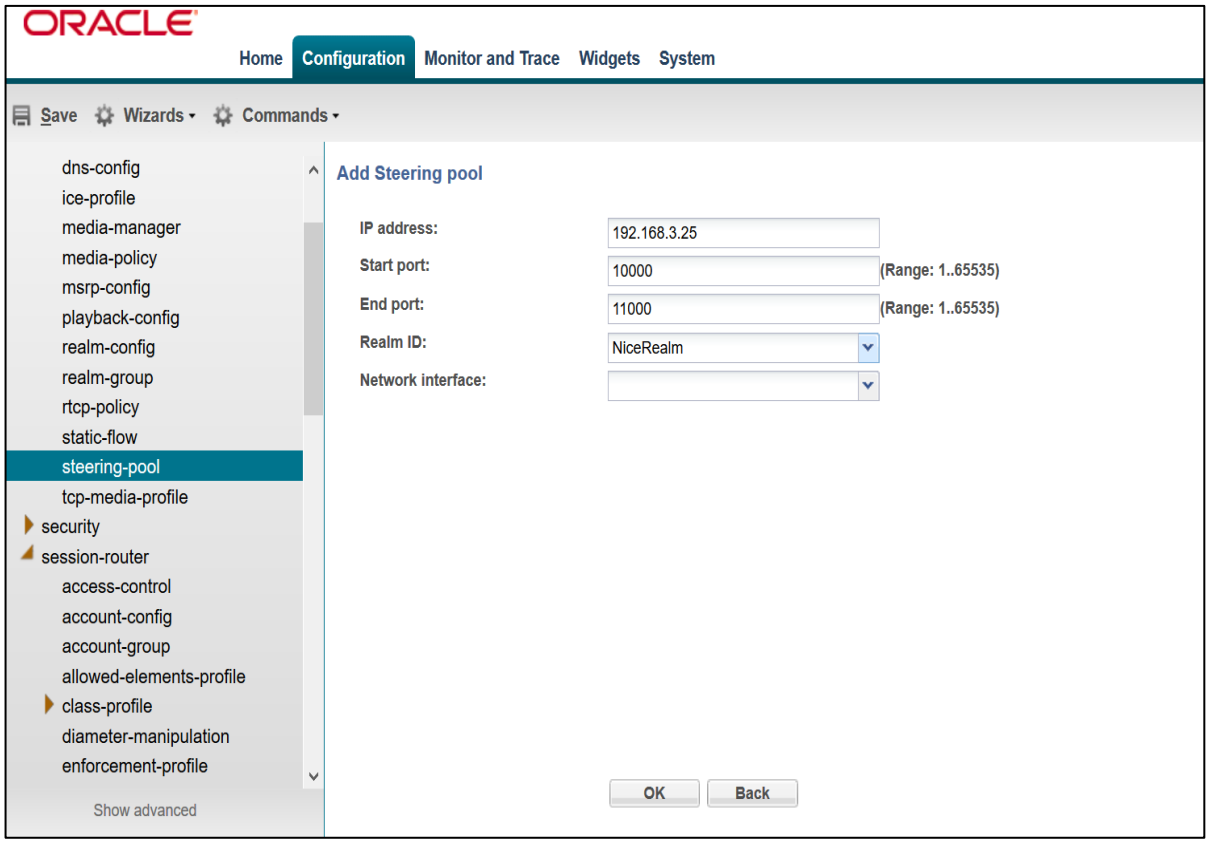
4.17. Configure SIP Interfaces.

Navigate to sip-interface under session-router and configure the sip-interface as shown below.
This interface will be used by SBC to connect to Nice Server for recording.
We have added interface for UDP, TCP and TLS in the SBC.
The other sip-interface that are created for calling purpose is out of our scope.



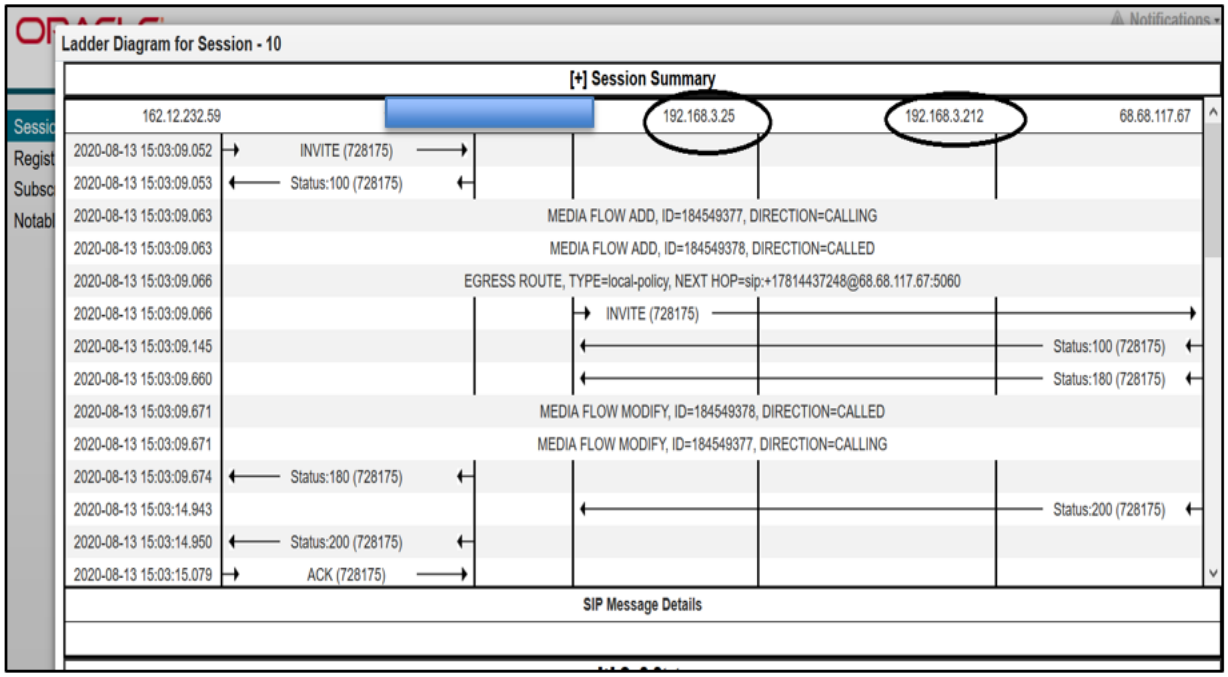
4.18. Configure steering-pool

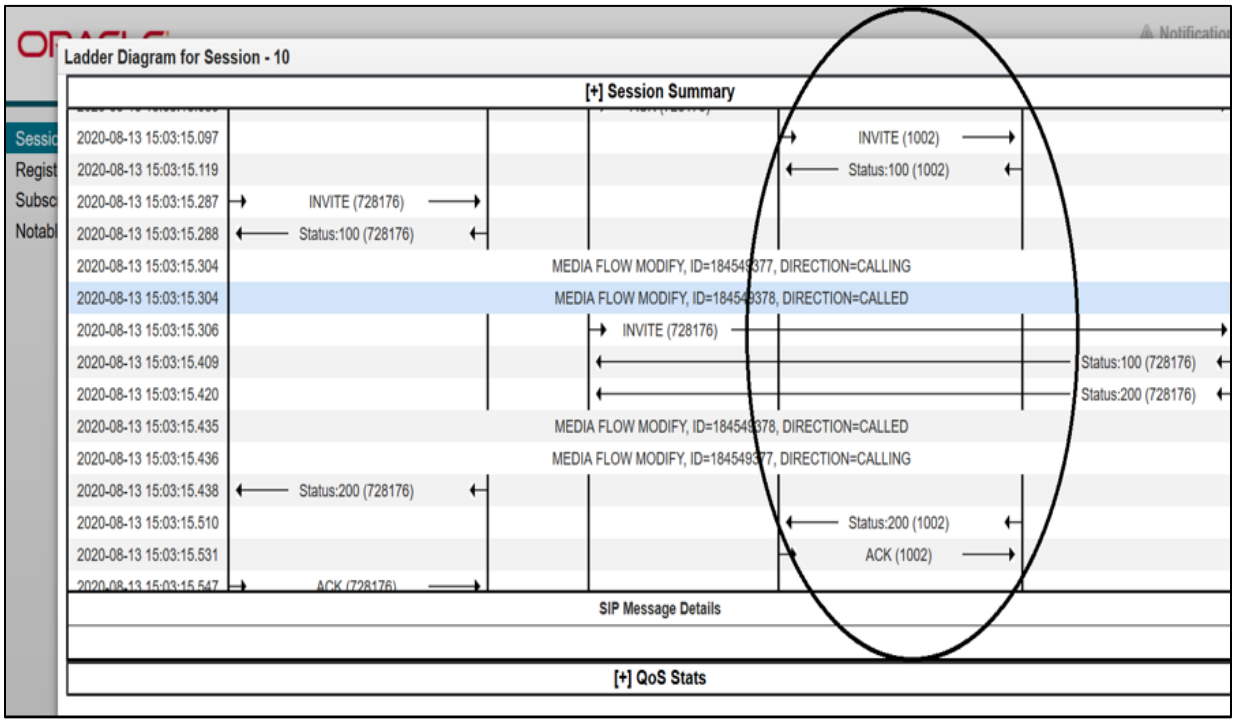
Steering-pool config allows configuration to assign IP address(es), ports & a realm.
This steering pool is exclusively created for Nice recording leg.
The other steering pools that are created for calling purpose is out of our scope.



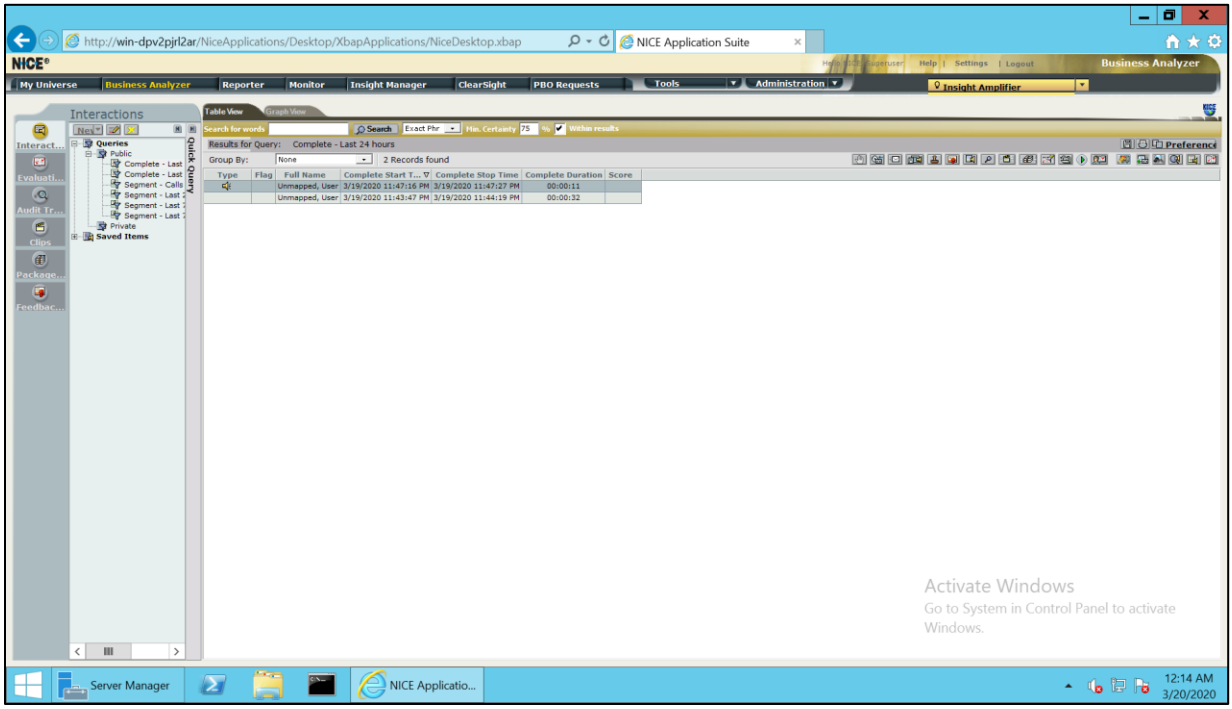
4.19. Verifying recorded Calls

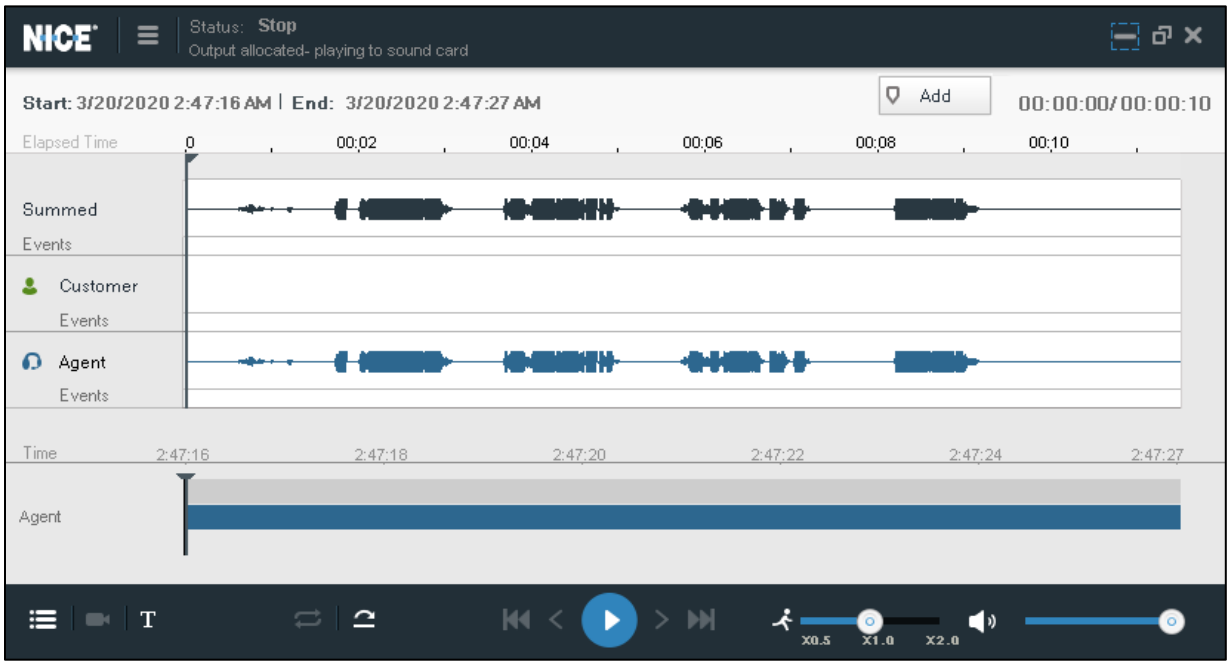
We will make calls now and verify the recording happening between SBC and Nice.
Open the SBC ladder diagram to see the recording flow (192.168.3.25 to 192.168.3.212).
We can see the recording flow for both normal and secure recording.





We can also check the actual recording (Both Secure and normal) with playback from Nice side
Open the Nice GUI and select Business Analyzer → Queries → Public -→ Complete – Last 24 hrs
You can see the recordings happened with the speaker icon to it.
You can click the speaker icon to hear the actual playback of recording from the Nice recorder Player.





5. Existing SBC configuration

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

- New realm-config
- Enable Session recording server in SBC
- Enable Session recording group in SBC
- Configuring a certificate for SBC Interface
- TLS-Profile
- Configure SIP Interfaces
- Configure steering-pool

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

Appendix A

Following are the test cases that are executed as part of Nice Recording with Zoom and Geneys side:

Here A1 and A2 Phone refers to Zoom side and Genesys side based on our testing scenario (Core Side)
Here C phone is common which always refers to Teams side (Access side)

Serial Number	Test Cases Executed (Incoming Calls)	Result (With Zoom)	Result (With Genesys)
1	C calls A1 (Short time and longtime Calls)	Pass	Pass
2	C calls A1 & A1 Blind Transfer A2	Pass	Pass
3	C calls A1 & A1 Consult Transfer A2	Pass	Pass
4	C calls A1 & A1 Blind Conference A2	Pass	Pass
5	C calls A1 & A1 Consult Conference A2	Pass	Pass
6	C calls A1, puts hold and resume	Pass	Pass

Serial Number	Test Cases Executed (Outgoing Calls)	Result (With Zoom)	Result (With Genesys)
1	A1 calls C(Short time and longtime Calls)	Pass	Pass
2	A1 calls C & A1 Blind Transfer A2	Pass	Pass
3	A1 calls C & A1 Consult Transfer A2	Pass	Pass
4	A1 calls C & A1 Blind Conference A2	Pass	Pass
5	A1 calls C & A1 Consult Conference A2	Pass	Pass
6	A1 calls C, puts hold and resume	Pass	Pass

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