



Oracle Enterprise Session Border
Controller and Genesys Pure Engage for
Enterprise SIP Trunking with NTT
Communications

Technical Application Note





Disclaimer

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

Revision History

Version	Description of Changes	Date Revision Completed
1.1	Oracle SBC and Genesys SIP Server with NTT	20-04-2022
1.3	Updated internal review comments	27-04-2022

Table of Contents

1. INTENDED AUDIENCE	4
2. DOCUMENT OVERVIEW.....	4
3. INTRODUCTION	5
3.1. AUDIENCE	5
3.2. REQUIREMENTS	5
3.3. ARCHITECTURE	6
4. CONFIGURING THE SBC.....	7
4.1. VALIDATED ORACLE SBC VERSION.....	7
5. NEW SBC CONFIGURATION.....	7
5.1. ESTABLISHING A SERIAL CONNECTION TO THE SBC	7
5.2. CONFIGURE SBC USING WEB GUI.....	11
5.3. CONFIGURE SYSTEM-CONFIG	13
5.4. CONFIGURE PHYSICAL INTERFACE VALUES	13
5.5. CONFIGURE NETWORK INTERFACE VALUES	14
5.6. ENABLE MEDIA MANAGER.....	16
5.7. SPLS REQUIRED FOR NTT	17
5.8. CONFIGURE REALMS.....	18
5.9. ENABLE SIP-CONFIG.....	20
5.10. CONFIGURE SIP MANIPULATION.....	21
GENESYS SIP-MANIPULATIONS.....	21
Forsurragent-(Genesys-In-Manipulation)	21
ToGenesys(Genesys-Out-Manipulation)	22
NTT SIP-MANIPULATIONS.....	24
ModSupportedfromntt -(NTT-In-Manipulation):	24
Changecontact- (NTT-Out-Manipulation):	27
5.11. CONFIGURE SESSION-TIMER PROFILE.....	43
5.12. CONFIGURE SURROGATE-AGENT	43
5.13. CONFIGURE SIP INTERFACES.....	45
5.14. CONFIGURE SESSION-AGENT	48
5.15. CONFIGURE LOCAL-POLICY	51
5.16. CONFIGURE CODEC POLICY.....	52
5.17. CONFIGURE MEDIA POLICY	52
5.18. CONFIGURE STEERING-POOL	53
5.19. NUMBER TRANSLATION	54
5.20. UPDATE INTERWORKING	55
6. EXISTING SBC CONFIGURATION.....	56
7. SECURITY CONFIGURATION	56
7.1. ACCESS-CONTROL LISTS.....	57



1. Intended Audience

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

2. Document Overview

This Oracle technical application note outlines the configuration needed to set up the interworking between Oracle SBC and Genesys SIP Server along with NTT Communications SIP Trunking. The solution contained within this document has been tested using Oracle Communication 840p10. Our scope of this document is only limited to testing Oracle SBC with Genesys SIP Server and NTT SIP Trunk.

It should be noted that while this application note focuses on the optimal configurations for the Oracle SBC in a Genesys SIP Server and NTT Communications. Many SBC applications may have additional configuration requirements that are specific to individual customer requirements. These configuration items are not covered in this guide. Please contact your Oracle representative with any questions pertaining to this topic.

Please note that the IP address, FQDN and 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.

3. Introduction

3.1.Audience

This is a technical document intended for telecommunications engineers with the purpose of configuring Genesys SIP Server for calling using Oracle Enterprise SBC and the NTT SIP Trunk. There will be steps that require navigating the Genesys Server and Oracle SBC GUI interface. Having an understanding of 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.

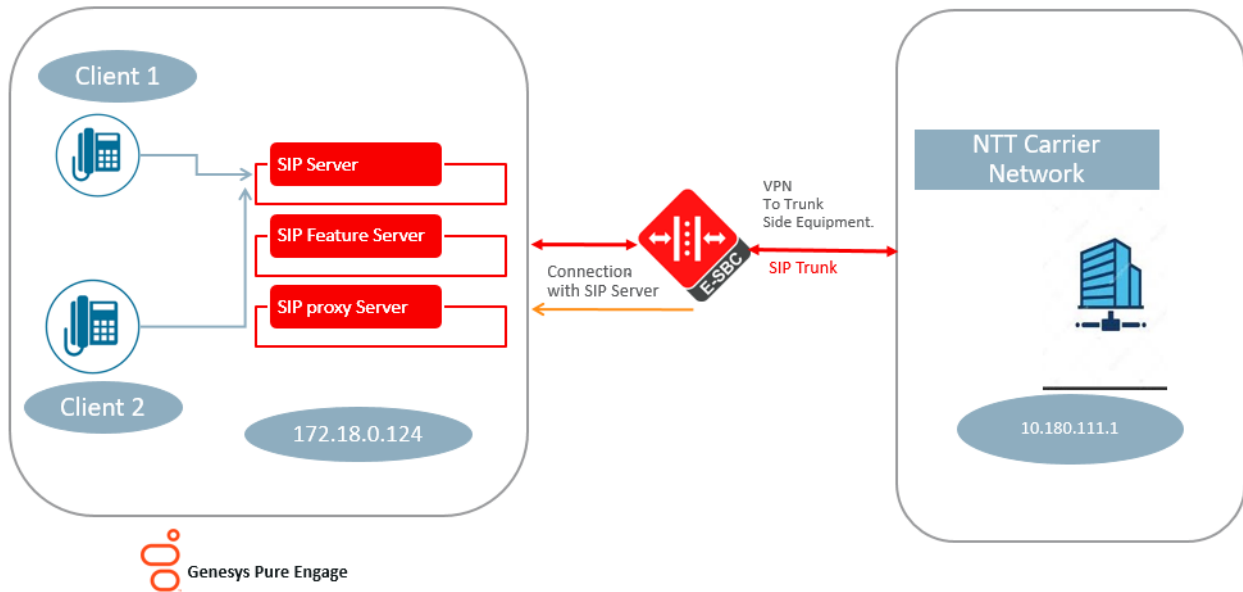
3.2. Requirements

- Genesys SIP Server R8.1
- NTT SIP Trunk
- Oracle Enterprise Session Border Controller (hereafter Oracle SBC) running 8.4.0 version

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

Software Used	Genesys Version	SBC Version	NTT Software Version
Revision 1	R8.1	8.4.0 p10	

3.3. Architecture



Client's 1 and 2 numbers are provided by the NTT and are registered with the Genesys SIP Server. Oracle SBC also performs surrogate registration for Genesys towards NTT with client1's number.



4. Configuring the SBC

This chapter provides step-by-step guidance on how to configure Oracle SBC for interworking with Genesys SIP Server Platform

4.1. Validated Oracle SBC version

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

- AP 1100
- AP 3900
- AP 4600
- AP 6350
- AP 6300
- VME
- AP 3950(Release 9.0 onwards)
- AP 4900(Release 9.0 onwards)

5. New SBC configuration

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

5.1.Establishing a serial connection to the SBC

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

Note: This doesn't apply to VME and cloud deployments.

Start the terminal emulation application using the following settings:

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

```

Starting tLemd...
Starting tServiceHealth...
Starting tCollect...
Starting tAtcpd...
Starting tAsctpd...
Starting tMbcd...
Starting tCommMonitord...
Starting tFped...
Starting tAlgd...
Starting tRadd...
Starting tEbmd...
Starting tSipd...
Starting tH323d...
Starting tIPTd...
Starting tSecured...
Starting tAuthd...
Starting tCerts...
Starting tiked...
Starting tTscfd...
Starting tAppWeb...
Starting tauditd...
Starting tauditpusher...
Starting tSnmpd...
Starting tIFMIBd...
Start platform alarm...
Starting display manager...
Initializing /opt/ 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

```

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”.

Note: The password is different for cloud and VME deployments. Please check the required documentation

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.

```
NN4600-100# conf t
NN4600-100(configure)# bootparam

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

Boot File      : /boot/nnSCZ830mlp7.bz
IP Address     : 10.138.194.139
VLAN           : 0
Netmask        : 255.255.255.192
Gateway        : 10.138.194.129
IPv6 Address   :
IPv6 Gateway   :
Host IP        :
FTP username    : vxftp
FTP password    : vxftp
Flags          :
Target Name     : NN4600-100
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.

NN4600-100(configure)#
NN4600-100(configure)#
NN4600-100(configure)#
```

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

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

```
NN4600-100# setup product

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

Last Modified 2019-06-28 14:05:33
-----

 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->http-server

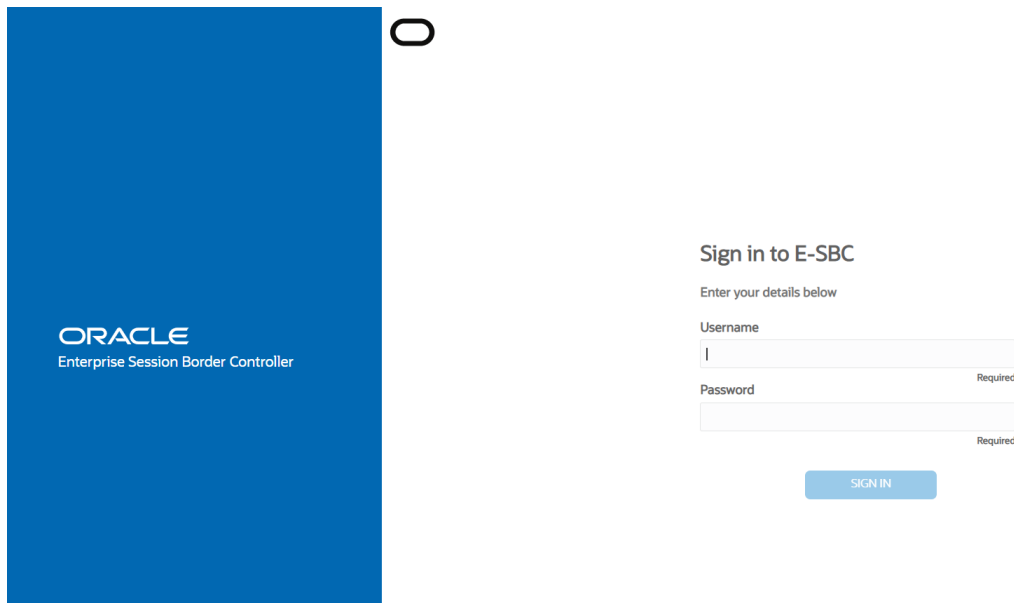
Enable the web-server-config to access the SBC using Web GUI. Save and activate the config

```
state                enabled
inactivity-timeout   5
http-state           enabled
http-port            80
https-state          disabled
https-port           443
http-interface-list  REST,GUI
tls-profile
last-modified-by     admin@console
last-modified-date    2020-04-03 00:21:22
```

5.2.Configure SBC using Web GUI

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

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



ORACLE
Enterprise Session Border Controller

Sign in to E-SBC

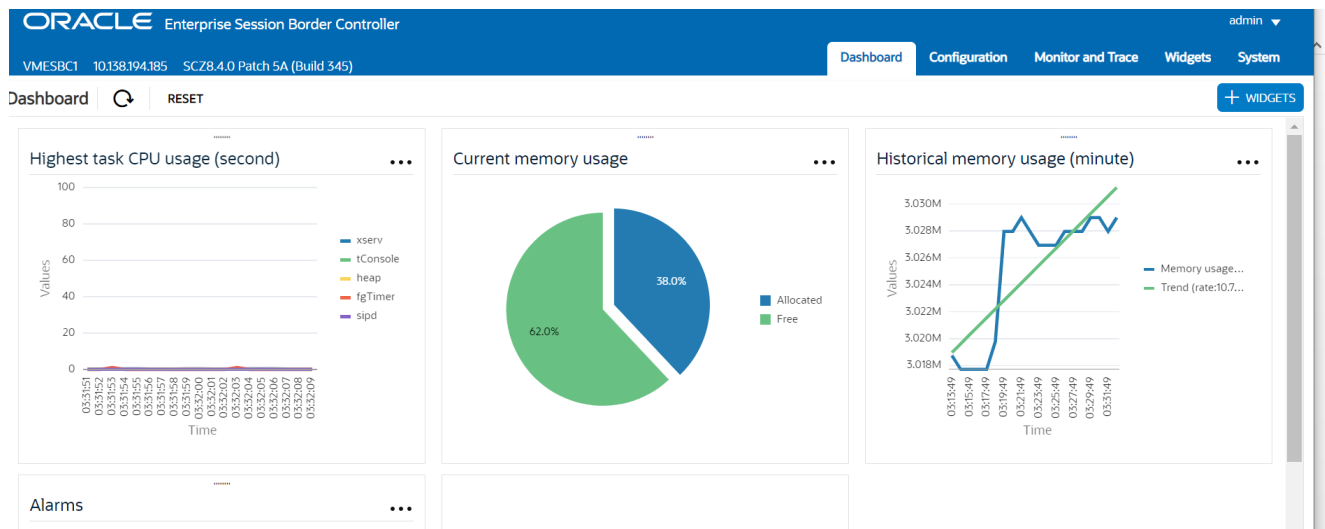
Enter your details below

Username I Required

Password Required

SIGN IN

For login use username user and password of user to login as user mode. For username admin and password of super user to login as super user mode.



Go to

Configuration as shown below, to configure the SBC

The Configuration page displays a list of configuration objects. The table below shows the first 10 objects:

Name	Description
access-control	Configure a static or dynamic access control list
account-config	Configure Quality of Service accounting
authentication-profile	Configure authentication profile
certificate-record	Create, generate, and import a certificate
class-policy	Configure classification profile policies
codec-policy	Create and apply a codec policy to a realm and an agent
filter-config	Create a custom filter for SIP monitor and trace
fraud-protection	Configure fraud protection
host-route	Insert entries into the routing table
http-client	Configure an HTTP client
http-server	Configure an HTTP server
ldap-config	Configure an LDAP server, filter, and policy

Showing 1 - 17 of 40

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

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

The expert mode is used for configuration.

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

5.3. Configure system-config

Go to system->system-config

The screenshot shows the 'Modify System Config' page in a web application. On the left, a sidebar lists various configuration objects: 'router-protection', 'host-route', 'http-client', 'http-server', 'network-interface', 'ntp-config', 'phy-interface', 'redundancy-config', 'snmp-community', 'spl-config', and 'system-config'. 'system-config' is currently selected. The main content area is titled 'Modify System Config' and contains several input fields: 'Hostname' (with the value 'genesys.com'), 'Description' (empty), 'Location' (empty), 'Mib System Contact' (empty), 'Mib System Name' (empty), 'Mib System Location' (empty), and 'Acp TLS Profile' (a dropdown menu). At the top right of the main area, there are buttons for 'Discard', 'Verify', and 'Show Config'. At the top left of the main area, there are buttons for 'onfiguration' and 'View Configuration'.

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

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

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

5.4. Configure Physical Interface values

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

You will first configure the slot 0, port 0 interface designated with the name S0P0. This will be the port plugged into your (connection to the Genesys) interface. NTT TRUNK side is configured on the slot 0 port 1.

Parameter Name	Genesys (S0P0)	NTT TRUNK (S1P0)
Slot	0	0
Port	0	1
Operation Mode	Media	Media

Below is the screenshot for creating a phy-interface on S0P0. Create a similar interface for Sip Trunk as well from the Web GUI. The table above specifies the values for both Genesys and NTT TRUNK.

The screenshot shows the 'Modify Phy Interface' configuration page. The left sidebar lists various configuration sections, with 'phy-interface' selected. The main area contains the following fields and values:

- Name: s0p0
- Operation Type: Media (dropdown)
- Port: 0 (Range: 0..5)
- Slot: 0 (Range: 0..2)
- Virtual Mac: (empty field)
- Admin State: ☒ enable
- Auto Negotiation: ☒ enable
- Duplex Mode: FULL (dropdown)
- Speed: 100 (dropdown)

At the bottom, there are 'OK' and 'Back' buttons. The top of the page shows 'Configuration' and 'View Configuration' buttons, along with 'Discard', 'Verify', and 'Save' buttons.

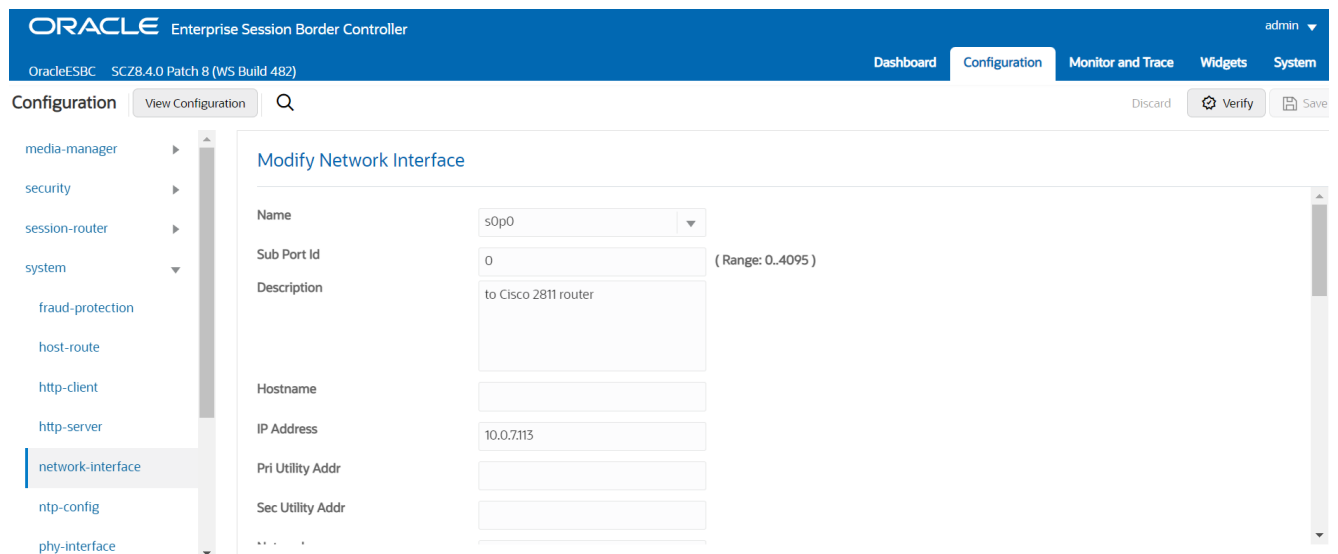
5.5. Configure Network Interface values

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

- Genesys
- NTT Trunk

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

Parameter Name	Genesys Network Interface	NTT Trunk
Name	S1P0	S0P0
IP address	172.18.0.139	10.0.7.113
Netmask	255.255.0.0	255.255.255.248
Gateway	172.18.0.1	10.0.7.114
DNS-IP Primary	8.8.8.8	8.8.8.8



ORACLE Enterprise Session Border Controller

OracleESBC SCZ8.4.0 Patch 8 (WS Build 482)

Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration

Discard Verify Save

media-manager

security

session-router

system

fraud-protection

host-route

http-client

http-server

network-interface

ntp-config

phy-interface

Modify Network Interface

Name: s0p0

Sub Port Id: 0 (Range: 0..4095)

Description: to Cisco 2811 router

Hostname:

IP Address: 10.0.7.113

Pri Utility Addr:

Sec Utility Addr:

The screenshot shows the Oracle Enterprise Session Border Controller (ESBC) configuration interface. The top navigation bar includes 'Dashboard', 'Configuration', 'Monitor and Trace', 'Widgets', and 'System'. The 'Configuration' tab is active. On the left, a sidebar lists various configuration categories: media-manager, security, session-router, system, fraud-protection, host-route, http-client, http-server, network-interface (selected), and ntp-config. The main content area is titled 'Modify Network Interface' and contains the following fields:

Field	Value	Range
DNS Domain		
DNS Timeout	11	(Range: 0..4294967295)
DNS Max Ttl	86400	(Range: 30..2073600)
Signalling Mtu	0	(Range: 0,576..4096)
HIP IP List	10.0.7.113	
ICMP Address	10.0.7.113	
SSH Address	172.16.1.21	
Tunnel Config		

Similarly configure network interfaces for S0P0 (NTT Trunk) as well

5.6.Enable media manager

Media-manager handles the media stack required for SIP sessions on the SBC. Enable the media manager by checking the state as enabled.

The screenshot shows the Oracle Enterprise Session Border Controller (ESBC) configuration interface for the 'Modify Media Manager' section. The top navigation bar is the same as the previous screenshot. The left sidebar shows the 'media-manager' category selected. The main content area is titled 'Modify Media Manager' and contains the following fields:

Field	Value	Range
State	☒ enable	
Flow Time Limit	86400	(Range: 0..4294967295)
Initial Guard Timer	300	(Range: 0..4294967295)
Subsq Guard Timer	300	(Range: 0..4294967295)
TCP Flow Time Limit	86400	(Range: 0..4294967295)
TCP Initial Guard Timer	300	(Range: 0..4294967295)
TCP Subsq Guard Timer	300	(Range: 0..4294967295)
Hnt Rtcp	☐ enable	
Algd Log Level	NOTICE	
Mbcd Log Level	NOTICE	

At the bottom of the form, there are 'OK' and 'Delete' buttons. A 'Show All' toggle is also visible at the bottom left of the sidebar.

5.7.SPLs required for NTT

As part of the integration of the ESBC with NTT trunk, three SPLs, SurrogateRegister.0.3.spl, NttMsgConverter.0.3.spl , SurrogateContact.0.6.spl were developed to include 5 features required to comply with the signaling requirements. All these spl's are available in the SBC by default.

1. As a part of the surrogate registration, SBC is required to send a unique/random user-info portion in every REGISTER request that is sent to the NTT SIP trunk as well as outgoing INVITE messages for calls.
2. The ESBC is required to apply validity check to an incoming INVITE from the SIP trunk before sending out 100 TRYING and subsequent 1xx, 2xx messages to progress the call. It is expected that the incoming INVITE Request-URI user portion will contain the same randomized value that the E-SBC sent in the most recent REGISTER message to the trunk
3. NTT regulation requires that the tag size of From/To headers in the SIP messages be under 32 bytes. The tags sent by GENESYS in the originating SIP messages are large in size, approximately 51 bytes.
4. NTT specification also requires that the Rseq, Cseq, Session ID (in SDP) be under the value of 999900 and the SDP o line username character length be a maximum of 10 bytes. The E-SBC receives messages from Enterprise PBX – Cisco Unified Communications Manager with a large RSeq value in 18x messages which it forwards as is. Also, the SDP o line username is 19 bytes in length (generated by GENESYS).
5. E-SBC is expected check RURI user portion of incoming CANCEL request for the AoR and compare it with the AoR specified in the Request-URI of the initial INVITE received.. If the value is different, E-SBC should respond with a 481 Call/Transaction Does Not Exist.
6. NTT also requires that the Host IP in the Call-ID is same as the IP of the Egress-interface communicating with NTT-Trunk

The SPL SurrogateRegister.0.3.spl was developed to implement the features 1 and 2. This SPL is enabled by configuring the spl-option

- dyn-contact-start on the realm facing Genesys and
- dyn-contact-method=randomseed on the realm facing the NTT trunk.

The SPL NttMsgConverter.0.3.spl - was developed to implement the features 3, 4 and 5. This is enabled by configuring the spl-option

- ocNttMsgConverterTagging=opposite on the realm facing Genesys and
- ocNttMsgConverterTagging=enabled on the realm facing the NTT trunk.

The SurrogateContact.0.6.spl was developed to implement the feature 6
This is enabled by configuring the spl-option

- Control-Surr-Reg in the spl-options on sip-interface facing NTT Trunk

5.8.Configure Realms

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

In the below case, Realm name is given as Genesys

ORACLE Enterprise Session Border Controller

OracleESBC SCZB.4.0 Patch 8 (WS Build 482)

Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration Q Discard Verify Save

media-manager
codec-policy
media-manager
media-policy
realm-config
steering-pool
security
session-router
access-control
account-config
filter-config

Show All

Modify Realm Config

Identifier Genesys

Description

Addr Prefix 0.0.0.0

Network Interfaces s1p0:0.4 X

Media Realm List

Mm In Realm ☐ enable

Mm In Network ☒ enable

OK Back

ORACLE Enterprise Session Border Controller

OracleESBC SCZB.4.0 Patch 8 (WS Build 482)

Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration Q Discard Verify Save

media-manager
codec-policy
media-manager
media-policy
realm-config
steering-pool
security
session-router
access-control
account-config
filter-config

Show All

Modify Realm Config

Early Media Allow

Enforcement Profile

Additional Prefixes

Restricted Latching none

Options

SPL Options ocNttMsgConverterTagging=opposite

Delay Media Update ☐ enable

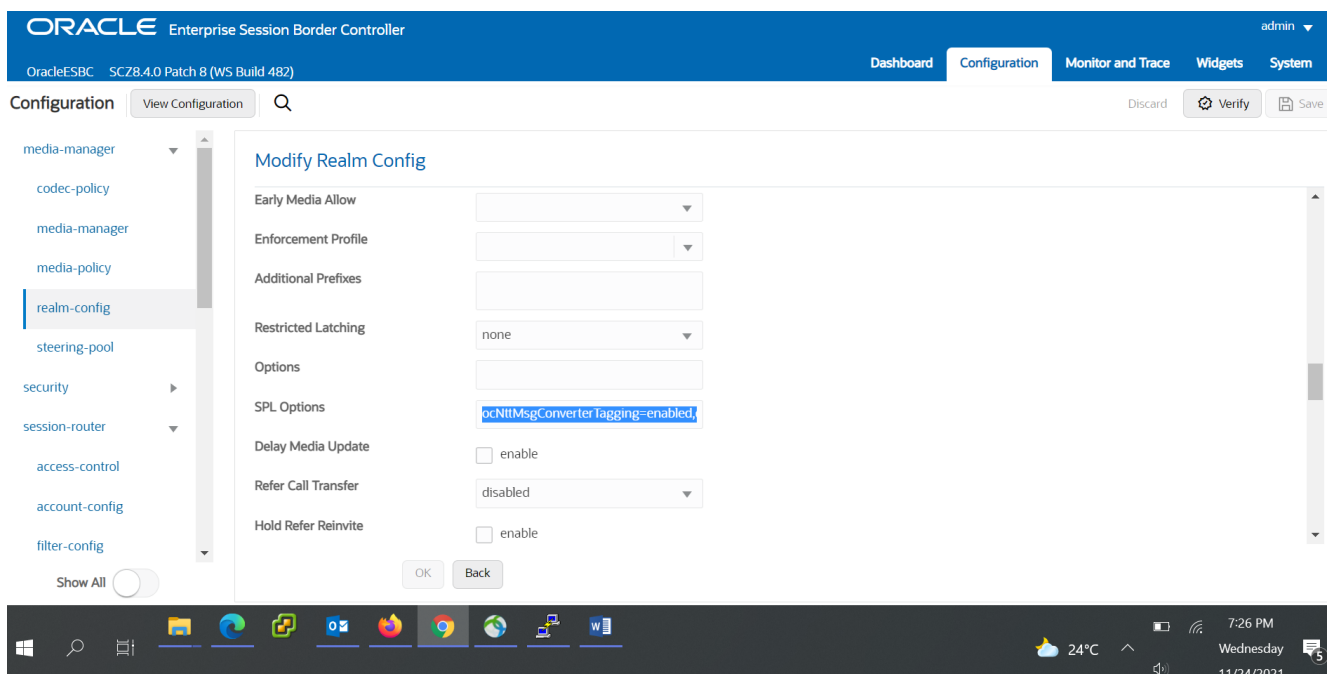
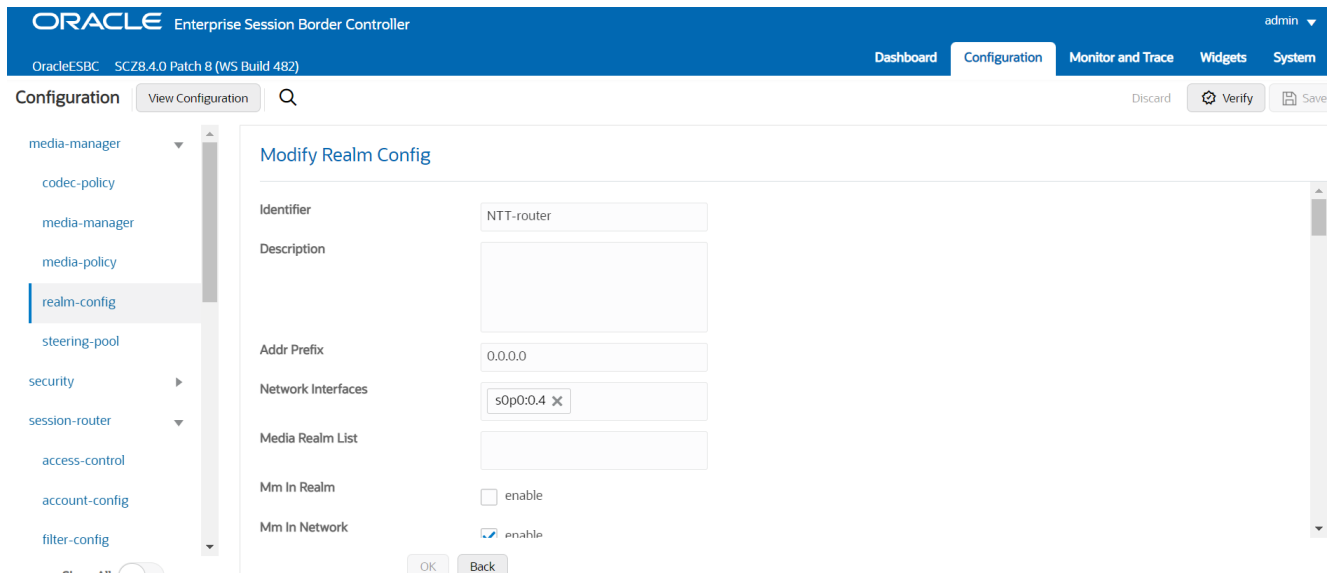
Refer Call Transfer disabled

Hold Refer Reininvite ☐ enable

OK Back

As explained in the last section, "ocNttMsgConverterTagging=opposite,dyn-contact-start" is configured towards Genesys realm.

Similarly for NTT trunk, a realm is created, realm is named as NTT-Router for realm facing NTT Trunk.



As mentioned in last section ,the spl-options "ocNttMsgConverterTagging=enabled,dyn-contact-method=randomseed" are configured in the NTT realm

5.9.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, Go to Session-Router->sip-config and in options

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

The screenshot shows the Oracle Enterprise Session Border Controller (ESBC) Configuration page. The left sidebar lists various configuration sections, with 'sip-config' selected. The main area displays the 'Modify SIP Config' form. The form includes the following fields:

Field	Value	Range
State	☒ enable	
Dialog Transparency	☒ enable	
Home Realm ID	Genesys	
Egress Realm ID		
Nat Mode	None	
Registrar Domain	*	
Registrar Host	*	
Registrar Port	5060	(Range: 0,1025..65535)
Init Timer	500	(Range: 0..4294967295)

Buttons: OK, Delete

The screenshot shows the Oracle Enterprise Session Border Controller (ESBC) Configuration page, specifically the 'Modify SIP Config' form. The left sidebar lists various configuration sections, with 'sip-config' selected. The main area displays the 'Modify SIP Config' form with the following fields:

Field	Value	Range
Enforcement Profile		
Red Max Trans	10000	(Range: 0..50000)
Options	☒ force-unregistration ☒ max-udp-length=0	
SPL Options		
SIP Message Len	4096	(Range: 0..65535)
Enum Sag Match	☐ enable	
Extra Method Stats	☐ enable	
Extra Enum Stats	☐ enable	

5.10. Configure SIP Manipulation

There are 4 sip-manips that are applied in the sip-interfaces.

1. Genesys
 - a. ToGenesys-Applied as Out Manipulationid
 - b. Forsurragent-Applied as In Manipulationid
2. NTT
 - a. Changecontact-Applied as Out Manipulationid
 - b. ModSupportedfromntt-Applied as In Manipulationid

Below is a detailed explanation of every rule in the sip-manip.

Genesys SIP-Manipulations

Note: In this app note ,we have used the CLI snippets of each sip manipulation as it is easier to cover all the manipulations. You can also use the WEBGUI to configure the sip-manipulations mentioned here

Forsurragent-(Genesys-In-Manipulation)

This manipulation is configured as in-manipulation from Genesys. This is for replacing the from user number to that of the registered number with NTT and to delete the 100 rel from the Supported header in INVITE and UPDATE.(for 100 rel-interworking by the SBC)

```
sip-manipulation
  name                                Forsurragent
  header-rule
    name                              forsupportedinINVITE
    header-name                        From
    action                             sip-manip
    new-value                          ModSupportedinINVITE
  header-rule
    name                              ChangeFrom
    header-name                        From
    action                             manipulate
    msg-type                           request
    methods                            INVITE
    element-rule
      name                             NTT_from_user
      parameter-name                   From
      type                             uri-user
      action                           replace
      new-value                        81334252021
```

```
sip-manipulation
  name                                ModSupportedinINVITE
  header-rule
```

name	delete100rel
header-name	Supported
action	delete
methods	INVITE, UPDATE
match-value	*100rel*

ToGenesys(Genesys-Out-Manipulation)

This manipulation is configured as out-manipulation towards Genesys.

There are three manipulations under this master sip-manipulation. Each sip-manipulation is configured separately and then mapped to sip-manip inside the master sip-manipulation as shown below

sip-manipulation	
name	ToGenesys
header-rule	
name	ForNAT_IP
header-name	From
action	sip-manip
new-value	Topohiding
header-rule	
name	forRURI
header-name	From
action	sip-manip
new-value	ModRURItToGenesys
header-rule	
name	RemoveTimertoGenesys1
header-name	From
action	sip-manip
new-value	RemoveTimertoGenesys

Topohiding:

Configured for hiding the topology,towards Genesys

sip-manipulation	Topohiding
name	
header-rule	
name	From
header-name	From
action	manipulate
element-rule	
name	From_header
type	uri-host
action	replace
new-value	\$LOCAL_IP
header-rule	
name	st
header-name	To
action	manipulate
element-rule	
name	To
type	uri-host
action	replace
new-value	\$REMOTE_IP

ModRURItogenesys

This sip-manip is for replacing the random contact in the uri-user of the RURI with that of the To header

```
sip-manipulation
  name
  header-rule
    name
    header-name
    action
    msg-type
    methods
    element-rule
      name
      type
      action
      comparison-type
  header-rule
    name
    header-name
    action
    msg-type
    methods
    element-rule
      name
      parameter-name
      type
      action
      comparison-type
      new-value
$CheckToheader.$storeTouriuser.$0
```

ModRURItogenesys

```
CheckToheader
To
manipulate
request
INVITE

storeTouriuser
uri-user
store
pattern-rule

request
Request-URI
manipulate
request
INVITE

storeTouriuser
Request-URI
uri-user
replace
pattern-rule
```

RemoveTimertogenesys

This sip-manip is for removing the unnecessary headers towards Genesys. Since Genesys doesn't support update for session –refresh, we are deleting

- Session-Expires and Min-SE from INVITE and UPDATE headers.
- Update method from Supported in Invite

Also adding back the 100rel, we deleted from the Supported header in Invite deleted in the previous sip-manip

```
sip-manipulation
  name
  header-rule
    name
    header-name
    action
    methods
  header-rule
    name
    header-name
    action
    msg-type
    methods
  header-rule
```

RemoveTimertogenesys

```
RemoveSessionExp
Session-Expires
delete
INVITE, UPDATE

RemoveSupportedUpdate
Supported
delete
request
UPDATE
```

name	RemoveMinSEfromRequest
header-name	Min-SE
action	delete
msg-type	request
methods	INVITE, UPDATE
header-rule	
name	ModifySupportedInvite
header-name	Supported
action	manipulate
comparison-type	pattern-rule
msg-type	request
methods	Invite
match-value	(100rel) (.*)
new-value	\$1

NTT SIP-Manipulations

ModSupportedfromntt –(NTT-In-Manipulation):

The following manipulation is configured as in-manipulation from NTT. There are manipulations under this master sip-manipulation. Each sip-manipulation is configured separately and then mapped to sip-manip inside the master sip-manipulation as shown below

sip-manipulation	
name	ModSupportedfromntt
header-rule	
name	delete100rel
header-name	Supported
action	delete
methods	INVITE
match-value	100rel
header-rule	
name	add100rel
header-name	Require
action	add
msg-type	request
methods	INVITE
new-value	100rel
header-rule	
name	checkPCPID2
header-name	P-Called-Party-ID
action	manipulate
comparison-type	pattern-rule
msg-type	out-of-dialog
methods	INVITE
element-rule	
name	modToer
type	header-value
action	sip-manip
comparison-type	pattern-rule
new-value	change4orPCPID
header-rule	
name	tc1282

```

        header-name      To
        action            sip-manip
        msg-type          request
        methods           INVITE
        new-value         checkip6
header-rule
    name                  tc1283
    header-name           To
    action                sip-manip
    msg-type              request
    methods               INVITE
    new-value             tc1283
header-rule
    name                  tc1284
    header-name           To
    action                sip-manip
    msg-type              request
    methods               INVITE
    new-value             tc1284

```

Manipulation for 100 rel

This sip manipulation is for allowing SBC handle the 100rel-interworking. One of the requirements for SBC to handle SBC is that incoming Invite should have Require:100 rel

Manipulation for PCPID Comparison:

This manipulation changes the To user id if it doesn't match with the PCPID.

```

sip-manipulation
    name                  changeforPCPID
    header-rule
        name              modforPCPID
        header-name       To
        action            manipulate
        comparison-type    pattern-rule
        msg-type          out-of-dialog
        methods           INVITE
        element-rule
            name           modToer
            type            uri-user
            action         replace
            comparison-type pattern-rule
            match-value    !($TO_USER.$0 ==
$PCPID_USER.$0)
            new-value      $PCPID_USER.$0

```

Manipulation for checking IP6 and rejecting in SDP

This manipulation is for checking whether the SDP has IPv6 and rejecting it with 406 Not Acceptable.

```

sip-manipulation
    name                  checkip6
    mime-sdp-rule
        name              check
        msg-type          request

```

```

methods
action
sdp-session-rule
    name
    action
    sdp-line-rule
        name
        type
        action
        comparison-type
rule
    match-value
    new-value
Acceptable Protocol"

```

INVITE
manipulate
check2
manipulate
From
o
reject
pattern-
^([0-
9]{ 10}) ([0-9]{10}) ([0- 9]{10}) (IN IP6 .*)\$
"403:Not

Manipulation for checking different protocol value in m line

This manipulation is for checking whether the SDP m line has UDP and to reject it with 403 Not Acceptable Media .

```

sip-manipulation
    name
    mime-sdp-rule
        name
        msg-type
        methods
        action
        sdp-media-rule
            name
            media-type
            action
            sdp-line-rule
                name
                type
                action
                comparison-type
rule
    match-value
    new-value
Acceptable Media"

```

tc1283
check
request
INVITE
manipulate
test
audio
manipulate
change
m
reject
pattern-
^ (audio) ([0-9]{4,5}) (UDP 0)\$
"403:Not

Manipulation for checking incompatible codecs

The below manipulation checks for incompatible codecs and rejects it with 403:codecs Not Allowed.

```

sip-manipulation
    name

```

tc1284

```

mime-sdp-rule
    name
    msg-type
    methods
    action
    sdp-media-rule
        name
        media-type
        action
        sdp-line-rule
            name
            type
            action
            comparison-type
            match-value
            new-value
rule
    match-value
    new-value
^ (audio) ( [0-9]{4,5}) ( RTP/AVP 9 15 18 4) $
"403:Codecs Not Allowed"

```

Changecontact- (NTT-Out-Manipulation):

This manipulation is configured as out-manipulation towards NTT. There are manipulations under this master sip-manipulation. Each sip-manipulation is configured separately and then mapped to sip-manip inside the master sip-manipulation as shown below

```

sip-manipulation
    name
    header-rule
        name
        header-name
        action
        new-value
    header-rule
        name
        header-name
        action
        new-value
    header-rule
        name
        header-name
        action
        new-value
    header-rule
        name
        header-name
        action
        new-value
    header-rule
        name
        header-name

```

Changecontact

```

forprivacy
From
sip-manip
NATting
forPAIandRPI
From
sip-manip
PAIandRPI
forUAinfo
From
sip-manip
AddSBCinfo
Toremovecallinfo
From
sip-manip
removecallinfo
forregsupport
From

```

action	sip-manip
new-value	AddSupportedinReg
header-rule	
name	outboundinvite
header-name	From
action	sip-manip
new-value	ModSupportedoutboundINVITE
header-rule	
name	regrule
header-name	From
action	sip-manip
new-value	ForREGISTER
header-rule	
name	formaxforwards
header-name	From
action	sip-manip
new-value	ModMaxforwards
header-rule	
name	fortransportudp
header-name	From
action	sip-manip
new-value	deltransportUDP
header-rule	
name	forplusinresponse
header-name	From
action	sip-manip
new-value	Modcontactuserinresponses
header-rule	
name	formodallowheader
header-name	From
action	sip-manip
new-value	ModAllowheader
header-rule	
name	forreasonheader
header-name	From
action	sip-manip
new-value	DelReasonheader
header-rule	
name	forupdatemessage
header-name	From
action	sip-manip
new-value	ModUPDATEmessage
header-rule	
name	DeleteexpiresinINVITE
header-name	From
action	sip-manip
new-value	DelExpiresinINVITE
header-rule	
name	forSEtoNTT
header-name	From
action	sip-manip
new-value	forsessionexpirestoNTT
header-rule	
name	foranonymouscall
header-name	From

```

        action                sip-manip
        new-value              anonymouscall
header-rule
    name                      remblines
    header-name               From
    action                    sip-manip
    new-value                  stripblines
header-rule
    name                      forfromport
    header-name               From
    action                    sip-manip
    new-value                  inviteffromport
header-rule
    name                      forprivacy1
    header-name               From
    action                    sip-manip
    new-value                  Privacy

```

NATting

This sip manipulation is configured for topology hiding.

NTT requires that the host part in the From and To headers in INVITE should be "ipvoice.jp"

```

sip-manipulation
    name                      NATting
    header-rule
        name
        header-name           From
        action                 From
        element-rule           manipulate
            name                From_header
            type                 uri-host
            action               replace
            new-value            ipvoice.jp
    header-rule
        name
        header-name           To
        action                 To
        element-rule           manipulate
            name                To
            type                 uri-host
            action               replace
            new-value            ipvoice.jp
        element-rule
            name                Toport
            type                 uri-port
            action               sip-manip
            new-value            ModToport

```

The below manipulation is a part of NATing sip-manipulation.

NTT requires the port be 7060 in the To header of Invite. This manipulation adds the port to the To header if it does not exist.

```

sip-manipulation
    name                      ModToport
    header-rule

```

```

name CheckToport
header-name To
action manipulate
element-rule
    name Storeport
    type uri-port
    action store
    match-value 7060
header-rule
    name CheckdoubleportsinTo
    header-name To
    action manipulate
    comparison-type boolean
    match-value !$CheckToport.$Storeport
    element-rule
        name ChangeToval
        type uri-port
        action add
        new-value 7060

```

PAIandRPI

To delete the Remote-Party-ID and P-Asserted-Identity headers sent by Genesys.

```

sip-manipulation
    name PAIandRPI
    header-rule
        name delRPI
        header-name Remote-Party-ID
        action delete
        methods INVITE,UPDATE
    header-rule
        name delPAI
        header-name P-Asserted-Identity
        action delete
        methods BYE, INVITE, UPDATE

```

AddSBCinfo

To replace the Genesys related information in the User-Agent header with the SBC image version. The pattern to be matched can be changed according to the customer's requirements.

```

sip-manipulation
    name AddSBCinfo
    header-rule
        name Addproductinfo
        header-name User-Agent
        action add
        msg-type request
        methods REGISTER
        new-value OracleE\-SBC/SCZ840p10
    header-rule
        name Moduseragentforall
        header-name User-Agent
        action manipulate
        comparison-type pattern-rule
        msg-type request

```

```

        methods
ACK, BYE, INVITE, PRACK, UPDATE
        element-rule
            name
            type
            action
            comparison-type
            match-value
            new-value
Modvalue
header-value
replace
pattern-rule
^Epi (.*)
OracleE\-
```

SBC/SCZ840p10

```

        header-rule
            name
            header-name
            action
            comparison-type
            msg-type
            methods
ACK, BYE, INVITE, PRACK, UPDATE
        element-rule
            name
            type
            action
            comparison-type
            match-value
            new-value
Moduseragentforcall2
User-Agent
manipulate
pattern-rule
request
```

SBC/SCZ840p10

AddSupportedinReg

NTT requires that the Path header be added to every Register message.
Below sip-manipulation is configured to add Path header

```

sip-manipulation
    name
    header-rule
        name
        header-name
        action
        msg-type
        methods
    new-value
AddSupportedinReg
Addtheheader
Supported
add
request
REGISTER
path
```

ModSupportedoutboundINVITE

To replace the value of Supported header in INVITE with 100rel,timer towards NTT.

```

sip-manipulation
    name
    header-rule
        name
        header-name
        action
        comparison-type
ModSupportedoutboundINVITE
CheckSupported
Supported
manipulate
pattern-rule
```

msg-type	request
methods	INVITE
element-rule	
name	Storevalue
type	header-value
action	store
comparison-type	pattern-rule
element-rule	
name	add100rel
type	header-value
action	find-replace-all
comparison-type	pattern-rule
new-value	100rel,timer

ForREGISTER

To add the required authentication details in the REGISTERs sent to NTT trunk.

Also the sip-manipulation adds user=phone in From,To and Request-URI of Register

In some requirements the SBC may have auth-params=sha1-credential or sha512-credential,change this sip-manipulation accordingly.

sip-manipulation	ForREGISTER
name	
header-rule	
name	Delroute
header-name	Route
action	delete
msg-type	request
methods	REGISTER
header-rule	
name	Delauthparams
header-name	Authorization
action	manipulate
msg-type	request
methods	REGISTER
element-rule	
name	storevalue
type	header-value
action	store
comparison-type	pattern-rule
match-value	(.+) (, auth-
params=sha1-credential)	
element-rule	
name	delparam
type	header-value
action	replace
comparison-type	pattern-rule
new-value	
\$Delauthparams.\$storevalue.\$1	
header-rule	
name	addContentlength
header-name	Content-Length
action	add
msg-type	request
methods	REGISTER
new-value	0
header-rule	
name	delexpires
header-name	Expires

action	delete
msg-type	request
methods	REGISTER
header-rule	
name	adduserphoneinFrom
header-name	From
action	manipulate
msg-type	request
methods	INVITE, REGISTER
element-rule	
name	adduserphone
parameter-name	user
type	uri-param
action	add
new-value	phone
header-rule	
name	adduserphoneinTo
header-name	To
action	manipulate
msg-type	request
methods	INVITE, REGISTER
element-rule	
name	adduserphonto
parameter-name	user
type	uri-param
action	add
new-value	phone
header-rule	
name	adduserphoneinRURIINVITE
header-name	Request-URI
action	manipulate
msg-type	request
methods	INVITE
element-rule	
name	adduserequalphone
parameter-name	user
type	uri-param
action	add
new-value	phone
header-rule	
name	Forinvitedelauthparams
header-name	Proxy-Authorization
action	manipulate
msg-type	request
methods	INVITE
element-rule	
name	storethevalue
type	header-value
action	store
comparison-type	pattern-rule
match-value	(.+) (, auth-
params=sha1-credential)	
element-rule	
name	delparam
type	header-value
action	replace
comparison-type	pattern-rule

```

                                new-value
$Forinvitedelauthparams.$storethevalue.$1
    header-rule
        name                                addopaqueinReg
        header-name                        Authorization
        action                            manipulate
        comparison-type                    pattern-rule
        msg-type                          request
        methods                           REGISTER
        element-rule
            name                            storeentireheader
            type                            header-value
            action                          store
            comparison-type                 pattern-rule
            match-value                     (.+) (,
algorithm=MD5)
    element-rule
        name                                addopaqueparam
        parameter-name                     opaque
        type                               header-value
        action                             replace
        comparison-type                    pattern-rule
        new-value
$addopaqueinReg.$storeentireheader.$1+$addopaqueinReg.$storeentireheader.$2+,+opaque=\\\"\\\"
    header-rule
        name                                addopaqueinINVITE
        header-name                        Proxy-authorization
        action                            manipulate
        msg-type                          request
        methods                           INVITE
        element-rule
            name                            Checkheader
            type                            header-value
            action                          store
            comparison-type                 pattern-rule
            match-value                     (.+) (,
algorithm=MD5)
    element-rule
        name                                addopaqueinheader
        type                               header-value
        action                             replace
        comparison-type                    pattern-rule
        new-value
$addopaqueinINVITE.$Checkheader.$1+$addopaqueinINVITE.$Checkheader.$2+,+opaque=\\\"\\\"
"
```

ModMaxforwards

To modify the Max-Forwards header value to 70 and adds the header if it is not present.

```

sip-manipulation
    name                                ModMaxforwards
    description                        Look for Max-Forwards header,
change it to 70 and if not present, add it
    header-rule
        name                            CheckMaxforwards
        header-name                      Max-Forwards
```

```

        action                                manipulate
        methods
ACK, BYE, INVITE, PRACK, UPDATE
        element-rule
            name                                storevalue
            type                                header-value
            action                                store
            comparison-type                      pattern-rule
        element-rule
            name                                add70
            type                                header-value
            action                                find-replace-all
            comparison-type                      pattern-rule
            new-value                            70
    header-rule
        name                                Addmaxforwardsifnotpresent
        header-name                          Max-Forwards
        action                                add
        comparison-type                      boolean
        msg-type                              reply
        methods
ACK, BYE, INVITE, PRACK, UPDATE
        match-
value                                !$CheckMaxforwards.$storevalue
        element-rule
            name                                addvalue
            type                                header-value
            action                                add
            new-value                            70

```

deltransportUDP

To remove the 'transport' uri-parameter from the Contact header.

```

sip-manipulation
    name                                deltransportUDP
    header-rule
        name                                Remtransportudp
        header-name                          Contact
        action                                manipulate
        methods                              INVITE, UPDATE
        element-rule
            name                                delparam
            parameter-name                      transport
            type                                uri-param
            action                                delete-element

```

Modcontactuserinresponses

This sip-manipulation is for modifying the required parameters in the responses towards NTT .

```

sip-manipulation
    name                                Modcontactuserinresponses
    header-rule
        name                                Replacesupported200
        header-name                          Supported
        action                                manipulate

```

msg-type	reply
methods	INVITE, UPDATE
new-value	timer
header-rule	
name	Modusergaent
header-name	User-Agent
action	delete
msg-type	reply
methods	INVITE, UPDATE
header-rule	
name	Modmaxf
header-name	Max-Forwards
action	delete
msg-type	reply
methods	INVITE, UPDATE
header-rule	
name	is180
header-name	@status-line
action	store
comparison-type	pattern-rule
methods	INVITE, UPDATE
element-rule	
name	Addinrerply
type	status-code
action	store
comparison-type	pattern-rule
match-value	180
header-rule	
name	Supported
header-name	Supported
action	delete
comparison-type	boolean
msg-type	reply
methods	INVITE, UPDATE
match-value	\$is180.\$Addinrerply

ModAllowheader

Modifies the Allow header value in INVITE and UPDATE to include the methods, INVITE,BYE,CANCEL,ACK,PRACK,UPDATE and adds the Allow header if it is not present.

sip-manipulation	ModAllowheader
name	
header-rule	
name	CheckAllowheader
header-name	Allow
action	manipulate
methods	INVITE, UPDATE
element-rule	
name	Storeheadervalue
type	header-value
action	store
comparison-type	pattern-rule
match-value	.*
element-rule	
name	Modallow
type	header-value
action	replace

```

                                new-value
INVITE, BYE, CANCEL, ACK, PRACK, UPDATE
    header-rule
        name                                Checkallowandifnotaddit
        header-name                        Allow
        action                             add
        comparison-type                    boolean
        msg-type                           request
        methods                            INVITE, UPDATE
        match-
value                                     !$CheckAllowheader.$Storeheadervalue
    element-rule
        name                                addheadervalue
        type                                header-value
        action                             add
        new-value
INVITE, BYE, CANCEL, ACK, PRACK, UPDATE
    header-rule
        name                                deleteAllow
        header-name                        Allow
        action                             delete
    methods                                ACK

```

DelReasonheader

To delete the Reason header in BYE.

```

sip-manipulation
    name                                DelReasonheader
    header-rule
        name                                delreason
        header-name                        Reason
        action                             delete
        msg-type                           request
        methods                            BYE

```

ModUPDATEmessage

To modify the Supported header in UPDATES to include only timer

```

sip-manipulation
    name                                ModUPDATEmessage
    header-rule
        name                                ModSupportedheader
        header-name                        Supported
        action                             manipulate
        comparison-type                    pattern-rule
        msg-type                           request
        methods                            UPDATE
        element-rule
            name                                keeptimeronly
            type                                header-value
            action                             replace
            comparison-type                    pattern-rule
            new-value                        timer

```

DelExpiresinINVITE

To delete the Expires header from the INVITE

sip-manipulation	
name	DelExpiresinINVITE
header-rule	
name	delexpires
header-name	Expires
action	delete
msg-type	request
methods	INVITE

forsessionexpirestoNTT

To modify the value in the Session-Expires header to 180

sip-manipulation		forsessionexpirestoNTT
name		
header-rule		
name		adduacforSE
header-name		Session-Expires
action		manipulate
comparison-type		pattern-rule
msg-type		request
methods		INVITE
element-rule		
name		storesevalue
type		header-value
action		store
comparison-type		pattern-rule
match-value		(.*)
element-rule		
name		addrefresheruac
type		header-value
action		replace
comparison-type		pattern-rule
new-value		
180+;+refresher=uac		
header-rule		
name		adduacforSE2
header-name		Min-SE
action		manipulate
comparison-type		pattern-rule
msg-type		request
methods		INVITE
element-rule		
name		storesevalue
type		header-value
action		store
comparison-type		pattern-rule
match-value		(.*)
element-rule		
name		addrefresheruac
type		header-value
action		replace
comparison-type		pattern-rule
new-value		180

sip-manipulation	anonymouscall
name	
header-rule	
name	changeRURI
header-name	Request-URI
action	manipulate
msg-type	request
methods	INVITE
element-rule	
name	storeuser
type	uri-user
action	store
comparison-type	pattern-rule
match-value	^\+184(.*\$)
element-rule	
name	striptheplus
type	uri-user
action	replace
comparison-type	boolean
match-value	
\$changeRURI.\$storeuser	
new-value	\$ORIGINAL-^"+"
header-rule	
name	addphonecontext
header-name	Request-URI
action	manipulate
comparison-type	boolean
msg-type	request
methods	INVITE
match-value	\$changeRURI.\$storeuser.\$0
element-rule	
name	addtheparam
parameter-name	phone-context
type	uri-user-param
action	add
new-value	\+81
header-rule	
name	ModToheader
header-name	To
action	manipulate
comparison-type	pattern-rule
msg-type	request
methods	INVITE
element-rule	
name	storetheuser
type	uri-user
action	store
comparison-type	pattern-rule
match-value	^\+184(.*\$)
element-rule	

```

                                name
Striptheplusfromuriuser
                                type                uri-user
                                action                replace
                                comparison-type        boolean
                                match-value
$ModToheader.$storetheuser
                                new-value            $ORIGINAL-^"+
    header-rule
        name                addphonecontextinTo
        header-name          To
        action                manipulate
        comparison-type        boolean
        msg-type              request
        methods                INVITE
        match-value
$ModToheader.$storetheuser.$0
    element-rule
        name                addpc
        parameter-name        phone-context
        type                  uri-user-param
        action                add
        new-value              \+81

```

stripblines

To remove the unwanted lines from the SDP as per NTT requirements.

```

sip-manipulation
    name                stripblines
    header-rule
        name                blinefix
        header-name          Content-Type
        action                manipulate
        element-rule
            name                removeb1
            parameter-name        application/sdp
            type                  mime
            action                find-replace-all
            comparison-type        pattern-rule
            match-value            b=TIAS:64000\r\n
        element-rule
            name                removeb2
            parameter-name        application/sdp
            type                  mime
            action                find-replace-all
            comparison-type        pattern-rule
            match-value            b=AS:64\r\n
        element-rule
            name                removemaxptime
            parameter-name        application/sdp
            type                  mime
            action                find-replace-all
            comparison-type        pattern-rule
            match-value            a=maxptime:20\r\n
        element-rule
            name                removemaxptime2
            parameter-name        application/sdp

```

	type	mime
	action	find-replace-all
	comparison-type	pattern-rule
8.5.000.64	match-value	EpiSIPphone-epi-
	new-value	session
element-rule	name	removemaxptime4
	parameter-name	application/sdp
	type	mime
	action	replace
	comparison-type	pattern-rule
	match-value	Session Name=*
	new-value	Session
Name=session		
element-rule	name	removemaxptime5
	parameter-name	application/sdp
	type	mime
	action	replace
	match-value	o=-
	new-value	o=Genesys
element-rule	name	ssrc
	parameter-name	application/sdp
	type	mime
	action	replace
	comparison-type	pattern-rule
	match-value	a =ssrc(.*)\n\r
mime-sdp-rule		
	name	sdp
	msg-type	request
	methods	INVITE
	action	manipulate
sdp-media-rule		
	name	user
	media-type	audio
	action	manipulate
sdp-line-rule		
	name	audio2
	type	a
	action	delete
	comparison-type	pattern-
rule	match-value	^ssrc.*
sdp-session-rule		
	name	oline
	action	manipulate
sdp-line-rule		
	name	replaceo
	type	o
	action	replace
	match-value	-
	new-value	Geneyss
inviteffromport		

This sip-manipulation is configured to change user-param and port in REGISTER. The new value should be left blank for Register To and From port as NTT does not support From and To ports in Register message.

```

sip-manipulation
  name
  header-rule
    name
    header-name
    action
    msg-type
    methods
    element-rule
      name
      parameter-name
      type
      action
      match-value
  header-rule
    name
    header-name
    action
    msg-type
    methods
    element-rule
      name
      parameter-name
      type
      action
      match-value
  header-rule
    name
    header-name
    action
    msg-type
    methods
    element-rule
      name
      parameter-name
      type
      action
      match-value
  header-rule
    name
    header-name
    action
    msg-type
    methods
    element-rule
      name
      parameter-name
      type
      action
      match-value
inviteffromport
  From
  From
  manipulate
  request
  REGISTER
  From_port
  From
  uri-param-name
  replace
  user
  To
  To
  manipulate
  request
  REGISTER
  From_port
  To
  uri-param-name
  replace
  user
  From_port
  From
  manipulate
  request
  INVITE, REGISTER, UPDATE
  From_port
  From
  uri-port
  replace
  4080
  To_port
  To
  manipulate
  request
  REGISTER
  From_port
  From
  uri-port
  replace
  7060

```

Privacy

This sip-manipulation deletes the Privacy header from the requests :ACK, BYE, CANCEL, INVITE, PRACK, UPDATE

```

sip-manipulation
    name                                Privacy
    header-rule
        name                            deletePriv
        header-name                      Privacy
        action                          delete
        msg-type                         request
        methods
ACK, BYE, CANCEL, INVITE, PRACK, UPDATE

```

5.11. Configure Session-Timer Profile

The Oracle® Enterprise Session Border Controller provides a SIP session timer feature that, when enabled, forwards the re-INVITE or UPDATE requests from a User Agent Client (UAC) to a User Agent Server (UAS) in order to determine whether or not a session is still active. This refresh feature works for both UAs and proxies.

To support UPDATE for session-refresh towards NTT, we configure session-time profile .

The screenshot shows the Oracle Enterprise Session Border Controller web interface. The top navigation bar includes 'Dashboard', 'Configuration', 'Monitor and Trace', 'Widgets', and 'System'. The 'Configuration' tab is active. On the left, a sidebar lists various configuration categories, with 'session-timer-profile' selected. The main area displays the 'Modify Session Timer Profile' form for a profile named 'NTT-ST'. The form includes fields for 'Session Expires' (180), 'Min Se' (180), 'Force Reinvite' (unchecked), 'Request Refresher' (uac), and 'Response Refresher' (uas). Ranges for the timer values are indicated as '(Range: 64..999999999)'.

Apply the timer –profile on the sip-interface towards NTT.

5.12. Configure Surrogate-agent

NTT requires the customer PBX to register in order to originate calls support authentication. Since Genesys cannot perform the registration, Oracle ESBC performs surrogate registrations on behalf of the PBX

Configure the following for surrogate registration to be successful

- Register Host
- Register User

- Realm-ID
- Customer-NextHop (Session Agent of NTT)
- Register-Contact-Host (IP of the Egress Interface toards NTT)
- Register-Contact-User (Phone number)
- Auth-User
- Auth-Passwd

ORACLE Enterprise Session Border Controller

OracleESBC SCZB.4.0 Patch 8 (WS Build 482) admin

Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration Q

Discard Verify Save

Configuration

- sip-interface
- sip-manipulation
- sip-monitoring
- sip-nat
- sip-profile
- sip-q850-map
- sip-recursion-policy
- surrogate-agent**
- survivability
- translation-rules

Modify Surrogate Agent

Register Host	ipvoice.jp
Register User	+81334
Description	
Realm ID	Genesys
State	☒ enable
Customer Host	
Customer Next Hop	ipvoice.jp

ORACLE Enterprise Session Border Controller

OracleESBC SCZB.4.0 Patch 8 (WS Build 482) admin

Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration Q

Discard Verify Save

Configuration

- sip-interface
- sip-manipulation
- sip-monitoring
- sip-nat
- sip-profile
- sip-q850-map
- sip-recursion-policy
- surrogate-agent**
- survivability
- translation-rules

Modify Surrogate Agent

Register Contact Host	ipvoice.jp
Register Contact User	10.0.7.113
Register Contact User	+813
Password	
Register Expires	3600 (Range: 0.999999999)
Replace Contact	☐ enable
Options	
Route To Registrar	☒ enable
Aor Count	1 (Range: 0.999999999)

ORACLE Enterprise Session Border Controller

OracleESBC SCZB.4.0 Patch 8 (WS Build 482) admin

Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration Q

Discard Verify Save

Configuration Menu:

- sip-interface
- sip-manipulation
- sip-monitoring
- sip-nat
- sip-profile
- sip-q850-map
- sip-recursion-policy
- surrogate-agent**
- survivability
- translation-rules
- system

Show All ☒

Modify Surrogate Agent

Route To Registrar ☒ enable

Aor Count (Range: 0..99999999)

Auth User

Max Register Attempts (Range: 0..10)

Register Retry Time (Range: 30..3600)

Count Start (Range: 0..99999999)

Register Mode

Triggered Inactivity Interval (Range: 5..300)

Triggered Oos Response

OK Back

5.13. Configure SIP Interfaces.

Navigate to sip-interface under session-router and configure the sip-interface as shown below
Genesys interface is configured with UDP port and allow-anonymous as “agents-only”

Make sure that the master sip-manipulations are applied at both the in and out manipulation-id.

ORACLE Enterprise Session Border Controller

OracleESBC SCZB.4.0 Patch 8 (WS Build 482) admin

Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration Q

Discard Verify Save

Configuration Menu:

- local-policy
- local-routing-config
- media-profile
- session-agent
- session-group
- session-recording-group
- session-recording-server
- session-translation
- sip-config
- sip-feature

Modify SIP Interface

State ☒ enable

Realm ID

Description

SIP Ports

Action	Select	Address	Port	Transport Protocol	Allow Anonymous	Multi Home Addr
⋮	☐	172.18.0.139	5060	UDP	agents-only	

Show Configuration

ORACLE Enterprise Session Border Controller admin ▼

OracleESBC SCZ8.4.0 Patch 8 (WS Build 482) Dashboard Configuration Monitor and Trace Widgets System

Configuration Discard Verify Save

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

Modify SIP Interface

Show Configuration

Nat Interval	30	(Range: 0..4294967295)
TCP Nat Interval	90	(Range: 0..4294967295)
Registration Caching	☒ enable	
Min Reg Expire	300	(Range: 0..999999999)
Registration Interval	3600	(Range: 0..4294967295)
Route To Registrar	☐ enable	
Secured Network	☐ enable	
Uri Fqdn Domain		
Options		

ORACLE Enterprise Session Border Controller admin ▼

OracleESBC SCZ8.4.0 Patch 8 (WS Build 482) Dashboard Configuration Monitor and Trace Widgets System

Configuration Discard Verify Save

local-policy
local-routing-config
media-profile
session-agent
session-group
session-recording-group
session-recording-server
session-translation
sip-config
sip-feature

Modify SIP Interface

Show Configuration

SPL Options		
Trust Mode	all	
Max Nat Interval	3600	(Range: 0..4294967295)
Stop Recurse	401,407	
Port Map Start	0	(Range: 0;1025..65535)
Port Map End	0	(Range: 0;1025..65535)
In Manipulationid	Forsuragent	
Out Manipulationid	ToGenesys	

NTT Sip-interface-Config

Configure a sip-interface for NTT with transport set as UDP and allow-anonymous set as “registered only”

ORACLE Enterprise Session Border Controller

OracleESBC SCZ8.4.0 Patch 8 (WS Build 482) admin

Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration Q

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

Modify SIP Interface Show Configuration

State ☒ enable

Realm ID NTT-router

Description

SIP Ports

Action	Select	Address	Port	Transport Protocol	Allow Anonymous	Multi Home Addr
⋮	☐	10.0.7.113	5060	UDP	registered	

Make sure the following configuration is there in sip-interface before moving to the next configuration

1. 100rel-interworking is set for early media support from SBC.
2. Control-Surr-Reg is configured as SPL-options for enabling the SurrogateContact.0.6.spl
3. The sip-manipulations for in and out manipulations.
4. Session-Timer Profile

ORACLE Enterprise Session Border Controller

OracleESBC SCZ8.4.0 Patch 8 (WS Build 482) admin

Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration Q

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

Modify SIP Interface Show Configuration

Registration Interval 3600 (Range: 0..4294967295)

Route To Registrar ☐ enable

Secured Network ☐ enable

Uri Fqdn Domain

Options 100rel-interworking X

SPL Options Control-Surr-Reg

Trust Mode all

Max Nat Interval 3600 (Range: 0..4294967295)

Stop Recurse 401,407

ORACLE Enterprise Session Border Controller

OracleESBC SCZ8.4.0 Patch 8 (WS Build 482)

Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration Q

Discard Verify Save

Show Configuration

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

Modify SIP Interface

Port Map Start 0 (Range: 0;1025..65535)

Port Map End 0 (Range: 0;1025..65535)

In ManipulationId ModSupportedfromntt

Out ManipulationId Changecontact

SIP Atcf Feature ☐ enable

Rfc2833 Payload 101 (Range: 96..127)

Rfc2833 Mode transparent

Response Map

Local Response Map

ORACLE Enterprise Session Border Controller

OracleESBC SCZ8.4.0 Patch 8 (WS Build 482)

Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration Q

Discard Verify Save

Show Configuration

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

Modify SIP Interface

Msrp Delay Egress Bye ☐ enable

Send 380 Response

Pcsf Restoration

Session Timer Profile NTT-ST

Session Recording Server

Session Recording Required ☐ enable

Service Tag

Reg Cache Route ☐ enable

Diversion Info Mapping Mode none

Once sip-interface is configured – the SBC is ready to accept traffic on the allocated IP address. Now configure where the SBC sends the outbound traffic.

5.14. Configure session-agent

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

Configure the session-agent for Genesys with the following parameters.
Go to session-router->Session-Agent.

- hostname as hostname of Genesys SIP Server
- IP address as Genesys SIP server IP address
- port (Genesys SIP server port)
- realm-id – needs to match the realm created for Genesys
- transport set to “UDP”
- In addition to the above configuration, Auth Attributes are configured to challenge the requests coming from Genesys

- Username and Password are those provided by NTT trunk.

ORACLE Enterprise Session Border Controller

OracleESBC SCZ8.4.0 Patch 8 (WS Build 482) admin

Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration Q Discard Verify Save

media-manager
security
session-router
access-control
account-config
filter-config
ldap-config
local-policy
local-routing-config
media-profile
session-agent

Modify Session Agent

Show Configuration

Hostname	172.18.0.124
IP Address	172.18.0.124
Port	4080 (Range: 0,1025..65535)
State	☒ enable
App Protocol	SIP
App Type	
Transport Method	UDP
Realm ID	Genesys
Egress Realm ID	

ORACLE Enterprise Session Border Controller

OracleESBC SCZ8.4.0 Patch 8 (WS Build 482) admin

Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration Q Discard Verify Save

media-manager
security
session-router
access-control
account-config
filter-config
ldap-config
local-policy
local-routing-config
media-profile
session-agent

Modify Session Agent

Show Configuration

Burst Rate Window	0 (Range: 0..999999999)
Sustain Rate Window	0 (Range: 0..999999999)
Proxy Mode	
Redirect Action	
Loose Routing	☒ enable
Response Map	
Ping Method	OPTIONS
Ping Interval	30 (Range: 0..4294967295)
Ping Send Mode	keep-alive
Ping All Addresses	☐ enable

Show All ☐ OK Back

ORACLE Enterprise Session Border Controller

OracleESBC SCZ8.4.0 Patch 8 (WS Build 482)

admin

Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration

media-manager

security

session-router

access-control

account-config

filter-config

ldap-config

local-policy

local-routing-config

media-profile

session-agent

Modify Session agent / auth attributes

Auth Realm ipvoice.jp

Username user

Password *****

In Dialog Methods INVITE X

Similarly, Configure the session-agent for NTT TRUNK Go to session-router->Session-Agent.

- Host name set to ipvoice.jp
- IP address to ip-address of NTT Trunk.
- port 7060
- realm-id – needs to match the realm created for NTT TRUNK.
- transport set to “UDP”

ORACLE Enterprise Session Border Controller

OracleESBC SCZ8.4.0 Patch 8 (WS Build 482) Dashboard **Configuration** Monitor and Trace Widgets System admin

Configuration View Configuration Q Discard Verify Save

Modify Session Agent Show Configuration

media-manager
security
session-router
access-control
account-config
filter-config
ldap-config
local-policy
local-routing-config
media-profile
session-agent

Hostname: ipvoice.jp
IP Address: 10.180.111.1
Port: 7060 (Range: 0,1025..65535)
State: ☒ enable
App Protocol: SIP
App Type:
Transport Method: UDP
Realm ID: NTT-router
Egress Realm ID:

OK Back

5.15. Configure local-policy

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

Configure two local-policies

- From Genesys to NTT
- From NTT to Genesys

Below is the snapshot for NTT to Genesys.

ORACLE Enterprise Session Border Controller

OracleESBC SCZ8.4.0 Patch 8 (WS Build 482) Dashboard **Configuration** Monitor and Trace Widgets System admin

Configuration View Configuration Q Discard Verify Save

Modify Local Policy

media-manager
security
session-router
access-control
account-config
filter-config
ldap-config
local-policy
local-routing-config
media-profile
session-agent

From Address: * X
To Address: * X
Source Realm: NTT-router X
Description:
State: ☒ enable
Policy Priority: none

For this local-policy (only) set the action as replace-uri as shown .(to replace the contact-user received in INVITE from NTT with Genesys number)

ORACLE Enterprise Session Border Controller

admin

OracleESBC SC28.4.0 Patch 8 (WS Build 482)

Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration

media-manager security session-router access-control account-config filter-config ldap-config local-policy local-routing-config media-profile session-agent

Show All

Modify Local policy / policy attribute

Next Hop 172.18.0.124

Realm Genesys

Action replace-uri

Terminate Recursion ☐ enable

Cost 0 (Range: 0.999999999)

State ☒ enable

App Protocol SIP

Lookup single

Next Key

OK Back

Similarly configure local-policy from Genesys to NTT with action set as none.

5.16. Configure Codec Policy

The Oracle Session Border Controller (SBC) uses codec policies to describe how to manipulate SDP messages as they cross the SBC. The SBC bases its decision to transcode a call on codec policy configuration and the SDP. Each codec policy specifies a set of rules to be used for determining what codecs are retained, removed, and how they are ordered within SDP.

Note: this is an optional config – configure codec policy only if deemed required.

5.17. Configure Media Policy

NTT requires that the TOS value for SIP and RTP be set to 5. The following media-policy is configured and applied on the realmconfig towards NTT.

Go to Media-manager and configure media-policy as shown below.

ORACLE Enterprise Session Border Controller

OracleESBC SCZ8.4.0 Patch 8 (WS Build 482)

Configuration

media-manager

codecs-policy

dns-alg-constraints

dns-config

ice-profile

media-manager

media-policy

msrp-config

playback-config

realm-config

realm-group

Show All

Modify Media Policy

Name: NTT-Tos

Tos Settings

Action	Select	Media Type	Media Sub Type	Tos Value	Media Attributes
:	☐	message	sip	0xa0	
:	☐	audio		0xa0	

OK Back

Apply this media-policy to the NTT realm as shown below.

ORACLE Enterprise Session Border Controller

OracleESBC SCZ8.4.0 Patch 8 (WS Build 482)

Configuration

media-manager

codecs-policy

dns-alg-constraints

dns-config

ice-profile

media-manager

media-policy

msrp-config

playback-config

realm-config

realm-group

Show All

Modify Realm Config

☐ enable

Mm In Network ☒ enable

Mm Same Ip ☒ enable

QoS Enable ☐ enable

Max Bandwidth 0 (Range: 0.999999999)

Max Priority Bandwidth 0 (Range: 0.999999999)

Parent Realm

DNS Realm

Media Policy NTT-Tos

RTCP Mux ☐ enable

OK Back

5.18. Configure steering-pool

Steering-pool config allows configuration to assign port range for media handling on the SBC. Configure steering pool for both the realms.

ORACLE Enterprise Session Border Controller

OracleESBC SCZ8.4.0 Patch 8 (WS Build 482)

Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration Q Discard Verify

msrp-config
playback-config
realm-config
realm-group
rtcp-policy
static-flow
steering-pool
tcp-media-profile
security
session-router

Modify Steering Pool

IP Address	10.0.7.113	
Start Port	41000	(Range: 0,1..65535)
End Port	45000	(Range: 0,1..65535)
Realm ID	NTT-router	
Network Interface		

5.19. Number Translation

NTT requires the telephone numbers in the From and To headers to be in E164 format. Since Genesys does not send the numbers in E164 format, we configure a translation rule to add + to the uri-users of the From and To headers of the INVITEs going to NTT and apply it on the realm towards NTT.

Go to session-router->translation-rules and add the following

ORACLE Enterprise Session Border Controller

OracleESBC SCZ8.4.0 Patch 8 (WS Build 482)

Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration Q Discard Verify Save

sip-interface
 sip-manipulation
 sip-monitoring
 sip-nat
 sip-profile
 sip-q850-map
 sip-recursion-policy
 surrogate-agent
 survivability
translation-rules
 system

Modify Translation Rules

Id	addforJP
Type	add
Add String	+
Add Index	0
Delete String	
Delete Index	0 (Range: 0..999999999)

OK Back

Show All

Now add the above rule to session-translation.

Oracle Enterprise Session Border Controller

OracleESBC SCZ8.4.0 Patch 8 (WS Build 482)

Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration Q

session-group
session-recording-group
session-recording-server
session-router
session-timer-profile
session-translation
sip-advanced-logging
sip-config
sip-feature

Modify Session Translation

Id	add81forJP
Rules Calling	addforJP X
Rules Called	addforJP X
Rules Asserted Id	
Rules Redirect	
Rules Isup Cdpn	

Apply the above translation to the realm-config of NTT as shown.

Oracle Enterprise Session Border Controller

OracleESBC SCZ8.4.0 Patch 8 (WS Build 482)

Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration Q

media-manager
codec-policy
dns-alg-constraints
dns-config
ice-profile
media-manager
media-policy
msip-config
playback-config
realm-config
realm-group

Modify Realm Config

Teams Fqdn In Uri	☐ enable
SDP Inactive Only	☐ enable
DTLS Srtp Profile	
Class Profile	
In Translationid	
Out Translationid	add81forJP
In Manipulationid	
Out Manipulationid	
Average Rate Limit	0 (Range: 0..4294967295)

OK Back

Similarly add translation rules for removing the + towards Genesys and apply it to the realm-config facing Genesys.

5.20. Update Interworking

Genesys doesn't support in-call modification for established dialogs using SIP UPDATE method. In the Genesys SIP server guide it is mentioned that "SIP Server supports UPDATE requests with SDP only for early dialogs and does not support UPDATE requests for established dialogs."

The SBC interworks between Genesys SIP server and NTT and converts the Update messages into Invite messages. This is configured by using the option "update-interworking" on the NTT sip interface .

Go to Sip-Interface-NTT-Router and configure as shown below

ORACLE Enterprise Session Border Controller

OracleESBC SCZ8.4.0 Patch 8 (WS Build 482)

Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration

Discard Verify Save

Show Configuration

Modify SIP Interface

Uri Fqdn Domain

Options

- 100rel-interworking
- dropResponse=699:698
- update-interworking

SPL Options

Control-Surr-Reg

Trust Mode

all

Max Nat Interval

3600 (Range: 0..4294967295)

Stop Recurse

401,407

Port Map Start

0 (Range: 0;1025..65535)

OK Back

Show All

6. Existing SBC configuration

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

- [New realm-config](#)
- [New sip-interface](#)
- [New session-agent](#)
- [Sip Manipulation](#)
- [New steering-pools](#)
- [New Local-policy](#)
- [Codec-policy](#)

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

7. Security Configuration

DoS and DDoS settings can protect against malicious and non-malicious SIP flooding attacks from untrusted sources without adversely affecting service to trusted peers. Attacks can be prevented through

configuration of Access Control Lists, appropriately sized traffic queues, and trust level settings that will limit or blacklist endpoints that become abusive. Configuration of these parameters will differ based upon the configuration model used – peering, access or hybrid.

Note that a truly comprehensive and effective DDoS prevention design requires analysis of traffic patterns, SIP message contents and performance characteristics of all peer devices to provide message thresholds, CAC, and traffic policing settings. Please contact your Oracle Sales representative for information on professional services designed to implement customized DDoS settings.

Please refer to the following app notes for further assistance.

[DDOS Prevention Configuration for SIP Access environments](#)
[DDOS Prevention Configuration for SIP Peering environments](#)

7.1. Access-control Lists

Using a list of IP addresses and subnets that are allowable as packet sources, you can configure what traffic the Oracle® Enterprise Session Border Controller accepts and what it denies. All IP packets arriving on the management interface are subject; if it does not match your configuration for system ACL, then the Oracle® Enterprise Session Border Controller drops it.

Configure the IP-addresses listed in the address list provided by NTT. Make sure the trust level is set to high here

Go to Session-Router-Access-control. Configure the realm-id (NTT) and source-address (address given by NTT here)

Configure the trust level as High.

The screenshot displays the Oracle Enterprise Session Border Controller web interface. The top navigation bar includes the Oracle logo, product name, version (NN4600-139), build (SCZ9.0.0 GA (Build 54)), and user (admin). The main menu on the left lists various configuration sections, with 'access-control' selected. The 'Modify Access Control' form is shown with the following fields: Realm ID (dropdown), Description (text area), Source Address (172.16.0.0/21), Destination Address (0.0.0.0), Application Protocol (SIP), Transport Protocol (ALL), Access (permit), Average Rate Limit (0, with a range of 0..4294967295), and Trust Level (dropdown). The form includes 'OK' and 'Back' buttons at the bottom.

Make sure the access control in the realm-configuration of NTT (NTT realm) is set to high as shown.

The screenshot shows the Oracle Configuration interface. The top navigation bar includes 'Dashboard', 'Configuration', 'Monitor and Trace', 'Widgets', and 'System'. The left sidebar lists various configuration categories: media-manager, codec-policy, media-manager, media-policy, realm-config (selected), steering-pool, security, session-router, and system. The main content area is titled 'Modify Realm Config' and contains a table of configuration parameters. The 'Access Control Trust Level' is highlighted with a blue arrow and is set to 'high'.

Parameter	Value	Range
In Translationid		
Out Translationid		
In Manipulationid		
Out Manipulationid		
Average Rate Limit	0	(Range: 0..4294967295)
Access Control Trust Level	high	
Invalid Signal Threshold	0	(Range: 0..4294967295)
Maximum Signal Threshold	0	(Range: 0..4294967295)
Untrusted Signal Threshold	0	(Range: 0..4294967295)
Nat Trust Threshold	0	(Range: 0..65535)
Max Endpoints Per Nat	0	(Range: 0..65535)
Nat Invalid Message Threshold	0	(Range: 0..65535)

ORACLE

CONNECT WITH US

-  blogs.oracle.com/oracle
-  facebook.com/Oracle/
-  twitter.com/Oracle
-  oracle.com

Oracle Corporation, World Headquarters
500 Oracle Parkway
Redwood Shores, CA 94065, USA

Worldwide Inquiries
Phone: +1.650.506.7000
Fax: +1.650.506.7200

Integrated Cloud Applications & Platform Services

Copyright © 2021, Oracle and/or its affiliates. All rights reserved. This document is provided for information purposes only, and the contents hereof are subject to change without notice. This document is not warranted to be error-free, nor subject to any other warranties or conditions, whether expressed orally or implied in law, including implied warranties and conditions of merchantability or fitness for a particular purpose. We specifically disclaim any liability with respect to this document, and no contractual obligations are formed either directly or indirectly by this document. This document may not be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without our prior written permission.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group. 0615