



ORACLE

Oracle SBC integration with Enterprise SIP Trunking with KDDI

Technical Application Note

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COMMUNICATIONS



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Contents

1. INTENDED AUDIENCE	4
2. DOCUMENT OVERVIEW	4
2.1. KDDI SIP TRUNK:	4
3. INTRODUCTION	5
3.1. AUDIENCE	5
3.2. REQUIREMENTS.....	5
3.3. ARCHITECTURE	6
4. CONFIGURING THE SBC	6
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.....	14
5.5. CONFIGURE NETWORK INTERFACE	15
5.6. ENABLE MEDIA MANAGER	17
5.7. ENABLE SIP-CONFIG	18
5.8. ENABLE SPLS REQUIRED FOR KDDI SIP TRUNK	19
5.9. CONFIGURE REALMS	20
5.10. CONFIGURE SIP-MANIPULATION	23
5.11. CONFIGURE SESSION-TIMER PROFILE	31
5.12. CONFIGURE SURROGATE-AGENT	31
5.13. CONFIGURE SIP INTERFACES	33
5.14. CONFIGURE SESSION-AGENT	36
5.15. CONFIGURE LOCAL-POLICY	39
5.16. CONFIGURE ACCESS-CONTROL (ACL)	40
5.17. CONFIGURE STEERING-POOL.....	42
5.18. CONFIGURE CODEC POLICY	43
6. EXISTING SBC CONFIGURATION	43
7. ORACLE SBC DEPLOYED BEHIND NAT	44
8. ACLI RUNNING CONFIGURATION	45

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 Generic PBX Platform and KDDI SIP Trunking.

2. Document Overview

This Oracle technical application note outlines the configuration needed to set up the interworking between Oracle SBC and Generic PBX platform (also called as IP-PBX platform) along with KDDI SIP Trunking. The solution contained within this document has been tested using Oracle Communication **OS 920p4**. Our scope of this document is only limited to testing Oracle SBC with Generic PBX platform and KDDI SIP Trunk.

It should be noted that while this application note focuses on the optimal configurations for the Oracle SBC in a Generic PBX platform and KDDI SIP Trunk. 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.

2.1. KDDI SIP Trunk:

There are two service modes KDDI provides to SIP trunk customer:

- **Main Number Service**
- **Dial-In Service**

Only one service mode is offered for each SIP trunk customer.

For both modes KDDI will assign multiple SIP-URL to SIP trunk customer.

One SIP-URI for one phone number, and in additional the number of SIP trunk capacity.

In the case of SIP trunk capacity as 10 simultaneous calls with the main number service (receiving main number), the number of SIP-URLs will be 1 SIP-URL linked to the main number + 10 SIP-URLs for Registration, totaling 11 SIP-URLs.

For Main Number Service, SBC need to register all SIP-URL assigned for simultaneous calls but needn't register the SIP-URL associated with the main number. When KDDI initiates the call to SBC, R-URI user part will be the random user part in the recent successful registration. **Oracle SBC validates the incoming INVITE by checking R-URI user part with its registration caching.** This is implemented with the help of SPLs created specifically for KDDI.

For Dial-In Service, SBC just need register one of SIP-URL assigned for simultaneous calls (also random user part as implemented by SPL). When KDDI initiates the call to SBC, R-URI user part will be the dial-in number. In this mode, **Oracle SBC should not validate the incoming INVITE by checking R-URI user part with its registration caching.**

This is the primary service mode that KDDI offers to its customers.

We will be focusing only on this model and its configuration in this Application Note document.

KDDI issues following account information to SIP trunk customer:

- * VoIP-ID
- * VoIP-PW
- * SIP Server
- * Phone Number
- * SIP-URL

KDDI requires uri-host in URI / From / To header in REGISTER / INVITE messages.
Below is the information about the uri-host as per KDDI specifications.

URI-Host	Request-URI	From	To
REGISTER sent to KDDI	SIP Server	Same as SIP-URL	Same as SIP-URL
INVITE sent to KDDI	SIP Server	Same as SIP-URL	SIP Server

Please note that the IP Addresses, FQDN and configuration names and details given in this document are used for reference purposes only. These same details cannot be used in customer configurations. End users of this document can use the configuration details according to their network requirements. There are some public facing IPs (externally routable IPs) that we use for our testing are masked in this document for security reasons. The customers can configure any publicly routable IPs for these sections as per their network architecture needs. We have also used some Generic terminology instead of actual values in this application note document as per KDDI specifications.

3. Introduction

3.1. Audience

This is a technical document intended for telecommunications engineers with the purpose of configuring Generic PBX platform for calling using Oracle Enterprise SBC and the KDDI SIP Trunk for Dial in service mode. There will be steps that require navigating the Generic PBX and 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

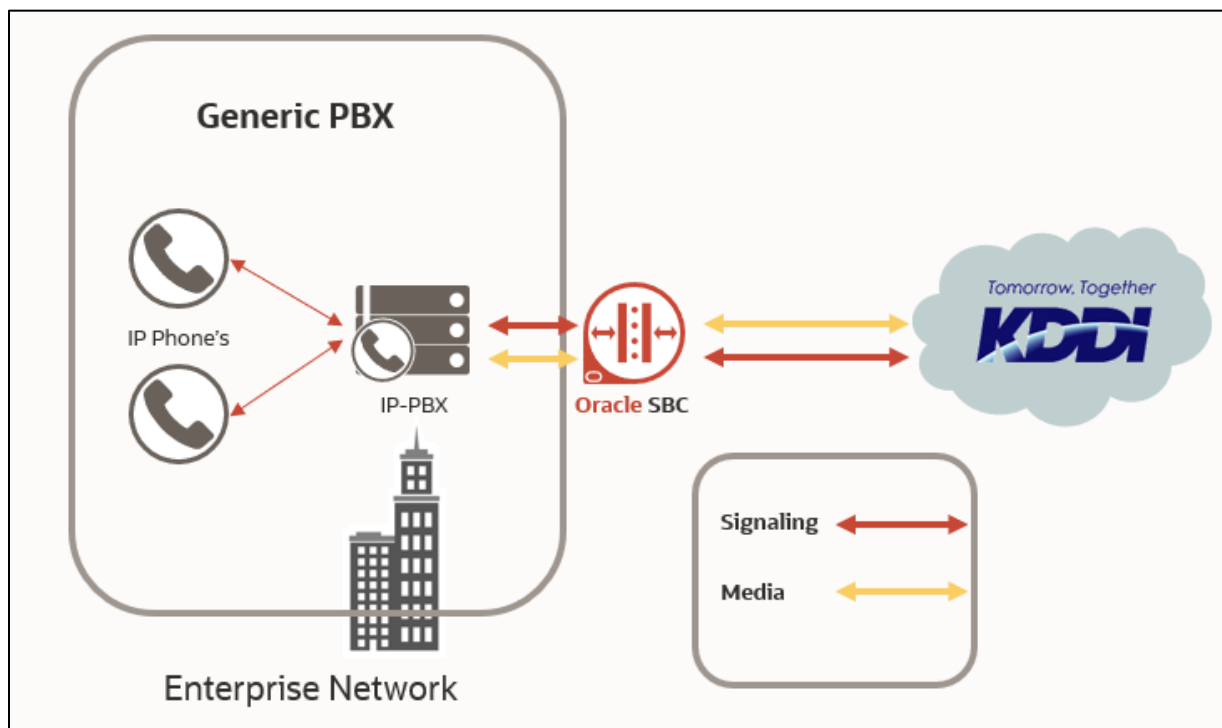
- Generic PBX Platform
- KDDI SIP Trunk
- Oracle Enterprise Session Border Controller (hereafter Oracle SBC) running 9.2.0 version.

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

Software Used	SBC Version	Generic PBX version
Revision 1	9.2.0	N/A

3.3. Architecture

The network configuration is illustrated below for KDDI SIP Trunk with Oracle Enterprise Session Border Controller and Generic PBX



4. Configuring the SBC

This chapter provides step-by-step guidance on how to configure Oracle SBC for Configuring Generic PBX platform. Oracle conducted tests with Oracle SBC 9.2 software – this software with the configuration listed below can run on any of the following products:

4.1. Validated Oracle SBC Version

Oracle conducted tests with SBC 9.2.0 software – this software with the configuration listed below can run on any of the following products:

- AP 1100
- AP 3900
- AP 4600
- AP 6300
- AP 6350
- AP 3950 (Starting from SBC 9.0 version)
- AP 4900 (Starting from SBC 9.0 version)
- VME
- Oracle SBC on Public Cloud

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. 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

```
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 tbfdd...
Starting tIPTd...
Starting tSecured...
Starting tAuthd...
Starting tCertd...
Starting tIked...
Starting tTscfd...
Starting tFcgid...
Starting tauditd...
Starting tauditpusher...
Starting tSnmpd...
Starting tIFMIBd...
Start platform alarm...
Starting display manager...
Initializing /opt/ Cleaner
Starting tLogCleaner task
Bringing up shell...

Starting acliMgr...
password secure mode is enabled
Admin Security is disabled
Password: █
```

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 must 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.

```
SolutionsLab-vSBC-2#
SolutionsLab-vSBC-2# conf t
SolutionsLab-vSBC-2(configure)# bootparam

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

Boot File           : /boot/nncSZ920p4.bz
IP Address          :
VLAN                :
Netmask             :
Gateway            :
IPv6 Address        :
IPv6 Gateway       :
Host IP             :
FTP username        : vxftp
FTP password        :
Flags               : 0x00000040
Target Name         : SolutionsLab-vSBC-2
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: 1)

SolutionsLab-vSBC-2(configure)#
SolutionsLab-vSBC-2(configure)#
SolutionsLab-vSBC-2(configure)#
```

Note: There is no management IP configured by default.

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

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

```
SolutionsLab-vSBC-2# setup product

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

Last Modified 2022-10-03 07:21:29
-----

 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.(The below screen is just an example and not actual config)

```
-----
Entitlements for Enterprise Session Border Controller
Last Modified: 2022-02-23 18:18:18
-----
 1 : Session Capacity           : 9999
 2 :   Advanced                 : enabled
 3 :   STIR/SHAKEN Client       :
 4 : Admin Security             :
 5 : Data Integrity (FIPS 140-2) :
 6 : IPSec Trunking Sessions    : 0
 7 : MSRP B2BUA Sessions        : 0
 8 : SRTP Sessions              : 0
 9 : Transcode Codec AMR        :
10: Transcode Codec AMR Capacity : 0
11: Transcode Codec AMRWB       :
12: Transcode Codec AMRWB Capacity : 0
13: Transcode Codec EVRC        :
14: Transcode Codec EVRC Capacity : 0
15: Transcode Codec EVRCB       :
16: Transcode Codec EVRCB Capacity : 0
17: Transcode Codec EVS        :
18: Transcode Codec EVS Capacity : 0
19: Transcode Codec OPUS        : enabled
20: Transcode Codec OPUS Capacity : 2000
21: Transcode Codec SILK        : enabled
22: Transcode Codec SILK Capacity : 2000

Enter 1 - 22 to modify, d' to display, 's' to save, 'q' to exit. [s]: 1
  Session Capacity (0-10000)           : 500

Enter 1 - 22 to modify, d' to display, 's' to save, 'q' to exit. [s]: 10
  Transcode Codec AMR Capacity (0-10000) : 50

Enter 1 - 22 to modify, d' to display, 's' to save, 'q' to exit. [s]: 14
  Transcode Codec EVRC Capacity (0-10000) : 40

Enter 1 - 22 to modify, d' to display, 's' to save, 'q' to exit. [s]: █
```

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

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

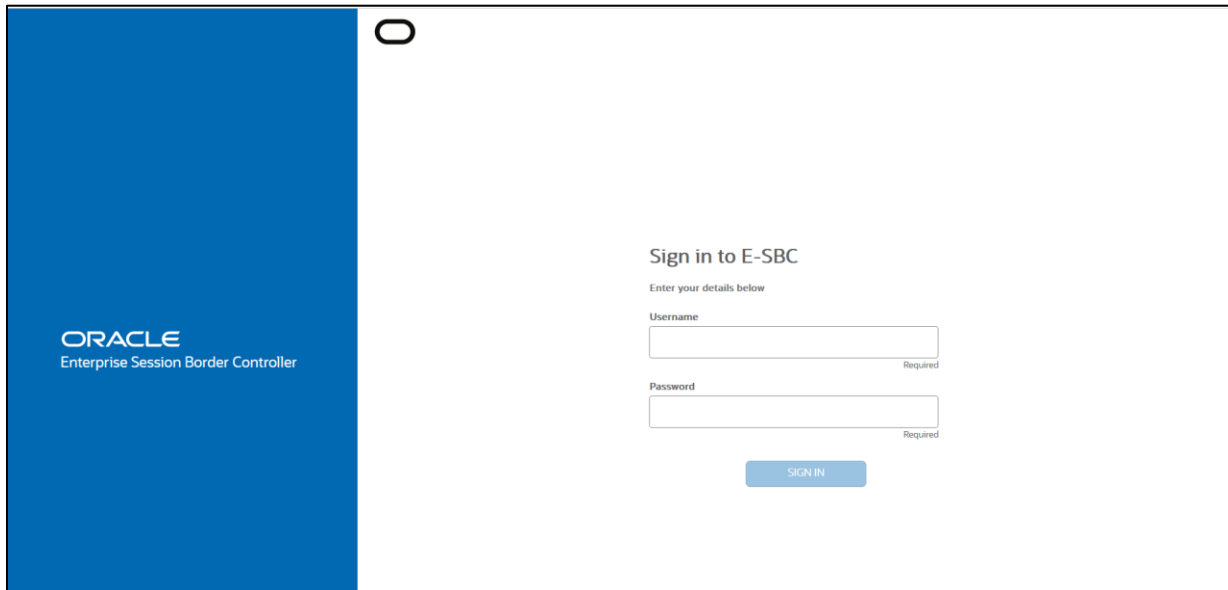
```
SolutionsLab-vSBC-2(http-server)# show
http-server
  name                webserver
  state                enabled
  realm
  ip-address
  http-state           enabled
  http-port            80
  HTTP-strict-transport-security-policy disabled
  https-state          disabled
  https-port           443
  http-interface-list REST, GUI
  http-file-upload-size 0
  tls-profile
  auth-profile
  last-modified-by     webHTTP-admin@196.15.23.12:33336
  last-modified-date   2022-07-07 17:34:44

SolutionsLab-vSBC-2(http-server)#
SolutionsLab-vSBC-2(http-server)#
SolutionsLab-vSBC-2(http-server)#
```

5.2. Configure SBC using Web GUI

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

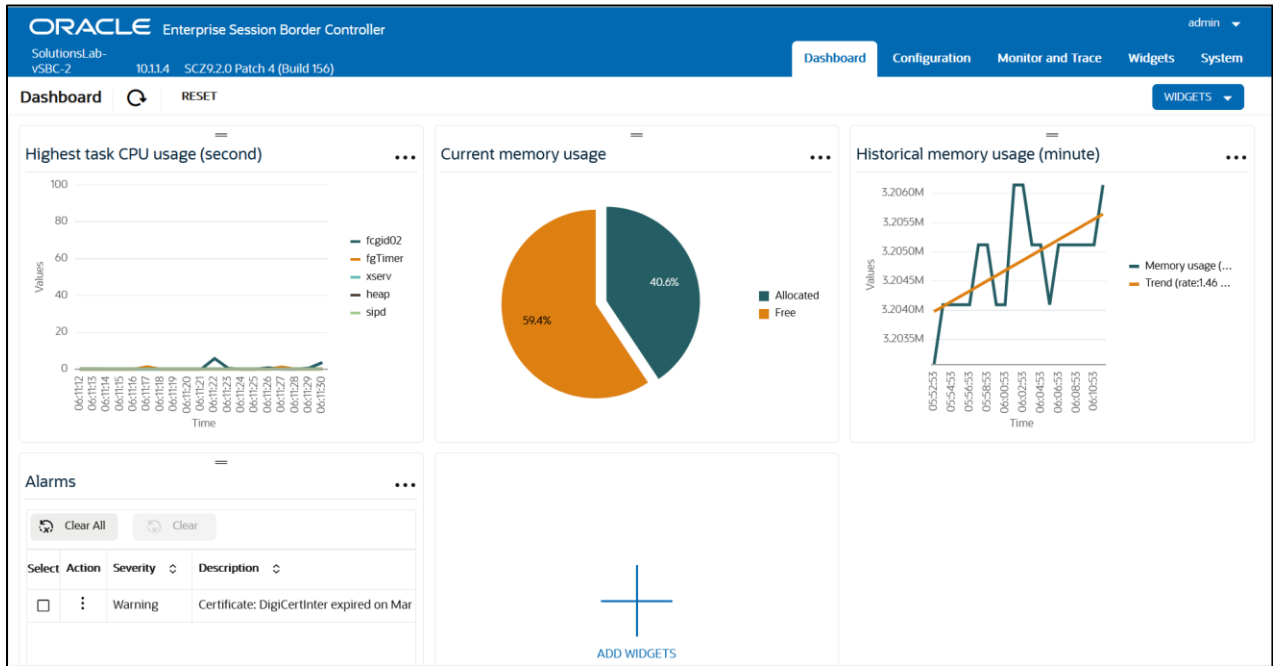
The Web GUI can be accessed through the url http://<SBC_MGMT_IP>.



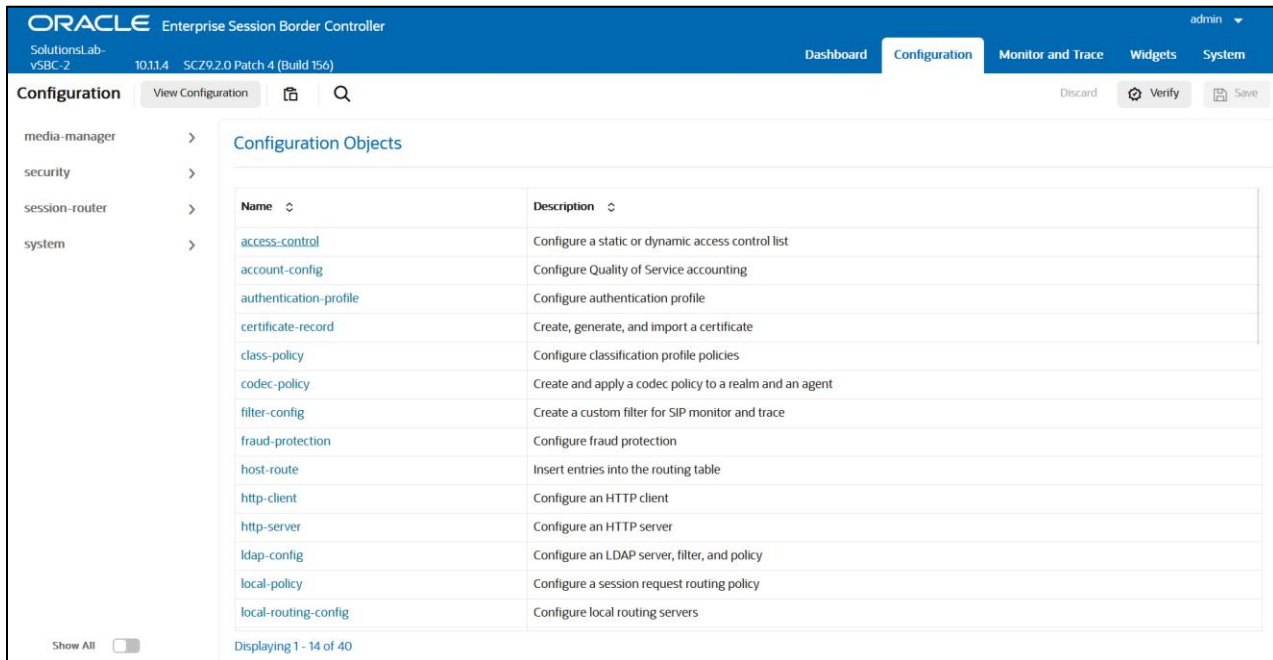
The screenshot shows the Oracle E-SBC Web GUI login page. On the left, there is a blue vertical banner with the Oracle logo and the text "ORACLE Enterprise Session Border Controller". The main content area is white and contains the following elements:

- A large, faint "O" logo in the top left corner.
- The heading "Sign in to E-SBC".
- The instruction "Enter your details below".
- A "Username" label above a text input field, with "Required" written below the field.
- A "Password" label above a text input field, with "Required" written below the field.
- A blue "SIGN IN" button centered below the password field.

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



Go to Configuration as shown below, to configure the SBC



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

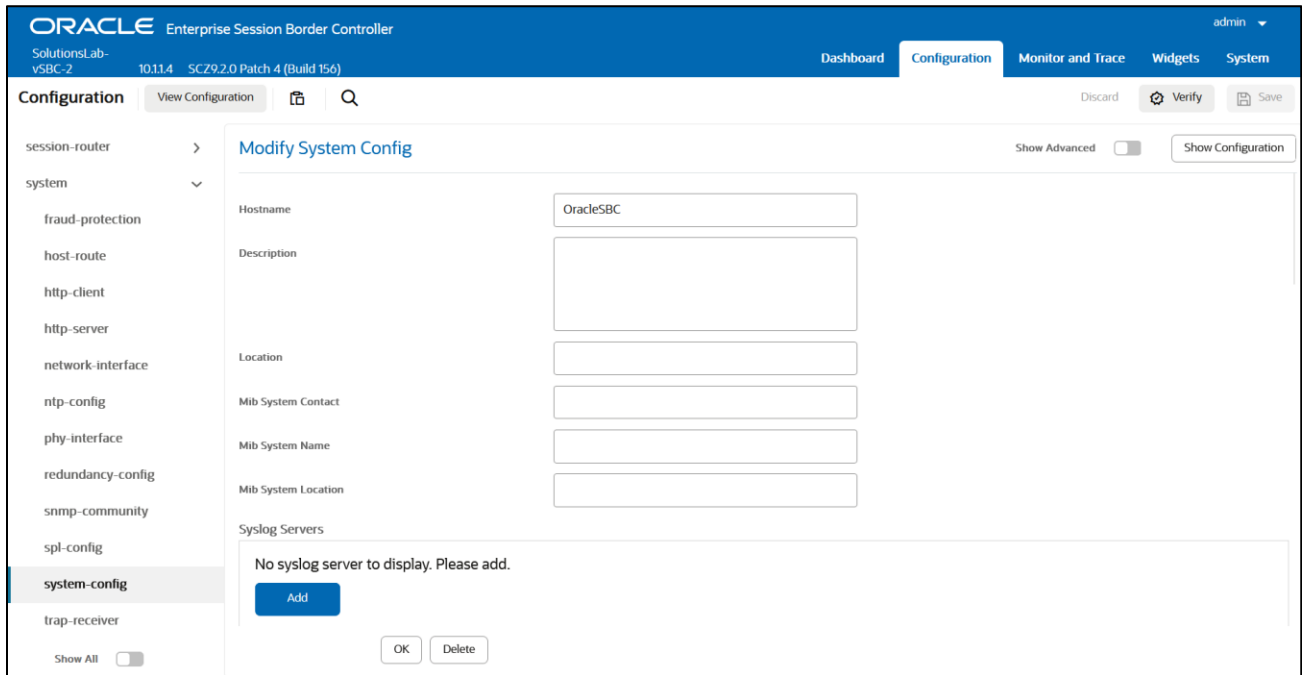
<https://docs.oracle.com/en/industries/communications/enterprise-session-border-controller/9.2.0/webgui/web-gui-guide.pdf>

The expert mode is used for configuration.

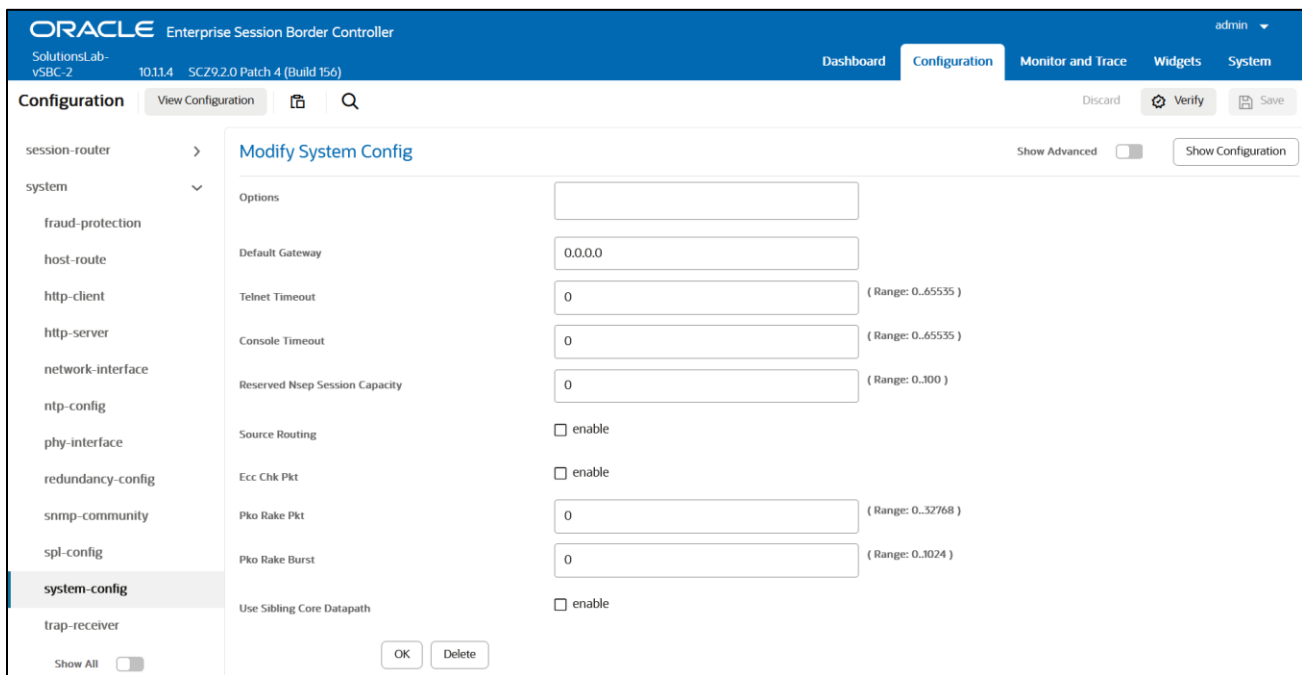
Tip: To make this configuration simpler, one can directly search the element to be configured, from the Objects tab available.

5.3. Configure system-config

Go to system->system-config



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



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/9.2.0/releasenotes/esbc-release-notes.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

To configure physical Interface values, go to System->phy-interface. Configure Physical interface towards KDDI Trunk and IP-PBX as shown below. The interface designated towards KDDI SIP Trunk is named as s0p0 (Slot 0, port 0).

Parameter Name	KDDI SIP Trunk (s0p0)	Generic-PBX side (s1p0)
Slot	0	0
Port	0	1
Operation Mode	Media	Media

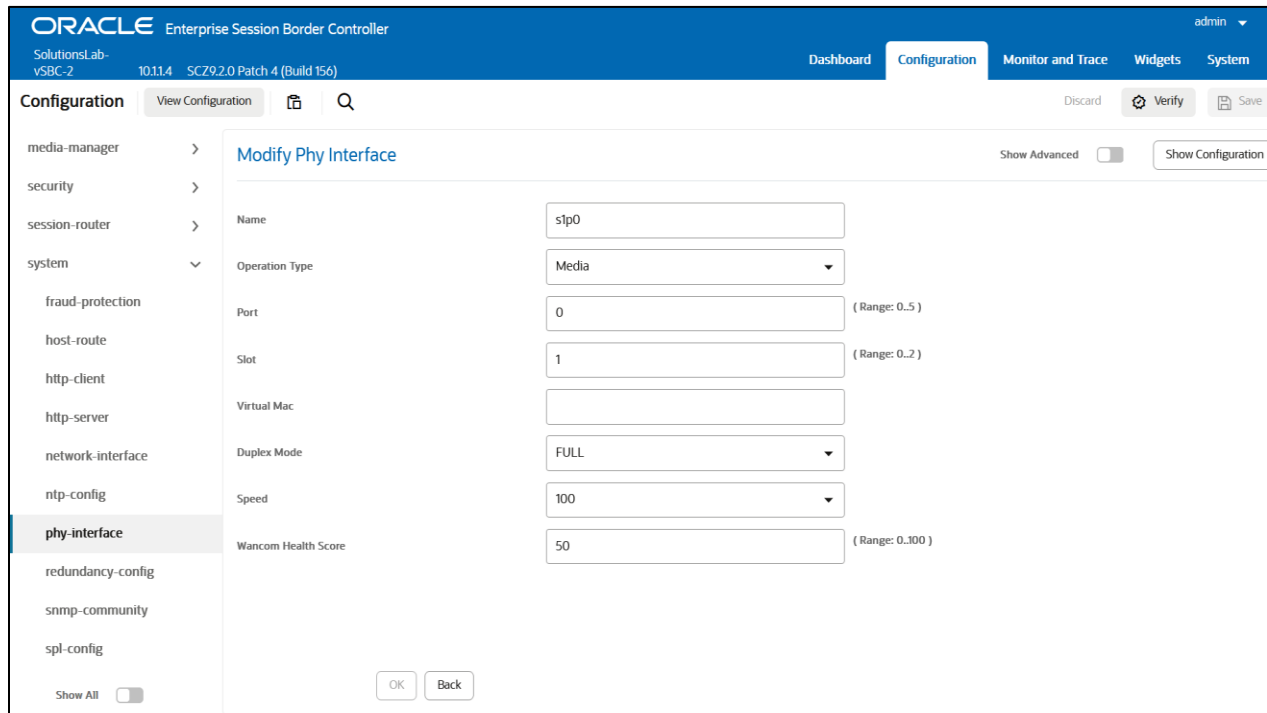
Please configure s0p0 interface as below.

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The 'Configuration' tab is active, and the 'phy-interface' section is selected in the left sidebar. The 'Modify Phy Interface' form is displayed with the following fields:

- Name: s0p0
- Operation Type: Media
- Port: 0 (Range: 0..5)
- Slot: 0 (Range: 0..2)
- Virtual Mac: (empty)
- Duplex Mode: FULL
- Speed: 100
- Wancom Health Score: 50 (Range: 0..100)

Buttons for 'OK' and 'Back' are visible at the bottom of the form.

Please configure s1p0 interface as below



5.5. Configure Network Interface

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

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

Parameter Name	KDDI SIP Trunk Network Interface(s0p0)	Generic-PBX Side Network Interface(s1p0)
Name	s0p0	s1p0
Host Name		
IP Address	10.1.2.4	10.1.3.4
Net Mask	255.255.255.0	255.255.255.0
Gateway	10.1.2.1	10.1.3.1

Please configure network interface s0p0 as below

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The top navigation bar includes 'Dashboard', 'Configuration', 'Monitor and Trace', 'Widgets', and 'System'. The 'Configuration' tab is active, and the page title is 'Modify Network Interface'. The left sidebar shows a tree view of configuration categories, with 'network-interface' selected. The main form contains the following fields:

Name	s0p0
Sub Port Id	0 (Range: 0..4095)
Description	
Hostname	
IP Address	10.12.4
Pri Utility Addr	
Sec Utility Addr	
Netmask	255.255.255.0
Gateway	10.1.21

Buttons for 'OK' and 'Back' are visible at the bottom of the form.

Similarly, configure network interface s1p0 as below

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface for a different network interface. The top navigation bar and sidebar are identical to the previous screenshot. The main form contains the following fields:

Name	s1p0
Sub Port Id	0 (Range: 0..4095)
Description	
Hostname	
IP Address	10.13.4
Pri Utility Addr	
Sec Utility Addr	
Netmask	255.255.255.0
Gateway	10.1.31

Buttons for 'OK' and 'Back' are visible at the bottom of the form.

5.6. Enable media manager

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

Go to Media-Manager->Media-Manager

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The top navigation bar includes 'Dashboard', 'Configuration', 'Monitor and Trace', 'Widgets', and 'System'. The 'Configuration' tab is active, and the 'media-manager' section is selected in the left sidebar. The main area is titled 'Modify Media Manager' and contains the following settings:

Parameter	Value	Range
State	<input checked="" type="checkbox"/> enable	
Flow Time Limit	86400	(Range: 0..999999999)
Initial Guard Timer	300	(Range: 0..999999999)
Subsq Guard Timer	300	(Range: 0..999999999)
TCP Flow Time Limit	86400	(Range: 0..999999999)
TCP Initial Guard Timer	300	(Range: 0..999999999)
TCP Subsq Guard Timer	300	(Range: 0..999999999)
Hnt Rtcp	<input type="checkbox"/> enable	
Algd Log Level	NOTICE	
Mbcd Log Level	NOTICE	

Buttons for 'OK' and 'Delete' are visible at the bottom of the configuration area.

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface, displaying advanced options for the Media Manager. The 'media-manager' section is selected in the left sidebar, and the 'Modify Media Manager' page is shown with 'Show Advanced' enabled. The settings are as follows:

Parameter	Value	Range
Options	audio-allow-asymmetric-pt x xcode-gratuitous-rtcp-report-generation x	
Red Max Trans	10000	(Range: 0..50000)
Red Sync Start Time	5000	(Range: 0..4294967295)
Red Sync Comp Time	1000	(Range: 0..4294967295)
Media Policing	<input checked="" type="checkbox"/> enable	
Max Arp Rate	10	(Range: 0..100)
Max Signaling Packets	6000	(Range: 0..4294967295)
Max Untrusted Signaling	9	(Range: 0..100)
Min Untrusted Signaling	8	(Range: 0..100)

Buttons for 'OK' and 'Delete' are visible at the bottom of the configuration area.

5.7. 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 which are required by KDDI

To configure sip-config, Go to Session-Router->sip-config.

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The top navigation bar includes 'Dashboard', 'Configuration', 'Monitor and Trace', 'Widgets', and 'System'. The left sidebar lists various configuration categories, with 'sip-config' selected. The main area is titled 'Modify SIP Config' and contains the following fields:

Field	Value	Range
State	<input checked="" type="checkbox"/> enable	
Dialog Transparency	<input checked="" type="checkbox"/> enable	
Home Realm ID	GenericPBX	
Egress Realm ID		
Nat Mode	None	
Registrar Domain		
Registrar Host	<KDDI SIP Server>	
Registrar Port	5060	(Range: 0,1025..65535)
Init Timer	500	(Range: 0..999999999)
Max Timer	4000	(Range: 0..999999999)

Buttons for 'OK' and 'Delete' are located at the bottom of the configuration area.

This screenshot shows the 'Modify SIP Config' page with advanced options visible. The 'Show Advanced' toggle is turned on. The configuration fields include:

Field	Value	Range
Red Max Trans	10000	(Range: 0..50000)
Options	force-unregistration x inmap-before-validate x max-udp-length=0 x	
SPL Options		
SIP Message Len	4096	(Range: 0..65535)
Enum Sag Match	<input type="checkbox"/> enable	
Extra Method Stats	<input checked="" type="checkbox"/> enable	
Extra Enum Stats	<input type="checkbox"/> enable	
Registration Cache Limit	0	(Range: 0..999999999)
Register Use To For Lp	<input type="checkbox"/> enable	

Buttons for 'OK' and 'Delete' are located at the bottom of the configuration area.

5.8. Enable SPLs required for KDDI SIP Trunk

As part of the integration of the SBC with KDDI SIP 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 KDDI 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. KDDI regulation requires that the tag size of From/To headers in the SIP messages be under 32 bytes. The tags sent by Generic PBX in the originating SIP messages are large in size, approximately 51 bytes.
4. KDDI specification also requires that the Cseq, Session ID (in SDP) to 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 Generic PBX in 18x messages which it forwards as it is. Also, the SDP o line username is 19 bytes in length (generated by Generic PBX).
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. KDDI requires that the Host IP in the Call-ID is same as the IP of the Egress-interface communicating with KDDI SIP Trunk
7. KDDI specification also requires Oracle SBC should not validate the incoming INVITE by checking R-URI user part with its registration caching in Dial-In-Service Mode.

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 or sip-interface facing Generic PBX
- ***dyn-contact-method=randomseed*** on the realm or sip-interface facing the KDDI SIP 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 or sip-interface facing Generic PBX and
- ***ocNttMsgConverterTagging=enabled*** on the realm or sip-interface facing the KDDI SIP 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 KDDI SIP Trunk

The SPL SurrogateRegister.1.9.spl was developed to implement the feature 7 along with

- **dyn-contact-method=randomseed**

especially for Dial-in-Service Mode

This is enabled by configuring the spl-option

- **dial-in service validation is the new SPL introduced in 9.2.0p6 and dyn-contact-method=randomseed on the realm or sip-interface facing the KDDI SIP trunk.**

5.9. Configure Realms

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

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

Config Parameter	KDDI SIP Trunk Side	Generic-PBX Side
Identifier	KDDIRealm	GenericPBX
Network Interface	S0p0	s1p0
MM in realm	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Codec policy	KDDICodec	
Access Control Trust Level	High	High

In the below case, Realm name is given as **KDDIRealm** for KDDI SIP Trunk Side
Please set the Access Control Trust Level as high for this realm
Please add the FQDN of KDDI Session Agent to trunk context parameter as below.

ORACLE Enterprise Session Border Controller
 SolutionsLab-vsBC-2 10.11.4 SCZ9.2.0 Patch 4 (Build 156) Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration [Icons] Search Discard Verify Save

media-manager [Dropdown] **Modify Realm Config** Show Advanced [Toggle] Show Configuration

media-manager	Identifier	KDDIRealm
codec-policy	Description	
media-manager	Addr Prefix	0.0.0.0
media-policy	Network Interfaces	s0p0:0.4 x
realm-config	Media Realm List	
steering-pool	Mm In Realm	<input checked="" type="checkbox"/> enable
security >	Mm In Network	<input checked="" type="checkbox"/> enable
session-router [Dropdown]	Mm Same Ip	<input checked="" type="checkbox"/> enable
access-control		<input type="checkbox"/> enable
account-config		
filter-config		
ldap-config		
local-policy		
local-routing-config		

Show All [Toggle] OK Back

ORACLE Enterprise Session Border Controller
 SolutionsLab-vsBC-2 10.11.4 SCZ9.2.0 Patch 4 (Build 156) Dashboard Configuration Monitor and Trace Widgets System

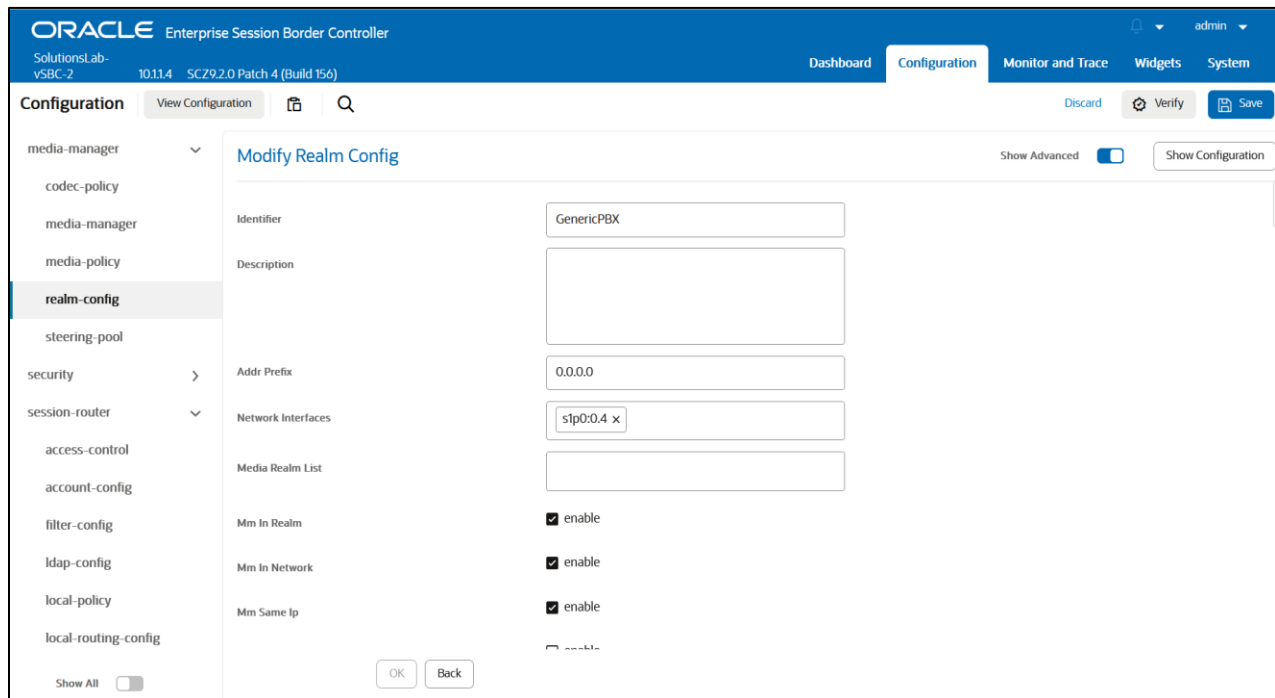
Configuration View Configuration [Icons] Search Discard Verify Save

media-manager [Dropdown] **Modify Realm Config** Show Advanced [Toggle] Show Configuration

media-manager	Trunk Context	<SIP-URL Host>
codec-policy	Early Media Allow	[Dropdown]
<i>dns-alg-constraints</i>	Enforcement Profile	[Dropdown]
<i>dns-config</i>	Additional Prefixes	
<i>ice-profile</i>	Restricted Latching	none [Dropdown]
media-manager	Options	
media-policy	SPL Options	
<i>mstp-config</i>	Delay Media Update	<input type="checkbox"/> enable
<i>playback-config</i>	Refer Call Transfer	disabled [Dropdown]
realm-config		
<i>realm-group</i>		
<i>rtcp-policy</i>		
<i>static-flow</i>		

Show All [Toggle] OK Back

Similarly, Realm name is given as GenericPBX for PBX side.
Please set the Access Control Trust Level as high for this realm too.



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

<https://docs.oracle.com/en/industries/communications/session-border-controller/9.2.0/security/security-guide.pdf>

5.10. Configure sip-manipulation

Navigate to Configuration > session-router > sip-manipulation
Configure SIP manipulation towards KDDI side as shown below with name **ToKDDI**
Assign this sip-manipulation to the KDDI sip-interface as out manipulation.

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The page title is "Modify SIP Manipulation". The left sidebar lists various configuration categories, with "sip-manipulation" selected. The main content area contains the following fields:

- Name: ToKDDI
- Description: (empty)
- Split Headers: (empty)
- Join Headers: (empty)
- CfgRules: A table with one entry:

Action	Name	Element Type
:	ChangeContact	header-rule

Buttons for "Add", "Verify", and "Save" are visible at the top right of the configuration area.

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface for "Modify Sip manipulation / header rule". The left sidebar lists various configuration categories, with "sip-manipulation" selected. The main content area contains the following fields:

- Name: ChangeContact
- Header Name: Contact
- Action: manipulate
- Comparison Type: pattern-rule
- Msg Type: request
- Methods: REGISTER x
- Match Value: (*)(expires=0)
- New Value: ""

The CfgRules section shows "No rules to display. Please add." with an "Add" button. "OK" and "Back" buttons are at the bottom.

Below manipulation **RURIHost** is used in our test environment to change the user Request-URI part of the registered surrogate agent towards KDDI side.

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The page title is "Modify Sip manipulation / header rule". The configuration fields are as follows:

Name	RURIHost
Header Name	Request-URI
Action	manipulate
Comparison Type	case-sensitive
Msg Type	request
Methods	REGISTER x
Match Value	
New Value	
CfgRules	

Buttons: OK, Back, Show Configuration, Discard, Verify, Save.

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The page title is "Modify Sip manipulation / header rule / element rule". The configuration fields are as follows:

Name	urihost
Parameter Name	
Type	uri-host
Action	replace
Match Val Type	any
Comparison Type	case-sensitive
Match Value	<SIP-URL Host>
New Value	<KDDI SIP Server>

Buttons: OK, Back, Show Configuration, Discard, Verify, Save.

Below manipulation **ChangeFrom** is used in our test environment to match the From Header user part of the registered surrogate agent towards KDDI side.

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The page title is "Modify Sip manipulation / header rule". The configuration fields are as follows:

Name	ChangeFrom
Header Name	From
Action	manipulate
Comparison Type	case-sensitive
Msg Type	request
Methods	Invite x
Match Value	
New Value	

At the bottom, there is a "Cfgrules" section with an "Add" button and a list of rules. The "OK" and "Back" buttons are visible at the bottom of the form.

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The page title is "Modify Sip manipulation / header rule / element rule". The configuration fields are as follows:

Name	changehost
Parameter Name	
Type	uri-host
Action	replace
Match Val Type	any
Comparison Type	case-sensitive
Match Value	
New Value	<SIP-URL Host>

At the bottom, there are "OK" and "Back" buttons.

ORACLE Enterprise Session Border Controller

SolutionsLab-VSBC-2 10.11.4 SCZ9.2.0 Patch 4 (Build 156)

Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration [Home] [Search] Discard Verify Save

local-routing-config

media-profile

session-agent

session-group

session-recording-group

session-recording-server

session-translation

sip-config

sip-feature

sip-interface

sip-manipulation

sip-monitoring

translation-rules

Show All

Modify Sip manipulation / header rule / element rule

Show Configuration

Name	deletedisplay
Parameter Name	
Type	uri-display
Action	delete-element
Match Val Type	any
Comparison Type	case-sensitive
Match Value	
New Value	

OK Back

Below manipulation **ModifyContact** is used in our test environment to delete the transport method of the registered surrogate agent towards KDDI side.

ORACLE Enterprise Session Border Controller

SolutionsLab-VSBC-2 10.11.4 SCZ9.3.0 Patch 1 (Build 74)

Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration [Home] [Search] Discard Verify Save

local-routing-config

media-profile

session-agent

session-group

session-recording-group

session-recording-server

session-translation

sip-config

sip-feature

sip-interface

sip-manipulation

sip-monitoring

translation-rules

Show All

Modify Sip manipulation / header rule

Show Configuration

Name	ModifyContact
Header Name	Contact
Action	manipulate
Comparison Type	case-sensitive
Msg Type	any
Methods	INVITE x PRACK x UPDATE x
Match Value	
New Value	
CfgRules	

OK Back

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The page title is "Modify Sip manipulation / header rule / element rule". The configuration fields are as follows:

Name	deletetransport
Parameter Name	transport
Type	uri-param
Action	delete-element
Match Val Type	any
Comparison Type	case-sensitive
Match Value	
New Value	

Buttons at the bottom include "OK" and "Back".

Below manipulation **ChangeTo** is used in our test environment to match the To Header user part of the registered surrogate agent towards KDDI side.

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The page title is "Modify Sip manipulation / header rule". The configuration fields are as follows:

Name	ChangeTo
Header Name	TO
Action	manipulate
Comparison Type	case-sensitive
Msg Type	request
Methods	Invite x
Match Value	
New Value	

Buttons at the bottom include "OK" and "Back".

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The top navigation bar includes 'Dashboard', 'Configuration', 'Monitor and Trace', 'Widgets', and 'System'. The left sidebar lists various configuration categories, with 'sip-manipulation' selected. The main content area is titled 'Modify Sip manipulation / header rule / element rule' and contains the following fields:

Name	changeTohost
Parameter Name	
Type	uri-host
Action	replace
Match Val Type	any
Comparison Type	case-sensitive
Match Value	
New Value	<KDDI SIP Server>

At the bottom of the configuration area, there are 'OK' and 'Back' buttons. The 'Show Configuration' button is located in the top right corner of the main area.

The following three header rules are used in our test environment to add the P-Preferred-Identity going towards the KDDI side.

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The top navigation bar includes 'Dashboard', 'Configuration', 'Monitor and Trace', 'Widgets', and 'System'. The left sidebar lists various configuration categories, with 'sip-manipulation' selected. The main content area is titled 'Modify Sip manipulation / header rule' and contains the following fields:

Name	storeFrom
Header Name	From
Action	store
Comparison Type	pattern-rule
Msg Type	request
Methods	Invite x
Match Value	
New Value	
CfgRules	

At the bottom of the configuration area, there are 'OK' and 'Back' buttons. The 'Show Configuration' button is located in the top right corner of the main area.

ORACLE Enterprise Session Border Controller
 SolutionsLab-vSBC-2 10.11.4 SCZ9.2.0 Patch 4 (Build 156) Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration [Icons] [Search] Discard Verify Save

Modify Sip manipulation / header rule Show Configuration

local-routing-config
 media-profile
 session-agent
 session-group
 session-recording-group
 session-recording-server
 session-translation
 sip-config
 sip-feature
 sip-interface
 sip-manipulation
 sip-monitoring
 translation-rules
 system Show All [Toggle]

Name: StorePPI
 Header Name: P-Preferred-Identity
 Action: store
 Comparison Type: case-sensitive
 Msg Type: request
 Methods: Invite x
 Match Value:
 New Value:
 CfgRules: No rules to display. Please add. [OK] [Back]

ORACLE Enterprise Session Border Controller
 SolutionsLab-vSBC-2 10.11.4 SCZ9.2.0 Patch 4 (Build 156) Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration [Icons] [Search] Discard Verify Save

Modify Sip manipulation / header rule Show Configuration

local-routing-config
 media-profile
 session-agent
 session-group
 session-recording-group
 session-recording-server
 session-translation
 sip-config
 sip-feature
 sip-interface
 sip-manipulation
 sip-monitoring
 translation-rules
 system Show All [Toggle]

Name: AddPPI
 Header Name: P-Preferred-Identity
 Action: add
 Comparison Type: boolean
 Msg Type: request
 Methods: Invite x
 Match Value: !\$StorePPI
 New Value: \$storeFrom.\$0
 CfgRules: [Add] [Edit] [Delete] [Up] [Down]
 [OK] [Back]

The following two header rules are used in our test environment to add or change User-Agent header to include SBC information going towards the KDDI side.

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The page title is "Modify Sip manipulation / header rule". The configuration details are as follows:

Name	deleteUA
Header Name	User-Agent
Action	delete
Comparison Type	case-sensitive
Msg Type	any
Methods	
Match Value	
New Value	

The CfgRules section contains the text: "No rules to display. Please add." Below this are "OK" and "Back" buttons.

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The page title is "Modify Sip manipulation / header rule". The configuration details are as follows:

Name	addUA
Header Name	User-Agent
Action	add
Comparison Type	case-sensitive
Msg Type	request
Methods	Register x
Match Value	
New Value	"Oracle-ESBC/9.2"

The CfgRules section contains the text: "No rules to display. Please add." Below this are "OK" and "Back" buttons.

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 KDDI, we configure session-time profile as below.

The screenshot displays the Oracle Enterprise Session Border Controller configuration page. The top navigation bar includes 'ORACLE Enterprise Session Border Controller', 'SolutionsLab-vSBC-2', '10.11.4 SCZ9.2.0 Patch 4 (Build 156)', and tabs for 'Dashboard', 'Configuration', 'Monitor and Trace', 'Widgets', and 'System'. The 'Configuration' tab is active, and the 'session-timer-profile' category is selected in the left sidebar. The main content area is titled 'Modify Session Timer Profile' and contains the following fields:

Name	<input type="text" value="KDDI"/>	
Session Expires	<input type="text" value="180"/>	(Range: 64..999999999)
Min Se	<input type="text" value="180"/>	(Range: 64..999999999)
Force Reinvite	<input type="checkbox"/> enable	
Request Refresher	<input type="text" value="uas"/>	
Response Refresher	<input type="text" value="uas"/>	

At the bottom of the form, there are 'OK' and 'Back' buttons. The interface also includes a 'Show Advanced' toggle (checked) and a 'Show Configuration' button.

Apply the timer profile on the sip-interface towards KDDI SIP Trunk (Session Timer Profile)

5.12. Configure surrogate-agent

KDDI requires the customer PBX to register in order to originate calls support authentication. Since Generic PBX 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 KDDI)
- Register-Contact-Host (IP of the Egress Interface towards KDDI)
- Register-Contact-User (SIP-URL user)

- Auth-User
- Auth-Passwd

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The page title is "Modify Surrogate Agent". The left sidebar lists various configuration categories, with "surrogate-agent" selected. The main content area contains the following fields:

- Register Host: <SIP-URL Host>
- Register User: <SIP-URL User>
- Description: (empty text area)
- Realm ID: GenericPBX (dropdown menu)
- State: enable
- Customer Host: (empty text field)
- Customer Next Hop: <KDDI SIP Server> (dropdown menu)
- Register Contact Host: 10.1.2.4
- Register Contact User: <SIP-URL User>

Buttons for "OK" and "Back" are visible at the bottom of the form.

This screenshot shows the same "Modify Surrogate Agent" configuration page, but with the "Show Advanced" toggle turned on. The following advanced fields are visible:

- Register Contact User: <SIP-URL User>
- Password: (masked with dots) with a "Show Password" checkbox.
- Register Expires: 1800 (Range: 0..99999999)
- Replace Contact: enable
- Options: (empty text field)
- Route To Registrar: enable
- Aor Count: 1 (Range: 0..99999999)
- Auth User: <VoIP-ID>
- Max Register Attempts: 10 (Range: 0..10)
- Dissector Dotfru Time: onn (Range: 30..3600)

Buttons for "OK" and "Back" are visible at the bottom of the form.

Please follow the same procedure given above to register multiple Surrogate Agents in the SBC.

Please enable/disable the new parameter “**Un Register**” introduced in SBC 9.2 version to de-register and register a surrogate agent. This parameter is disabled by default, and you have to enable this parameter to de-register a surrogate agent. KDDI requires SBC to de-register all contacts after service recovery, by REGISTER message with Expires as 0, and Contact as *.

Besides enabling the parameter, HMR is also configured for Contact header.

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The top navigation bar includes 'ORACLE Enterprise Session Border Controller', 'SolutionsLab-vSBC-2', '10.11.4 SC79.2.0 Patch 4 (Build 156)', and tabs for 'Dashboard', 'Configuration', 'Monitor and Trace', 'Widgets', and 'System'. The 'Configuration' tab is active, and the 'Modify Surrogate Agent' configuration page is displayed. The left sidebar lists various configuration categories, with 'surrogate-agent' selected. The main configuration area includes fields for 'Max Register Attempts' (10), 'Register Retry Time' (900), 'Count Start' (1), 'Register Mode' (automatic), 'Triggered Inactivity Interval' (30), 'Triggered Oos Response' (503), 'Auth User Lookup', 'Proxy Name', 'Un Register' (checkbox), and 'Source IP Prefix'. The 'Un Register' checkbox is highlighted with a red box. The interface also includes 'Show Advanced' and 'Show Configuration' buttons, and 'OK' and 'Back' buttons at the bottom.

5.13. Configure SIP Interfaces

Navigate to sip-interface under session-router and configure the sip-interface as shown below. Please configure the below settings under the sip-interface.

Please Configure sip-interface for the KDDI SIP Trunk side as below:

- Set allow-anonymous to agents-only to ensure traffic to this sip-interface only comes from the particular Session agents added to the SBC.
- Make sure that all necessary sip-manipulations are applied at both the in and out manipulation-id.
- 100rel-interworking is set for early media support from SBC.
- All the mandatory SPLs is configured as SPL-options of the sip-interface
Please note that we also use HeaderNAT SPL option too in the sip-interface configuration.
- Session-Timer Profile

ORACLE Enterprise Session Border Controller
 Solutions Lab - vSBC-2 10.11.4 SCZ9.2.0 Patch 4 (Build 156) Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration [Add] [Search] Discard Verify Save

Configuration Menu: sip-config, sip-feature, sip-feature-caps, **sip-interface**, sip-manipulation, sip-monitoring, sip-nat, sip-profile, sip-q850-map, sip-recursion-policy, surrogate-agent, survivability, translation-rules, system

Modify SIP Interface

State: enable

Realm ID: KDDIRealm

Description: [Text Area]

SIP Ports

Select	Action	Address	Port	Transport Protocol	TLS Profile	Allow Anonymous	Multi Home Addr
<input type="checkbox"/>	[Add] [Edit] [Delete]	10.1.2.4	5060	UDP		agents-only	

OK Back

ORACLE Enterprise Session Border Controller
 Solutions Lab - vSBC-2 10.11.4 SCZ9.2.0 Patch 4 (Build 156) Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration [Add] [Search] Discard Verify Save

Configuration Menu: sip-config, sip-feature, sip-feature-caps, **sip-interface**, sip-manipulation, sip-monitoring, sip-nat, sip-profile, sip-q850-map, sip-recursion-policy, surrogate-agent, survivability, translation-rules, system

Modify SIP Interface

Options: 100rel-interworking x

SPL Options: HeaderNatPublicSipIpf=20.110.144.248,HeaderNatPr

Trust Mode: all

Max Nat Interval: 3600 (Range: 0..999999999)

Stop Recurse: 401,407

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

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

In Manipulationid: [Dropdown]

Out Manipulationid: ToKDDI

SIP Atcf Feature: enable

OK Back

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The page title is "Modify SIP Interface". The left sidebar lists various configuration categories, with "sip-interface" selected. The main content area contains several configuration options:

- Kpml Interworking: enable
- Kpml2835 hwf On Hairpin: enable
- Msrp Delay Egress Bye: enable
- Send 380 Response:
- Pcsf Restoration:
- Session Timer Profile: **KDDI** (highlighted with a red box)
- Session Recording Server:
- Session Recording Required: enable
- Service Tag:
- Reg Cache Route: enable

At the bottom, there are "OK" and "Back" buttons. The top navigation bar includes "Dashboard", "Configuration", "Monitor and Trace", "Widgets", and "System".

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

- Set allow-anonymous to agents-only to ensure traffic to this sip-interface only comes from the particular Session agents added to the SBC.
- 100rel-interworking is set for early media support from SBC.

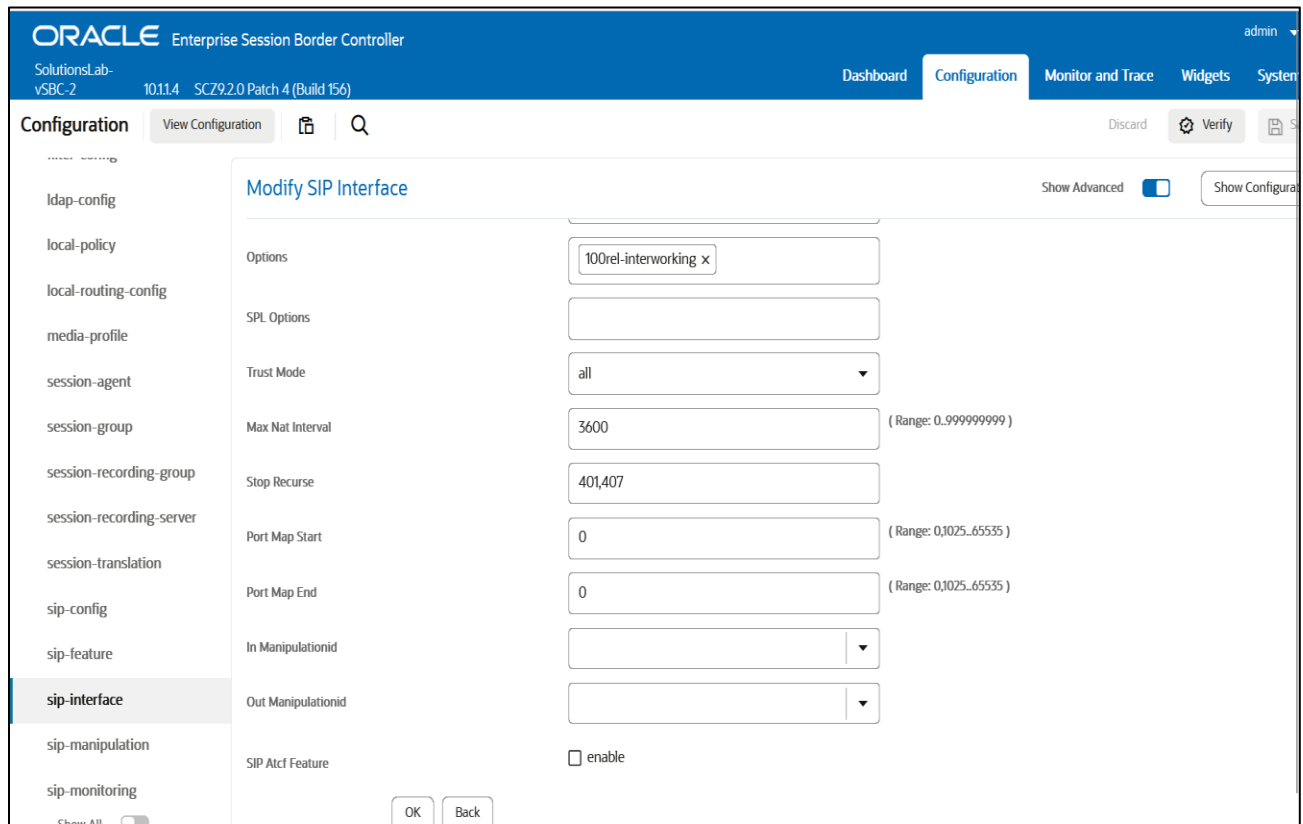
The screenshot shows the Oracle Enterprise Session Border Controller configuration interface for "Modify SIP Interface". The "sip-interface" category is selected in the sidebar. The configuration options are:

- State: enable
- Realm ID: GenericPBX
- Description:

Below these options is the "SIP Ports" section, which contains a table with the following data:

Select	Action	Address	Port	Transport Protocol	TLS Profile	Allow Anonymous	Multi Home Addr
<input type="checkbox"/>	:	101.5.4	5060	UDP		agents-only	

At the bottom, there are "OK" and "Back" buttons. The top navigation bar includes "Dashboard", "Configuration", "Monitor and Trace", "Widgets", and "System".



Once sip-interface is configured – the SBC is ready to accept traffic on the allocated IP address.

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.

Go to session-router->Session-Agent and Configure the session-agents for the KDDI SIP trunk side

- hostname as FQDN of KDDI Session Agent which is KDDI SIP Server
- port as 5060
- realm-id – needs to match the realm created for KDDI SIP trunk
- transport set to “UDP”
- Please enable the parameter **ping-response**,
- Please set ping method to OPTIONS and ping-interval duration in secs

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The top navigation bar includes 'Dashboard', 'Configuration', 'Monitor and Trace', 'Widgets', and 'System'. The 'Configuration' tab is active, and the 'Modify Session Agent' page is displayed. The left sidebar lists various configuration categories, with 'session-agent' selected. The main content area contains the following fields:

- Hostname: <KDDI SIP Server IP or FQDN>
- IP Address: (empty)
- Port: 5060 (Range: 0,1025..65535)
- State: enable
- Transport Method: UDP
- Realm ID: KDDIRealm
- Egress Realm ID: (empty)
- Description: (empty)
- Ping Method: (empty)

Buttons for 'OK' and 'Back' are located at the bottom of the form.

This screenshot shows the 'Modify Session Agent' configuration page with the 'Show Advanced' toggle turned on. The left sidebar is expanded to show the 'session-agent' category. The main content area displays the following advanced configuration options:

- Ping Method: OPTIONS
- Ping Interval: 30 (Range: 0..999999999)
- Ping Send Mode: keep-alive
- Ping All Addresses: enable
- Ping In Service Response Codes: (empty)
- Load Balance DNS Query: hunt
- Options: (empty)
- SPL Options: (empty)
- Media Profiles: (empty)
- In Session Translations: (empty)

Buttons for 'OK' and 'Back' are located at the bottom of the form.

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

- realm-id – needs to match the realm created for Generic PBX
- transport set to “UDP”
- Please enable the parameter **ping-response**,

- Please set ping method to OPTIONS and ping-interval duration in secs.

In addition to the above configuration, Auth Attributes are configured to challenge the requests coming from Generic PBX side
Username and Password are those provided by KDDI SIP trunk.

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The page title is "Modify Session Agent". The left sidebar lists various configuration categories, with "session-agent" selected. The main content area contains the following fields:

- Hostname: 10.2.0.4
- IP Address: 10.2.0.4
- Port: 5060 (Range: 0,1025...65535)
- State: enable
- App Protocol: SIP
- App Type: (empty)
- Transport Method: UDP
- Realm ID: GenericPBX
- Egress Realm ID: (empty)
- Description: (empty)

Buttons for "OK" and "Back" are visible at the bottom of the configuration area.

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface, specifically the "Modify Session Agent" page. The left sidebar lists various configuration categories, with "session-agent" selected. The main content area contains the following fields:

- Ping Method: OPTIONS
- Ping Interval: 30 (Range: 0..999999999)
- Ping Send Mode: keep-alive
- Ping All Addresses: enable
- Ping In Service Response Codes: (empty)
- Load Balance DNS Query: hunt
- Options: (empty)
- SPL Options: (empty)
- Media Profiles: (empty)
- In Session Translations: (empty)

Buttons for "OK" and "Back" are visible at the bottom of the configuration area.

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The page title is "Modify Session agent / auth attributes". The left sidebar lists various configuration categories, with "session-agent" selected. The main content area contains the following fields:

- Auth Realm: kddline.jp
- Username: <VoIP-ID>
- Auth User Lookup: *
- Password: ••••••••
- In Dialog Methods: INVITE x

Buttons for "OK" and "Back" are located at the bottom of the configuration area.

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. To route the calls from KDDI side to Generic PBX side, Use the below local policy.

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface for "local-policy". The page title is "Modify Local Policy". The left sidebar lists various configuration categories, with "local-policy" selected. The main content area contains the following fields:

- From Address: * x
- To Address: * x
- Source Realm: KDDIRealm x
- Description: (empty)
- Policy Priority: none

Below the fields is a "Policy Attributes" table with the following data:

Select	Action	Next Hop	Realm	Action	Terminate Recursion	Cost	State	App Protocol	Lookup	Next Key	Auth User Lookup
<input type="checkbox"/>	⋮	10.2.0.4	GenericPBX	replace-uri	disabled	0	enabled		single		

Buttons for "OK" and "Back" are located at the bottom of the configuration area.

To route the calls from Generic PBX side to KDDI side, Use the below local policy.

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The left sidebar lists various configuration categories, with 'local-policy' selected. The main area is titled 'Modify Local Policy' and contains the following fields:

- From Address: * x
- To Address: * x
- Source Realm: GenericPBX x
- Description: (empty text area)
- Policy Priority: none

Below these fields is a 'Policy Attributes' table with the following data:

Select	Action	Next Hop	Realm	Action	Terminate Recursion	Cost	State	App Protocol	Lookup	Next Key	Auth User Lookup
<input type="checkbox"/>	:	tsipe4.kddi...	KDDIRealm	replace-uri	disabled	0	enabled		single		

At the bottom of the table are 'OK' and 'Back' buttons. The interface also includes a 'Show All' toggle and 'Discard', 'Verify', and 'Save' buttons at the top right.

5.16. Configure access-control (ACL)

Please configure the ACL for KDDI side as below to allow traffic from KDDI SIP Trunk to reach SBC.

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface for 'Modify Access Control'. The left sidebar has 'access-control' selected. The main area contains the following configuration fields:

- Realm ID: KDDIRealm
- Description: (empty text area)
- Source Address: 111.86.158.82
- Destination Address: 0.0.0.0
- Application Protocol: SIP
- Transport Protocol: ALL
- Access: permit
- Average Rate Limit: 0 (Range: 0..100)
- Trust Level: high

At the bottom are 'OK' and 'Back' buttons. The interface also includes a 'Show All' toggle and 'Discard', 'Verify', and 'Save' buttons at the top right.

Similarly, configure the ACL for Generic PBX side as below to allow traffic from Generic PBX side to reach SBC.

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The top navigation bar includes 'ORACLE Enterprise Session Border Controller', 'SolutionsLab-vSBC-2', version '10.11.4 SCZ92.0 Patch 4 (Build 156)', and tabs for 'Dashboard', 'Configuration', 'Monitor and Trace', 'Widgets', and 'System'. The 'Configuration' tab is active, and the 'access-control' section is selected in the left sidebar. The main area is titled 'Modify Access Control' and contains the following fields:

Realm ID	GenericPBX
Description	
Source Address	10.2.0.4
Destination Address	0.0.0.0
Application Protocol	SIP
Transport Protocol	ALL
Access	permit
Average Rate Limit	0 (Range: 0..100)
Trust Level	high

At the bottom of the form are 'OK' and 'Back' buttons. The interface also includes a 'Show All' toggle and 'Show Advanced'/'Show Configuration' options.

5.17. Configure steering-pool

KDDI side steering pool.

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The page title is "Modify Steering Pool". The left sidebar shows a tree view with "steering-pool" selected. The main content area contains the following fields:

Field	Value	Range
IP Address	101.2.4	
Start Port	10000	(Range: 0..65535)
End Port	10999	(Range: 0..65535)
Realm ID	KDDIRealm	
Network Interface		
Port Allocation Strategy	mixed	

Buttons at the bottom include "OK", "Back", "Show All", "Discard", "Verify", and "Save".

Generic PBX side steering pool.

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The page title is "Modify Steering Pool". The left sidebar shows a tree view with "steering-pool" selected. The main content area contains the following fields:

Field	Value	Range
IP Address	101.3.4	
Start Port	20000	(Range: 0..65535)
End Port	29999	(Range: 0..65535)
Realm ID	GenericPBX	
Network Interface		
Port Allocation Strategy	mixed	

Buttons at the bottom include "OK", "Back", "Show All", "Discard", "Verify", and "Save".

5.18. 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.

Please go to →Media Manager → Codec Policy and create the policy as below.
Apply Codec Policy to the KDDI realm

The screenshot displays the Oracle Enterprise Session Border Controller (SBC) configuration interface. The top navigation bar includes 'ORACLE Enterprise Session Border Controller', 'SolutionLab-vSBC-2', '10.11.4 SCZ9.2.0 Patch 4 (Build 156)', and tabs for 'Dashboard', 'Configuration', 'Monitor and Trace', 'Widgets', and 'System'. The 'Configuration' tab is active, showing a search bar and 'Discard', 'Verify', and 'Save' buttons. The left sidebar lists configuration categories: 'media-manager' (selected), 'media-policy', 'realm-config', 'steering-pool', 'security', 'session-router', and 'system'. The main content area is titled 'Modify Codec Policy' and contains the following configuration fields:

- Name: KDDICodec
- Allow Codecs: PCMU x, Telephone-Event:NO x
- Add Codecs On Egress: PCMU x
- Order Codecs: (empty field)
- Packetization Time: 20
- Force PTime: enable
- Secure Dtmf Cancellation: enable
- Dtmf In Audio: disabled (dropdown menu)
- Tone Detect Renegotiate Timer: 500 (Range: 50..32000)
- Reverse Fax Tone Detection Reinvite: enable

At the bottom, there are 'Show All' and 'OK' buttons, and a 'Back' button.

With this, SBC configuration is complete.

6. Existing SBC configuration

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

- [New realm-config](#)
- [New sip-interface](#)
- [SIP-Manipulation](#)
- [New session-agent](#)
- [New Surrogate Agent](#)
- [New steering-pools](#)
- [New local-policy](#)
- [Session Timer Profile](#)

- [New Codec Policy](#)

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

7. Oracle SBC deployed behind NAT

The Support for SBC Behind NAT SPL plug-in changes information in SIP messages to hide the end point located inside the private network. The specific information that the Support for SBC Behind NAT SPL plug-in changes depends on the direction of the call, for example, from the NAT device to the SBC or from the SBC to the NAT device.

Configure the Support for SBC Behind NAT SPL plug-in for each SIP interface that is connected to a NAT device. One public-private address pair is required for each SIP interface that uses the SPL plug in, as follows.

- The private IP address must be the same IP as configured on both the SIP Interface and Steering Pool
- The public IP address must be the public IP address of the NAT device

Here is an example configuration with SBC Behind NAT SPL config.
The SPL is applied to the KDDI side SIP interface.

HeaderNatPublicSipIfIp=20.110.144.248,HeaderNatPrivateSipIfIp=10.1.2.4

HeaderNatPublicSipIfIp is the public interface IP.
HeaderNatPrivateSipIfIp is the private IP.

To configure header NAT SPL from ACLI

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

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

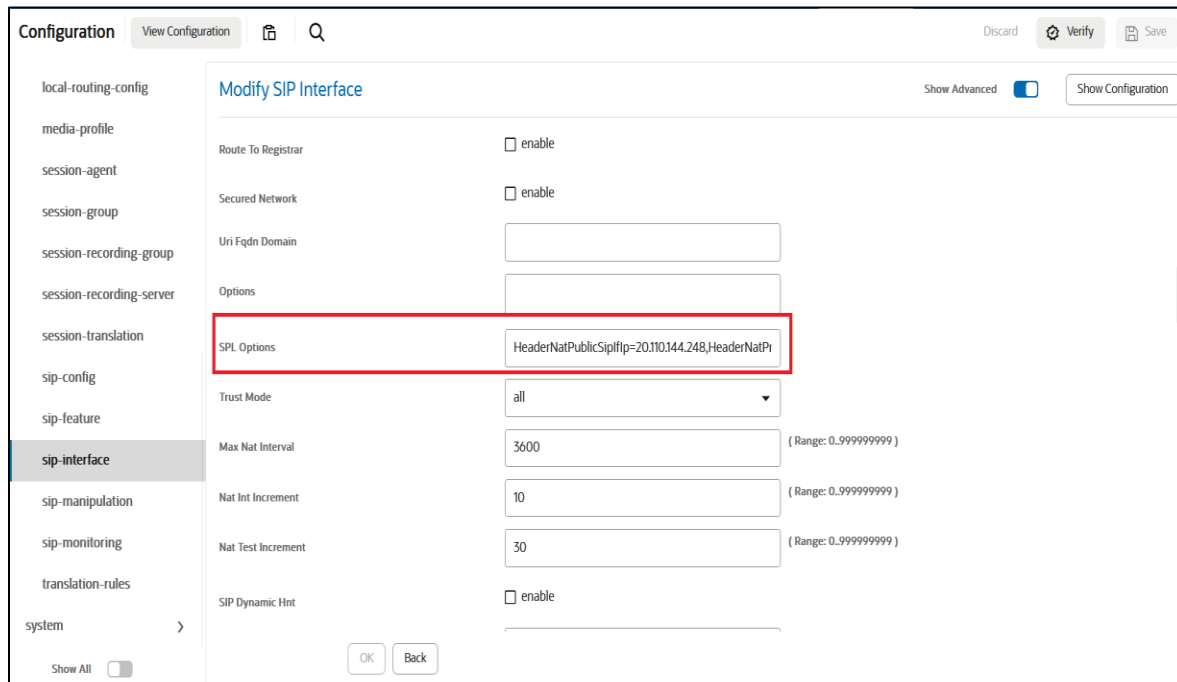
```
spl-options
```

```
HeaderNatPublicSipIfIp=20.110.144.248,HeaderNatPrivateSipIfIp=10.1.2.4
```

- Perform a **save and activate** configuration for changes to take effect.

To configure **header NAT SPL** from **SBC GUI**, please go to below path.

**Go to Session-Router->sip-interface and configure the SPL Options as shown below.
Please select “Show Advanced” tag to view the SPL Options.**



You will need to apply these options to every sip interface on the SBC that is connected through a NAT.

8. ACLI Running Configuration

Below is a complete output of the running configuration used to create this application note. This output includes all of the configuration elements used in our examples, including some of the optional configuration features outlined throughout this document. Be aware that not all parameters may be applicable to every Oracle SBC setup, so please take this into consideration if planning to copy and paste this output into your SBC.

SolutionsLab-vSBC-2# show running-config

```
access-control
  realm-id          GenericPBX
  source-address    10.2.0.4
  application-protocol SIP
  trust-level       high
access-control
  realm-id          KDDIRealm
  source-address    111.86.158.82
  application-protocol SIP
  trust-level       high
codec-policy
  name              KDDICodec
  allow-codecs      PCMU Telephone-Event:NO
  add-codecs-on-egress PCMU
http-server
  name              webServerInstance
  tls-profile        WebServerInstance
local-policy
  from-address      *
  to-address         *
  source-realm      GenericPBX
  policy-attribute
    next-hop        < KDDI SIP Server >
    realm            KDDIRealm
    action            replace-uri
local-policy
  from-address      *
  to-address         *
  source-realm      KDDIRealm
  policy-attribute
    next-hop        10.2.0.4
    realm            Cisco
    action            replace-uri
media-manager
  options           audio-allow-asymmetric-pt
                   xcode-gratuitous-rtcp-report-generation
  max-signaling-packets 6000
  max-untrusted-signaling 9
  min-untrusted-signaling 8
  anonymous-sdp       enabled
network-interface
  name              s0p0
  ip-address         10.1.2.4
  netmask            255.255.255.0
  gateway            10.1.2.1
  hip-ip-list        10.1.2.4
  icmp-address       10.1.2.4
```

```

network-interface
  name          s1p0
  ip-address    10.1.3.4
  netmask       255.255.255.0
  gateway       10.1.3.1
  dns-ip-primary 8.8.8.8
  dns-ip-backup1 8.8.4.4
  dns-ip-backup2 9.9.9.
  dns-domain    <DNS FQDN>
  hip-ip-list   10.1.3.4
  icmp-address  10.1.3.4
phy-interface
  name          s0p0
  operation-type Media
phy-interface
  name          s1p0
  operation-type Media
  slot          1
realm-config
  identifier    GenericPBX
  network-interfaces s1p0:0.4
  mm-in-realm   enabled
  access-control-trust-level high
  spl-options   dyn-contact-start,ocNttMsgConverterTagging=opposite
realm-config
  identifier    KDDIRealm
  network-interfaces s0p0:0.4
  mm-in-realm   enabled
  dns-realm     GenericPBX
  access-control-trust-level high
  trunk-context <SIP-URL Host>
  spl-options   ocNttMsgConverterTagging=enabled
  codec-policy  KDDICodec
session-agent
  hostname     10.2.0.4
  ip-address   10.2.0.4
  realm-id     GenericPBX
  ping-interval 60
  ping-response enabled
  auth-attributes
    auth-realm   kddi.ne.jp
    username     <VoIP-ID>
    password     <VoIP-PW>
    in-dialog-methods INVITE
session-agent
  hostname     <KDDI SIP Server IP or FQDN>
  realm-id      KDDIRealm
  ping-response enabled
  in-manipulationid ChangeCallIDBack
  max-register-sustain-rate 1
  max-register-burst-rate   1
  register-burst-window     1

```

```

session-timer-profile
  name          KDDI
  session-expires 180
  min-se        180
  request-refresher uas
sip-config
  home-realm-id      GenericPBX
  registrar-host     <KDDI SIP Server>
  registrar-port     5060
  options            force-unregistration
                   inmap-before-validate
                   max-udp-length=0
  extra-method-stats enabled
  allow-pani-for-trusted-only disabled
  add-ue-location-in-pani disabled
  npli-upon-register disabled
sip-interface
  realm-id          GenericPBX
  sip-port
    address         10.1.3.4
    port            5065
    allow-anonymous agents-only
  registration-caching enabled
  options           100rel-interworking
  out-manipulationid
  allow-diff2833-clock-rate-mode use-codec-clock-rate
sip-interface
  realm-id          KDDIRealm
  sip-port
    address         10.1.2.4
    allow-anonymous agents-only
  nat-traversal    always
  registration-caching enabled
  options           100rel-interworking
  spl-options
HeaderNatPublicSipIfIp=20.110.144.248,HeaderNatPrivateSipIfIp=10.1.2.4,Control-Surr-Reg
  out-manipulationid ToKDDI
  rfc2833-mode        preferred
  session-timer-profile KDDI
sip-manipulation
  name          ToKDDI
  header-rule
    name        ChangeContact
    header-name Contact
    action       manipulate
    comparison-type pattern-rule
    msg-type     request
    methods      REGISTER
    match-value  (.*)(expires=0)
    new-value    ""

```



```

header-rule
  name          RURIHost
  header-name   Request-URI
  action        manipulate
  comparison-type case-sensitive
  msg-type      request
  methods       REGISTER
  match-value
  new-value
  element-rule
    name        urihost
    parameter-name
    type        uri-host
    action      replace
    match-val-type any
    comparison-type case-sensitive
    match-value <SIP-URL Host>
    new-value   <KDDI SIP Server>

```

```

header-rule
  name          ChangeFrom
  header-name   From
  action        manipulate
  comparison-type case-sensitive
  msg-type      request
  methods       Invite
  match-value
  new-value
  element-rule
    name        changehost
    parameter-name
    type        uri-host
    action      replace
    match-val-type any
    comparison-type case-sensitive
    match-value
    new-value   <SIP-URL Host>
  element-rule
    name        deletedisplay
    parameter-name
    type        uri-display
    action      delete-element
    match-val-type any
    comparison-type case-sensitive
    match-value
    new-value

```

```

header-rule
  name          ModifyContact
  header-name   Contact
  action        manipulate
  comparison-type case-sensitive
  msg-type      any
  methods       INVITE,PRACK,UPDATE
  match-value
  new-value

```

element-rule	
name	deletetransport
parameter-name	transport
type	uri-param
action	delete-element
match-val-type	any
comparison-type	case-sensitive
match-value	
new-value	
header-rule	
name	ChangeTo
header-name	TO
action	manipulate
comparison-type	case-sensitive
msg-type	request
methods	Invite
match-value	
new-value	
element-rule	
name	changehost
parameter-name	
type	uri-host
action	replace
match-val-type	any
comparison-type	case-sensitive
match-value	
new-value	<KDDI SIP Server>
header-rule	
name	storeFrom
header-name	From
action	store
comparison-type	pattern-rule
msg-type	request
methods	Invite
match-value	
new-value	
header-rule	
name	StorePPI
header-name	P-Preferred-Identity
action	store
comparison-type	case-sensitive
msg-type	request
methods	Invite
match-value	
new-value	
header-rule	
name	AddPPI
header-name	P-Preferred-Identity
action	add
comparison-type	boolean
msg-type	request
methods	Invite
match-value	!\$StorePPI
new-value	\$storeFrom.\$0

```

header-rule
  name          deleteUA
  header-name   User-Agent
  action        delete
  comparison-type case-sensitive
  msg-type      any
  methods
  match-value
  new-value
header-rule
  name          addUA
  header-name   User-Agent
  action        add
  comparison-type case-sensitive
  msg-type      request
  methods       Register
  match-value
  new-value     "Oracle-ESBC/9.2"
sip-monitoring
  monitoring-filters *
steering-pool
  ip-address     10.1.2.4
  start-port     10000
  end-port       10999
  realm-id       KDDIRealm
steering-pool
  ip-address     10.1.3.4
  start-port     20000
  end-port       29999
  realm-id       GenericPBX
surrogate-agent
  register-host  <SIP-URL Host>
  register-user  <SIP-URL User>
  realm-id       GenericPBX
  customer-next-hop <SIP Server>
  register-contact-host 10.1.2.4
  register-contact-user <SIP-URL User>
  password        <VoIP-PW>
  register-expires 1800
  auth-user        <VoIP-ID>
  max-register-attempts 10
  register-retry-time 900
system-config
  hostname       OracleSBC
  description
  location       Burlingtn, MA
  dos-cores      1
SolutionsLab-vSBC-2#

```



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Integrated Cloud Applications & Platform Services

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