Oracle SBC integration with Enterprise SIP Trunking with KDDI

Technical Application Note

ORACLE
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Contents

1. Intended Audience

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

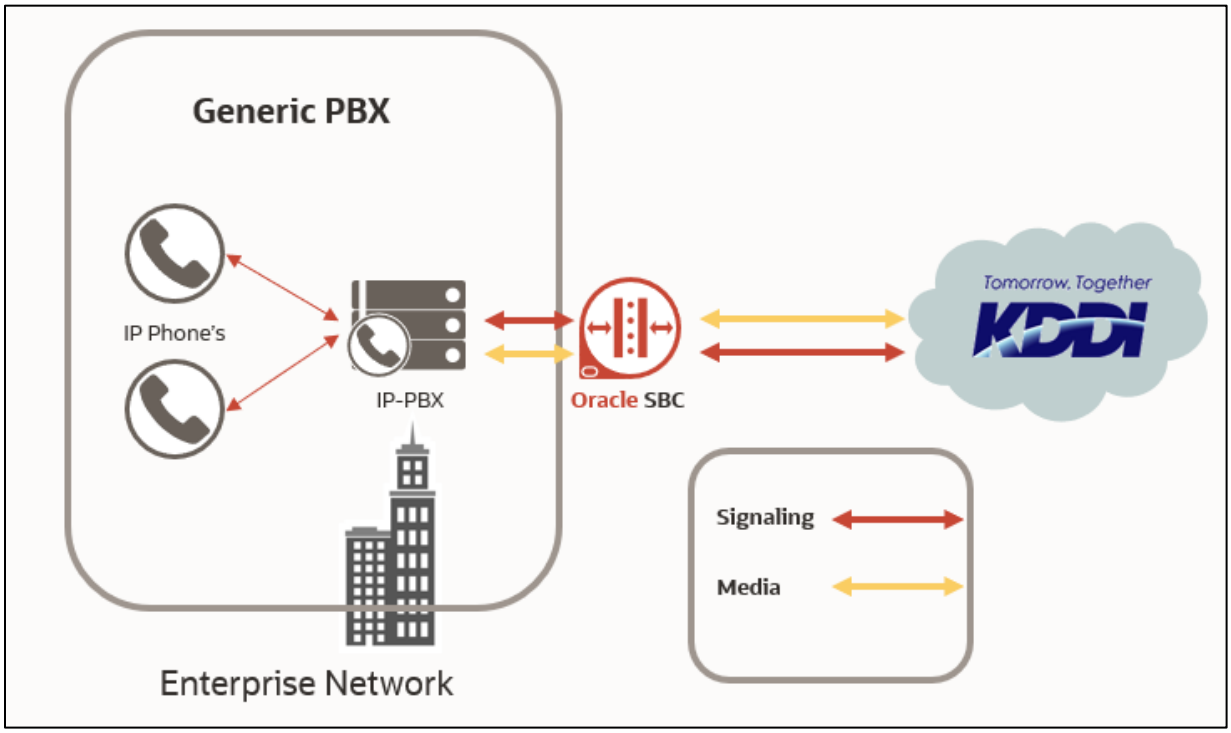
- Generic PBX Platform
- KDDI SIP Trunk
- Oracle Enterprise Session Border Controller (hereafter Oracle SBC) running 9.2.0 version.

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

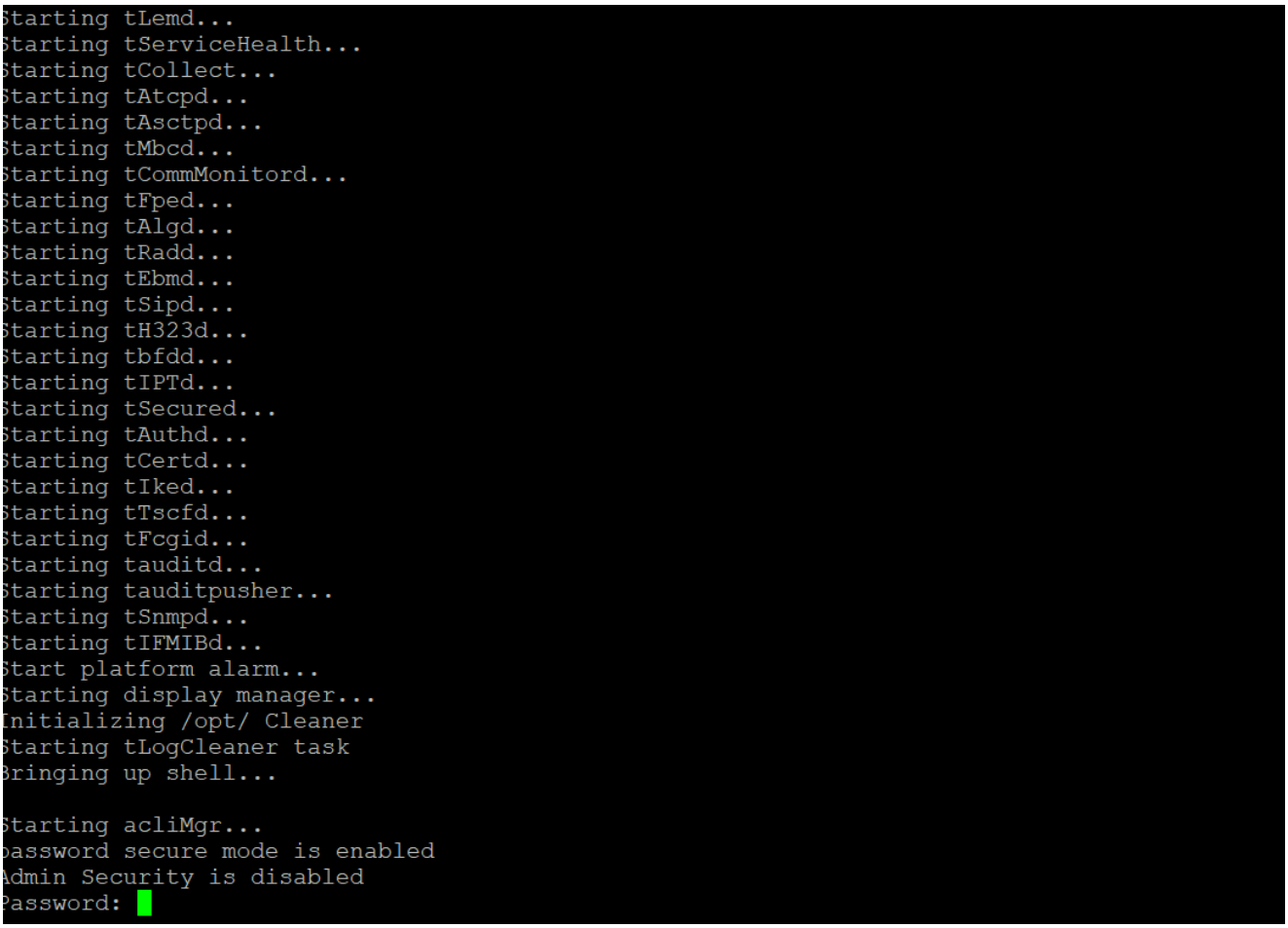
If the customer is looking to setup a new SBC from scratch, please follow the section below.

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:

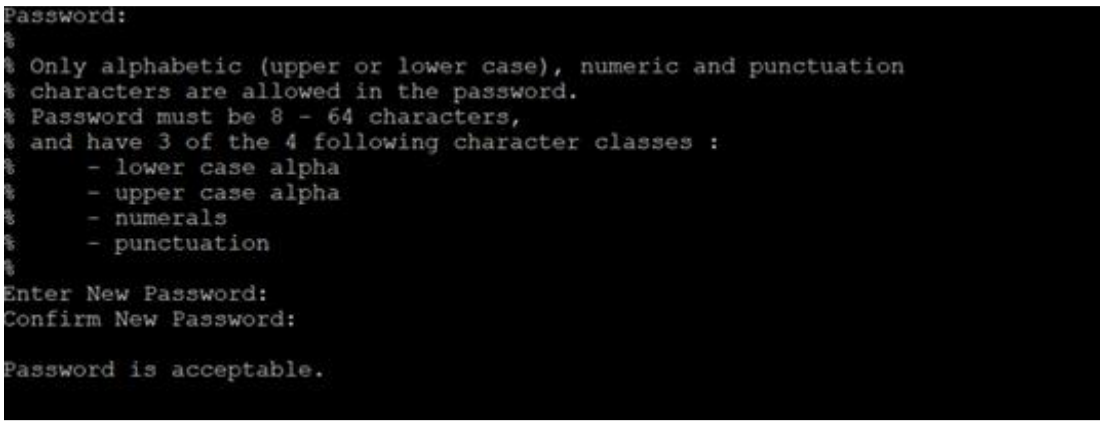
- Baud Rate=115200
- Data Bits=8
- Parity=None
- Stop Bits=1
- Flow Control=None

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



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.



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/nnSCZ920p4.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.

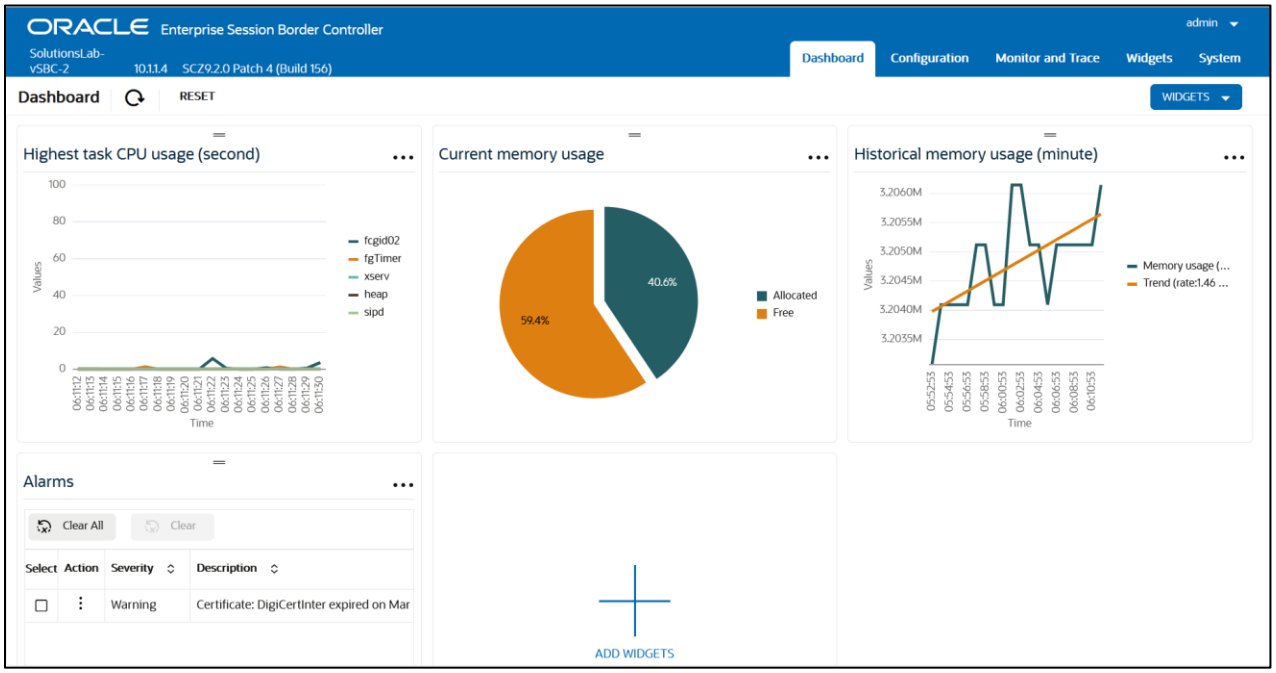
```
SolutionsLab-vSBC-2(http-server)# show
http-server
       name                                  webserver
       state                                 enabled
       realm
       ip-address
       http-state                            enabled
       http-port                             80
       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

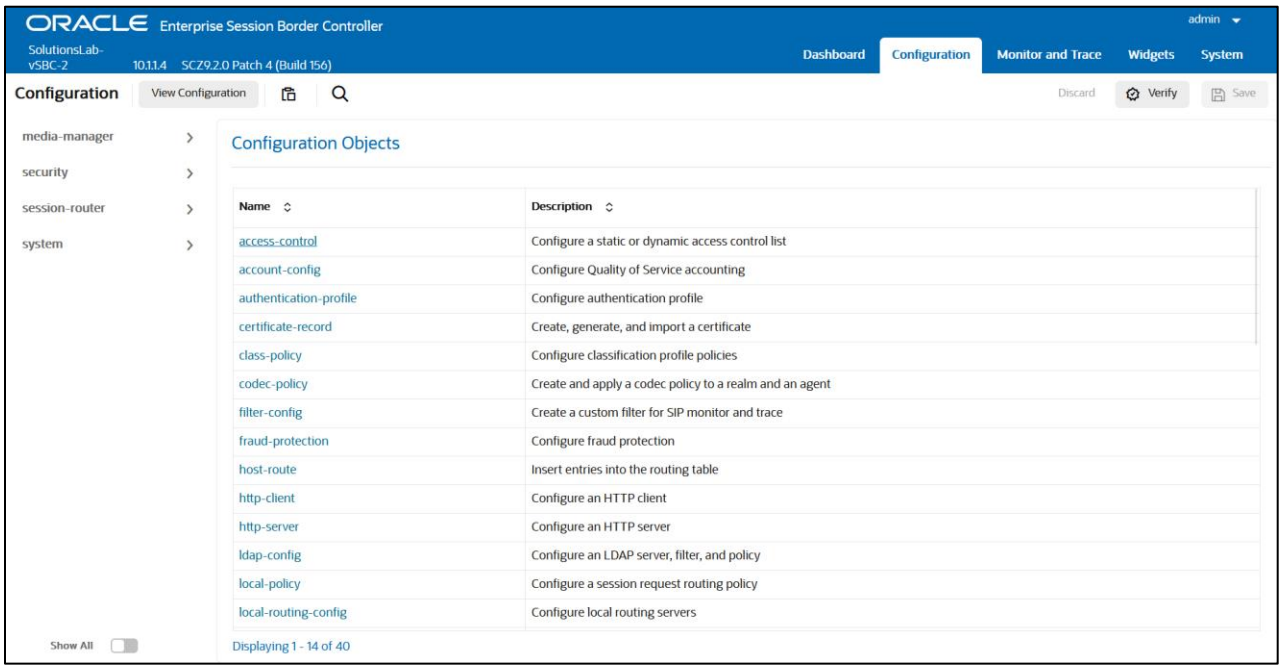
In this app note, we configure SBC using the WebGUI.

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

The 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.

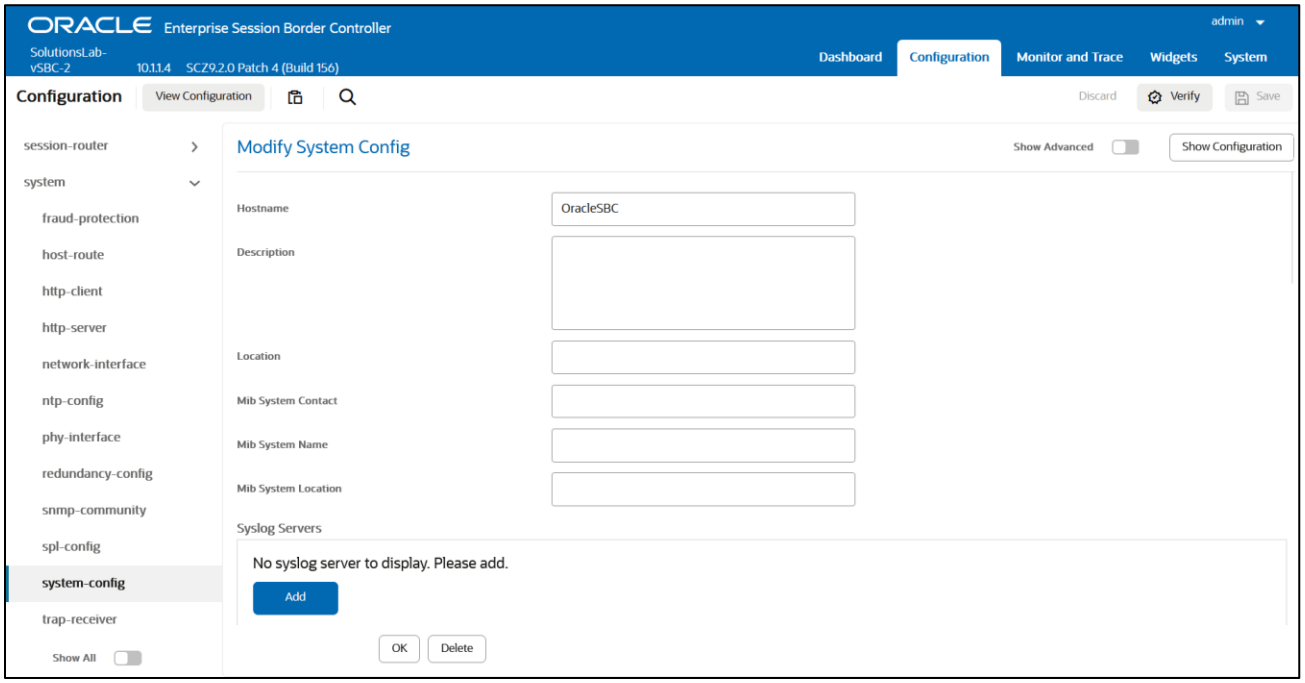
https://docs.oracle.com/en/industries/communications/enterprise-session-border-controller/9.2.0/webgui/web-gui-guide.pdf

The expert mode is used for configuration.

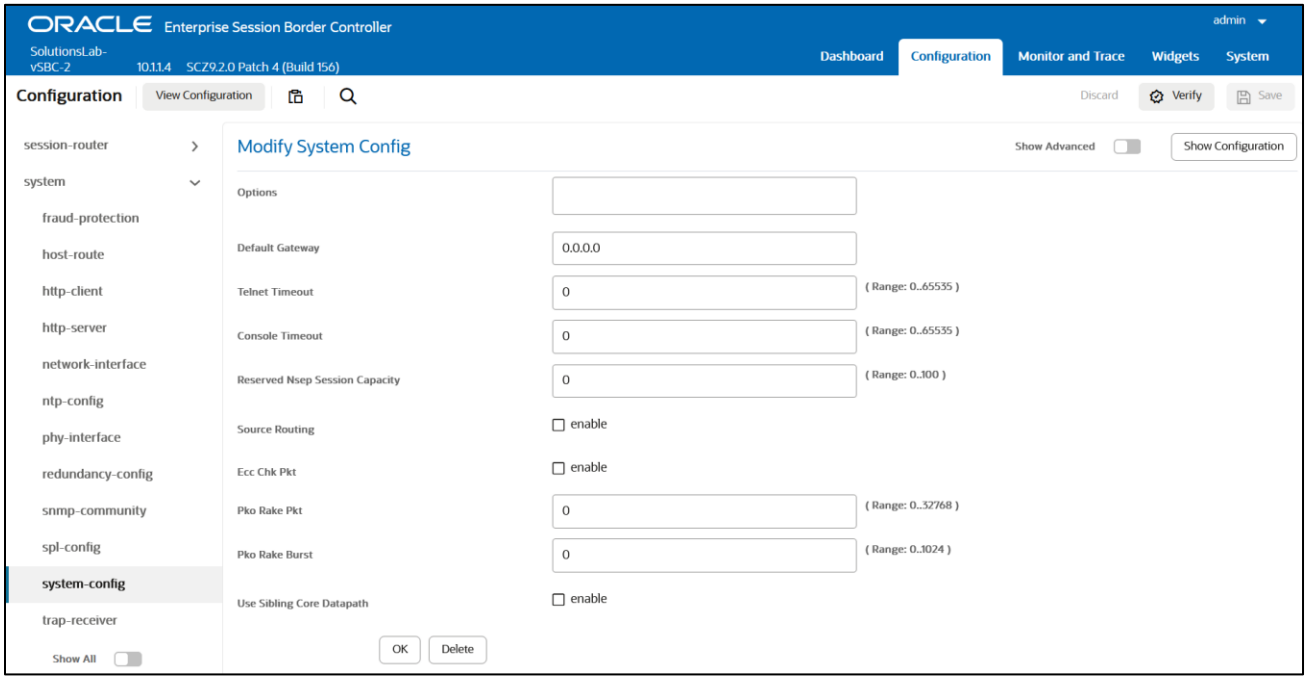
Tip: To make this configuration simpler, one can directly search the element to be configured, from the Objects tab available.

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

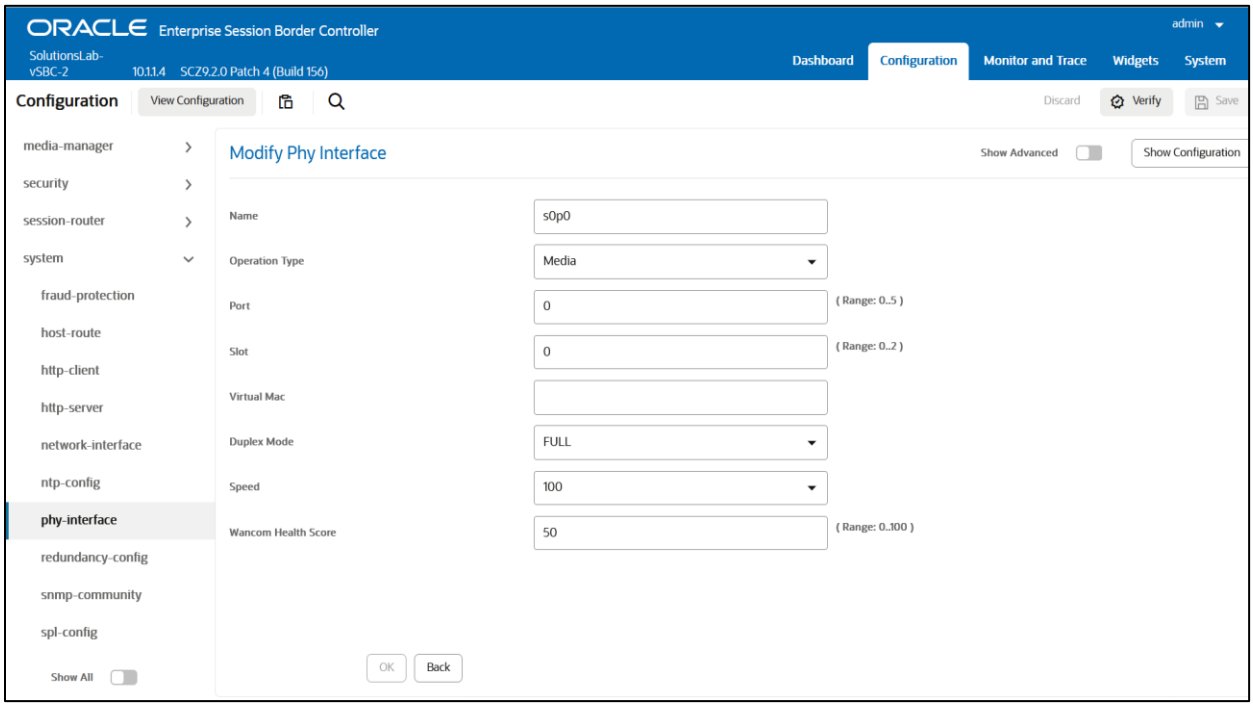
The above step is needed only if any transcoding is used in the configuration.
If there is no transcoding involved, then the above step is not needed.

5.4. Configure Physical Interface

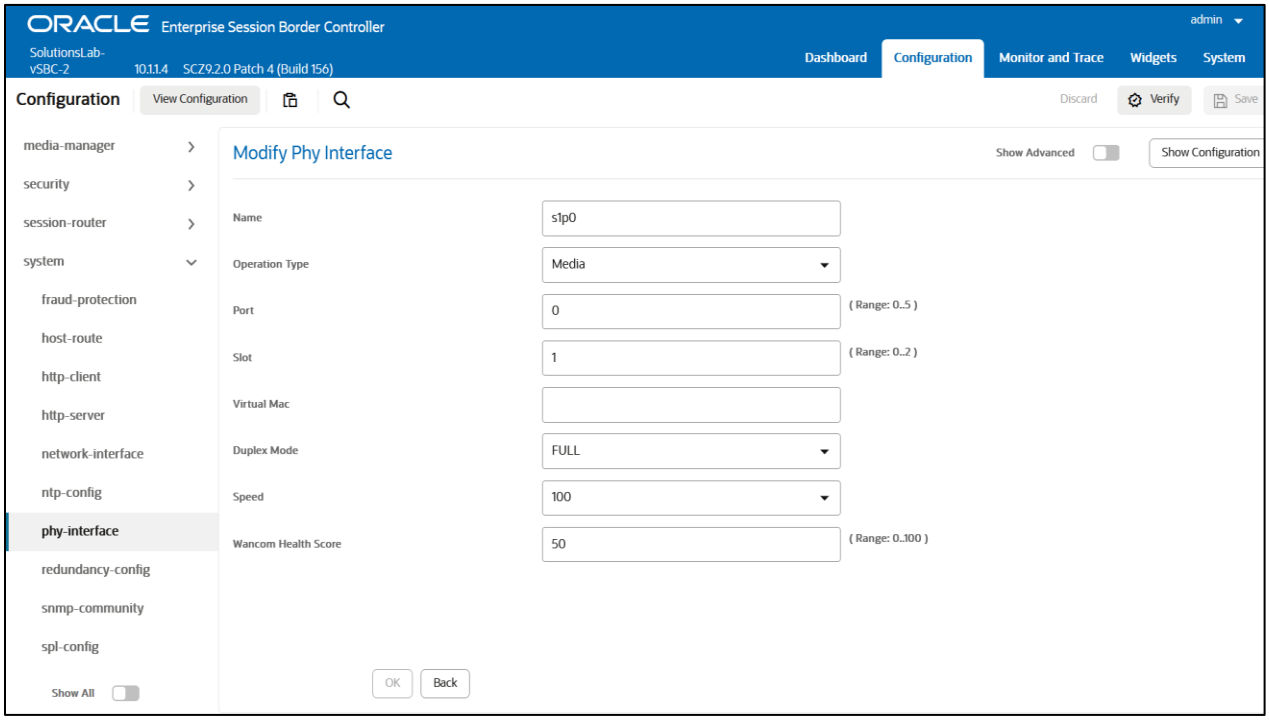
To configure physical Interface values, go to System->phy-interface.
Configure Physical interface towards KDDI Trunk and IP-PBX as shown below.
The interface designated towards KDDI SIP Trunk is named as s0p0 (Slot 0, port 0).

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.



Please configure s1p0 interface as below



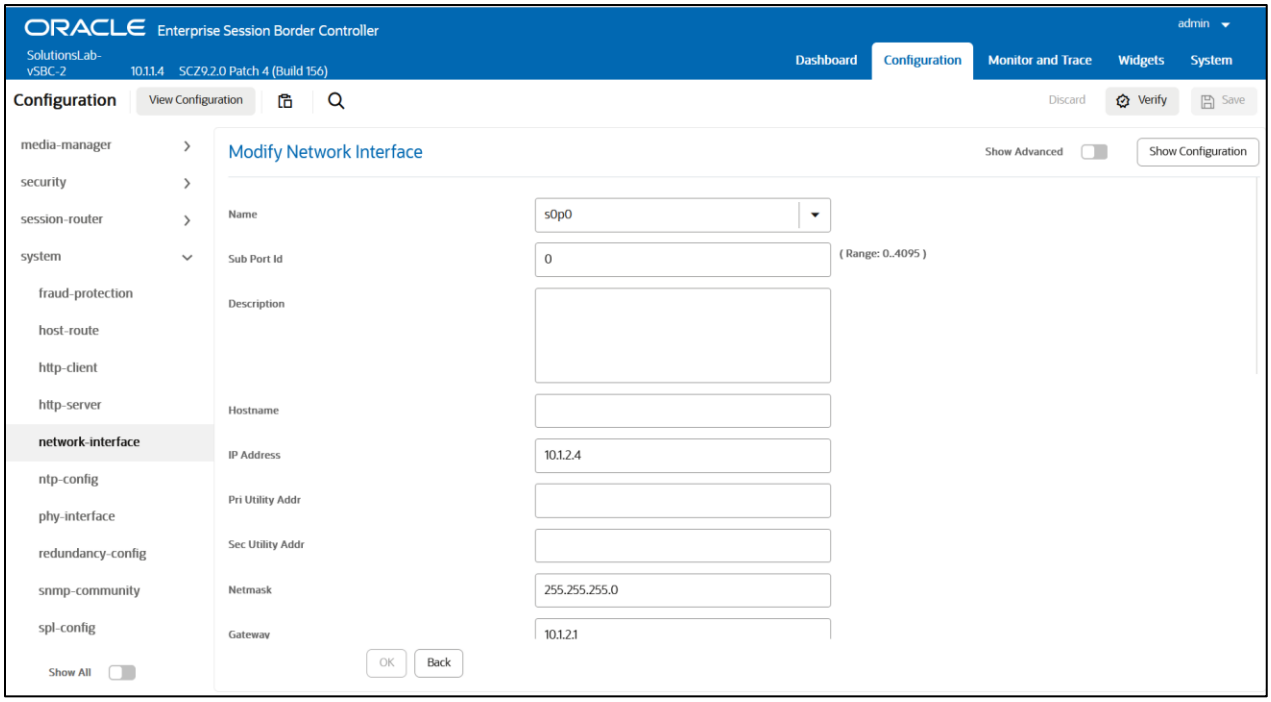
5.5. Configure Network Interface

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

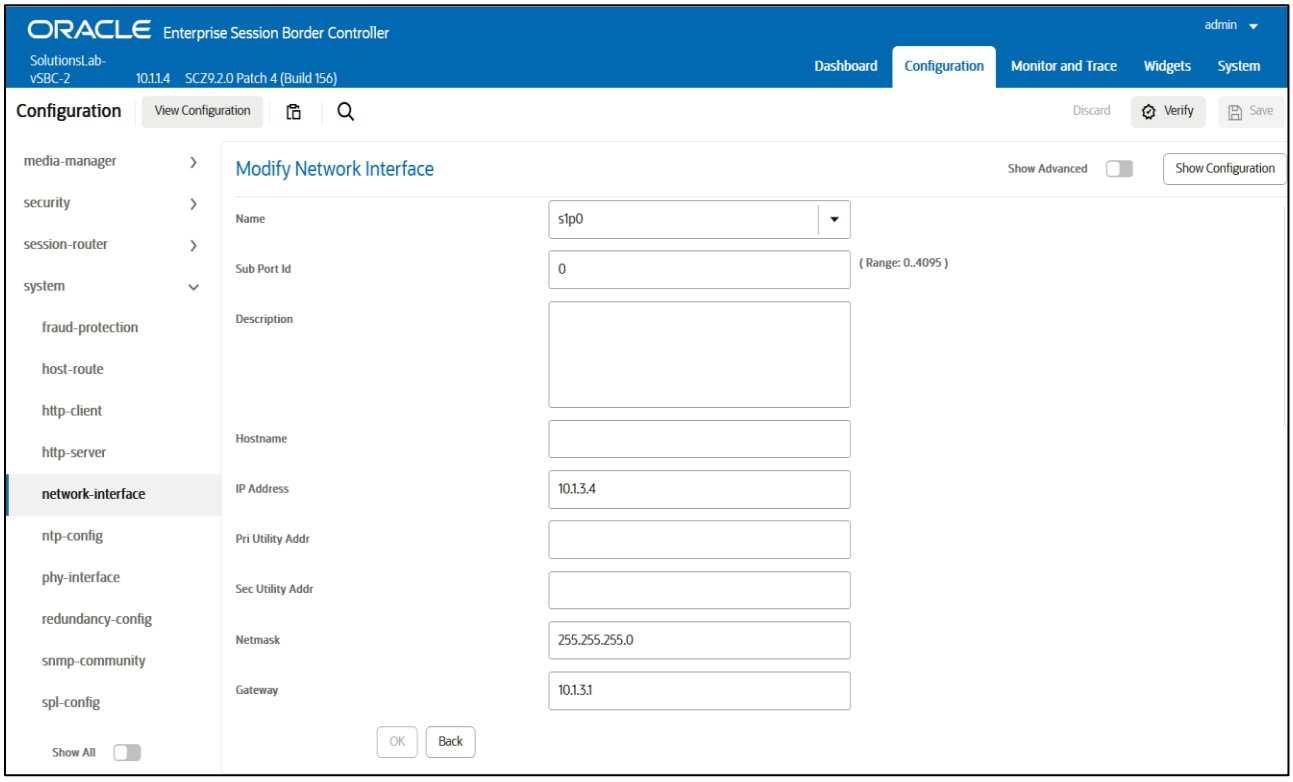
The table below lists the parameters, to be configured for both the interfaces.

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



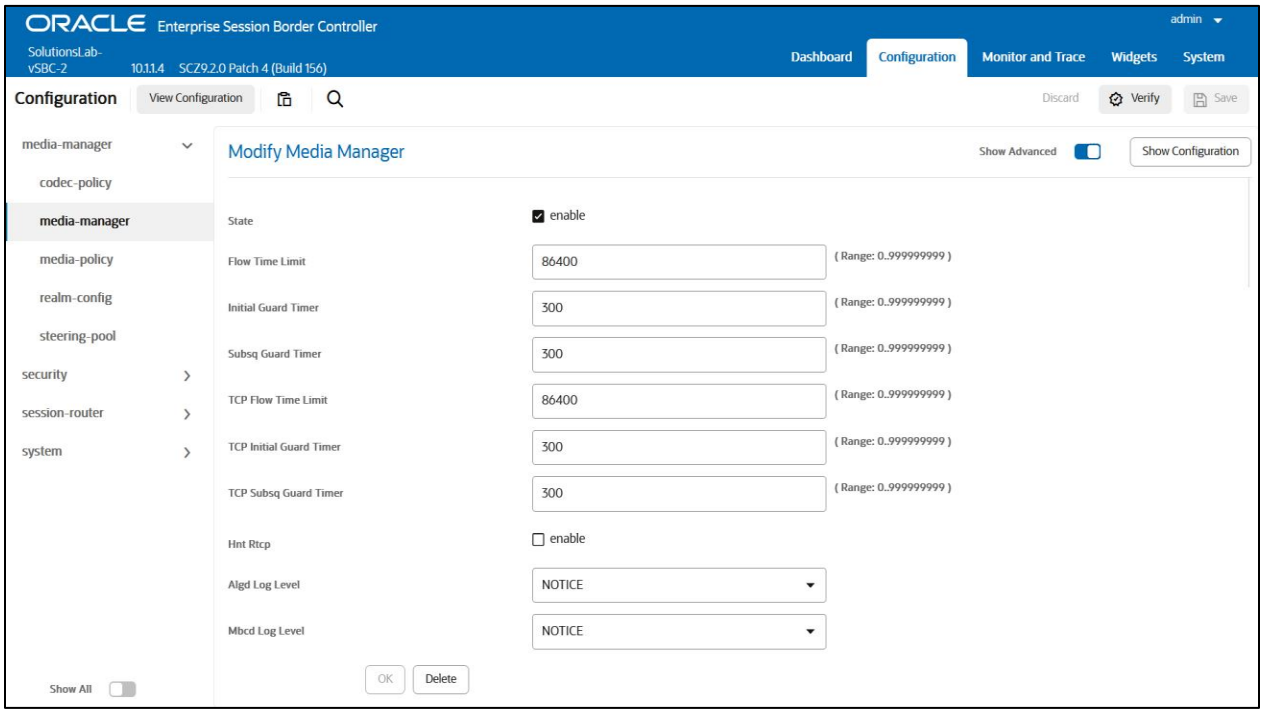
Similarly, configure network interface s1p0 as below

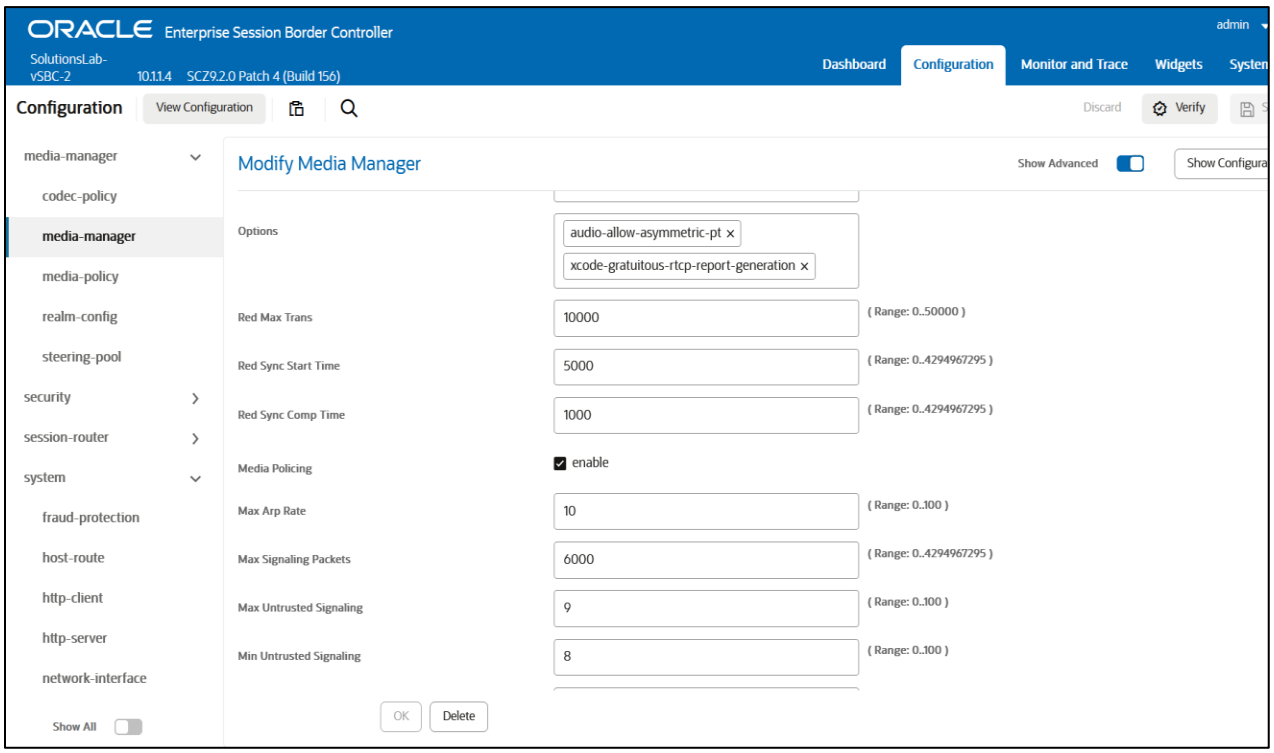


5.6. Enable media manager

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

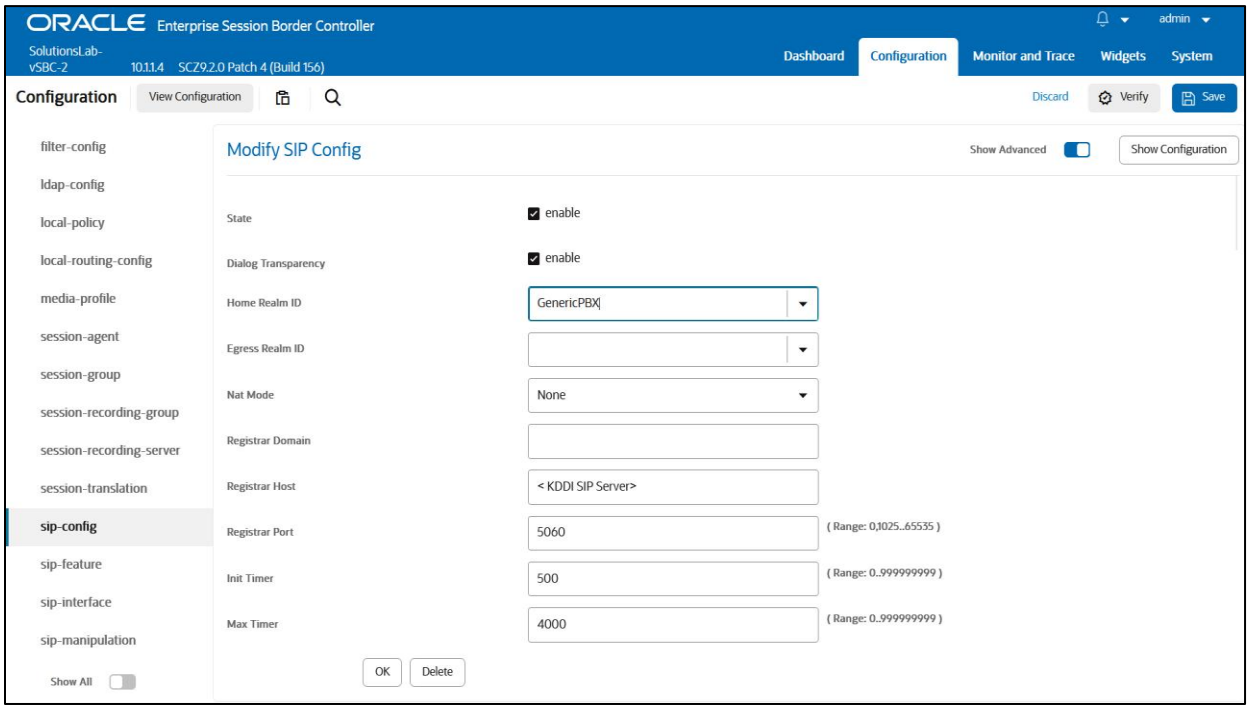


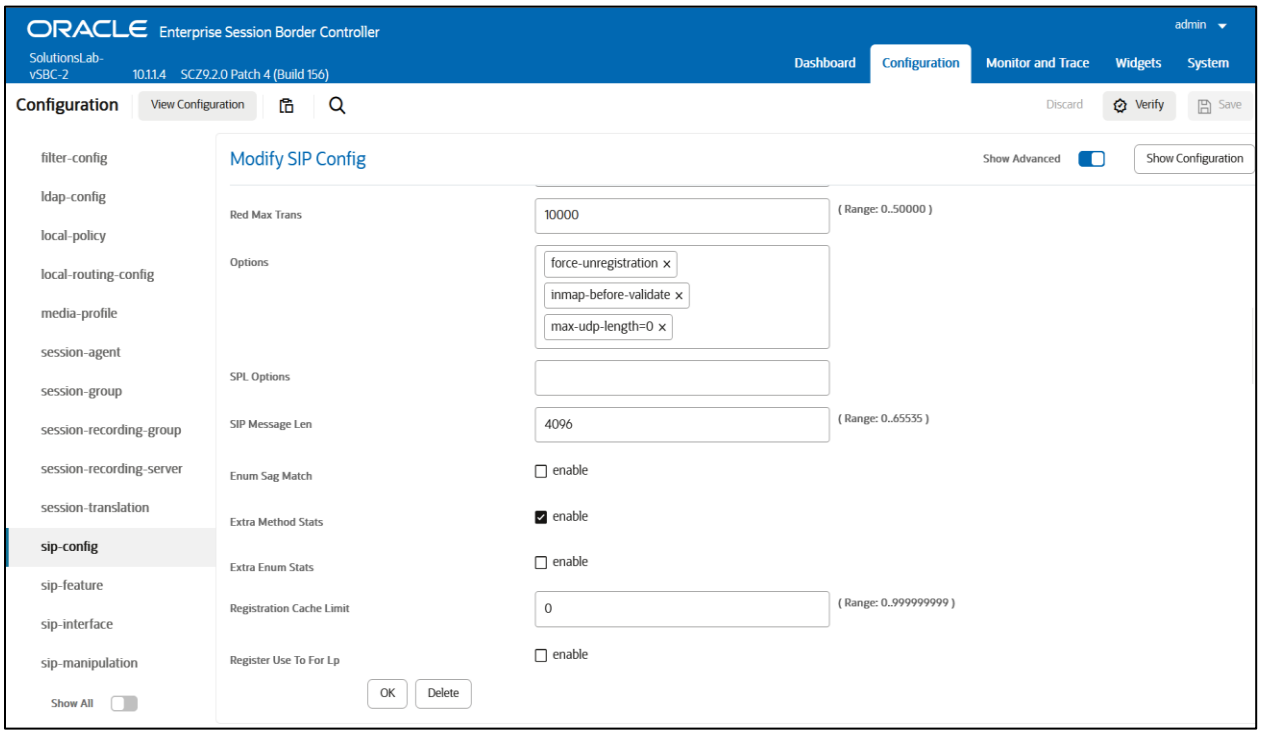


5.7. Enable sip-config

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.





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.**

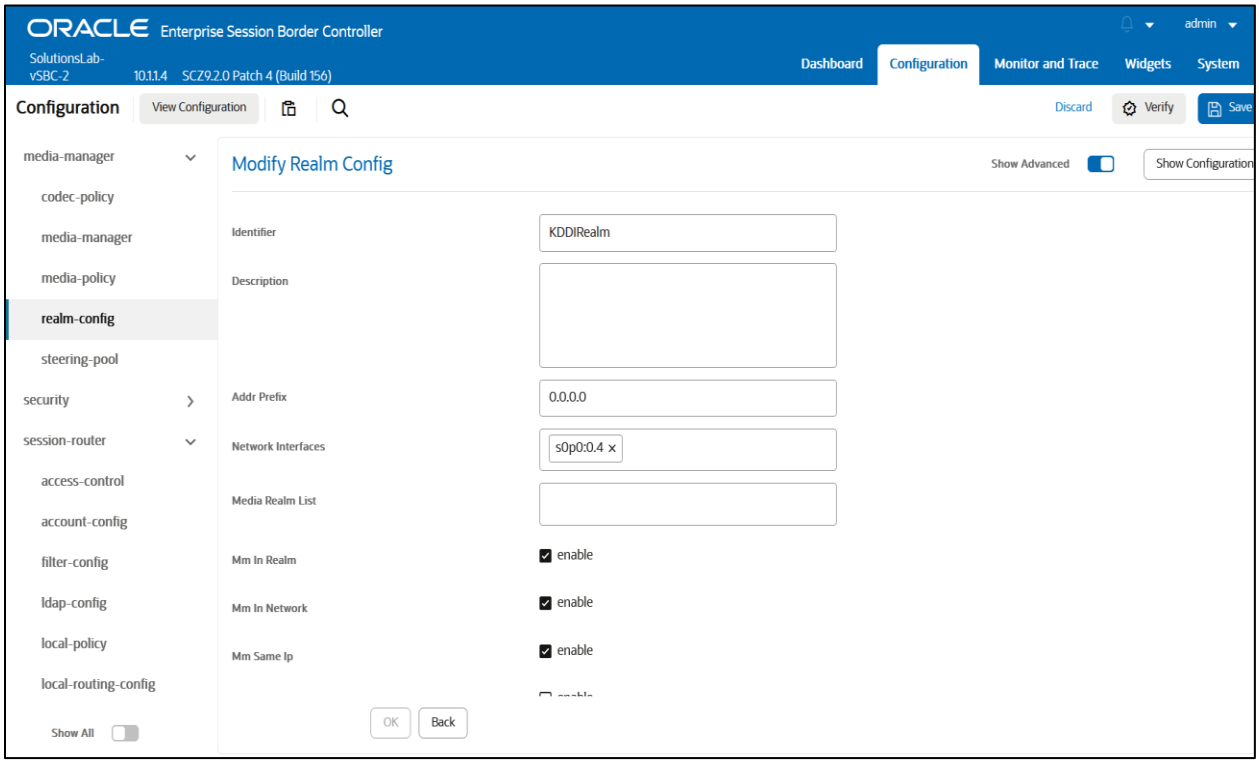
5.9. Configure Realms

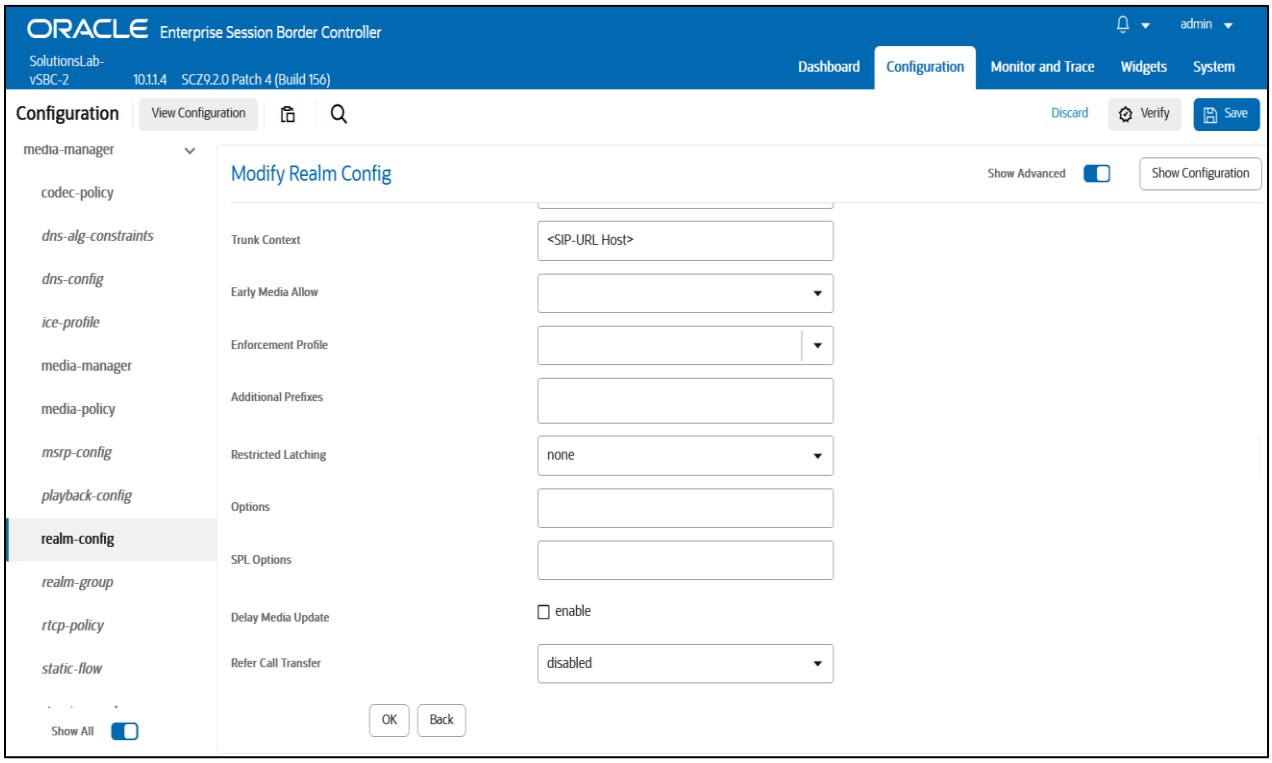
Navigate to realm-config under media-manager and configure a realm as shown below
The name of the Realm can be any relevant name according to the user convenience.

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

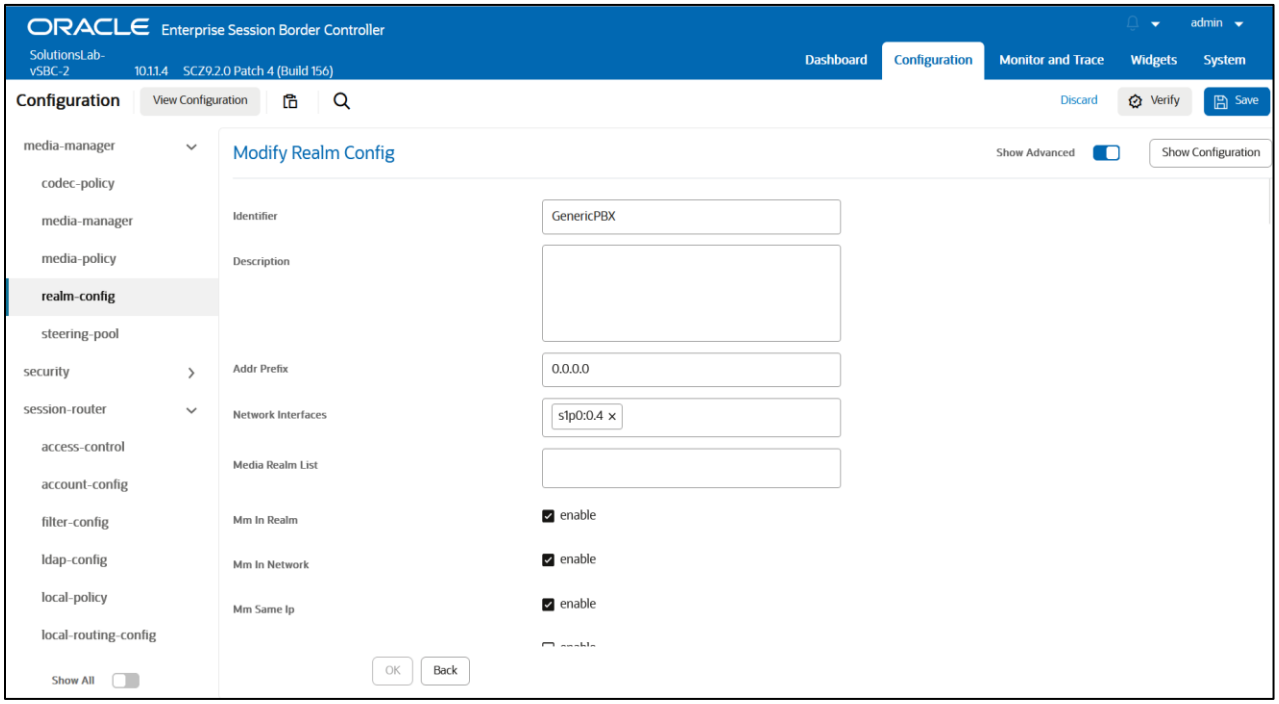
Config Parameter	KDDI SIP Trunk Side	Generic-PBX Side
Identifier	KDDIRealm	GenericPBX
Network Interface	S0p0	s1p0
MM in realm	☑	☑
Codec policy	KDDICodec	
Access Control Trust Level	High	High

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
10.1.1.4 SCZ9.2.0 Patch 4 (Build 156)
admin
Dashboard
Configuration
Monitor and Trace
Widgets
System
Configuration
View Configuration
Discard
Verify
Save
media-manager
codec-policy
media-manager
media-policy
realm-config
steering-pool
security
session-router
access-control
account-config
filter-config
ldap-config
local-policy
local-routing-config
Show All
Modify Realm Config
Show Advanced
Show Configuration
Identifier
KDDIRealm
Description
Addr Prefix
0.0.0.0
Network Interfaces
s0p0:0.4
Media Realm List
Mm In Realm
enable
Mm In Network
enable
Mm Same Ip
enable
OK
Back


ORACLE Enterprise Session Border Controller
SolutionsLab-vSBC-2
10.1.1.4 SCZ9.2.0 Patch 4 (Build 156)
admin
Dashboard
Configuration
Monitor and Trace
Widgets
System
Configuration
View Configuration
Discard
Verify
Save
media-manager
codec-policy
dns-alg-constraints
dns-config
ice-profile
media-manager
media-policy
msrp-config
playback-config
realm-config
realm-group
rtcp-policy
static-flow
Show All
Modify Realm Config
Show Advanced
Show Configuration
Trunk Context
<SIP-URL Host>
Early Media Allow
Enforcement Profile
Additional Prefixes
Restricted Latching
none
Options
SPL Options
Delay Media Update
enable
Refer Call Transfer
disabled
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.

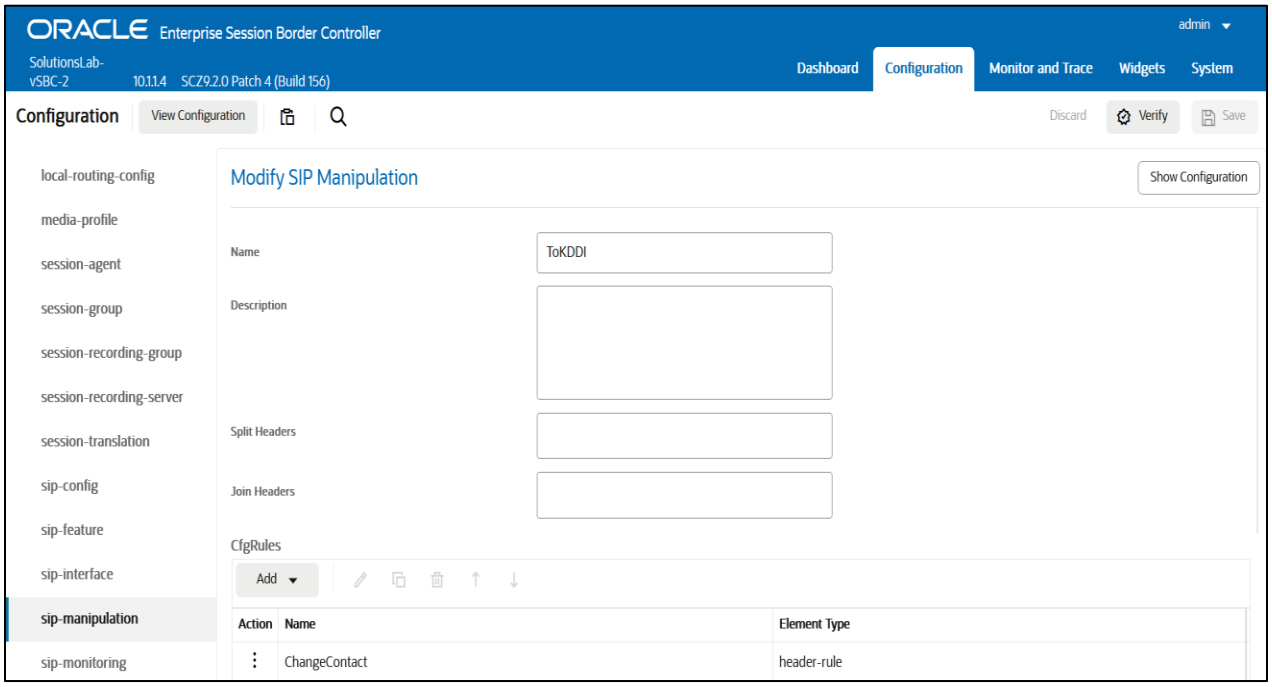


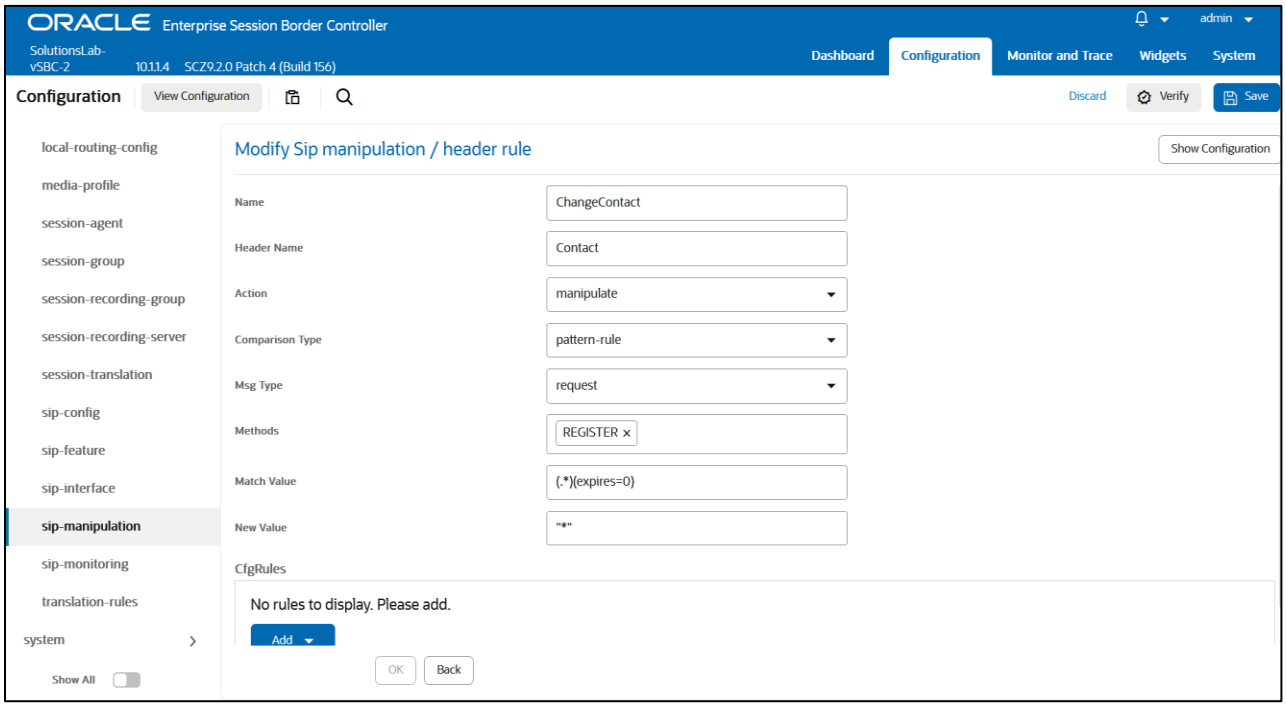
For more information on Access Control Trust Level, please refer to SBC Security guide link given below:

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

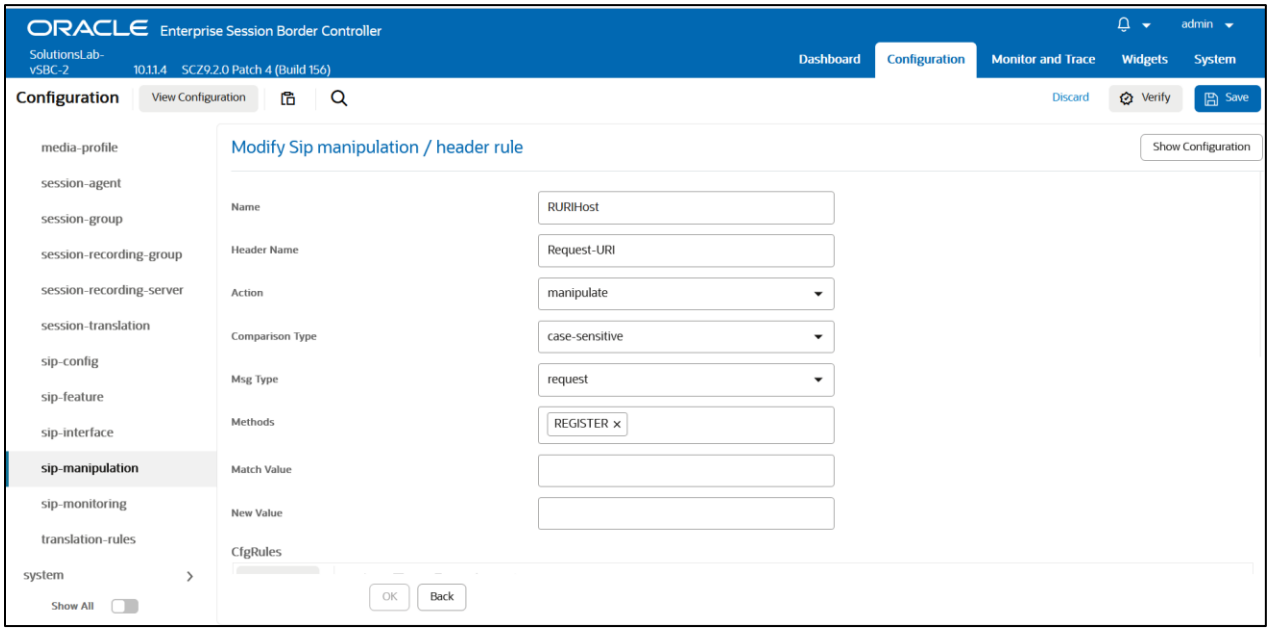
5.10. Configure sip-manipulation

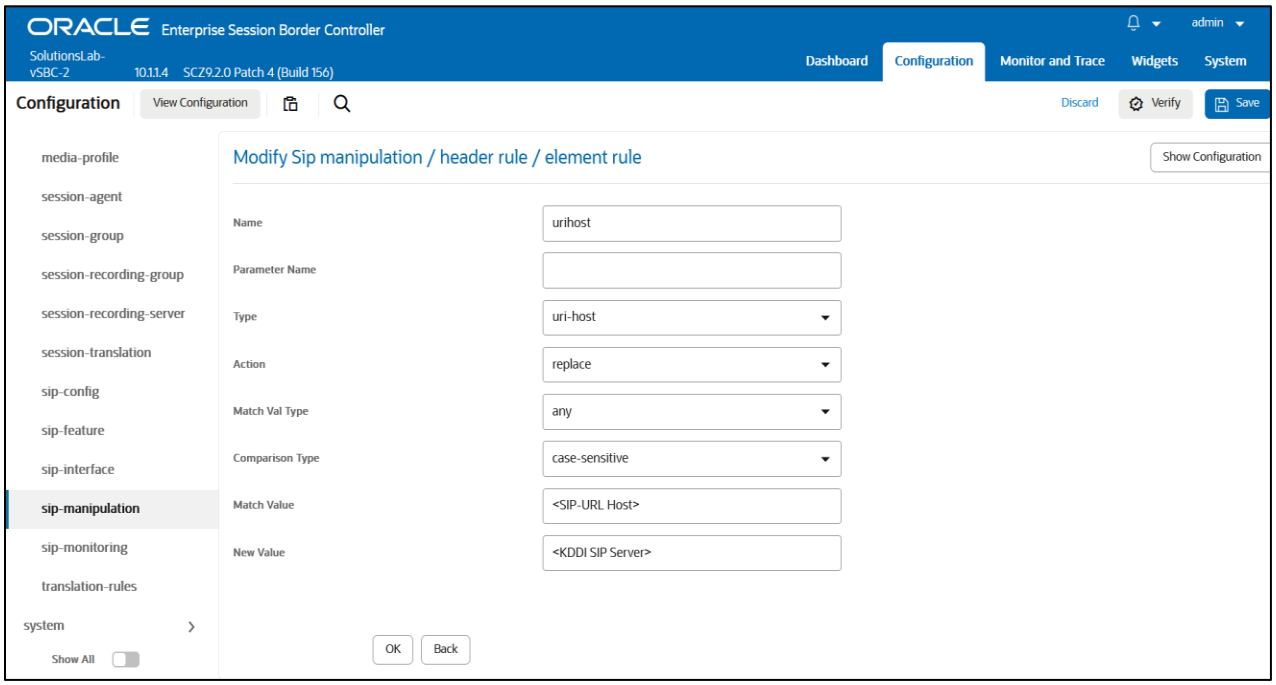
Navigate to Configuration > session-router > sip-manipulation
Configure SIP manipulation towards KDDI side as shown below with name **ToKDDI**
Assign this sip-manipulation to the KDDI sip-interface as out manipulation.



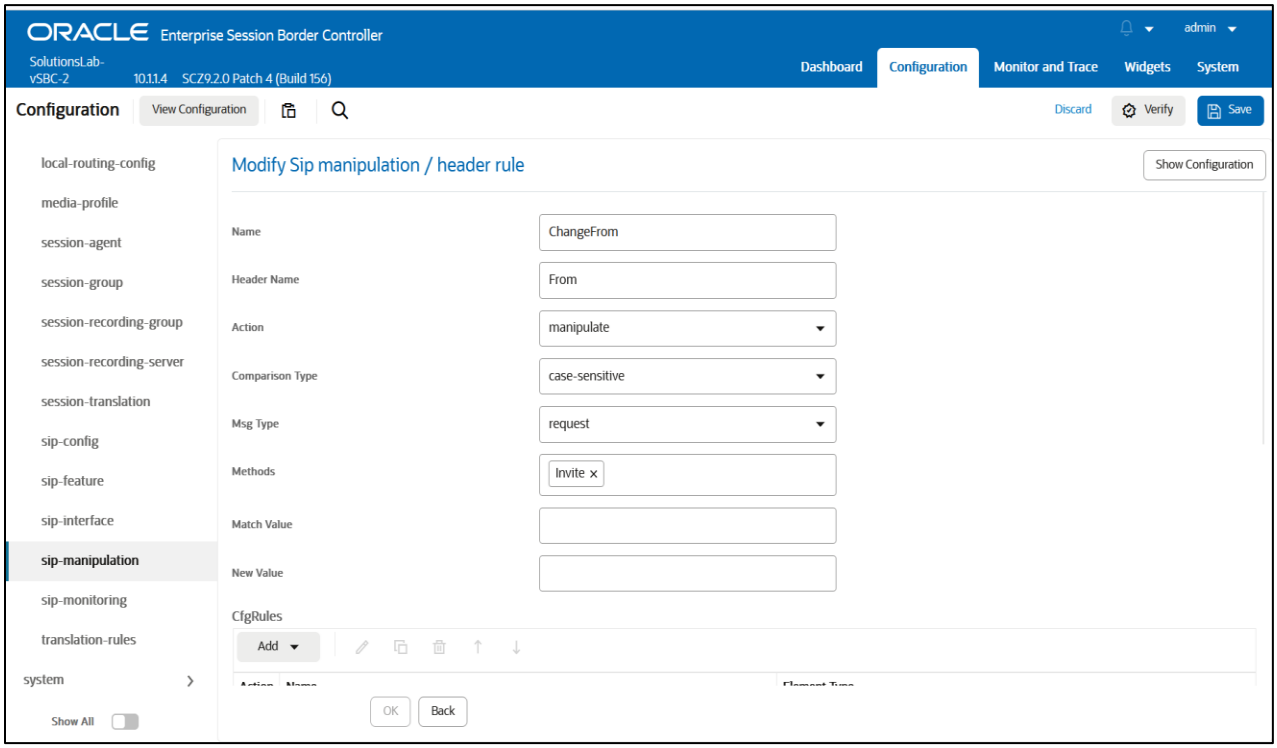


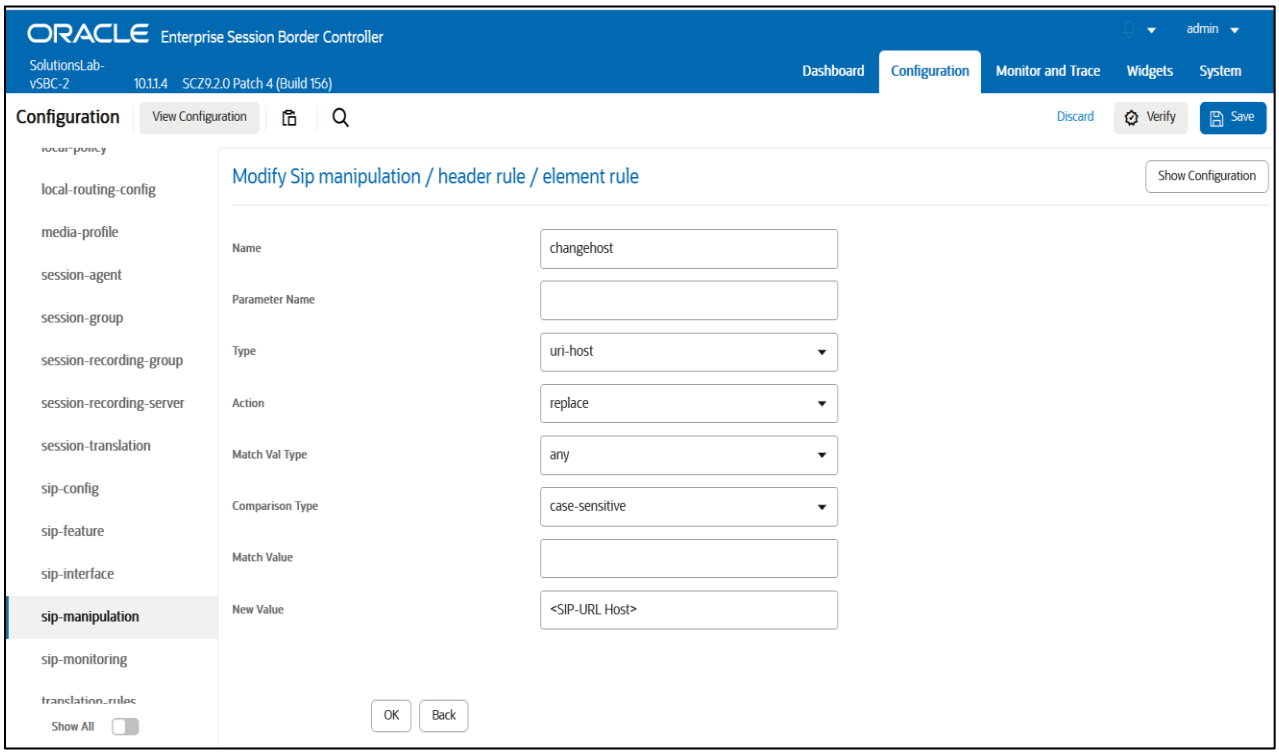
Below manipulation **RURIHost** is used in our test environment to change the user Request-URI part of the registered surrogate agent towards KDDI side.

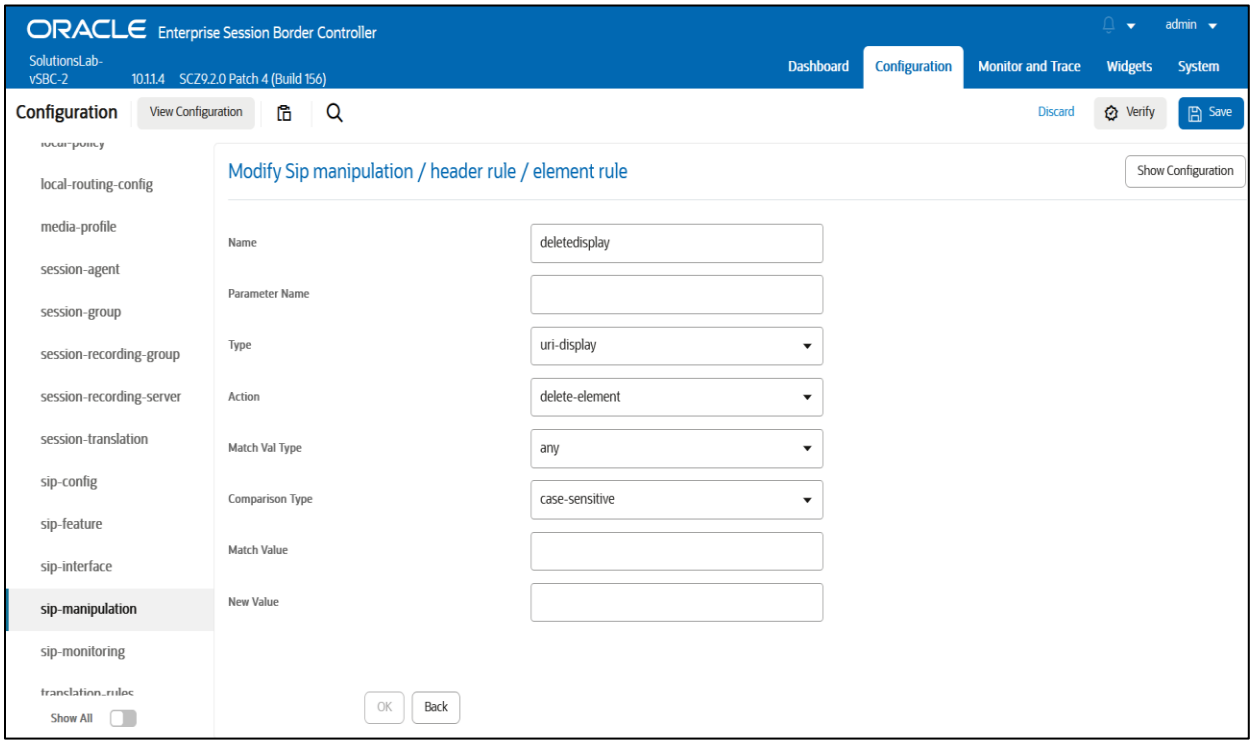




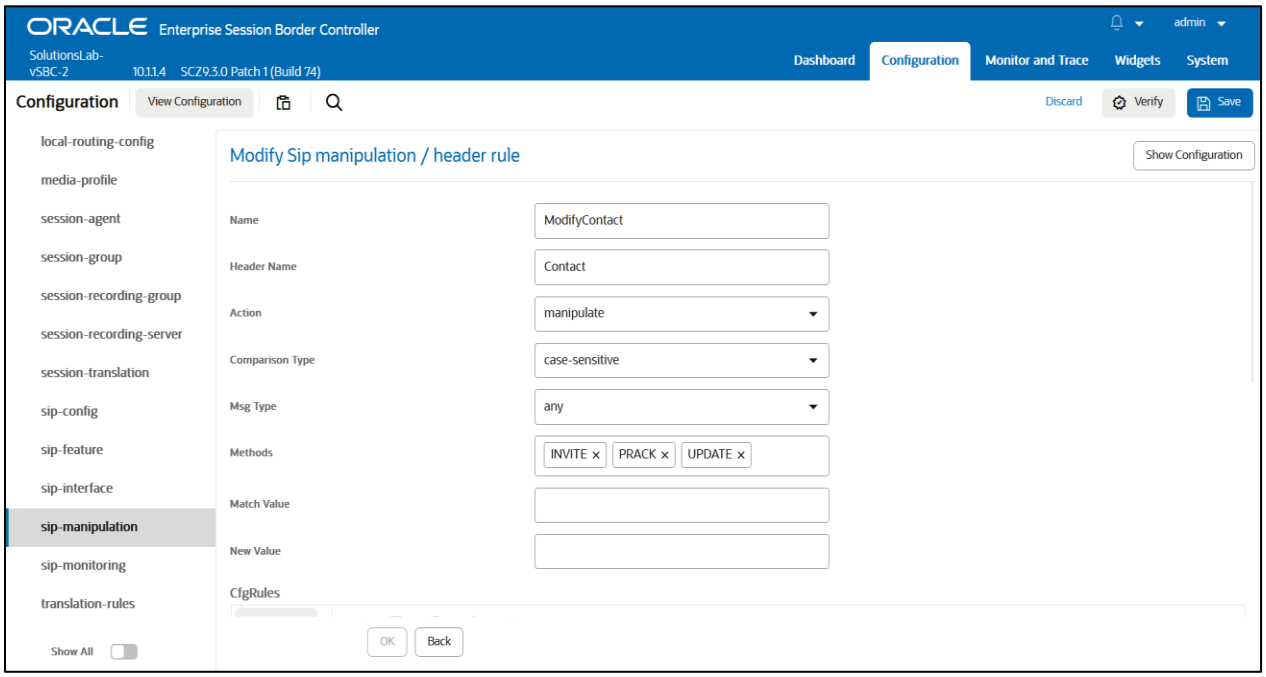
Below manipulation **ChangeFrom** is used in our test environment to match the From Header user part of the registered surrogate agent towards KDDI side.

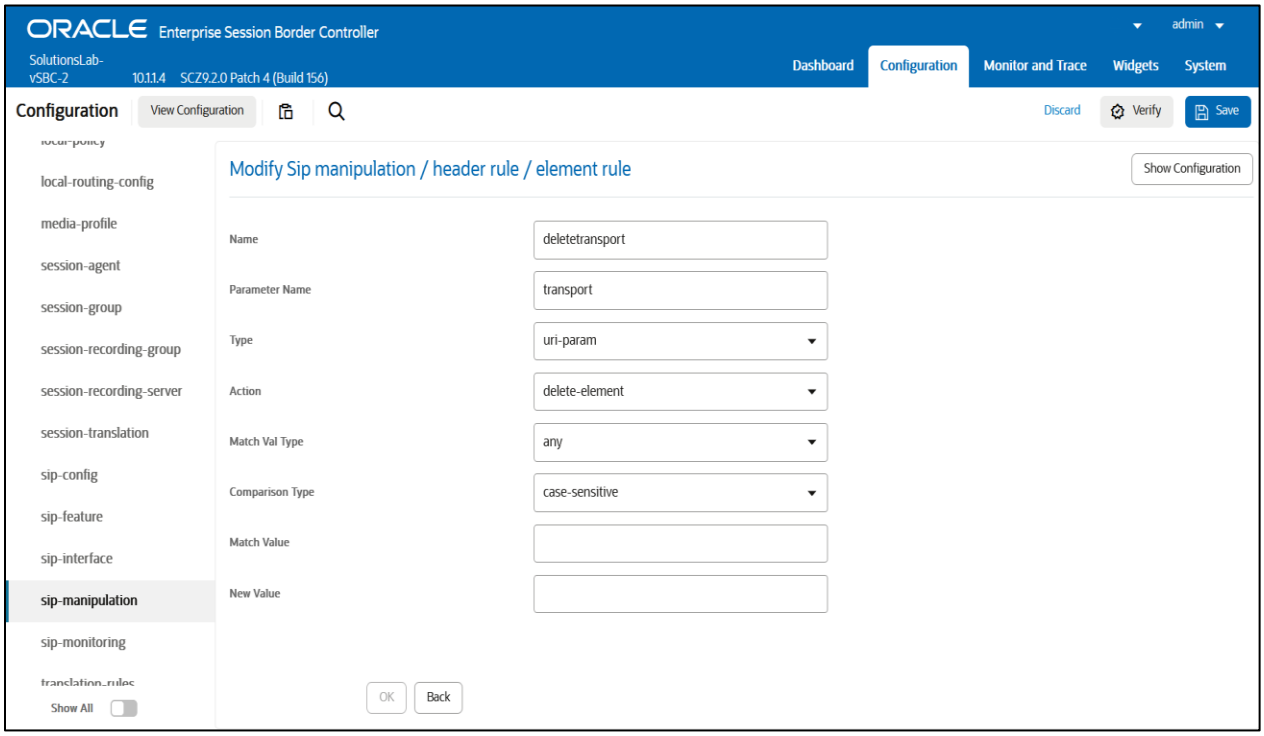




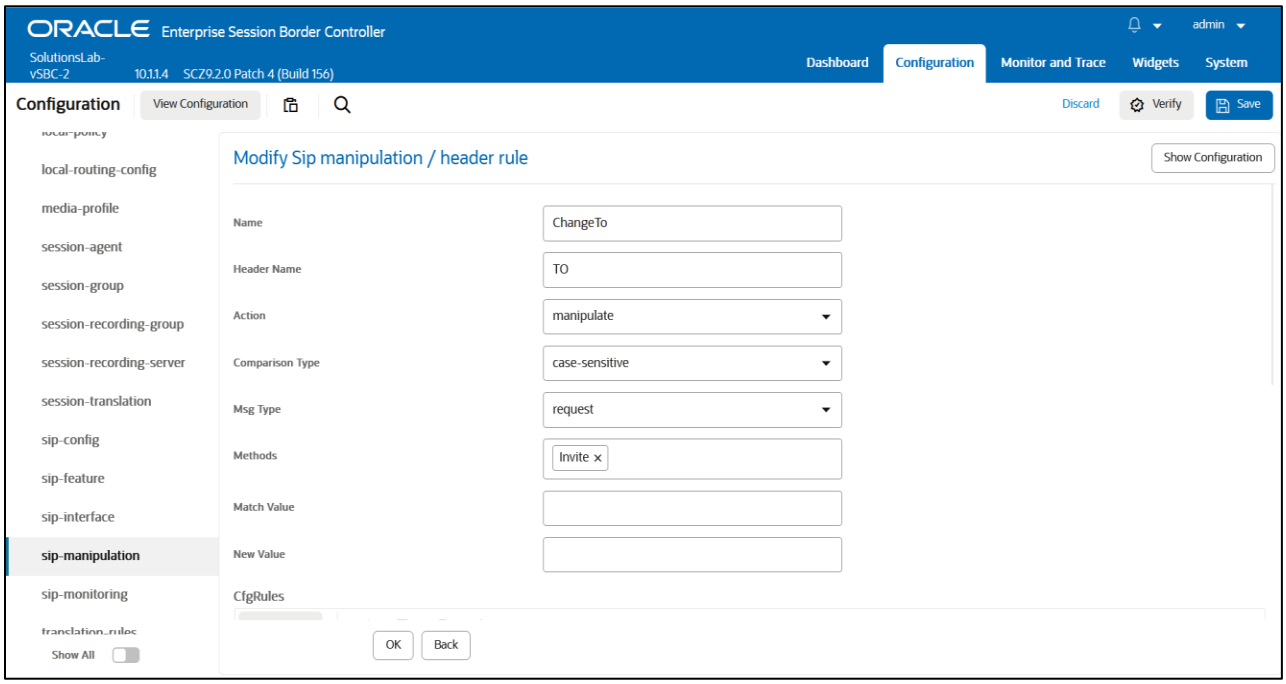


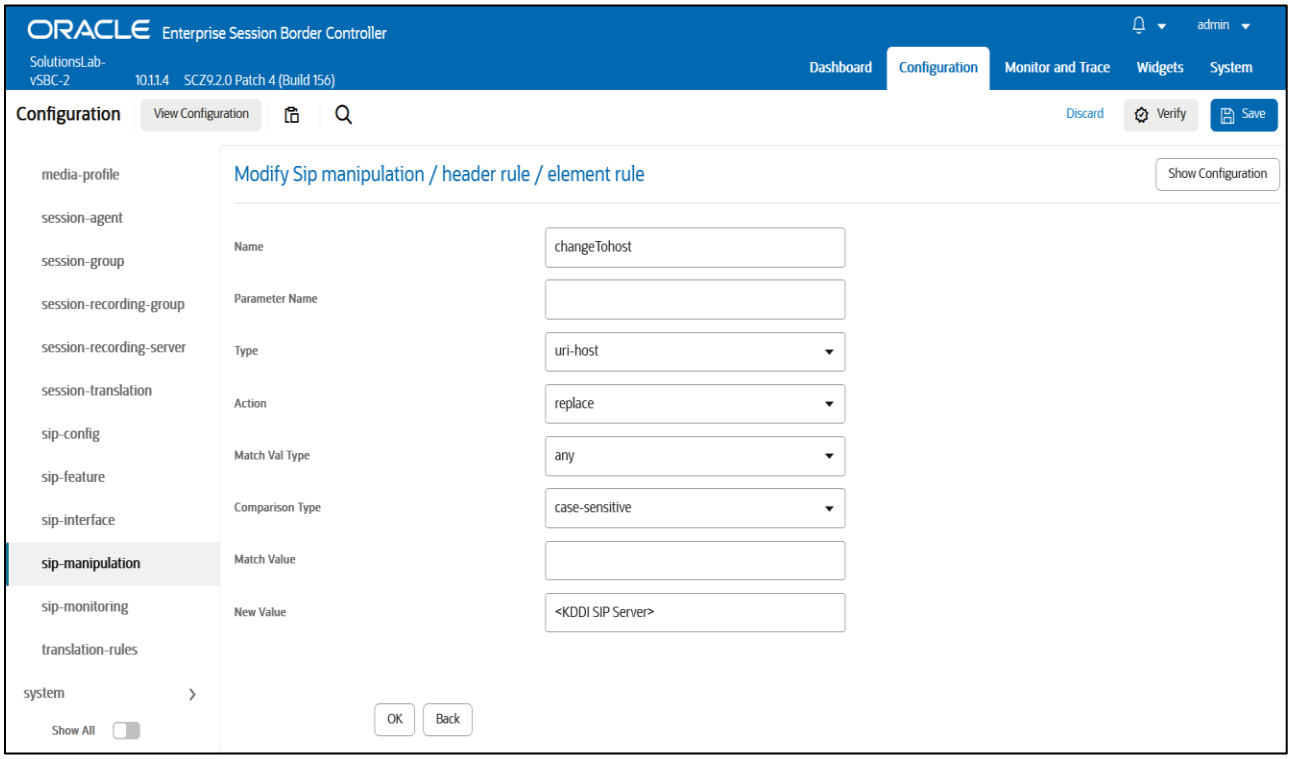
Below manipulation **ModifyContact** is used in our test environment to delete the transport method of the registered surrogate agent towards KDDI side.



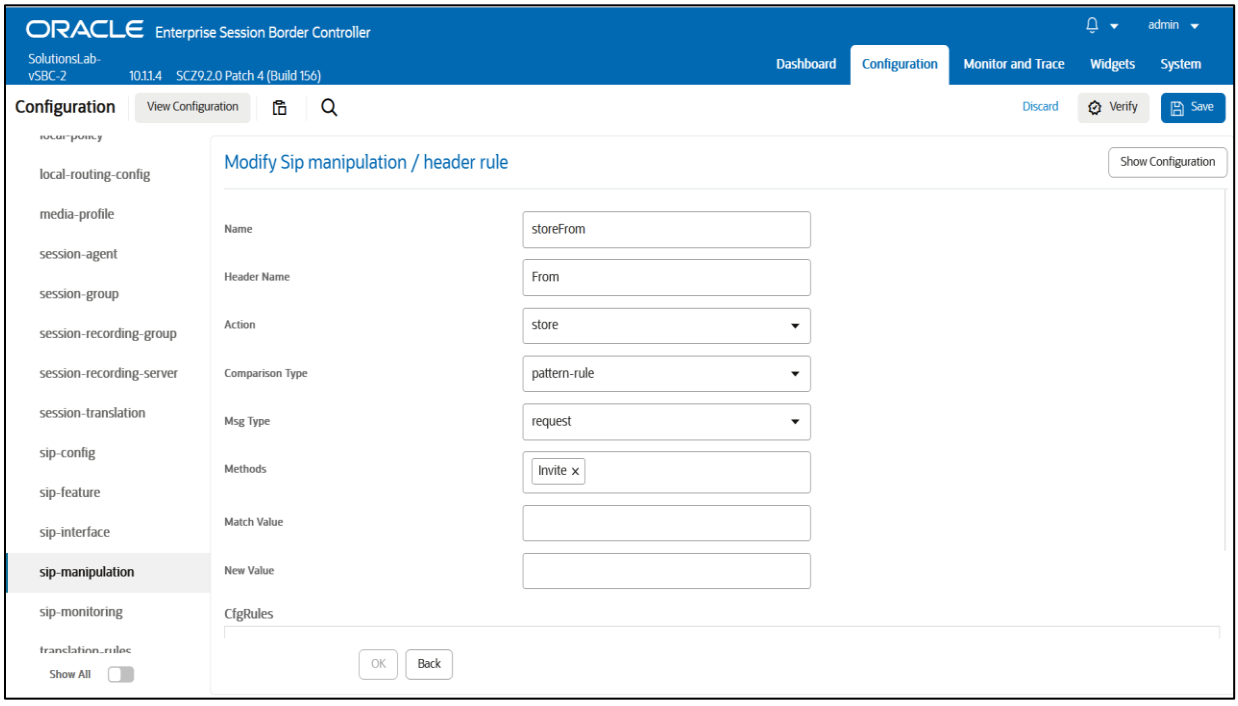


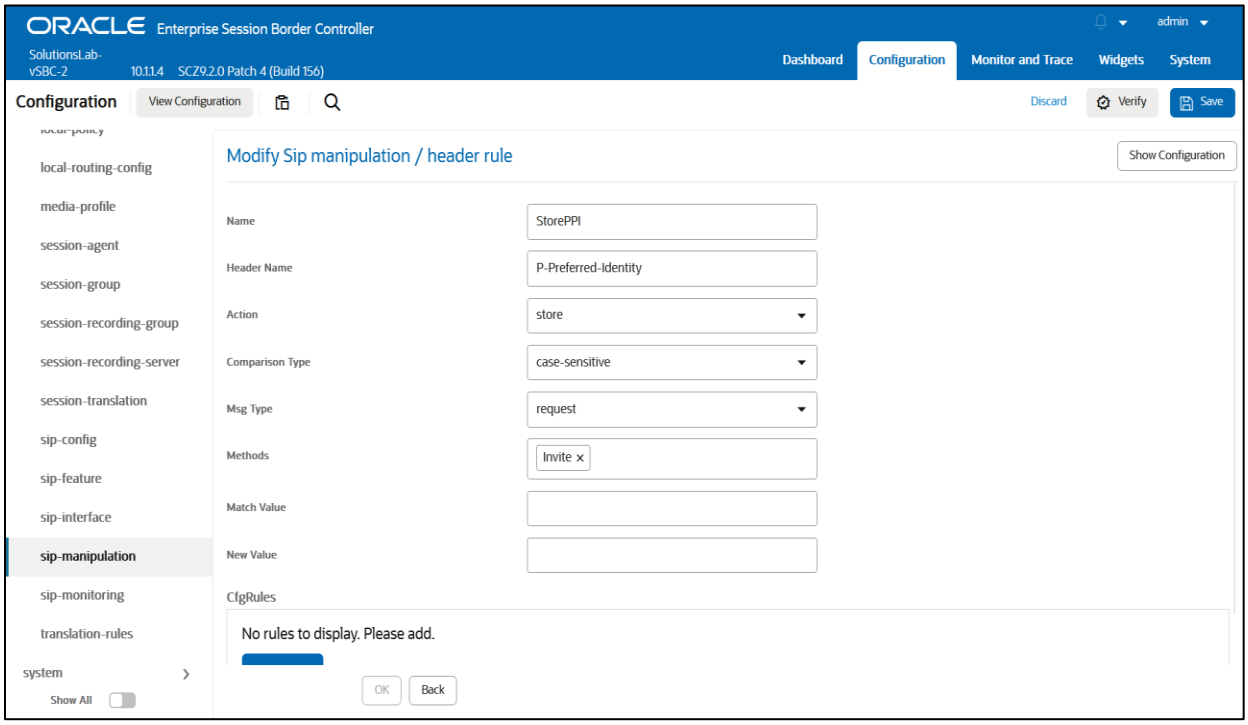
Below manipulation **ChangeTo** is used in our test environment to match the To Header user part of the registered surrogate agent towards KDDI side.

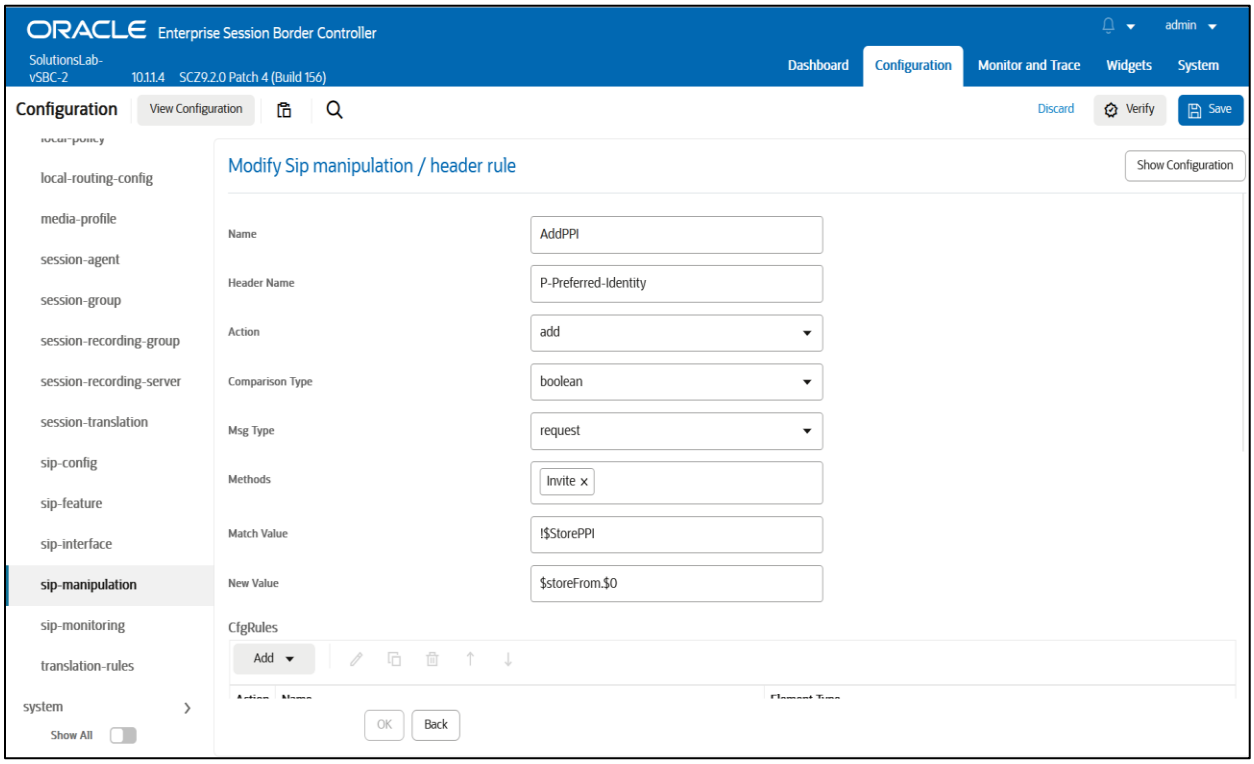




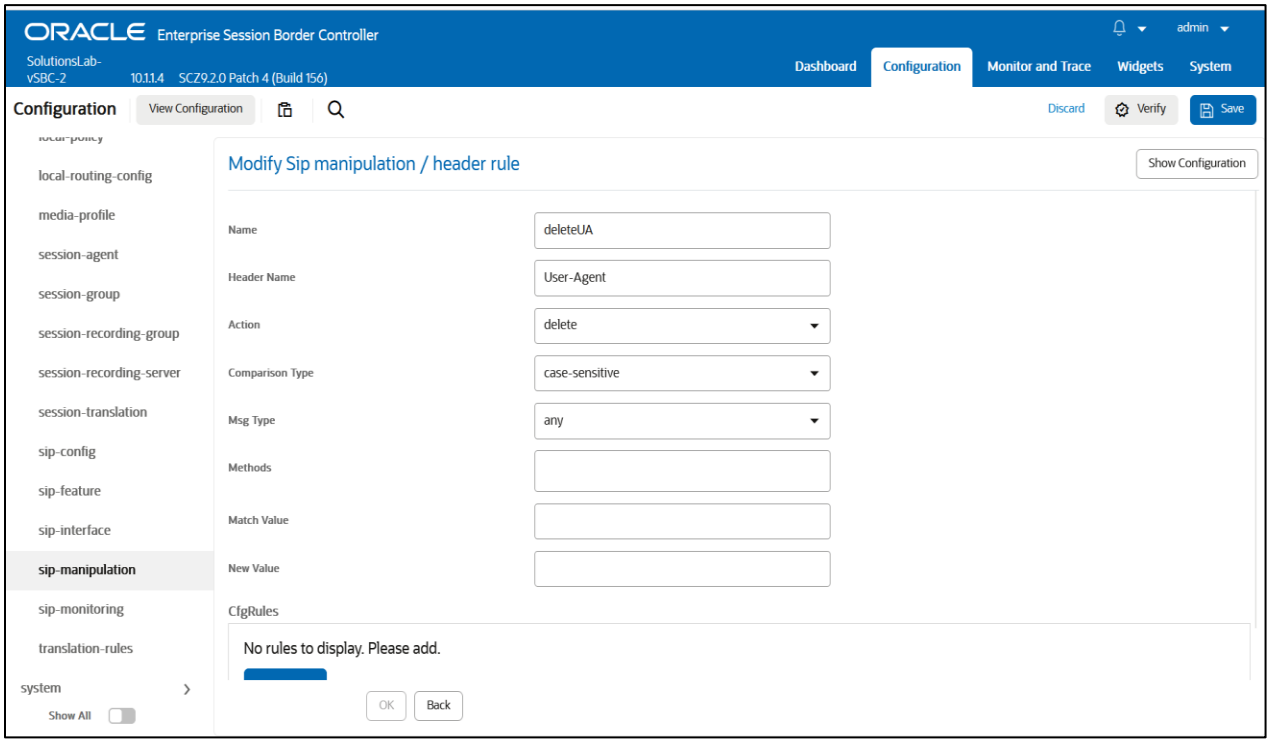
The following three header rules are used in our test environment to add the P-Preferred-Identity going towards the KDDI side.

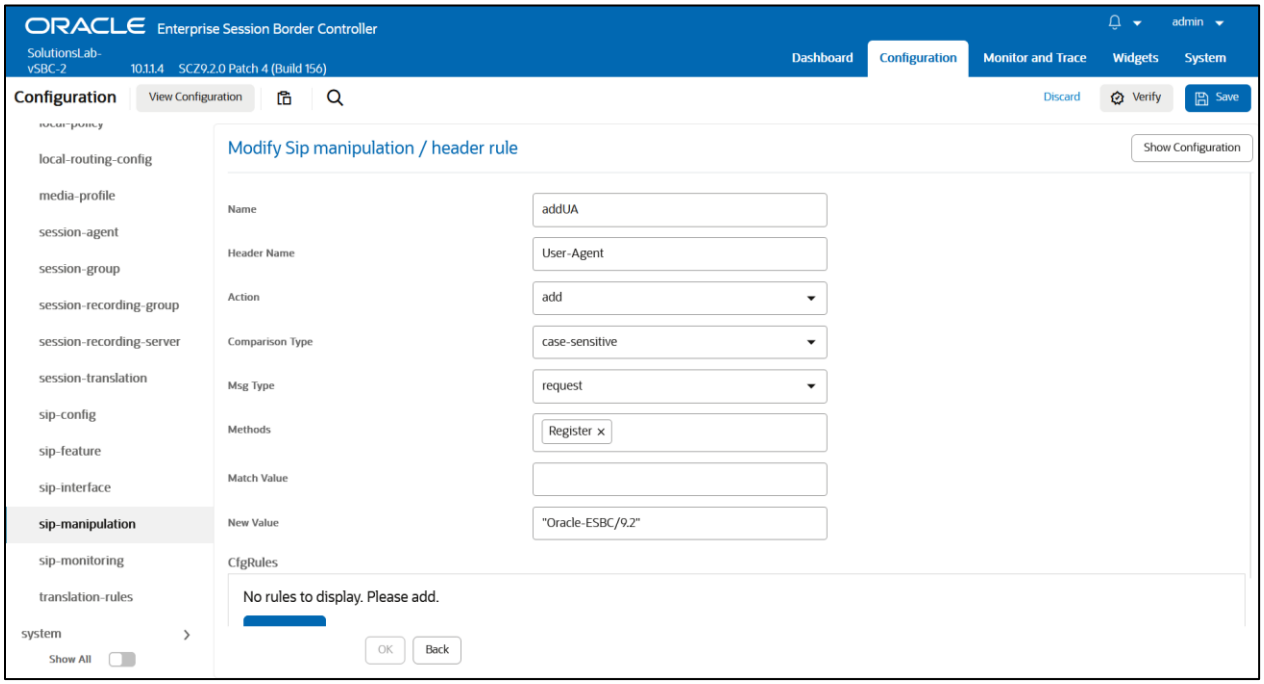



ORACLE Enterprise Session Border Controller
admin
SolutionsLab-vSBC-2 10.1.1.4 SCZ9.2.0 Patch 4 (Build 156)
Dashboard
Configuration
Monitor and Trace
Widgets
System
Configuration
View Configuration
Discard
Verify
Save
local-routing-config
media-profile
session-agent
session-group
session-recording-group
session-recording-server
session-translation
sip-config
sip-feature
sip-interface
sip-manipulation
sip-monitoring
translation-rules
system
Show All
Modify Sip manipulation / header rule
Show Configuration
Name
StorePPI
Header Name
P-Preferred-Identity
Action
store
Comparison Type
case-sensitive
Msg Type
request
Methods
Invite ×
Match Value
New Value
CfgRules
No rules to display. Please add.
OK
Back


ORACLE Enterprise Session Border Controller
admin
SolutionsLab-vSBC-2 10.1.1.4 SCZ9.2.0 Patch 4 (Build 156)
Dashboard
Configuration
Monitor and Trace
Widgets
System
Configuration
View Configuration
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
system
Show All
Modify Sip manipulation / header rule
Show Configuration
Name
AddPPI
Header Name
P-Preferred-Identity
Action
add
Comparison Type
boolean
Msg Type
request
Methods
Invite ×
Match Value
!$StorePPI
New Value
$storeFrom.$0
CfgRules
Add
OK
Back

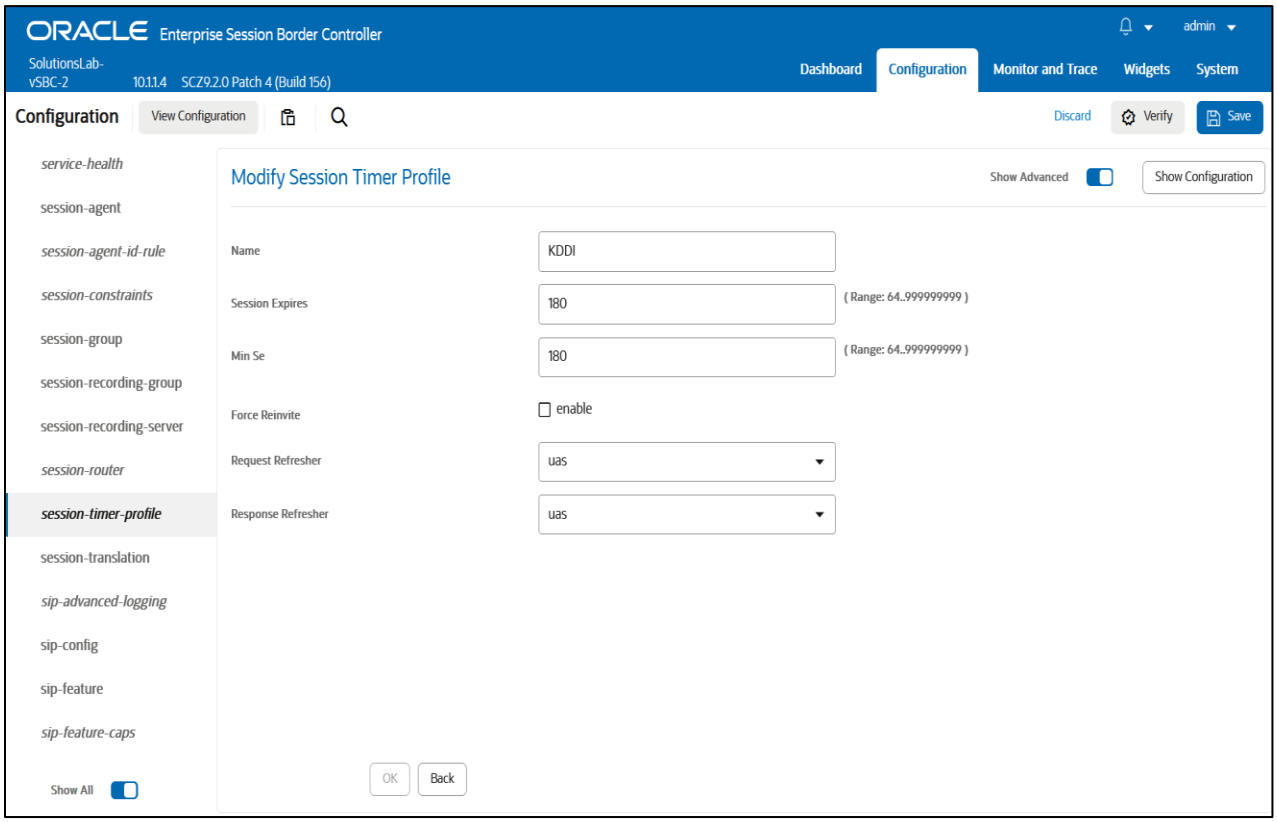
The following two header rules are used in our test environment to add or change User-Agent header to include SBC information going towards the KDDI side.





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.



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

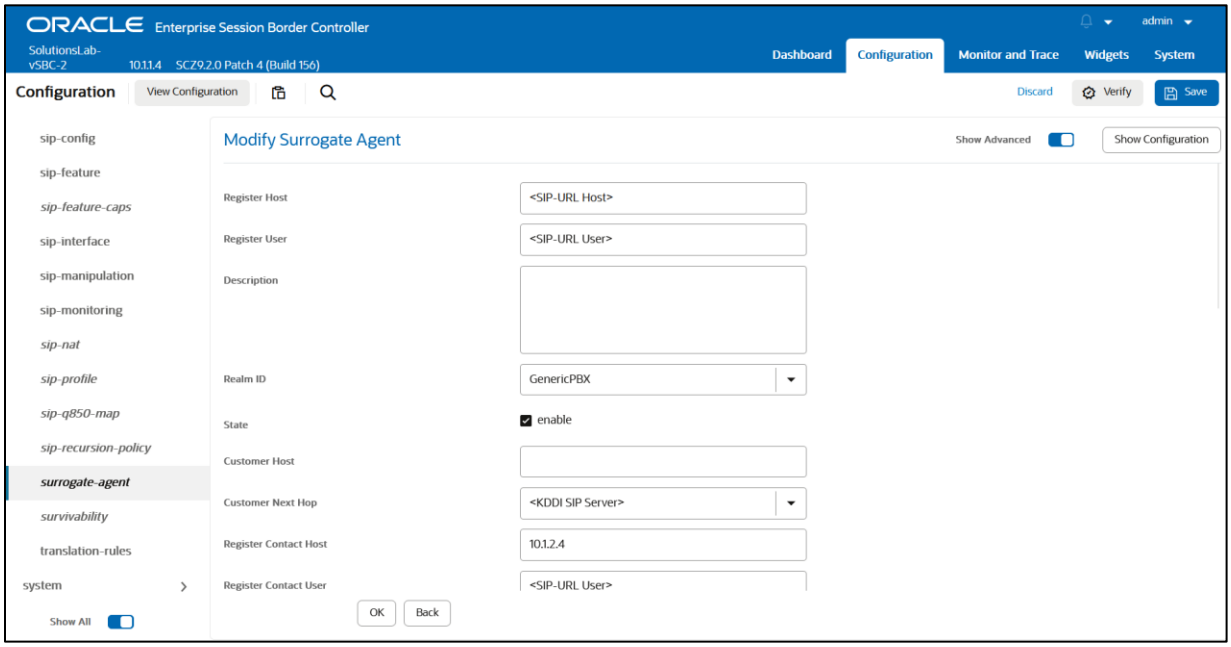
5.12. Configure surrogate-agent

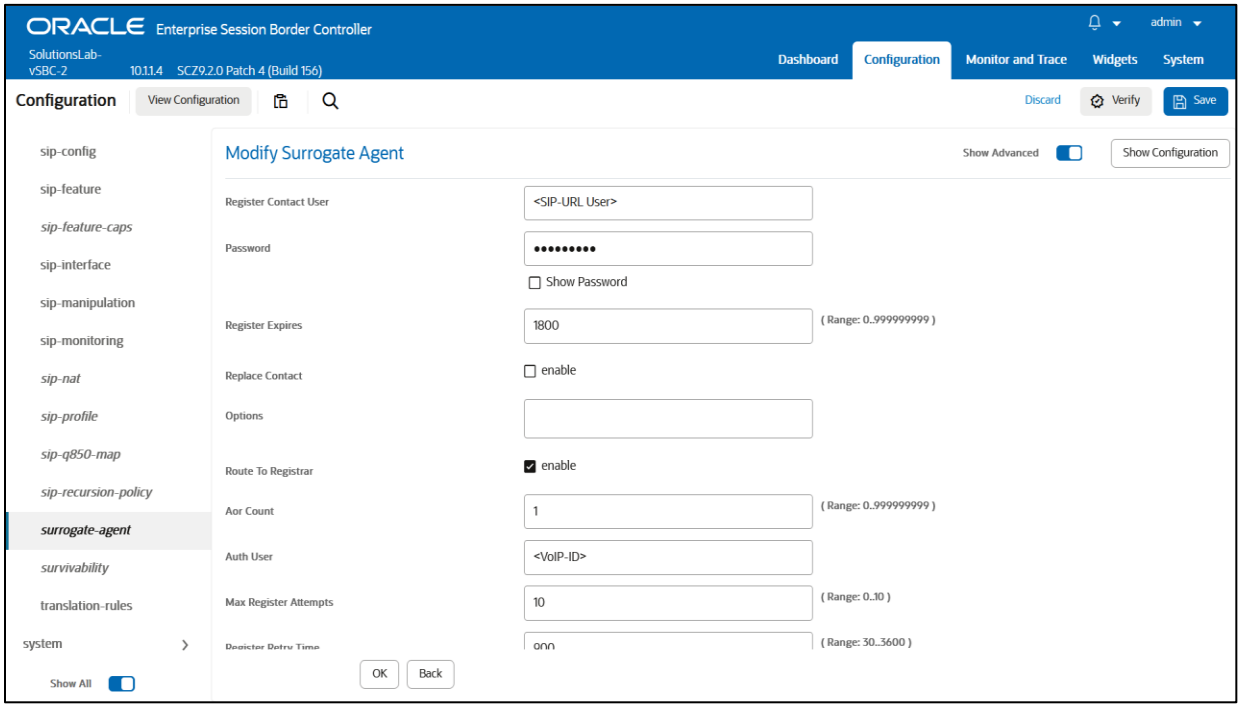
KDDI requires the customer PBX to register in order to originate calls support authentication. Since Generic PBX cannot perform the registration, Oracle ESBC performs surrogate registrations on behalf of the PBX

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

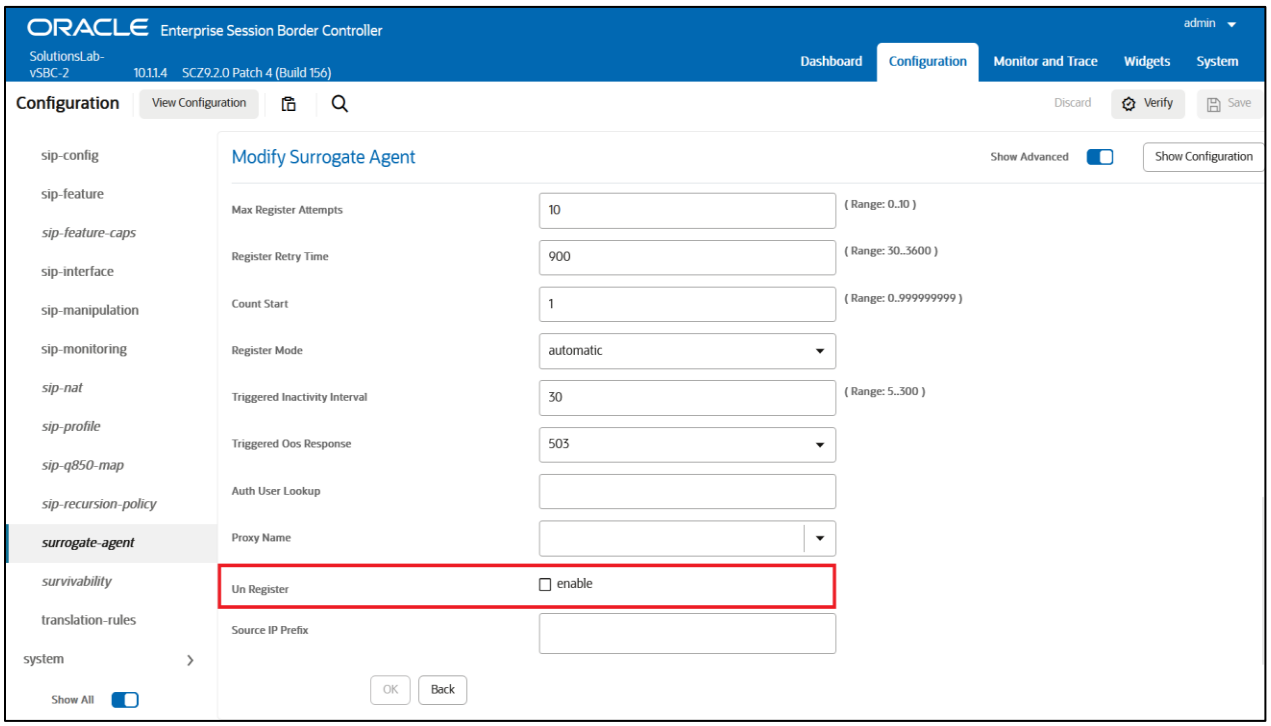




Please follow the same procedure given above to register multiple Surrogate Agents in the SBC.

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.

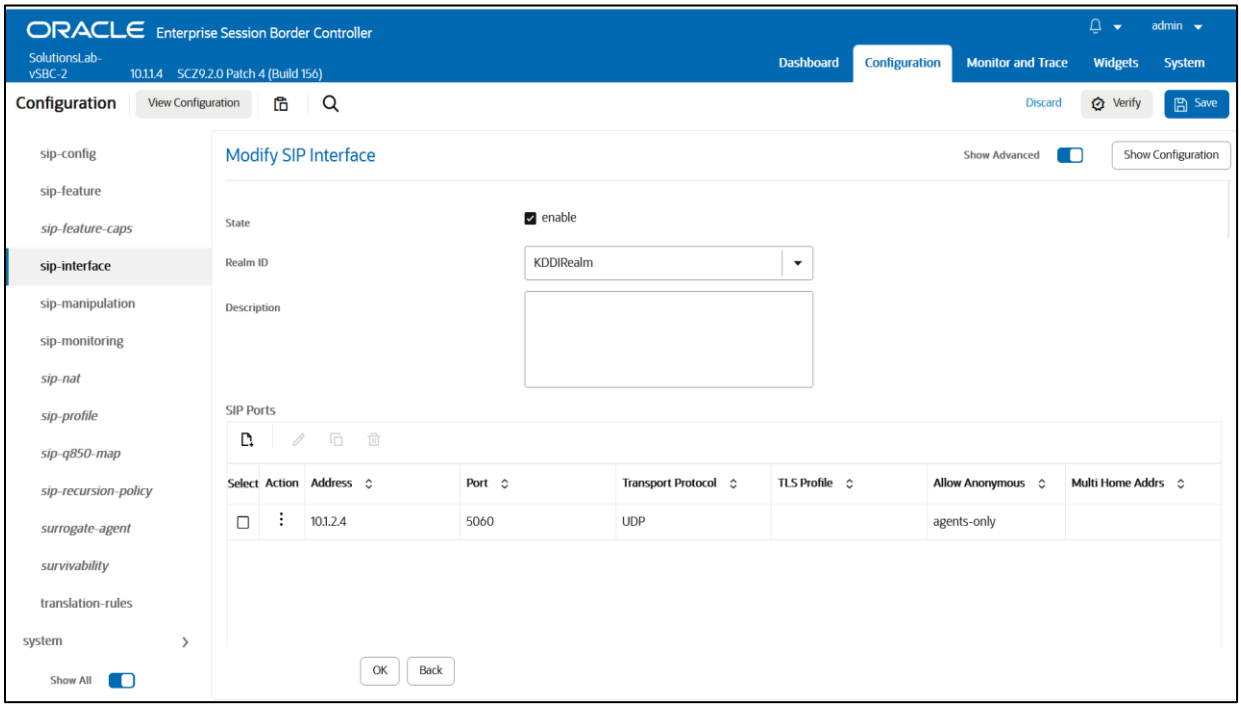


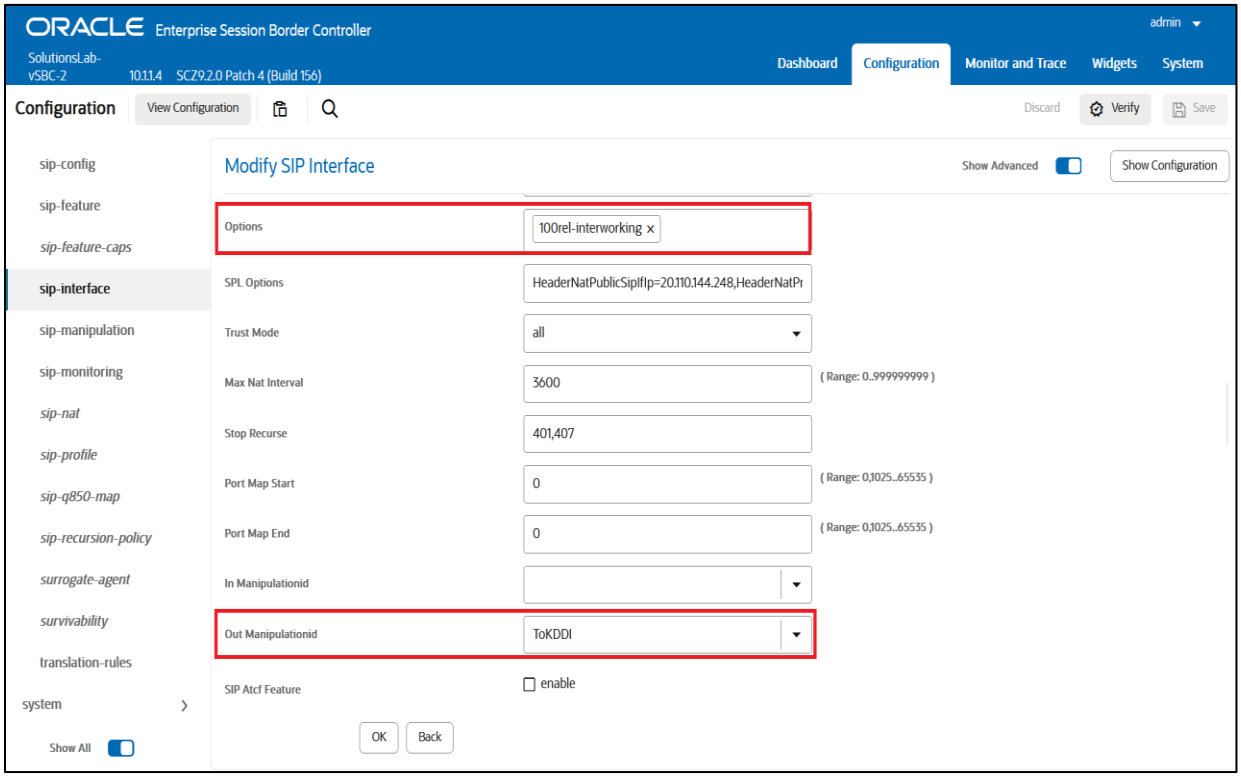
5.13. Configure SIP Interfaces

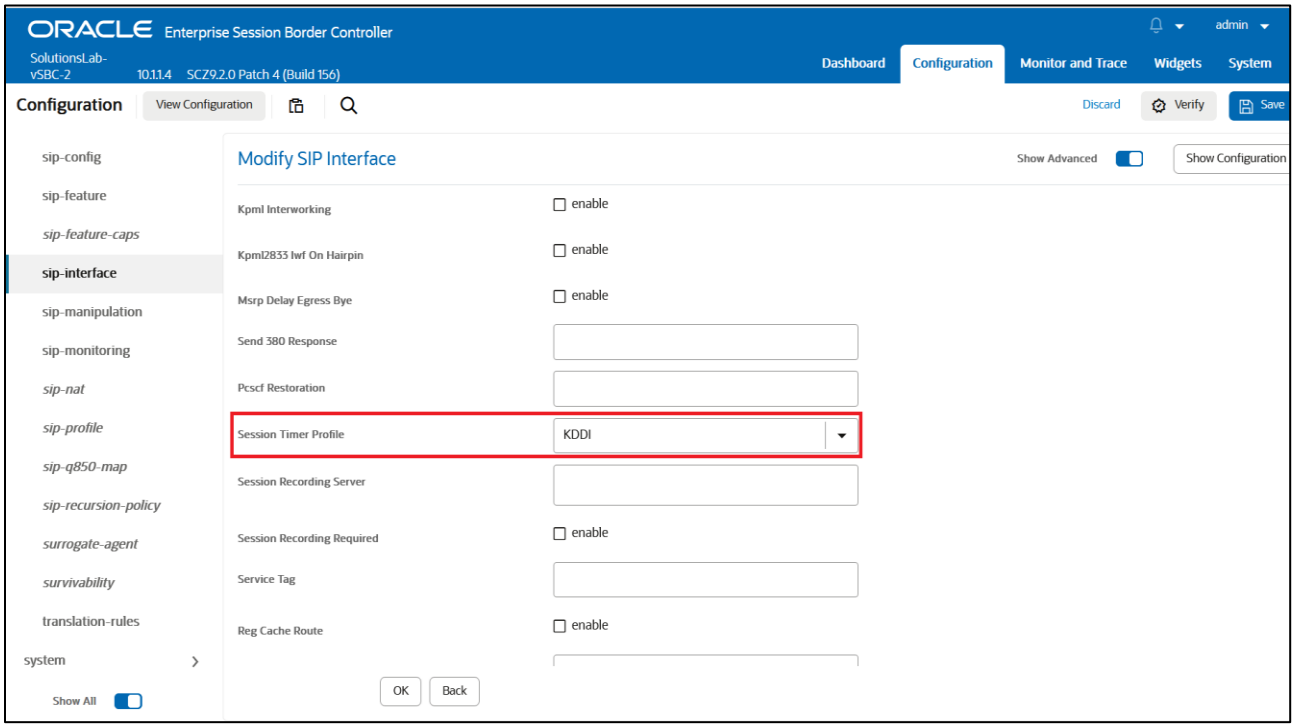
Navigate to sip-interface under session-router and configure the sip-interface as shown below.
Please configure the below settings under the sip-interface.

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

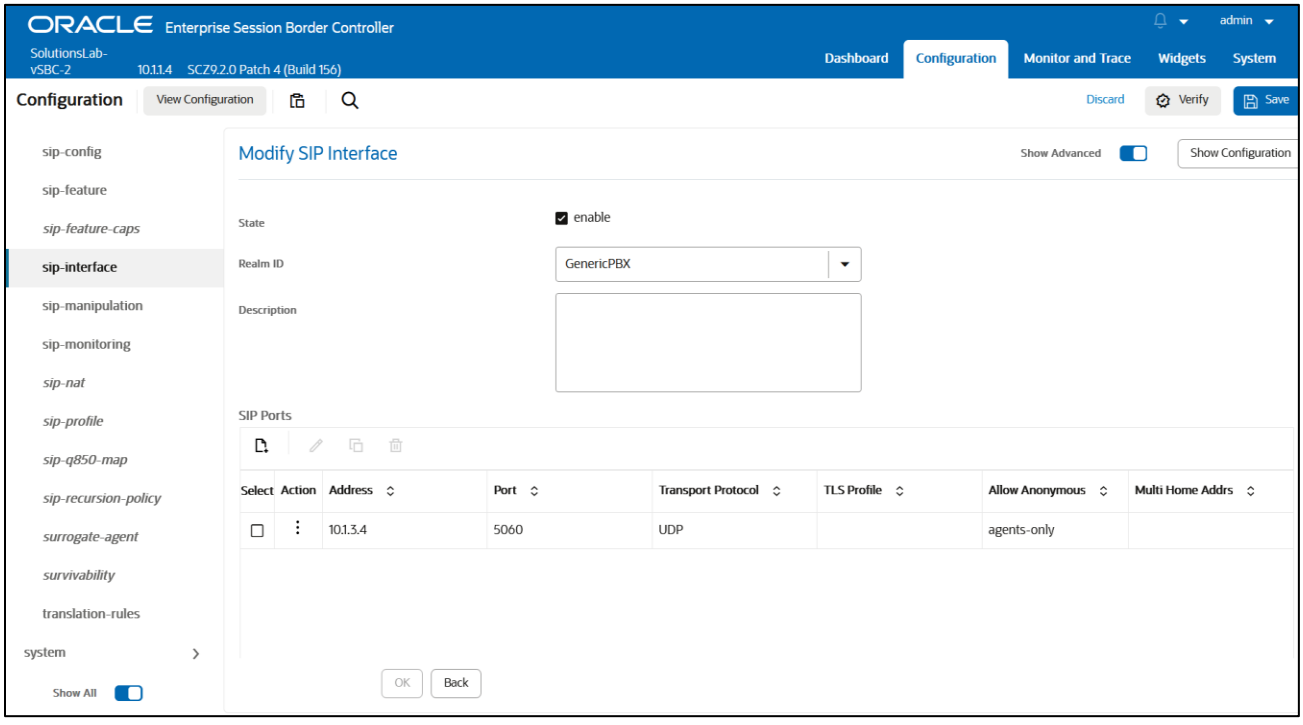

ORACLE Enterprise Session Border Controller
SolutionsLab-vSBC-2 10.1.1.4 SCZ9.2.0 Patch 4 (Build 156)
admin
Dashboard
Configuration
Monitor and Trace
Widgets
System
Configuration
View Configuration
Discard
Verify
Save
sip-config
sip-feature
sip-feature-caps
sip-interface
sip-manipulation
sip-monitoring
sip-nat
sip-profile
sip-q850-map
sip-recursion-policy
surrogate-agent
survivability
translation-rules
system
Show All
Modify SIP Interface
Show Advanced
Show Configuration
State
enable
Realm ID
KDDIRealm
Description
SIP Ports
Select
Action
Address
Port
Transport Protocol
TLS Profile
Allow Anonymous
Multi Home Addrs
10.1.2.4
5060
UDP
agents-only
OK
Back

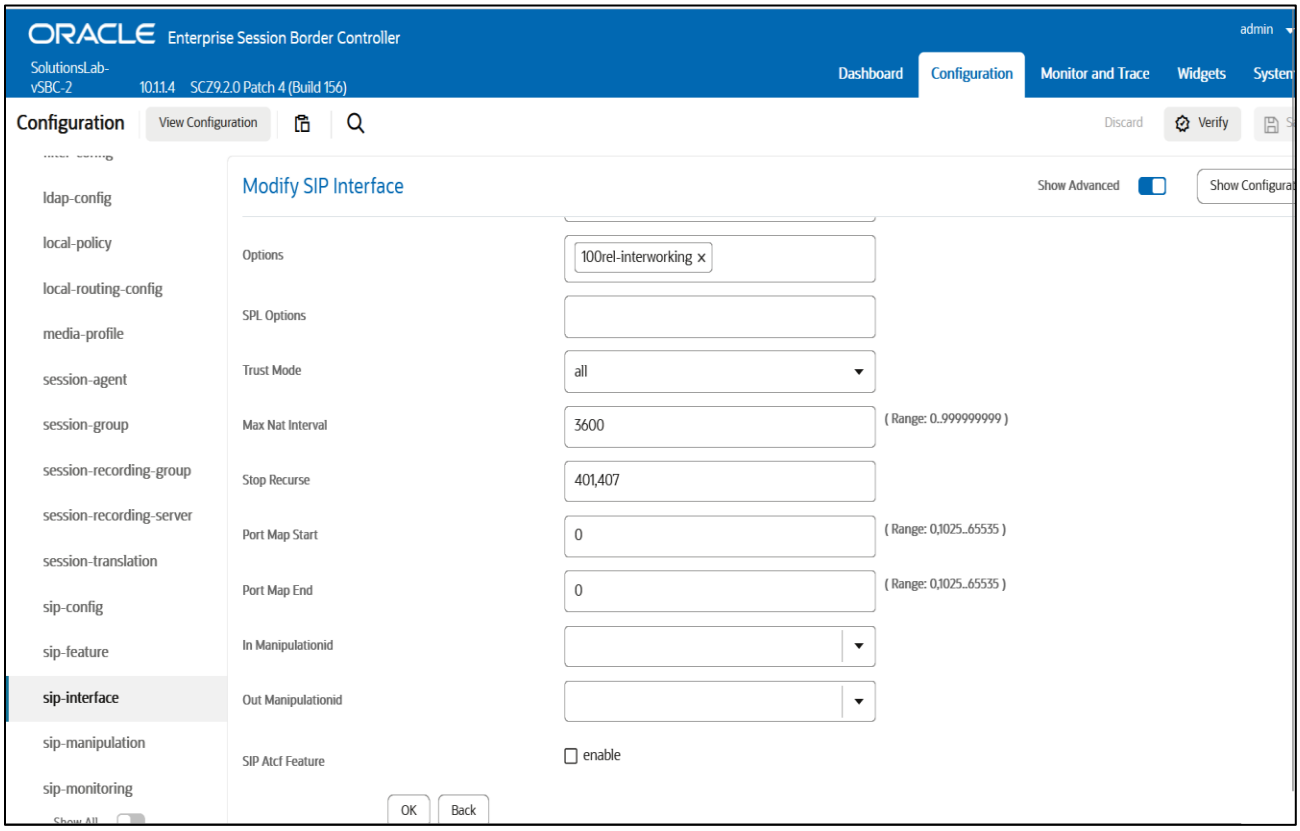

ORACLE Enterprise Session Border Controller
SolutionsLab-vSBC-2 10.1.1.4 SCZ9.2.0 Patch 4 (Build 156)
admin
Dashboard
Configuration
Monitor and Trace
Widgets
System
Configuration
View Configuration
Discard
Verify
Save
sip-config
sip-feature
sip-feature-caps
sip-interface
sip-manipulation
sip-monitoring
sip-nat
sip-profile
sip-q850-map
sip-recursion-policy
surrogate-agent
survivability
translation-rules
system
Show All
Modify SIP Interface
Show Advanced
Show Configuration
Options
100rel-interworking
SPL Options
HeaderNatPublicSiplfIp=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
Out Manipulationid
ToKDDI
SIP Atcf Feature
enable
OK
Back



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.





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

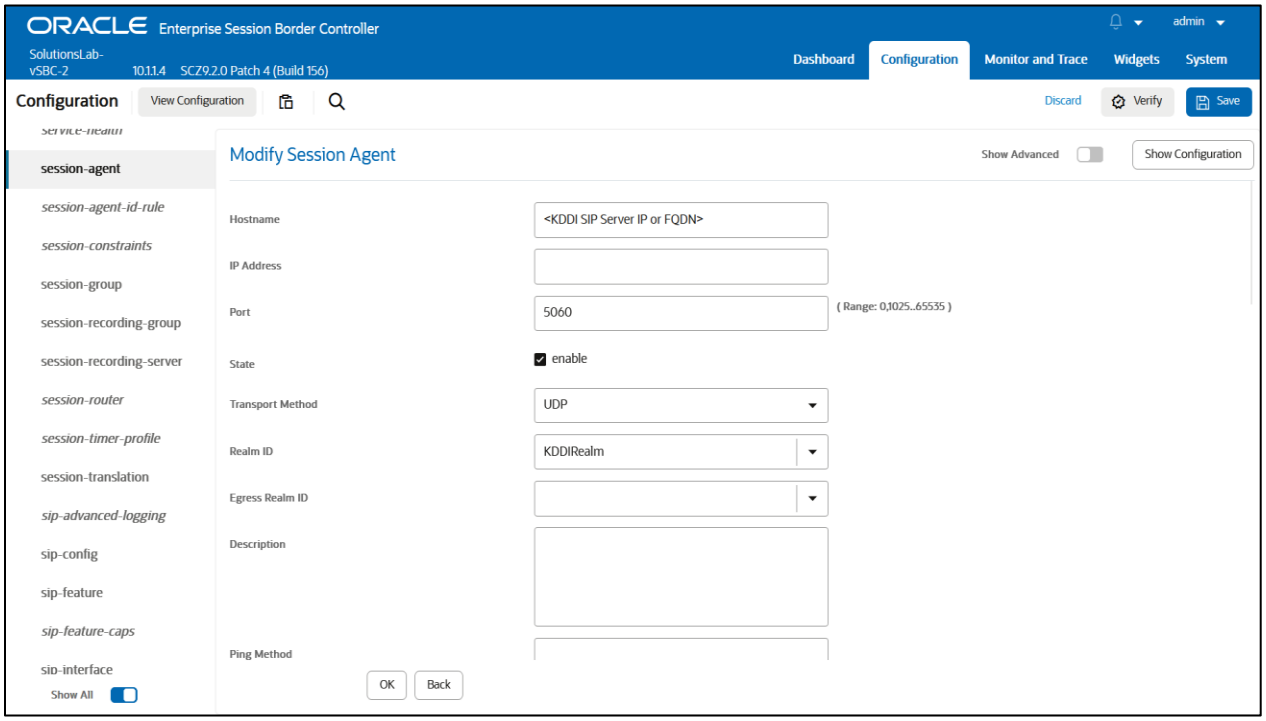
5.14. Configure session-agent

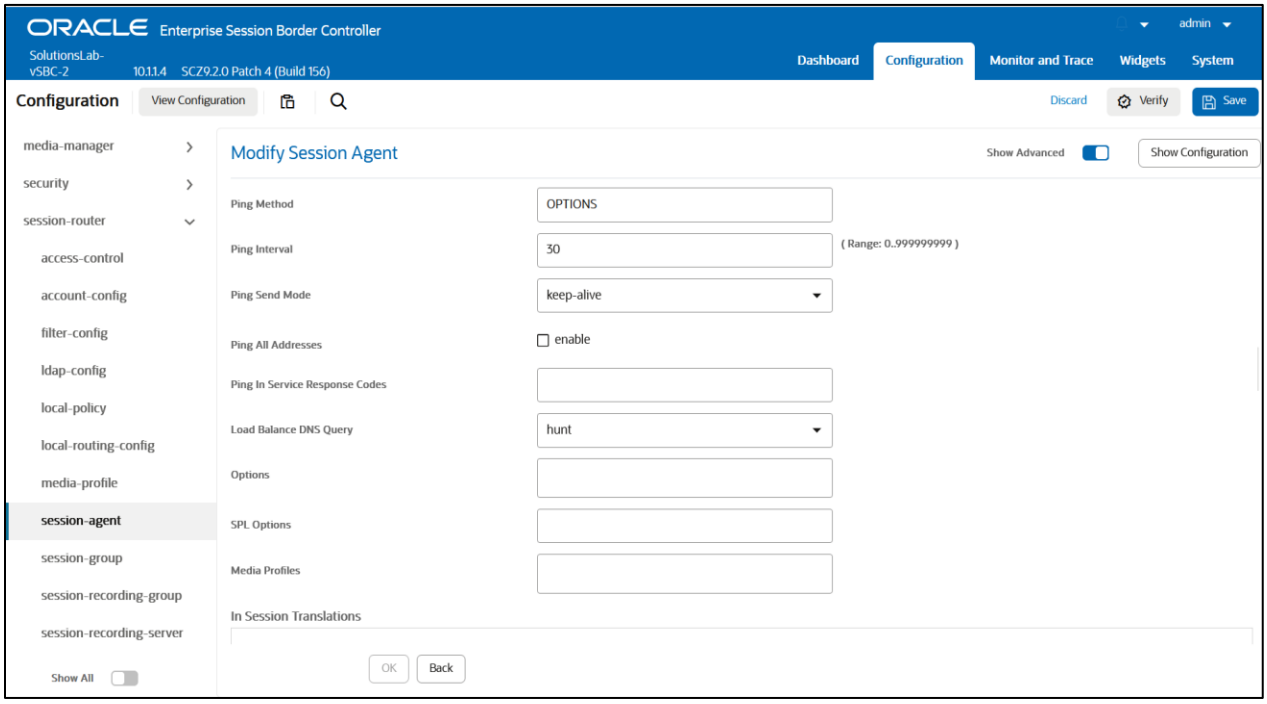
Session-agents are config elements which are trusted agents who can send/receive traffic from the SBC with direct access to trusted data path.

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



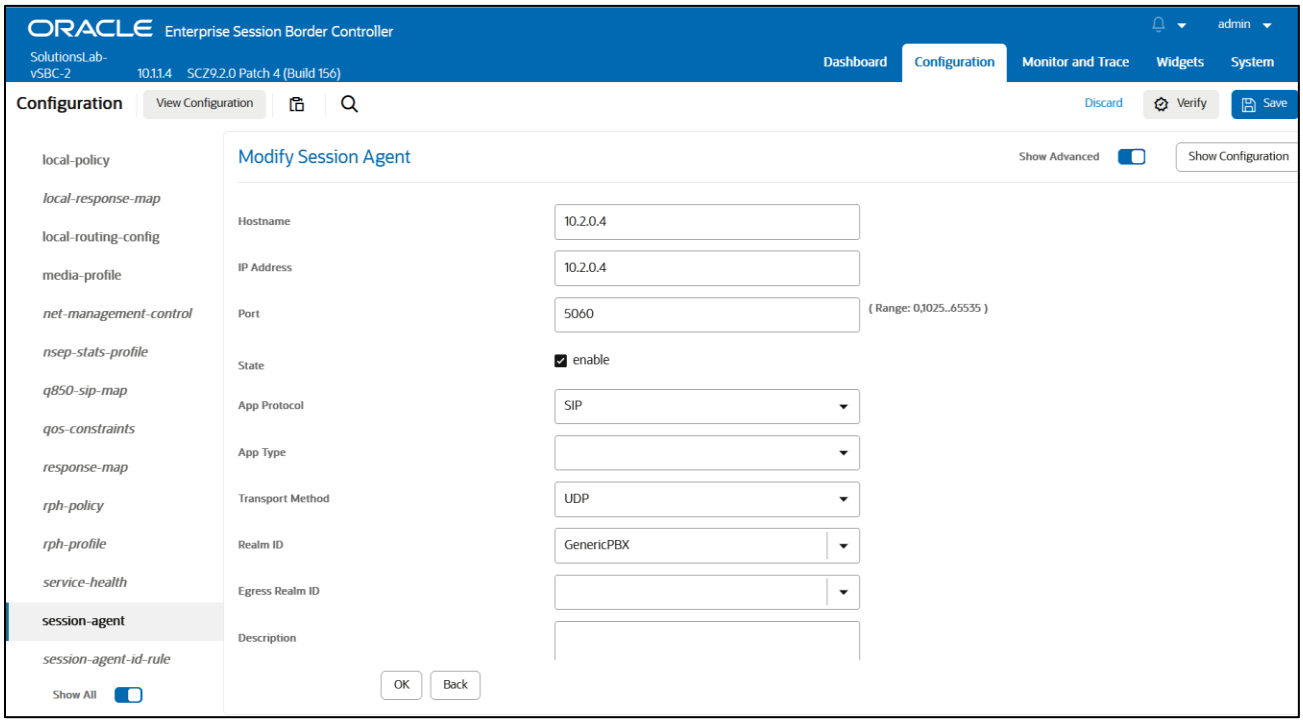


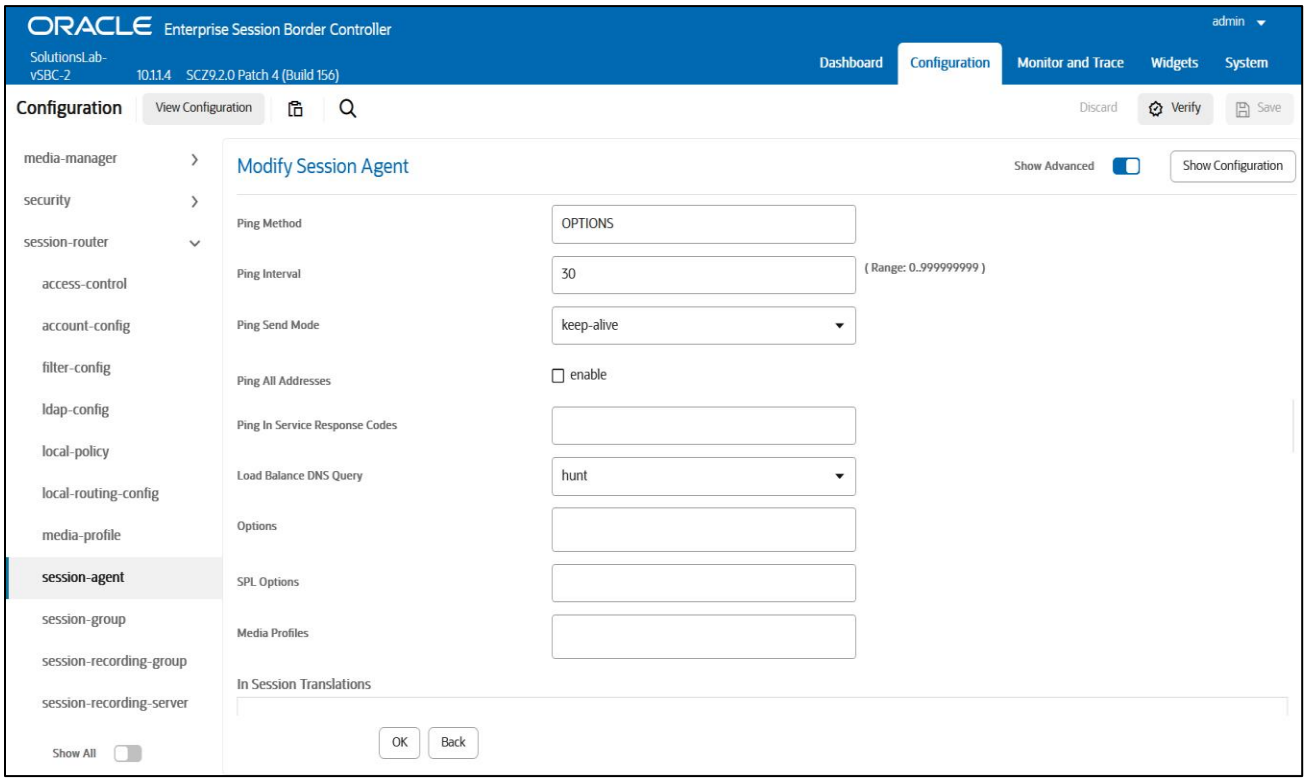
Similarly, configure the session-agents for the Generic PBX Side as below:

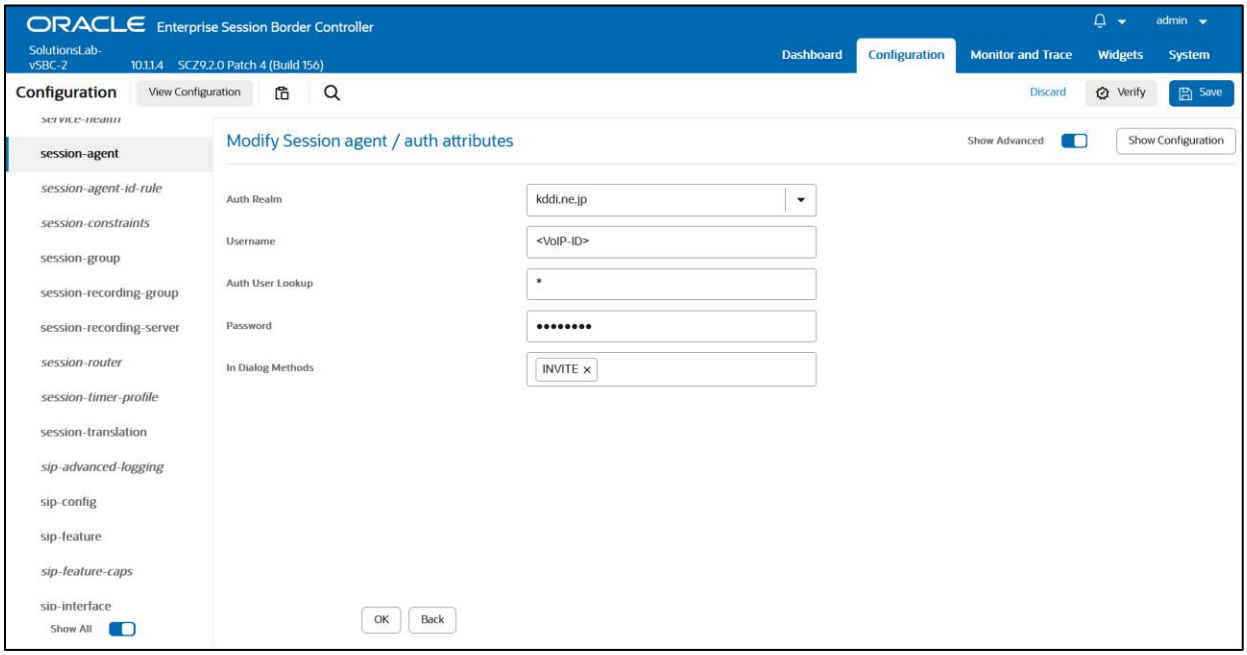
- realm-id – needs to match the realm created for Generic PBX
- transport set to “UDP”
- Please enable the parameter **ping-response**,

- 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.

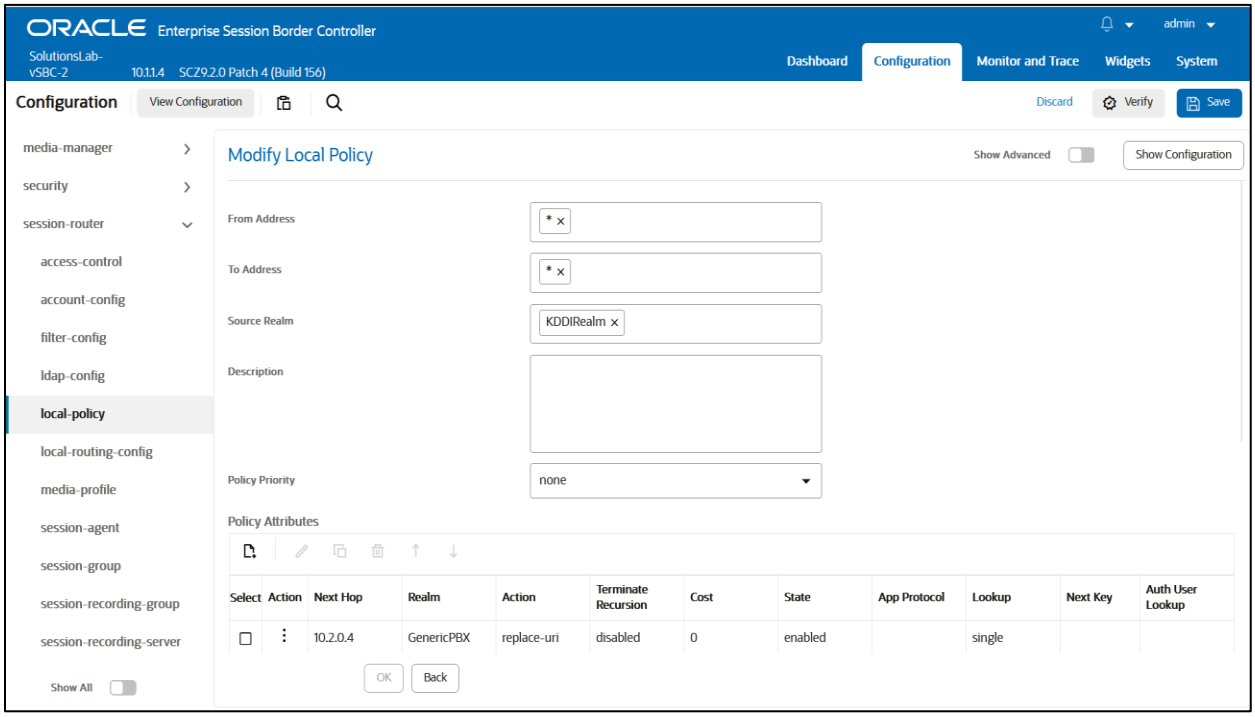




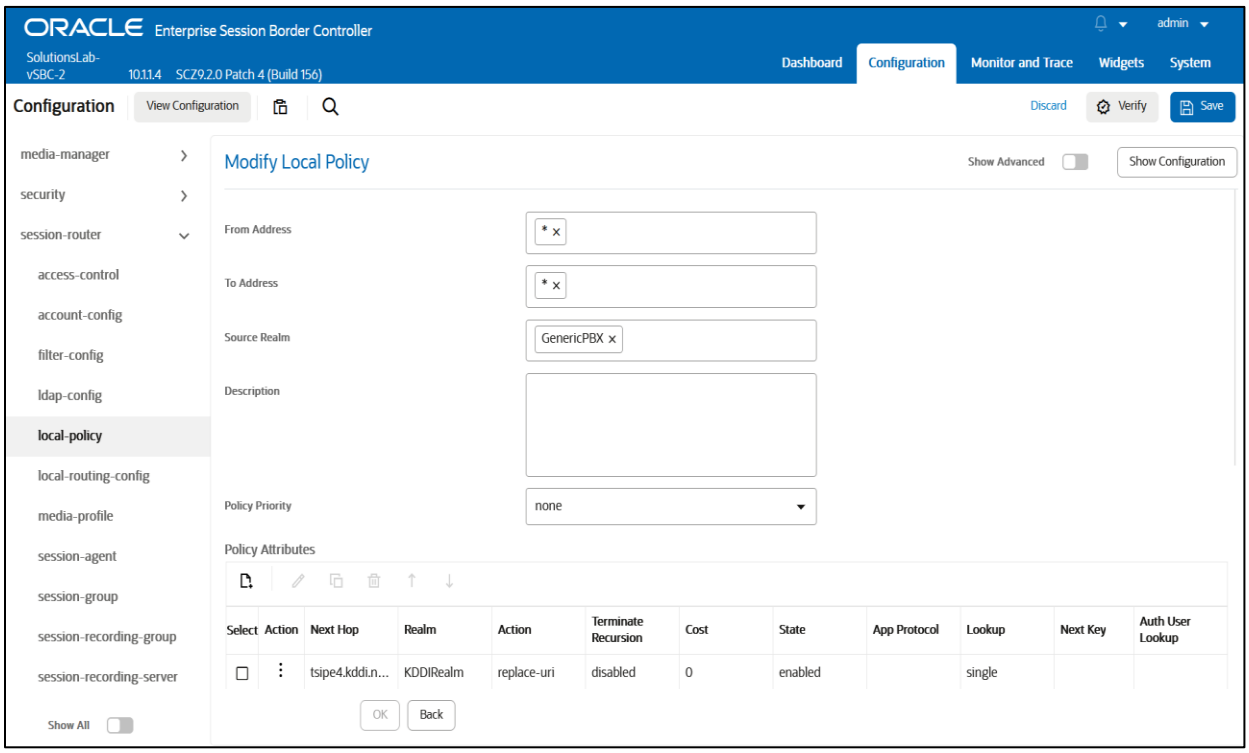


5.15. Configure local-policy

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.

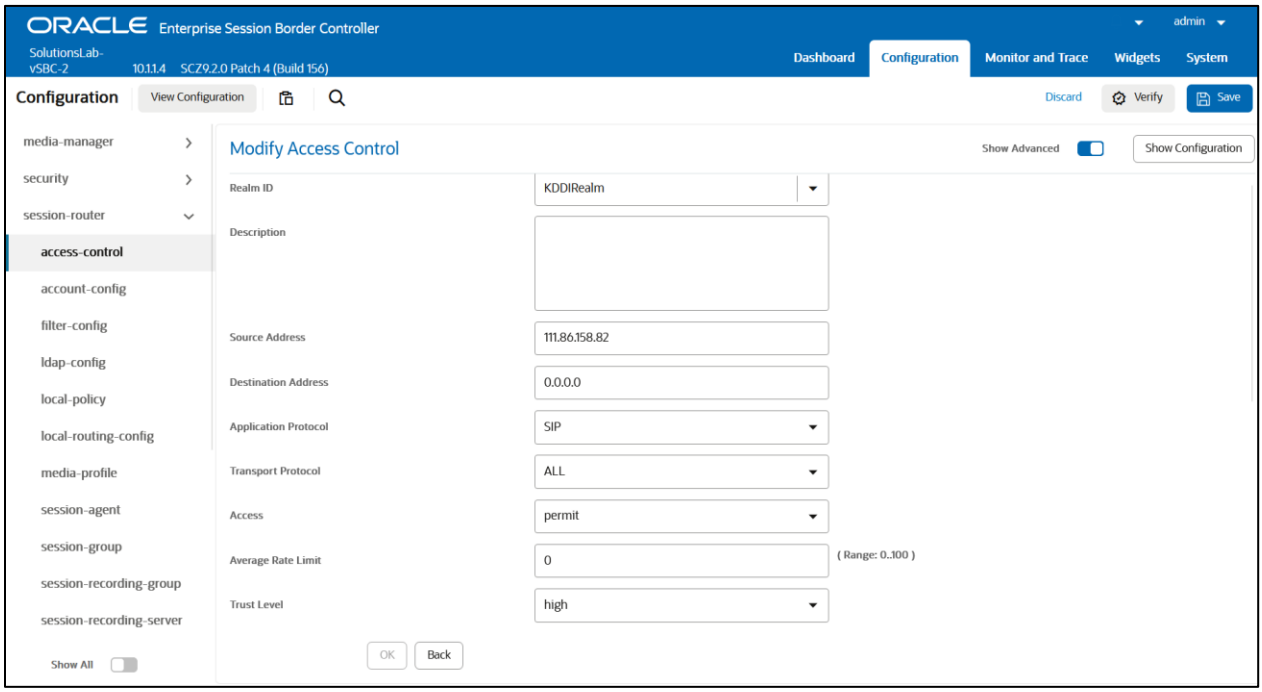


To route the calls from Generic PBX side to KDDI side, Use the below local policy.

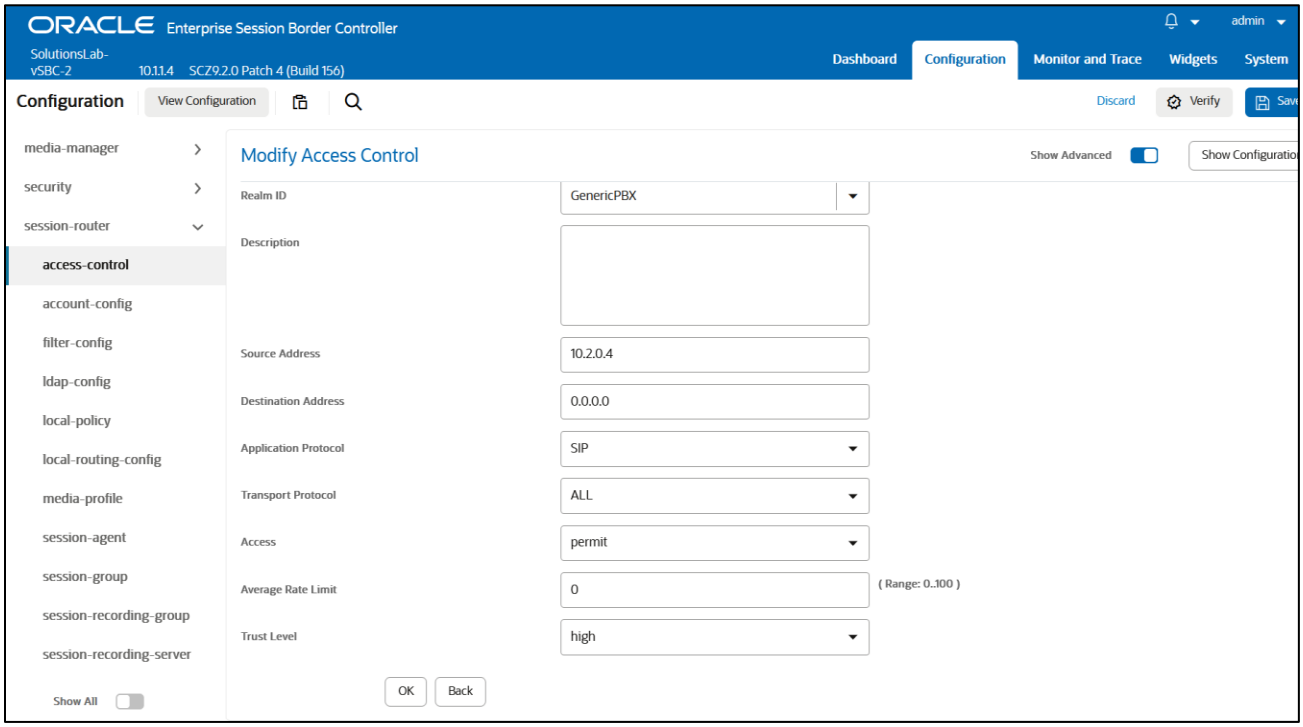


5.16. Configure access-control (ACL)

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

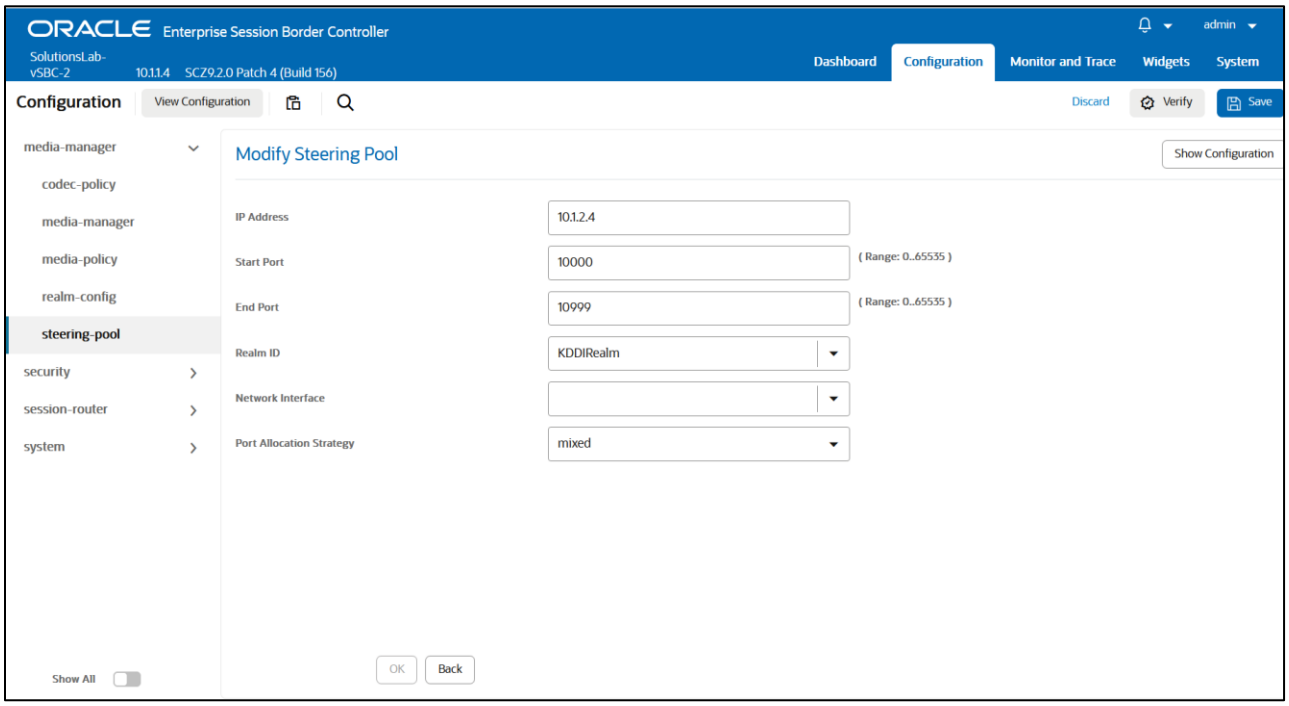


Similarly, configure the ACL for Generic PBX side as below to allow traffic from Generic PBX side to reach SBC.

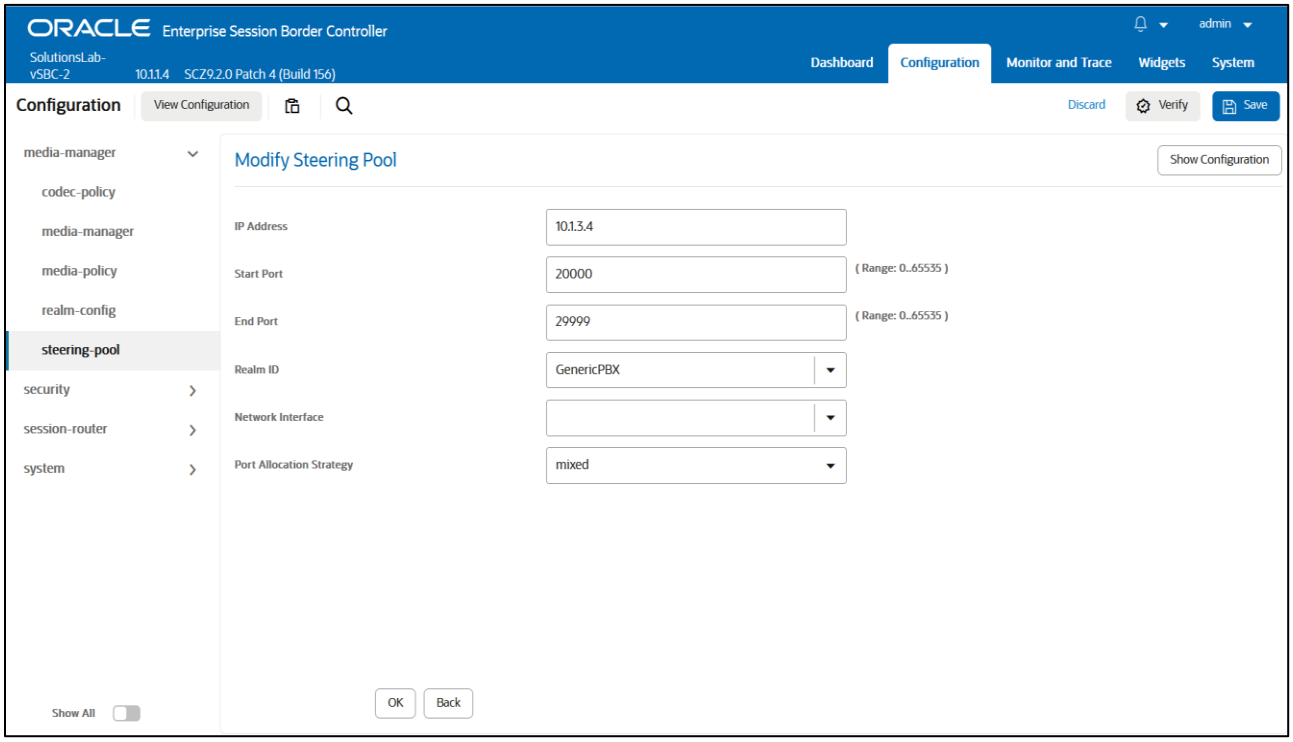


5.17. Configure steering-pool

KDDI side steering pool.



Generic PBX side steering pool.

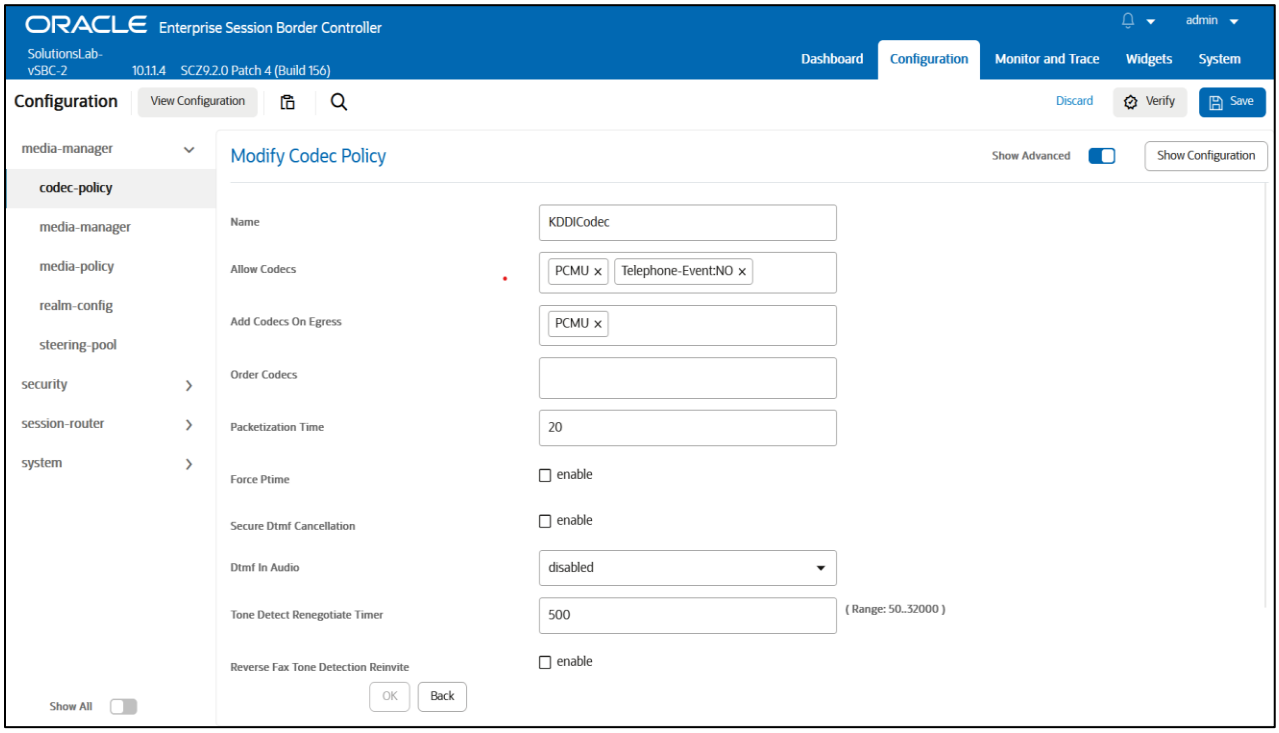


5.18. Configure Codec Policy

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



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

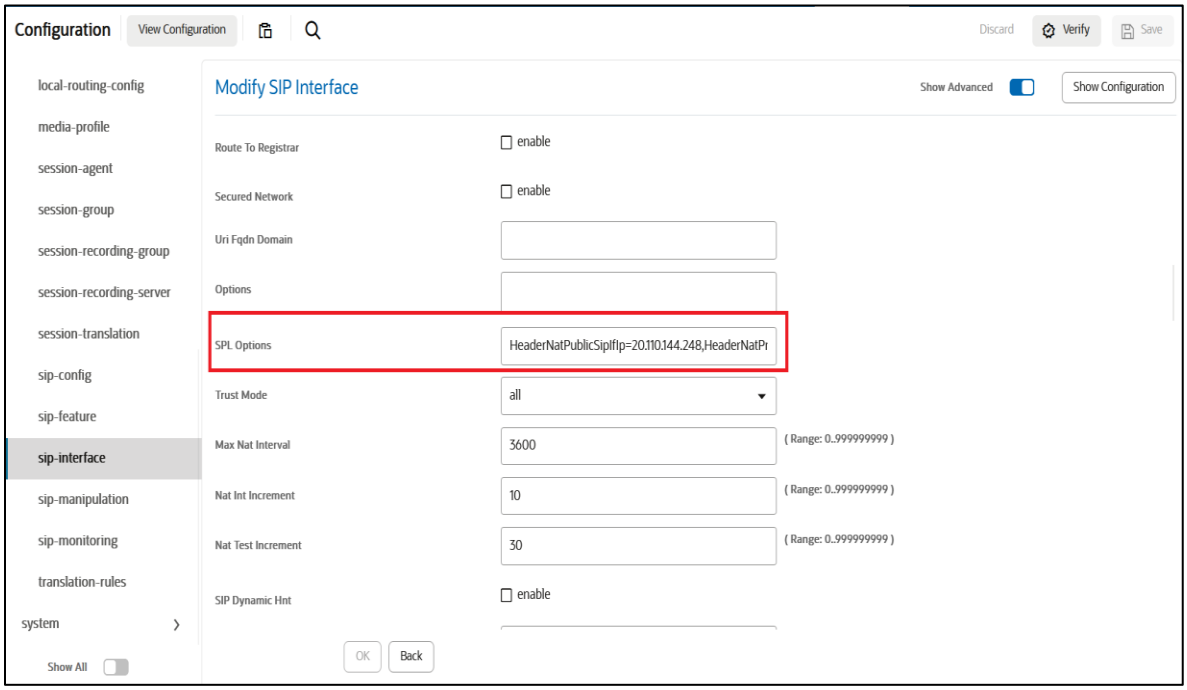
ACLI Path: config t→session-router→sip-interface

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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