



# ORACLE

## Oracle SBC integration with RingCentral BYOC

Technical Application Note

**ORACLE**  
**COMMUNICATIONS**



## Disclaimer

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

## Revision History

Version	Description of Changes	Date Revision Completed
1.0	Initial Version	28 <sup>th</sup> February 2025

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## 2 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 RingCentral BYOC and CC Platforms.

## 3 Document Overview

This Oracle technical application note outlines how to configure the Oracle SBC to interwork with RingCentral BYOC and RingCentral Cloud Connector (CC). The solution contained within this document has been tested using Oracle Communication SBC with software version **OS930 GA (SCZ9.3.0 Patch)**

Please note that we have covered the Oracle SBC integration with RingCentral BYOC in this application note document and for the RingCentral CC, the config remains the same for all except the Session Agent IP address or FQDN which changes for the CC platform. **For more assistance on this topic, please check with your RingCentral representative.**

**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. The customers can configure any publicly routable IPs for these sections as per their network architecture needs.**

## 4 About RingCentral BYOC

RingCentral offers a software as a service in which customers provide their own local telecommunication carrier services ("Bring Your Own Carrier" or "BYOC"). BYOC allows customers to receive the cloud PBX functionality of RingEX, by connecting their existing local voice carrier to the cloud PBX functionality, which includes videoconferencing, team messaging, and file sharing services. All calls to and from the Public Switched Telephone Network ("PSTN") travel over the local voice carrier's network via a gateway purchased and owned by the Customer (the "Gateway").

RingCentral provides the BYOC solution only in connection with Services purchased in the Home Country. RingCentral makes available to Customer the use of RingCentral's cloud PBX and related services so that Customer may deploy those services to support its End Users in the BYOC Locations. RingCentral has enabled such services at Customer's direction, including call queues, call transfer, voicemail, extension-to-extension VoIP, and other related services. Customer acknowledges that RingCentral is not the provider of VoIP or voice services as part of the BYOC solution, and that. Customer, together with its local voice carrier, is the provider of any voice, VoIP, conferencing, or other related services to its users in BYOC Locations ("Local Telecommunications Service").

For more information about the RingCentral BYOC, please refer to the below link:

<https://www.ringcentral.com/solutions/BYOC.html>

<https://www.ringcentral.com/legal/BYOC-service-description.html>

## 5 Introduction

### 5.1 Audience

This is a technical document intended for telecommunications engineers with the purpose of configuring RingCentral BYOC using Oracle Enterprise SBC. There will be steps that require navigating the Oracle SBC GUI interface, understanding the basic concepts of TCP/UDP, IP/Routing, DNS server, SIP/RTP and TLS/SRTP are also necessary to complete the configuration and for troubleshooting, if necessary.

### 5.2 Requirements

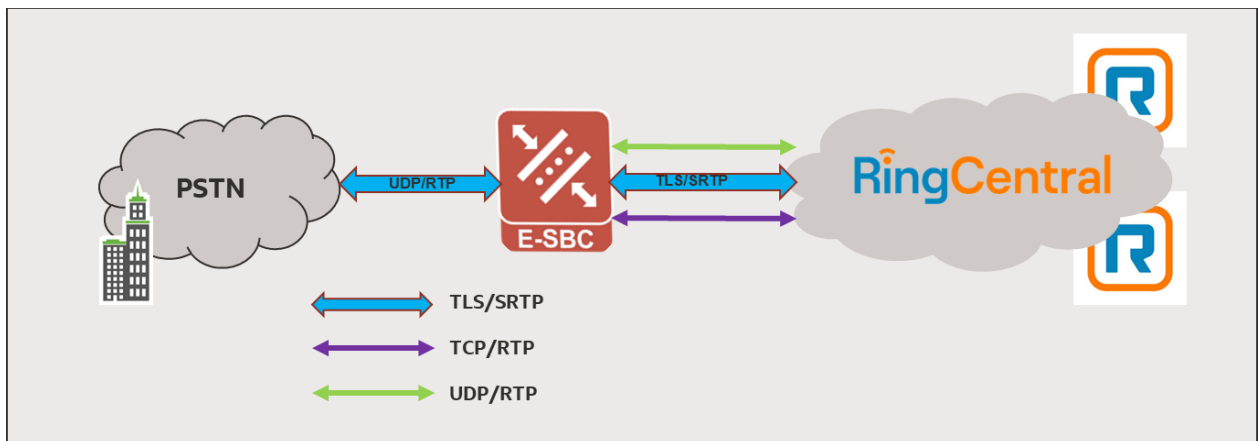
- Fully functioning RingCentral BYOC Environment.
- Oracle Enterprise Session Border Controller (hereafter Oracle SBC) running 9.3.0 version.

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
Revision 1	9.3.0

### 5.3 Architecture

The network configuration is illustrated below for RingCentral BYOC with Oracle Enterprise Session Border Controller and PSTN network



## 6 Configuring the SBC

This chapter provides step-by-step guidance on how to configure Oracle SBC for Configuring the RingCentral BYOC Environment. **In this SBC config, RingCentral BYOC side is secure (TLS/SRTP) and PSTN side is unsecure (UDP or TCP/RTP).**

### 6.1 Validated Oracle SBC Version

Oracle conducted tests with Oracle SBC 9.3 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
- AP 4900
- VME

### 6.2 New SBC configuration

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

As there are many ways to install the SBC (purpose-built appliance, VM, and public cloud deployment), please follow the link given below for the type of install base used to deploy the Oracle SBC.

<https://docs.oracle.com/en/industries/communications/session-border-controller/9.3.0/installation/index.html>

Once the SBC is installed and logged in, please follow the steps given below.

#### 6.2.1 Setup product

To configure product type, type in “*setup product*” in the terminal Setup.

```
last modified date 2023-10-06 09:20:20
NN4600-139# setup product

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

Last Modified 2023-02-07 15:50:20
-----
 1 : Product          : Enterprise Session Border Controller
Enter 1 to modify, d' to display, 's' to save, 'q' to exit. [s]:
```

## 6.2.2 Setup Entitlements

Enable features for the ESBC using the “*setup entitlements*” command as shown below.

```
Entitlements for Enterprise Session Border Controller
Last Modified: Never
-----
 1 : Session Capacity                : 0
 2 :   Advanced                      :
 3 : Admin Security                  :
 4 : Data Integrity (FIPS 140-2)    :
 5 : Transcode Codec AMR Capacity   : 0
 6 : Transcode Codec AMRWB Capacity : 0
 7 : Transcode Codec EVRC Capacity  : 0
 8 : Transcode Codec EVRCB Capacity : 0
 9 : Transcode Codec EVS Capacity   : 0
10 : Transcode Codec OPUS Capacity  : 0
11 : Transcode Codec SILK Capacity  : 0

Enter 1 - 11 to modify, d' to display, 's' to save, 'q' to exit. [s]: 1
  Session Capacity (0-128000)      : 500

Enter 1 - 11 to modify, d' to display, 's' to save, 'q' to exit. [s]: 3
*****
CAUTION: Enabling this feature activates enhanced security
functions. Once saved, security cannot be reverted without
resetting the system back to factory default state.
*****
  Admin Security (enabled/disabled) :

Enter 1 - 11 to modify, d' to display, 's' to save, 'q' to exit. [s]: 5
  Transcode Codec AMR Capacity (0-102375) : 50

Enter 1 - 11 to modify, d' to display, 's' to save, 'q' to exit. [s]: 2
  Advanced (enabled/disabled)         : enabled

Enter 1 - 11 to modify, d' to display, 's' to save, 'q' to exit. [s]: 10
  Transcode Codec OPUS Capacity (0-102375) : 50

Enter 1 - 11 to modify, d' to display, 's' to save, 'q' to exit. [s]: 11
  Transcode Codec SILK Capacity (0-102375) : 50
```

Save changes and reboot the SBC.

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

## 6.2.3 Enable Management GUI

ALCI Path: config t→system→http-server

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



```

http-server
  name                               webServerInstance
  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              GUI
  http-file-upload-size            0
  tls-profile
  auth-profile
  last-modified-by                  @
  last-modified-date                2020-10-06 00:28:26
NN4600-139#

```

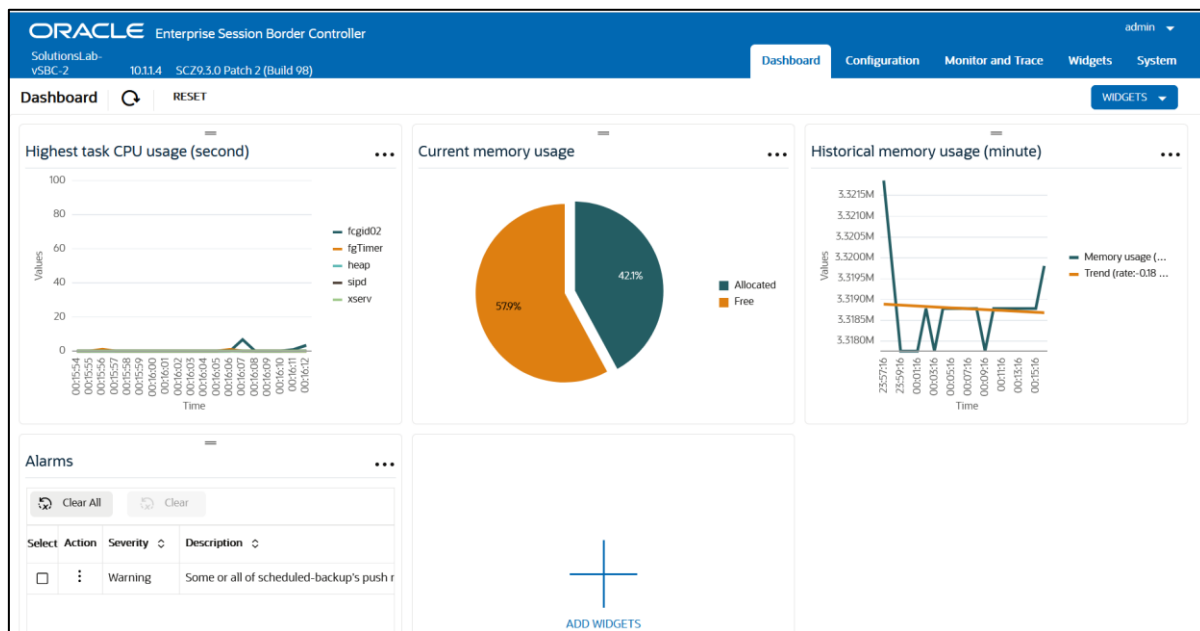
## 6.2.4 Configure SBC using Web GUI

There are two methods for configuring the SBC, ACLI or GUI. For the purposes of this note, we'll be using the SBC GUI for all configuration examples. We will however provide the ACLI path to each element.

To access the SBC GUI, enter the management IP address into a web browser. When the login screen appears, enter the username and password to access the SBC.

Once you have access to the SBC GUI, at the top, click the Configuration Tab. This will bring up the SBC Configuration Objects List on the left-hand side of the screen.

*Note: the configuration examples below were captured from a system running the latest GA software, 9.3.0*



**ORACLE Enterprise Session Border Controller**  
SolutionsLab-vSBC-2 10.11.4 SC29.3.0 Patch 2 (Build 98)

**Configuration** View Configuration Configuration Objects Discard Verify Save

media-manager > security > session-router > system >

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

Showing 1 - 14 of 41

Refer to the SBC GUI User Guide for more information:

<https://docs.oracle.com/en/industries/communications/enterprise-session-border-controller/9.3.0/webgui/web-gui-guide.pdf>

*Note: Expert Mode is used when adding or modifying the SBC configuration*

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

## 6.3 System-Config

To enable system level functionality for the OCSBC, you must first enable the system-config

GUI Path: system/system-config

ACL Path: config t→system→system-config

The screenshot displays the Oracle Enterprise Session Border Controller (ESBC) Configuration page. The top navigation bar includes 'Dashboard', 'Configuration', 'Monitor and Trace', 'Widgets', and 'System'. The 'Configuration' tab is active, showing a 'Modify System Config' form. The left sidebar lists various configuration categories, with 'system-config' selected. The form fields include: Hostname (OracleSBC), Description (empty), Location (empty), Mib System Contact (empty), Mib System Name (empty), Mib System Location (empty), and Syslog Servers (No syslog server to display. Please add.). There are 'Add', 'OK', and 'Delete' buttons at the bottom of the form.

If media transcoding is required in your environment and the SBC is deployed as VME SBC or in a public cloud, you'll need to enable transcoding cores under the system config element. Please see the document below for more information:

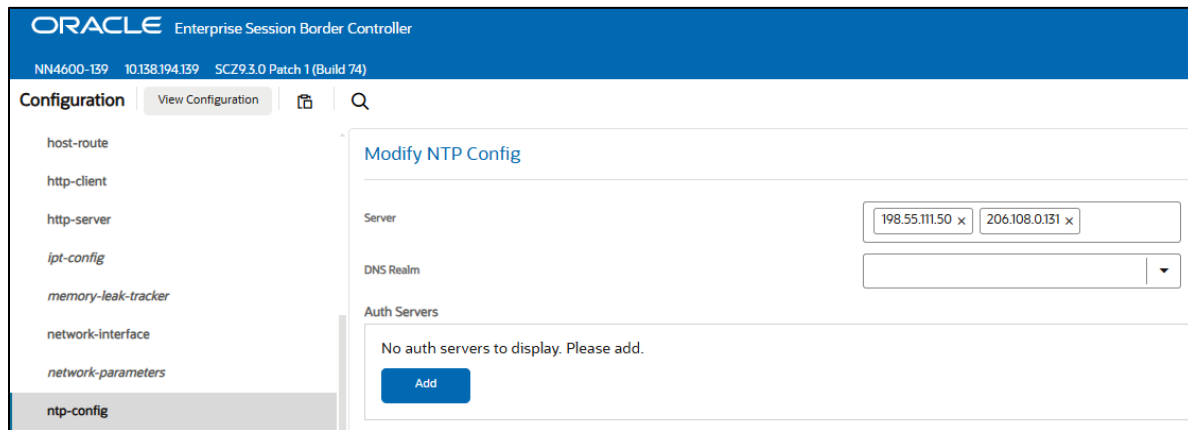
<https://docs.oracle.com/en/industries/communications/enterprise-session-border-controller/9.3.0/releasenotes/esbc-release-notes.pdf>

### 6.3.1 NTP-Sync

You can use the following example to connect the Oracle SBC to any network time servers you have in your network. This is an optional configuration but recommended.

GUI Path: system/ntp-config

ACL Path: config t→system→ntp-sync



- Select OK at the bottom

Now we'll move on configuring network connections on the SBC.

## 6.4 Networking configuration

To connect the SBC to network elements, we must configure both physical and network interfaces. For the purposes of this example, we will configure two physical interfaces, and two network interfaces. One to communicate with RingCentral BYOC, other to connect to PSTN Network.

*Note: The slots and ports used in this example may be different from your network setup.*

### 6.4.1 Physical Interfaces

GUI Path: system/phy-interface

ACL Path: config t→system→phy-interface

- Click Add, use the following table as a configuration example:

Parameter Name	PSTN side (s0p0)	RingCentral (s1p0)
Slot	0	1
Port	0	0
Operation Mode	Media	Media

*Note: Physical interface names, slot and port may vary depending on environment*

Please configure s0p0 interface as below

The screenshot shows the Oracle Enterprise Session Border Controller configuration page for the 'phy-interface' section. The 'Modify Phy Interface' form is displayed with the following values:

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

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

Please configure s1p0 interface as below

The screenshot shows the Oracle Enterprise Session Border Controller configuration page for the 'phy-interface' section. The 'Modify Phy Interface' form is displayed with the following values:

Field	Value	Range
Name	s1p0	
Operation Type	Media	
Port	0	( Range: 0..5 )
Slot	1	( Range: 0..2 )
Virtual Mac		
Duplex Mode	FULL	
Speed	100	
Wancom Health Score	50	( Range: 0..100 )

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

## 6.4.2 Network Interfaces

GUI Path: system/network-interface

ACLI Path: config t→system→network-interface

- Click Add, use the following table as a configuration example:

Config Parameter	PSTN	RingCentral
Name	s0p0	S1p0
IP Address	10.1.2.4	155.212.214.90
Netmask	255.255.255.0	255.255.255.0
Gateway	10.1.2.1	155.212.214.65

Please configure network interface s0p0 as below

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The 'Configuration' tab is active, and the 'network-interface' section is selected in the left sidebar. The 'Modify Network Interface' form is displayed, showing the configuration for the 's0p0' interface. The fields are as follows:

Field	Value
Sub Port Id	0 (Range: 0..4095)
Description	
Hostname	
IP Address	10.1.2.4
Pri Utility Addr	
Sec Utility Addr	
Netmask	255.255.255.0
Gateway	10.1.2.1

At the bottom of the form, there is a 'Gw Heartbeat' section and 'OK' and 'Back' buttons.


Similarly, configure network interface s1p0 as below

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The 'Configuration' tab is active, and the 'network-interface' section is selected in the left sidebar. The 'Modify Network Interface' form is displayed, showing the configuration for the 's1p0' interface. The fields are as follows:

Field	Value
Name	s1p0
Sub Port Id	0 (Range: 0..4095)
Description	
Hostname	
IP Address	155.212.214.90
Pri Utility Addr	
Sec Utility Addr	
Netmask	255.255.255.0
Gateway	155.212.214.65

At the bottom of the form, there is a 'Gw Heartbeat' section and 'OK' and 'Back' buttons.

- Click OK at the bottom of each after entering the config information.



Next, we'll configure the necessary elements to setup Media on the SBC.

## 6.5 Security Configuration

This section describes how to configure the SBC for TLS and SRTP communication for RingCentral BYOC.

RingCentral allows TLS connections from SBCs for SIP traffic, and SRTP for media traffic along with other non-secure transport methods which are TLS-Unencrypted SRTP / TLS-RTP/ TCP-RTP. For the purposes of this application note, we'll focus only on TLS/SRTP.

### 6.5.1 Certificate Records

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

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

GUI Path: security/certificate-record

ACLI Path: config t→security→certificate-record

For the purposes of this application note, we'll create two certificate records. The are as follows:

- SBC Certificate (end-entity certificate)
- GoDaddy Root Cert (Root CA used to sign the SBC's end entity certificate)

*Note: Most deployments typically require additional root and intermediate certificates. However, in this instance, both Oracle and RingCentral use the same certificate authority, GoDaddy so these extra certificates are not needed.*

#### 6.5.1.1 SBC End Entity Certificate

The SBC's end entity certificate is the certificate the SBC presents to Ring Central to secure the connection. The only requirements when configuring this certificate is the common name must contain the SBC's FQDN and the extended key usage list must contain both serverAuth and clientAuth. In this example our common name will be cloudsbc.cgbusolutionslab.com. You must also give it a name. All other fields are optional and can remain at default values.

To Configure the certificate record:

Click Add, and use the following example to configure the SBC certificate

**ORACLE** Enterprise Session Border Controller  
SolutionsLab-ESBC-2 10.11.4 SC79.5.0 Patch 2 (Build 98)

Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration

media-manager >  
security >  
authentication-profile >  
**certificate-record**  
tls-global >  
tls-profile >  
session-router >  
system >

**Modify Certificate Record**

Show Advanced ☐ Show Configuration

Name: cloudsbc.cbusolutionslab.com  
Country: US  
State: MA  
Locality: Burlington  
Organization: Engineering  
Unit:   
Common Name: cloudsbc.cbusolutionslab.com  
Key Algor: rsa  
Digest Algor: sha256  
EcDSA Key Size: p256

Show All ☒ OK Back

- Click OK at the bottom

Next, using this same procedure, configure certificate records for the Root CA certificates.

#### 6.5.1.2 Root CA Certificates

The following, GoDaddyRoot, is the root CA certificate used to sign both the SBC's end entity certificate as well as the certificate Ring Central presents to the SBC to secure the connection. As mentioned above, your root CA and/or intermediate certificate may differ. This is for example purposes only.

You can download the Ring Central Root CA certificate bundle here:

[https://certs.godaddy.com/repository/gd\\_bundle-g2-g1.crt](https://certs.godaddy.com/repository/gd_bundle-g2-g1.crt)

Please use the following table as a configuration reference: Modify the table according to the certificates in your environment.

Config Parameter	GoDaddy Root CA
Common Name	GoDaddy Root CA
Key Size	2048
Key-Usage-List	digitalSignature keyEncipherment
Extended Key Usage List	serverAuth clientAuth
Key algor	rsa
Digest-algor	Sha256



At this point, before generating a certificate signing request, or importing any of the Root CA certs, we must [save and activate](#) the configuration of the SBC.

### 6.5.1.3 Generating a certificate signing request.

Now that the SBC's certificate has been configured, create a certificate signing request for the SBC's end entity only. This is not required for any of the Root CA or intermediate certificates that have been created.

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

The screenshot shows the Oracle Enterprise Session Border Controller GUI. The left sidebar contains a navigation menu with options like authentication, authentication-profile, cert-status-profile, certificate-record (selected), factory-accounts, local-accounts, media-security, password-policy, security-config, ssh-config, ssh-key, tls-global, tls-profile, and x509-cert. The main area displays the 'Certificate Record' page. At the top of this page, there are buttons for 'Generate', 'Import', 'Export', 'PKCS12', 'Edit', 'Delete', and 'Generate' (highlighted with a red arrow). Below these buttons is a table with columns: Select, Action, Name, Country, State, Locality, Organization, Unit, and Common Name. The table contains two entries: 'GoDaddyRootCA' and 'cloudsbc.cgbusolutio...'. The 'cloudsbc.cgbusolutio...' entry is selected. At the bottom of the table, it says 'Displaying 1 - 2 of 2'.

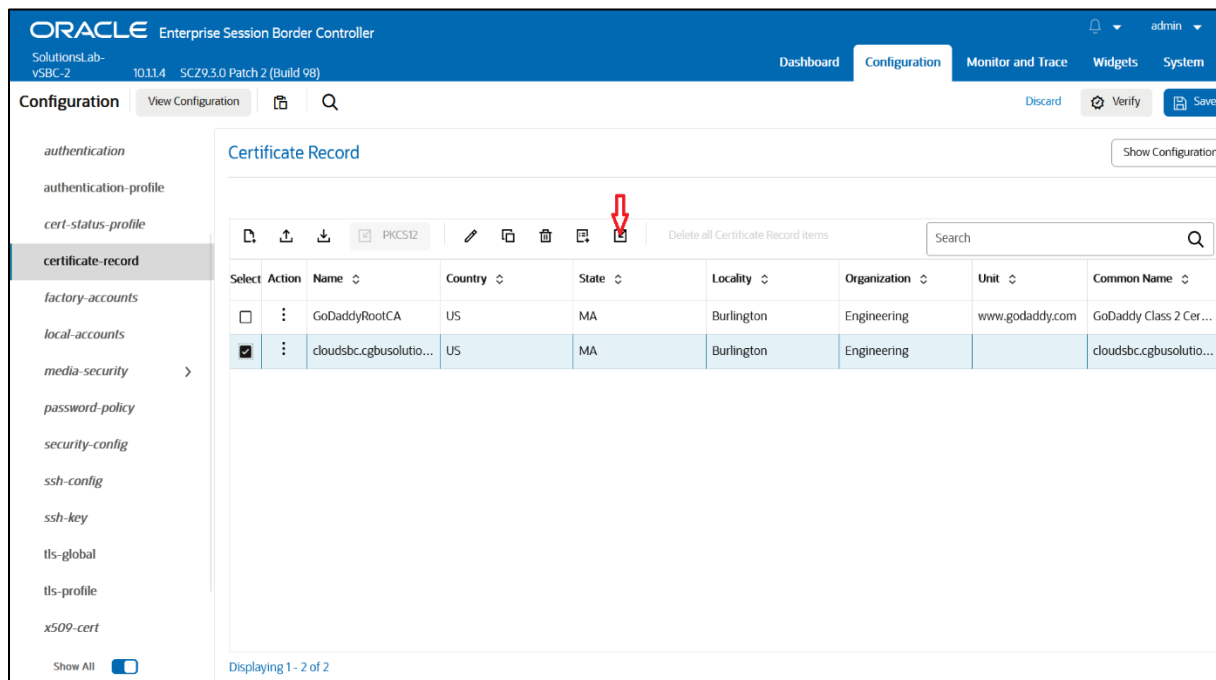
The screenshot shows a dialog box titled 'Generate certificate response'. It contains a text area with the following text: 'Copy the following information and send to a CA authority.' followed by a long string of base64-encoded text representing a certificate request. The string starts with '-----BEGIN CERTIFICATE REQUEST-----' and ends with '-----END CERTIFICATE REQUEST-----'. At the bottom of the dialog box, there is a 'Close' button.

Copy/paste the text that gets printed on the screen as shown above and upload to your CA server for signature. Also note, another [save and activate](#) is required before you can import the certificates to each certificate record created above.

#### 6.5.1.4 Import Certificates to SBC

Once certificate signing request have been completed – import the signed certificate to the SBC.

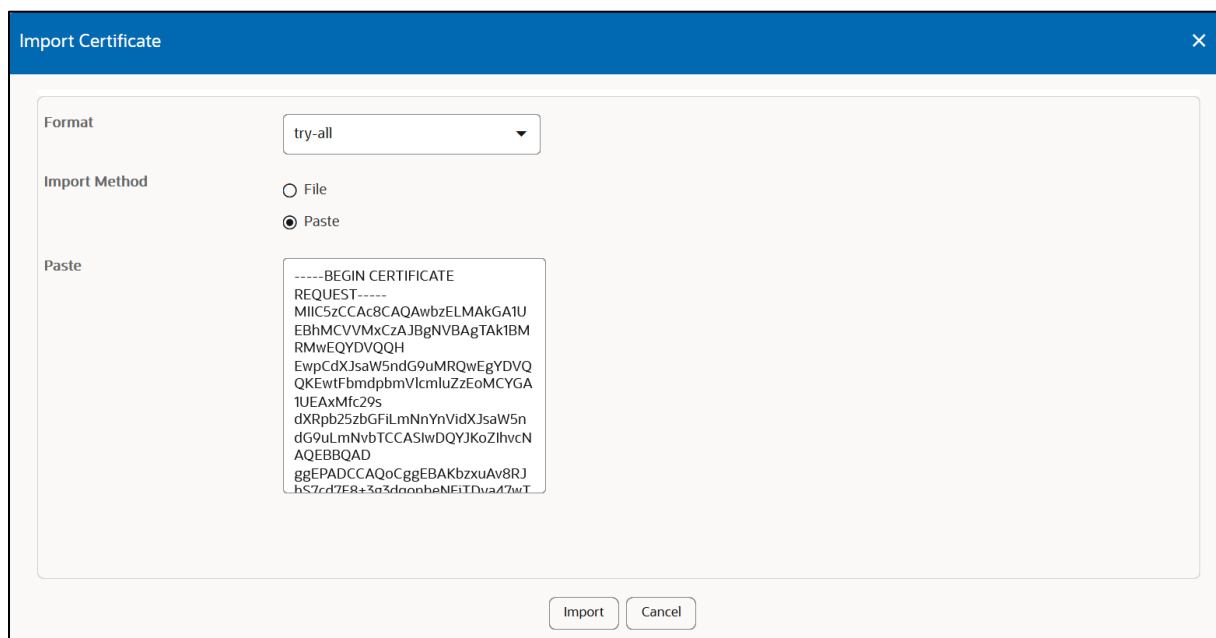
Please note – all certificates including root and intermediate certificates are required to be imported to the SBC. Once done, issue [save/activate](#) from the WebGUI to complete the configuration of certificate records on the Oracle SBC.



The screenshot shows the Oracle Enterprise Session Border Controller (SBC) Configuration page. The left sidebar lists various configuration categories, with 'certificate-record' selected. The main area displays a table of Certificate Records. A red arrow points to the 'Import' icon in the toolbar above the table.

Select	Action	Name	Country	State	Locality	Organization	Unit	Common Name
<input type="checkbox"/>	⋮	GoDaddyRootCA	US	MA	Burlington	Engineering	www.godaddy.com	GoDaddy Class 2 Cer...
<input checked="" type="checkbox"/>	⋮	cloudsbc.cgbusolutio...	US	MA	Burlington	Engineering		cloudsbc.cgbusolutio...

Displaying 1 - 2 of 2



The screenshot shows the 'Import Certificate' dialog box. It has a 'Format' dropdown set to 'try-all'. Under 'Import Method', the 'Paste' radio button is selected. The 'Paste' text area contains a certificate request (CSR) in PEM format. At the bottom are 'Import' and 'Cancel' buttons.

Format: try-all

Import Method: ☐ File ☒ Paste

Paste:

```
-----BEGIN CERTIFICATE REQUEST-----
MIIC5zCCAc8CAQAwbzELMAkGA1UEBhMCVVMxMzA1BjBhTAK1BM
RMwEQYDVQQL
EwpCdXJsaW5ndG9uMRQwEgYDVQ
QKEwtFbmdpbmVlcmluZzEoMCMYGA
1UEAxMfc29s
dXRpb25zbGFILmNnYnVidXJsaW5n
dG9uLmNvbTCCASlwdQYJKoZIhvcN
AQEBBQAD
ggEPADCCAQoCggEBAKbzXuAv8RJ
hS7cd7E8+3n3dooonheNEITDva47wT
```

Import Cancel

Once pasted in the text box, select Import at the bottom, then [save and activate](#) your configuration.

Repeat these steps to import all the root and intermediate CA certificates into the SBC:

## 6.5.2 TLS-Profile

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

GUI Path: security/tls-profile

ACLI Path: config t→security→tls-profile

- Click Add, use the example below to configure:

The screenshot displays the Oracle Enterprise Session Border Controller (SBC) GUI. The top navigation bar includes 'Dashboard', 'Configuration', 'Monitor and Trace', 'Widgets', and 'System'. The 'Configuration' tab is active, and the left sidebar shows a tree view with 'tls-profile' selected. The main area is titled 'Modify TLS Profile' and contains the following fields:

- Name: RingCentralTLS
- End Entity Certificate: cloudsbc.cgbusolutionslab.com
- Trusted Ca Certificates: GoDaddyRootCA x
- Cipher List: DEFAULT x
- Verify Depth: 10 (Range: 0..10)
- Mutual Authenticate: ☒ enable
- TLS Version: tlsv12
- Options: (empty field)
- Cert Status Check: ☐ enable
- Cert Status Profile List: (empty field)

At the bottom left, there is a 'Show All' toggle switch. At the bottom center, there are 'OK' and 'Back' buttons.

- Select OK at the bottom

Next, we'll move to securing media between the SBC and Microsoft Teams.

## 6.5.3 Media Security

This section outlines how to configure support for media security between the OCSBC and Ring Central.

### 6.5.3.1 sdes-profile

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

In the SBC's GUI, on the bottom left, you will need to enable the switch "Show All" to access the media security configuration elements.

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

ACL Path: config → security → media-security → sdes-profile

Click Add, and use the example below to configure:

The screenshot displays the Oracle Enterprise Session Border Controller (ESBC) Configuration page for the 'Modify Sdes Profile' section. The page shows various configuration options for the 'sdes-profile'. The 'Srtcp Encrypt' checkbox is highlighted with a red rectangle and is checked. Other options include 'Srtcp Auth' (checked), 'Srtcp Encrypt' (checked), 'Mki' (unchecked), 'Egress Offer Format' (set to 'same-as-ingress'), 'Use Ingress Session Params' (empty), and 'Options' (empty). The left sidebar shows the navigation menu with 'sdes-profile' selected. The top bar shows the Oracle logo and navigation tabs: Dashboard, Configuration, Monitor and Trace, Widgets, and System. The bottom bar shows 'OK' and 'Back' buttons.

Also, please disable the “Srtcp Encrypt” parameter shown above for the TLS/Unencrypted SRTP session.

- Select OK at the bottom

### 6.5.3.2 Media Security Policy

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

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

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

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

- Click Add, use the examples below to configure:

**ORACLE** Enterprise Session Border Controller  
 SolutionsLab-  
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Configuration View Configuration [Icon] [Search]

Discard Verify Save

Show Advanced [Toggle] Show Configuration

*authentication*  
*authentication-profile*  
*cert-status-profile*  
*certificate-record*  
*factory-accounts*  
*local-accounts*  
*media-security* [Dropdown]  
*dtls-srtp-profile*  
**media-sec-policy**  
*sdes-profile*  
*sipura-profile*  
*password-policy*  
*security-config*  
*ssh-config*  
*ssh-key*  
*tls-global*

Show All [Toggle]

### Modify Media Sec Policy Entries

Name RingCentralSRTP

Pass Through ☐ enable

Options

**Inbound**

Profile RCS RTP

Mode srtp

Protocol sdes

Hide Egress Media Update ☐ enable

**Outbound**

Profile RCS RTP

Mode srtp

Protocol sdes

OK Back

**ORACLE** Enterprise Session Border Controller  
 SolutionsLab-  
 vSBC-2 10.11.4 SCZ9.3.0 Patch 2 (Build 98) Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration [Icon] [Search]

Discard Verify Save

Show Advanced [Toggle] Show Configuration

*authentication*  
*authentication-profile*  
*cert-status-profile*  
*certificate-record*  
*factory-accounts*  
*local-accounts*  
*media-security* [Dropdown]  
*dtls-srtp-profile*  
**media-sec-policy**  
*sdes-profile*  
*sipura-profile*  
*password-policy*  
*security-config*  
*ssh-config*  
*ssh-key*  
*tls-global*

Show All [Toggle]

### Modify Media Sec Policy Entries

Name RTP

Pass Through ☐ enable

Options

**Inbound**

Profile

Mode rtp

Protocol none

Hide Egress Media Update ☐ enable

**Outbound**

Profile

Mode rtp

Protocol none

OK Back

# 6.6 Media Configuration

This section will guide you through the configuration of media manager, realms, and steering pools, all of which are required for the SBC to handle signaling and media flows through the SBC.

## 6.6.1 Media Manager

To configure media functionality on the SBC, you must first enable the global media manager

GUI Path: media-manager/media-manager

ACL Path: config t→media-manager→media-manager-config

The screenshot shows the Oracle Enterprise Session Border Controller GUI. The top navigation bar includes 'Dashboard', 'Configuration', 'Monitor and Trace', 'Widgets', and 'System'. The 'Configuration' tab is active. On the left, a sidebar lists various configuration categories: media-manager, codec-policy, media-manager (selected), media-policy, realm-config, steering-pool, security, authentication-profile, certificate-record, tls-global, tls-profile, session-router, and system. The main content area is titled 'Modify Media Manager'. It features a 'State' checkbox labeled 'enable' which is checked. Below this, there are several input fields for configuration parameters, each with a range in parentheses: 'Max Arp Rate' (10, Range: 0..100), 'Max Signaling Packets' (0, Range: 0..4294967295), 'Max Untrusted Signaling' (100, Range: 0..100), 'Min Untrusted Signaling' (30, Range: 0..100), 'Dos Guard Window' (5, Range: 1..30), 'Untrusted Minor Threshold' (0, Range: 0..100), 'Untrusted Major Threshold' (0, Range: 0..100), 'Untrusted Critical Threshold' (0, Range: 0..100), and 'Trusted Minor Threshold' (0, Range: 0..100). At the bottom of the form are 'OK' and 'Delete' buttons. There are also 'Show Advanced' and 'Show Configuration' toggle buttons.

- Click OK at the bottom.

## 6.6.2 Realm Config

Realms are a logical distinction representing routes (or groups of routes) reachable by the Oracle® Session Border Controller and what kinds of resources and special functions apply to those routes. Realms are used as a basis for determining ingress and egress associations to network interfaces.

GUI Path; media-manger/realm-config

ACL Path: config t→media-manger→realm-config

Click Add and use the following table as a configuration example for the realms. The following parameters are all required unless mentioned as optional below.

Config Parameter	PSTN	RingCentral
Identifier	SIPTrunk	RingCentral
Network Interface	s0p0	S1p0
MM in Realm	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Access Control trust level	High	High
Media Sec Policy		RingCentralSRTP

In the below case, Realm name is given as **SIPTrunk** for PSTN.

Please set the Access Control Trust Level as high for this realm

Similarly, Realm name is given as **RingCentral** for RingCentral BYOC.

Please set the Access Control Trust Level as high for this realm too.

- Select OK at the bottom of each.

## 6.6.3 Steering Pools

Steering pools define sets of ports that are used for steering media flows through the OCSBC. These selected ports are used to modify the SDP to cause receiving session agents to direct their media toward this system.

We configure one steering pool for PSTN. The other for Ring Central

GUI Path: media-manger/steering-pool

ACLI Path: config t→media-manger→steering-pool

Click Add and use the below examples to configure.

The screenshot shows the Oracle Enterprise Session Border Controller GUI. The left sidebar lists configuration categories: media-manger, codec-policy, media-manger, media-policy, realm-config, steering-pool (selected), security, authentication-profile, certificate-record, tls-global, tls-profile, session-router, access-control, and account-config. The main panel is titled 'Modify Steering Pool'. The configuration fields are: IP Address (155.212.214.90), Start Port (10000, Range: 0.65535), End Port (10999, Range: 0.65535), Realm ID (RingCentral), Network Interface (empty), and Port Allocation Strategy (mixed). At the bottom are 'OK' and 'Back' buttons.

The screenshot shows the Oracle Enterprise Session Border Controller GUI. The left sidebar lists configuration categories: media-manger, codec-policy, media-manger, media-policy, realm-config, steering-pool (selected), security, authentication-profile, certificate-record, tls-global, tls-profile, session-router, access-control, and account-config. The main panel is titled 'Modify Steering Pool'. The configuration fields are: IP Address (10.12.4), Start Port (10000, Range: 0.65535), End Port (20000, Range: 0.65535), Realm ID (SIPTrunk), Network Interface (empty), and Port Allocation Strategy (mixed). At the bottom are 'OK' and 'Back' buttons.

- Select OK at the bottom of each.



## 6.7 Sip Configuration

This section outlines the configuration parameters required for processing, modifying, and securing sip signaling traffic.

### 6.7.1 Sip-Config

To enable sip related objects on the Oracle SBC, you must first configure the global Sip Config element:

GUI Path: session-router/sip-config

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

There are only two recommended and one optional changes/additions to the global Sip Config.

- Set the home realm ID parameter to RingCentral Realm, and add the following hidden option:
- Max-udp-length=0: Setting this option to zero (0) forces sipd to send fragmented UDP packets. Using this option, you override the default value of the maximum UDP datagram size (1500 bytes; sipd requires the use of SIP/TCP at 1300 bytes).
- Enable sag-lookup-on-redirect if using a session agent group for your RingCentral platform.

*Note: toggle show advanced to expose the "Option" parameter*

The screenshot displays the Oracle Enterprise Session Border Controller (ESBC) configuration interface. The top navigation bar includes 'Dashboard', 'Configuration', 'Monitor and Trace', 'Widgets', and 'System'. The 'Configuration' tab is active, showing a search bar and 'Discard', 'Verify', and 'Save' buttons. On the left, a sidebar lists configuration categories: local-routing-config, media-profile, session-agent, session-group, session-recording-group, session-recording-server, session-translation, sip-config (selected), sip-feature, sip-interface, sip-manipulation, sip-monitoring, translation-rules, and system. The main area is titled 'Modify SIP Config' and contains a 'Show Advanced' toggle switch, which is currently turned on and highlighted by a red arrow. Below the toggle, the configuration parameters are listed:

Parameter	Value	Range
State	<input checked="" type="checkbox"/> enable	
Dialog Transparency	<input checked="" type="checkbox"/> enable	
Home Realm ID	RingCentral	
Egress Realm ID		
Nat Mode	None	
Registrar Domain		
Registrar Host		
Registrar Port	5060	( Range: 0,3025..65535 )
Init Timer	500	( Range: 0..999999999 )
Max Timer	4000	( Range: 0..999999999 )

At the bottom of the configuration area, there are 'OK' and 'Delete' buttons. A 'Show All' toggle is also present in the bottom left corner.

The screenshot shows the Oracle Enterprise Session Border Controller (SBC) Configuration page. The top navigation bar includes 'Dashboard', 'Configuration', 'Monitor and Trace', 'Widgets', and 'System'. The 'Configuration' tab is active. The left sidebar lists various configuration categories, with 'sip-config' highlighted. The main area displays the 'Modify SIP Config' form, which includes fields for 'Emergency Dscp Profile', 'Red Max Trans' (set to 10000), 'Options' (set to max-udp-length=0 x), 'SPL Options', 'SIP Message Len' (set to 4096), 'Enum Sag Match' (checkbox), 'Extra Method Stats' (checkbox), 'Extra Enum Stats' (checkbox), 'Registration Cache Limit' (set to 0), and 'Register Use To For Lp' (checkbox). The 'Show Advanced' toggle is turned on. At the bottom of the form are 'OK' and 'Delete' buttons.

- Select OK at the bottom.

## 6.7.2 Sip Interface

The SIP interface defines the transport addresses (IP address and port) upon which the Oracle SBC receives and sends SIP messages.

GUI Path: session-router/sip-interface

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

Please Configure sip-interface for the RingCentral BYOC as shown below:

- Tls-profile needs to match the name of the tls-profile previously created.
- Set allow-anonymous to agents-only to ensure traffic to this sip-interface only comes from the particular Session agents added to the SBC.

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Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration [Icons] [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  
 system >

Modify SIP Interface Show Advanced [Toggle] Show Configuration

State ☒ enable

Realm ID RingCentral

Description

SIP Ports

Select	Action	Address	Port	Transport Protocol	TLS Profile	Allow Anonymous	Multi Home Address
<input type="checkbox"/>	[Edit] [Delete]	155.212.214.90	5061	TLS	RingCentralTLS	agents-only	

OK Back

Show All [Toggle]

Please Configure sip-interface for the PSTN as show below:

**ORACLE** Enterprise Session Border Controller  
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Dashboard Configuration Monitor and Trace Widgets System

Configuration View Configuration [Icons] [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  
 system >

Modify SIP Interface Show Advanced [Toggle] Show Configuration

State ☒ enable

Realm ID SIPTrunk

Description

SIP Ports

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

OK Back

Show All [Toggle]

- Select OK at the bottom of each when applicable.

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

### 6.7.3 Session Agents

Session Agents are configuration elements which are trusted agents that can both send and receive traffic from the Oracle SBC with direct access to the trusted data path.

GUI Path: session-router/session-agent

ACLI Path: config t→session-router→session-agent.

- transport set to “staticTLS”
- Please enable the parameter **ping-response**,
- Please set ping method to OPTIONS and ping-interval duration in secs

ORACLE Enterprise Session Border Controller  
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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 Session Agent Show Advanced Show Configuration

Hostname 192.209.28.158  
IP Address 192.209.28.158  
Port 5061 (Range: 0,3025..65535)  
State ☒ enable  
Transport Method StaticTLS  
Realm ID RingCentral  
Egress Realm ID  
Description Ring Central Session Agent 1  
Ping Method OPTIONS

OK Back

ORACLE Enterprise Session Border Controller  
SolutionsLab-  
vSBC-2 10.11.4 SCZ9.3.0 Patch 2 (Build 98) 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 Session Agent Show Advanced Show Configuration

Hostname 192.209.28.53  
IP Address 192.209.28.53  
Port 5061 (Range: 0,3025..65535)  
State ☒ enable  
Transport Method StaticTLS  
Realm ID RingCentral  
Egress Realm ID  
Description  
Ping Method OPTIONS

OK Back

- Select OK at the bottom.

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

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The left sidebar lists various configuration sections, with 'session-agent' selected. The main area is titled 'Modify Session Agent'. The configuration fields are as follows:

Field	Value
Hostname	1015.8
IP Address	1015.8
Port	5060 (Range: 0,1025..65535)
State	<input checked="" type="checkbox"/> enable
Transport Method	UDP+TCP
Realm ID	LabRealm
Egress Realm ID	
Description	
Ping Method	

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

## 6.7.4 Session Group

A session agent group allows the SBC to create a load balancing model:

Session agents configured for the RingCentral in above section will be added to the group. The session agents listed under destination must be in this order, and the strategy to select the session agents can be selected by the End Users based on their needs and we have selected "RoundRobin" in this example.

Go to session-router-> session-group

The screenshot shows the Oracle Enterprise Session Border Controller configuration interface. The left sidebar lists various configuration sections, with 'session-group' selected. The main area is titled 'Modify Session Group'. The configuration fields are as follows:

Field	Value
Group Name	RingCentral
Description	
State	<input checked="" type="checkbox"/> enable
Strategy	RoundRobin
Dest	192.209.28.158 x 192.209.28.55 x
Sag Recursion	<input type="checkbox"/> enable
Stop Sag Recurse	401,407

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

## 6.8 Routing Configuration

Now that most of the system, signaling, and media configuration is in place, we can configure the SBC to route calls from one end of the network to the other. The SBC has multiple routing features that can be utilized, but for the purposes of this example configuration, we'll configure local policies to route calls to and from PSTN and RingCentral BYOC.

### 6.8.1 Local Policy

GUI Path: session-router/local-policy

ACL Path: config t→session-router→local-policy

To route the calls from PSTN side to RingCentral side, Use the below local policy.

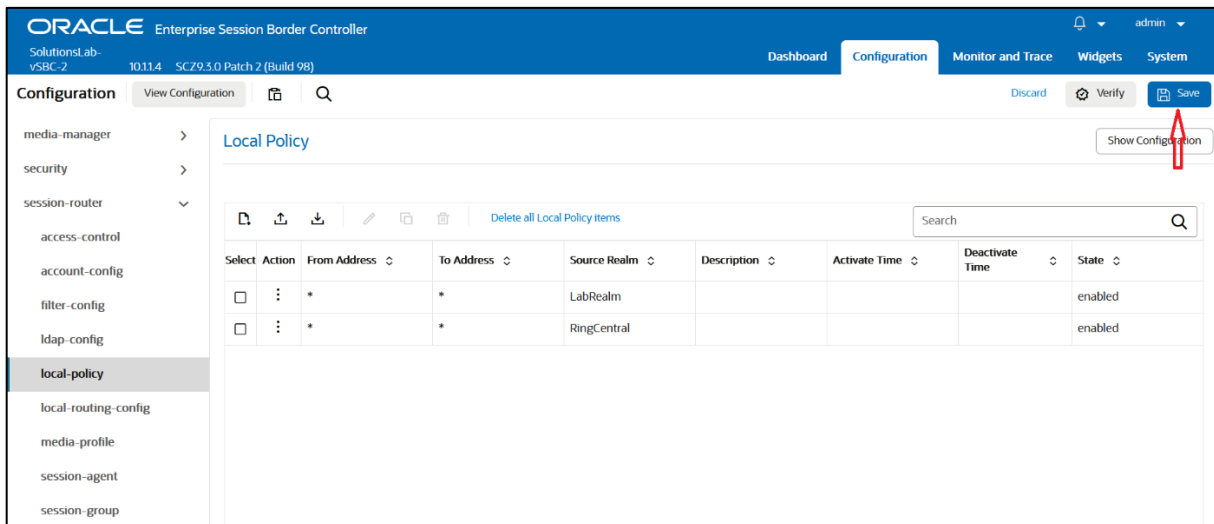
Select	Action	Next Hop	Realm	Action	Terminate Recursion	Cost	State	App Protocol	Lookup	Next Key	Auth User Lookup
<input type="checkbox"/>	:	sagRingCent...	RingCentral	replace-uri	disabled	0	enabled		single		

To route the calls from RingCentral side to PSTN side, Use the below local policy.

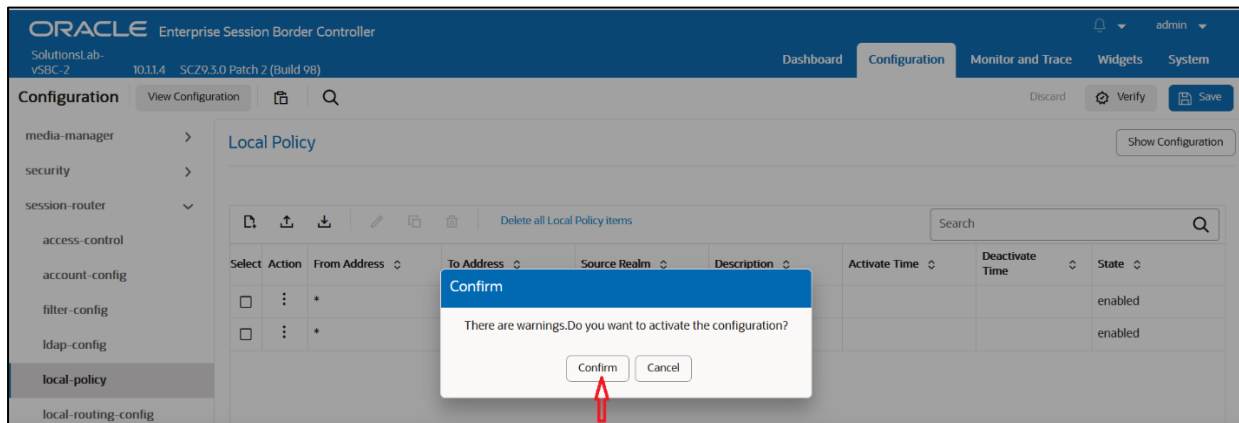
Select	Action	Next Hop	Realm	Action	Terminate Recursion	Cost	State	App Protocol	Lookup	Next Key	Auth User Lookup
<input type="checkbox"/>	:	1015.8	SIPTrunk	replace-uri	disabled	0	enabled		single		

## 6.9 Save and Activate

### 6.9.1 Save Config



### 6.9.2 Activate Config



This concludes the minimum required configuration to successfully integrate RingCentral BYOC with your Oracle Session Border Controller.

## 7 Existing SBC configuration

If your environment has an Oracle SBC deployed with a fully functional configuration, the following configuration elements are required to integrate RingCentral BY into your existing config.

- [Configuring a certificate for SBC Interface](#)
- [TLS-Profile](#)
- [SDES Profile](#)
- [Media-sec-Policy](#)
- [New realm-config](#)
- [New steering-pools](#)
- [New sip-interface](#)
- [New session-agent](#)
- [Session Group](#)
- [New local-policy](#)

## 7 Appendix A

### 7.1 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 Ring Central 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

GUI Path: session-router/sip-interface

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

The screenshot shows the 'Modify SIP Interface' configuration page. The left sidebar lists various configuration categories, with 'sip-interface' selected. The main area contains several configuration fields:

- Route To Registrar:** ☐ enable
- Secured Network:** ☐ enable
- Uri Fqdn Domain:**
- Options:**
- SPL Options:**  (This field is highlighted with a red box in the original image)
- Trust Mode:**
- Max Nat Interval:**  (Range: 0.999999999)
- Nat Int Increment:**  (Range: 0.999999999)
- Nat Test Increment:**  (Range: 0.999999999)
- SIP Dynamic Hint:** ☐ enable

At the bottom, there are 'OK' and 'Back' buttons. The top of the page has 'Configuration', 'View Configuration', 'Discard', 'Verify', and 'Save' buttons. The 'Show Advanced' toggle is turned on, and the 'Show Configuration' button is visible.

- Perform a [save and activate](#) configuration for changes to take effect.

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

## 8 Appendix B

### 8.1 ACLI Running Config

Below is a complete output of the running configuration used to create this application note.

This output includes all 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 short
access-control
  realm-id          SIPTrunk
  source-address    10.1.5.8
  application-protocol SIP
  trust-level       high
access-control
  realm-id          RingCentral
  source-address    192.209.0.0/16
  application-protocol SIP
  trust-level       high
certificate-record
  name              GoDaddyRootCA
  unit              www.godaddy.com
  common-name       GoDaddy Class 2 Certification Authority Root Certificate
certificate-record
  name              cloudsbc.cgbusolutionslab.com
  common-name       cloudsbc.cgbusolutionslab.com
http-server
  name              webserver
local-policy
  from-address      *
  to-address        *
  source-realm       RingCentral
  policy-attribute
    next-hop         10.1.5.8
    realm             SIPTrunk
    action            replace-uri
local-policy
  from-address      *
  to-address        *
  source-realm       SIPTrunk
  policy-attribute
    next-hop         sag:RingCentral
    realm             RingCentral
    action            replace-uri
```

```

media-manager
media-sec-policy
  name PSTNSide
media-sec-policy
  name RingCentralSRTP
  inbound
    profile RCS RTP
    mode srtp
    protocol sdes
  outbound
    profile RCS RTP
    mode srtp
    protocol sdes
network-interface
  name s0p0
  ip-address 10.1.2.4
  netmask 255.255.255.0
  gateway 10.1.2.1
network-interface
  name s1p0
  ip-address 155.212.214.90
  netmask 255.255.255.0
  gateway 155.212.214.65
  dns-ip-primary 9.9.9.9
  dns-ip-backup1 8.8.8.8
  dns-ip-backup2 8.8.4.4
  dns-domain cgbusolutionslab.com
phy-interface
  name s0p0
  operation-type Media
phy-interface
  name s1p0
  operation-type Media
  slot 1
sdes-profile
  name RCS RTP
  crypto-list
    AES_CM_128_HMAC_SHA1_80
    AES_256_CM_HMAC_SHA1_80
    AES_CM_128_HMAC_SHA1_32
  srtp-rekey-on-re-invite enabled

```

```

realm-config
  identifier          RingCentral
  network-interfaces  s1p0:0.4
  mm-in-realm         enabled
  access-control-trust-level  high
  trunk-context       cloudsbc.cgbusolutionslab.com
  rtcp-policy         RingCentralRTCP
realm-config
  identifier          SIPTrunk
  network-interfaces  s0p0:0.4
  mm-in-realm         enabled
  access-control-trust-level  high
session-agent
  hostname            10.1.5.8
  ip-address           10.1.5.8
  transport-method     UDP+TCP
  realm-id             SIPTrunk
  ping-interval        30
  ping-response        enabled
  reuse-connections    TCP
session-agent
  hostname            192.209.28.158
  ip-address           192.209.28.158
  port                 5061
  transport-method     StaticTLS
  realm-id             RingCentral
  ping-method          OPTIONS
  ping-interval        30
  ping-response        enabled
session-agent
  hostname            192.209.28.53
  ip-address           192.209.28.53
  port                 5061
  transport-method     StaticTLS
  realm-id             RingCentral
  ping-method          OPTIONS
  ping-interval        30
  ping-response        enabled

```

```

session-group
  group-name      RingCentral
  strategy        RoundRobin
  dest            192.209.28.158
                 192.209.28.53
sip-config
  home-realm-id   RingCentral
  registrar-port  5060
  options         max-udp-length=0
  extra-method-stats  enabled
sip-interface
  realm-id        RingCentral
  sip-port
    address       155.212.214.90
    port          5061
    transport-protocol  TLS
    tls-profile    RingCentralTLS
    allow-anonymous  agents-only
    secured-network  enabled
sip-interface
  realm-id        SIPTrunk
  sip-port
    address       10.1.2.4
    transport-protocol  TCP
    allow-anonymous  agents-only
  sip-port
    address       10.1.2.4
    allow-anonymous  agents-only
    secured-network  enabled
  spl-options
HeaderNatPublicSipIfIp=20.110.144.248,HeaderNatPrivateSipIfIp=10.1.2.4
sip-monitoring
  match-any-filter  enabled
  monitoring-filters  *
steering-pool
  ip-address       10.1.2.4
  start-port       10000
  end-port         20000
  realm-id         SIPTrunk
steering-pool
  ip-address       155.212.214.90
  start-port       10000
  end-port         10999
  realm-id         RingCentral

```

## 9 Appendix C

### 9.1 Test Case Execution status

SI No	Test Case	Description	Status
1	Incoming from GW	GW dials DL number, both participants hangup in turn	Pass
2	Outgoing to GW	DL dials a GW, both participants hangup in turn	Pass
3	Hold/Resume by DL	DL puts GW on hold and resumes	Pass
4	Hold/Resume by GW	GW puts DL on hold and resumes	Pass
5	Anonymous call to GW	DL dials GW anonymously (the From is anonymous, the PAI contains a number, the Privacy header is "id")	Pass
6	Anonymous call from GW	GW dials DL anonymously	Pass
7	Long duration call	The participants keep the call for at least 30 minutes	Pass
8	G.711 fax to GW	DL sends G.711 encoded fax to GW	Pass
9	G.711 fax from GW	GW sends G.711 encoded fax to DL	Pass
10	T.38 fax to GW	DL sends T.38 fax to GW	Pass
11	T.38 fax from GW	GW sends T.38 fax to DL	Pass



CONNECT WITH US



#### Oracle Corporation, World Headquarters

2300 Oracle Way  
Austin, TX 78741, USA

#### Worldwide Inquiries

Phone: +1.650.506.7000 or  
Phone: +1.800.392.2999

#### Integrated Cloud Applications & Platform Services

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