Configuration Guide for Google CES Call Recording Using Oracle E-SBC Acme Packet 4600 SCZ9.3.0 GA (Build 46)

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1 Audience

This document is intended for the SIP Trunk customer's technical staff and Value-Added Reseller (VAR) having installation and operational responsibilities.

1.1 Introduction

This configuration guide describes configuration steps for **Google CES Call Recording** using **Oracle Enterprise Session Border Controller Acme Packet 4600 SCZ9.3.0 GA (Build 46)**

1.1.1 TekVizion Labs

TekVizion Labs™ is an independent testing and verification facility offered by TekVizion, Inc. TekVizion Labs offers several types of testing services including:

- Remote Testing – provides secure, remote access to certain products in TekVizion Labs for pre-Verification and ad hoc testing.
- Verification Testing – Verification of interoperability performed on-site at TekVizion Labs between two products or in a multi-vendor configuration.
- Product Assessment – independent assessment and verification of product functionality, interface usability, assessment of differentiating features as well as suggestions for added functionality, stress, and performance testing, etc.

TekVizion is a systems integrator specifically dedicated to the telecommunications industry. Our core services include consulting/solution design, interoperability/Verification testing, integration, custom software development and solution support services. Our services help service providers achieve a smooth transition to packet-voice networks, speeding delivery of integrated services. While we have expertise covering a wide range of technologies, we have extensive experience surrounding our practice areas which include SIP Trunking, Packet Voice, Service Delivery, and Integrated Services.

The TekVizion team brings together experience from the leading service providers and vendors in telecom. Our unique expertise includes legacy switching services and platforms, and unparalleled product knowledge, interoperability, and integration experience on a vast array of VoIP and other next-generation products. We rely on this combined experience to do what we do best: help our clients advance the rollout of services that excite customers and result in new revenues for the bottom line. TekVizion leverages this real-world, multi-vendor integration and test experience and proven processes to offer services to vendors, network operators, enhanced service providers, large enterprises and other professional services firms. TekVizion's headquarters, along with a state-of-the-art test lab and Executive Briefing Center, is located in Plano, Texas.

For more information on TekVizion and its practice areas, please visit [TekVizion Labs website](#).

2 SIP Trunking Network Components

The network for the SIP Trunk reference configuration is illustrated below and is representative of Google CES Call Recording with Oracle Enterprise Session Border Controller (E-SBC) Acme Packet 4600 SCZ9.3.0 GA (Build 46) configuration.

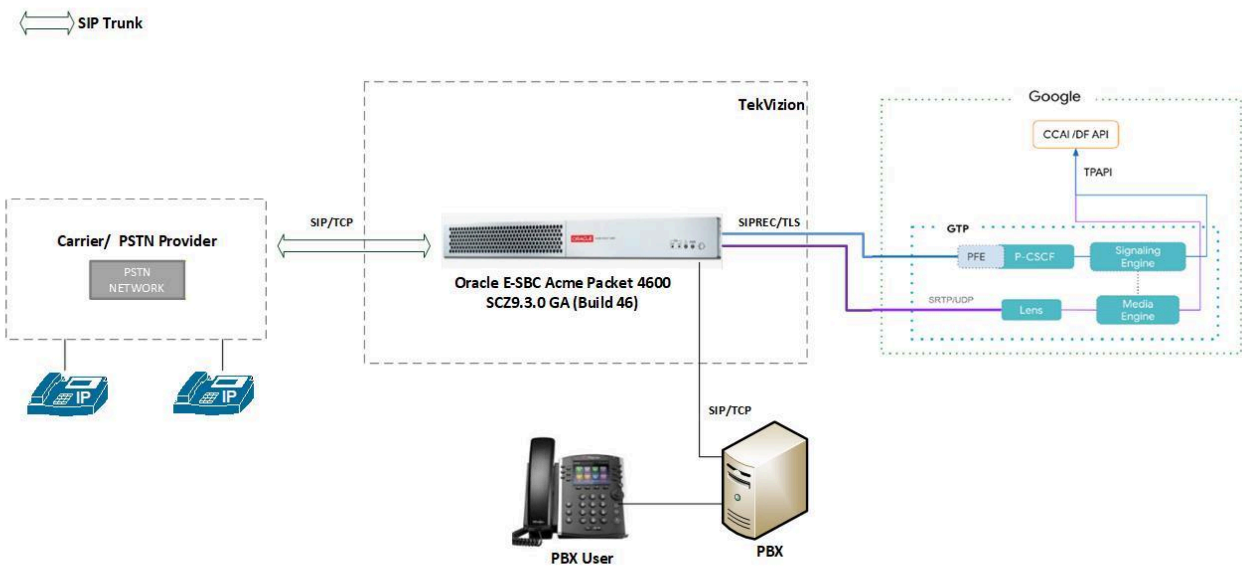

Figure 1: SIP Trunk Lab Reference Network

The lab network consists of the following components.

- Google CES cloud Environment
- Oracle E-SBC Acme Packet 4600
- OnPrem PBX
- PSTN Gateway

3 Hardware Components

- Oracle E-SBC Acme Packet 4600

4 Software Requirements

- Oracle E-SBC Acme Packet 4600 SCZ9.3.0 GA (Build46)

5 Google CES Certified Oracle E-SBC Versions

Table 1 – Google CES Certified Oracle E-SBC Version

Google CES Certified Oracle E-SBC Version	
Oracle E-SBC 4600	SCZ9.3.0 GA (Build46)
Oracle E-SBC 3900	SCZ9.3.0 GA (Build46)
Oracle E-SBC 3900	SCZ8.4.0 Patch 2 (Build 151)

6 Features

6.1 Features tested for Google CES Call Recording

- Basic Inbound calls
- Call Hold and Resume
- Call Transfer
- Conference

6.2 Features Not tested for Google CES Call Recording

- None

6.3 Caveats and Limitations

DTLS	DTLS towards Google CES is not tested

6.4 Failed Testcase

- None

7 Configuration

7.1 Configuration Checklist

Below are the steps that are required to configure Oracle E-SBC.

Table 1 – Oracle E-SBC Configuration Steps

Step	Description	Reference
Step 1	Media Manager	Section 7.4.1
Step 2	Physical Interface	Section 7.4.2
Step 3	Network Interface	Section 7.4.3
Step 4	SIP Config	Section 7.4.4
Step 5	System-Config	Section 7.4.5
Step 6	SIP Monitoring	Section 7.4.6
Step 7	HTTP Server	Section 7.4.7
Step 8	Codec Policy	Section 7.4.8
Step 9	Translation Rules	Section 7.4.9
Step 10	Session Translation	Section 7.4.10
Step 11	Session Recording Server	Section 7.4.11
Step 12	Realm Config	Section 7.4.12
Step 13	Steering Pool	Section 7.4.13
Step 14	SDES Profile	Section 7.4.14
Step 15	Media Sec Policy	Section 7.4.15
Step 16	TLS – Certificate Record	Section 7.4.16
Step 17	TLS – TLS Profile	Section 7.4.17
Step 18	Session Timer	Section 7.4.18
Step 19	SIP Interface	Section 7.4.19
Step 20	Session Agent	Section 7.4.20
Step 21	Local Policy	Section 7.4.21
Step 22	SIP Manipulation	Section 7.4.22

7.2 IP Address Worksheet

The specific values listed in the table below and in subsequent sections are used in the lab configuration described in this document are for **illustrative purposes only**.

Table 3 - IP Address Worksheet

Component	IP Address
Google CES	
Signaling	us.telephony.goog:5672
Media	74.125.X.X
OnPrem PBX	
LAN IP Address	172.16.X.X
Oracle E-SBC	
LAN IP Address	10.80.X.X
WAN IP Address	192.65.X.X

7.3 Google CES API Configuration

Below link can be referred for troubleshooting Google CES API configuration for Call recording.

https://docs.cloud.google.com/contact-center/insights/docs/troubleshooting

7.4 Oracle E-SBC Configuration

The following is the example configuration of Oracle E-SBC for Google CES Call Recording.

7.4.1 Media Manager

- Media-Manager handles the media stack required for SIP sessions on the Oracle E-SBC. Media Manager is configured as shown below
- Navigate to **Configuration □ media-manager □ media-manager**

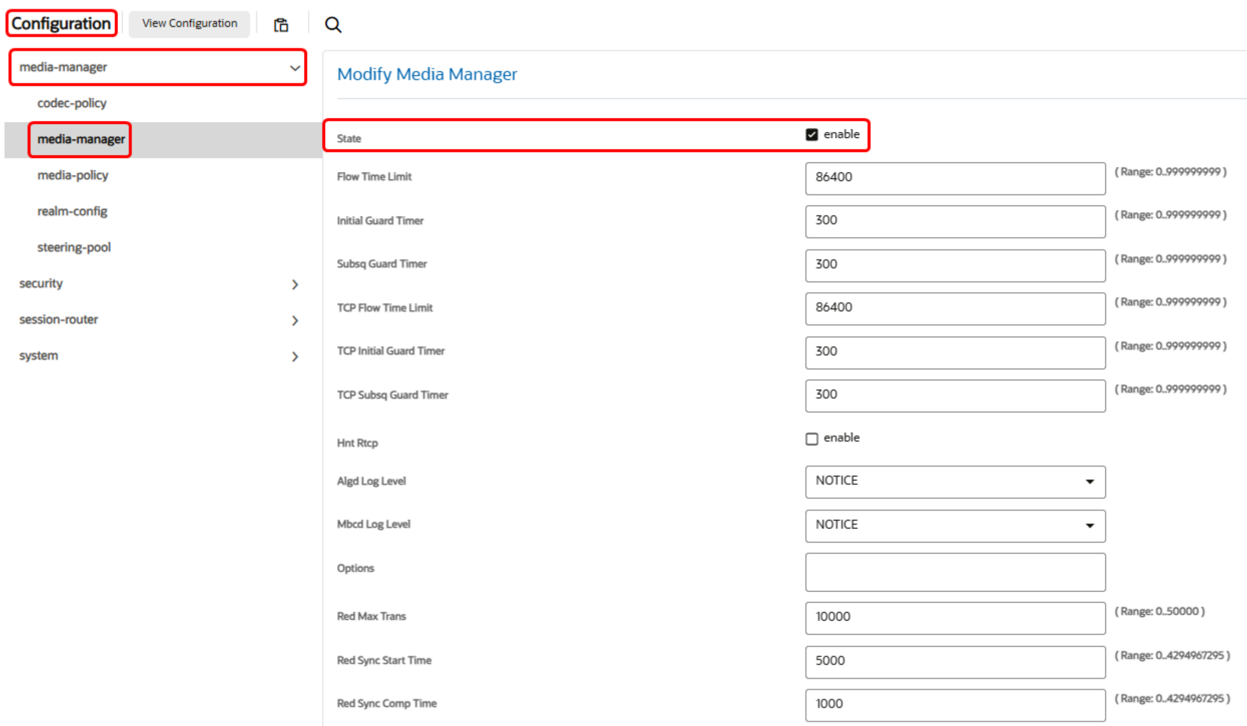

Figure 2: Media Manager Configuration

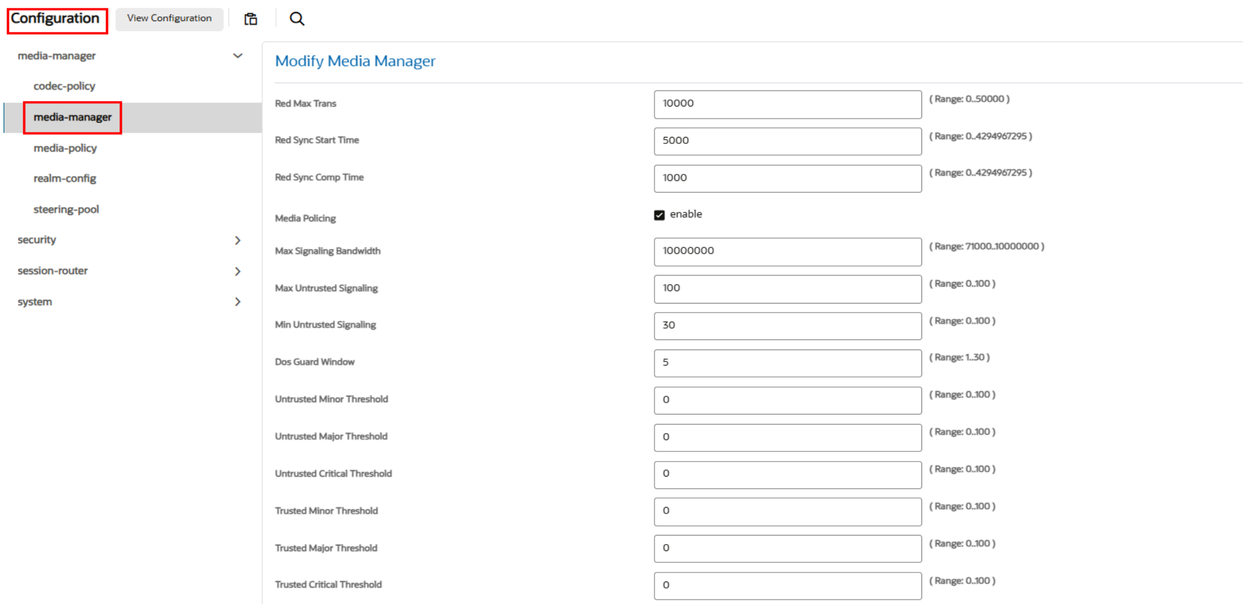

Figure 3: Media Manager Configuration (Cont.)

7.4.2 Physical Interface

- Navigate to **Configuration □ system □ phy-interface.**
- Configure Physical interface towards Google CES, OnPrem PBX and PSTN Gateway as shown below.

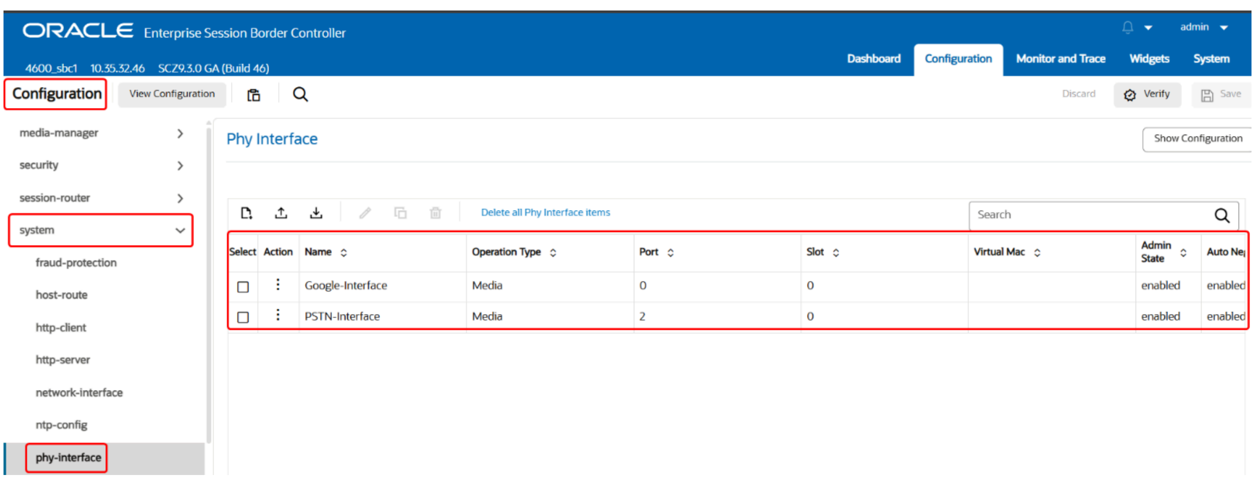

Figure 4: Physical Interfaces

- The interface designated towards Google CES is named as Google-Interface (Slot 0, Port 0).

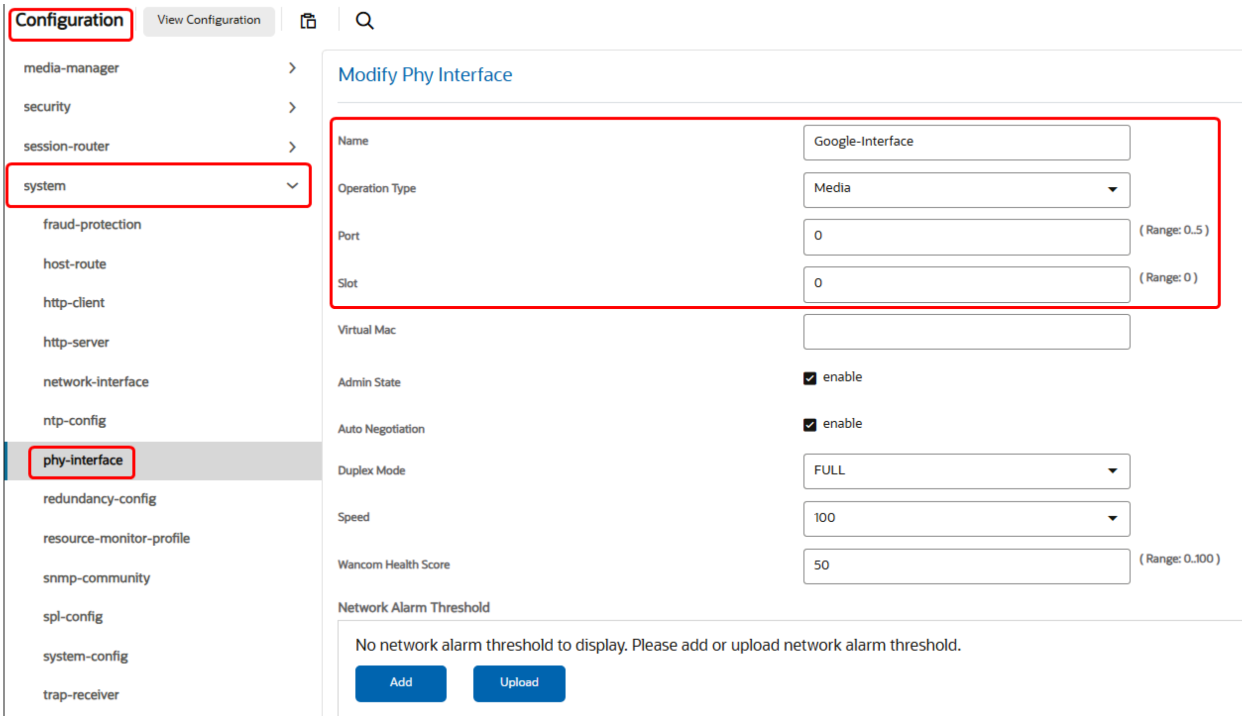

Figure 5: Physical Interface towards Google CES

- The interface designated towards PSTN Gateway and OnPrem PBX are named as PSTN-Interface (Slot 0, Port 2).

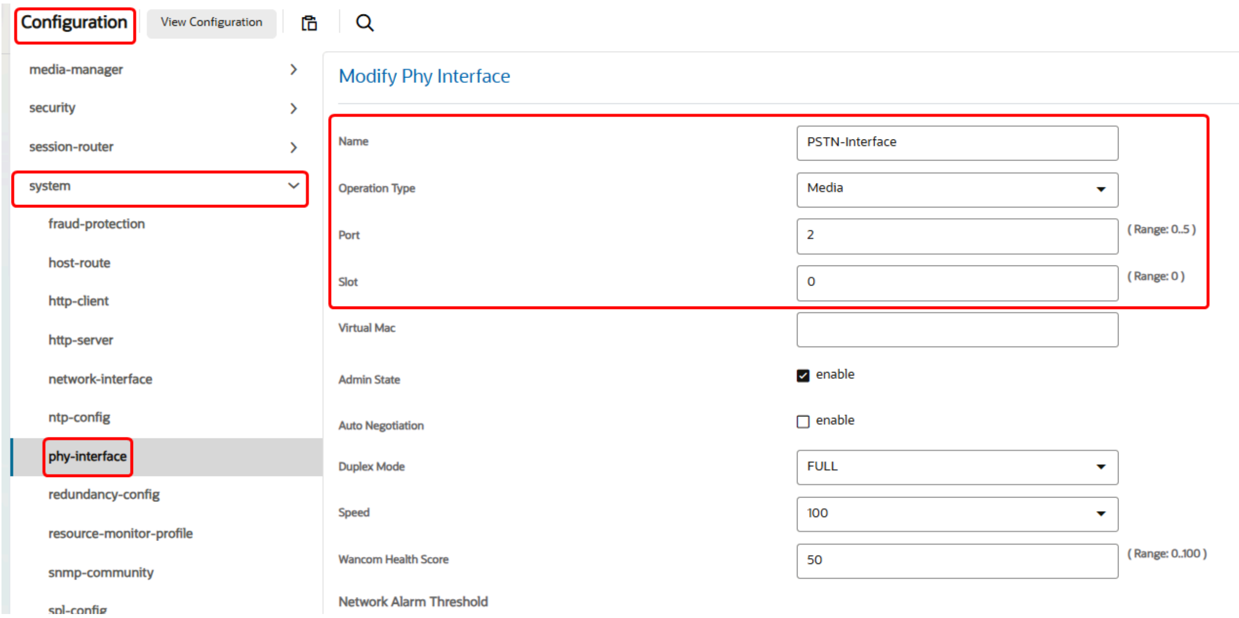

Figure 6: Physical Interface towards PSTN Gateway and OnPrem PBX

7.4.3 Network Interface

- Navigate to **Configuration** □ **system** □ **network-interface**.
- Configure network interface towards Google CES, OnPrem PBX and PSTN Gateway as shown below.

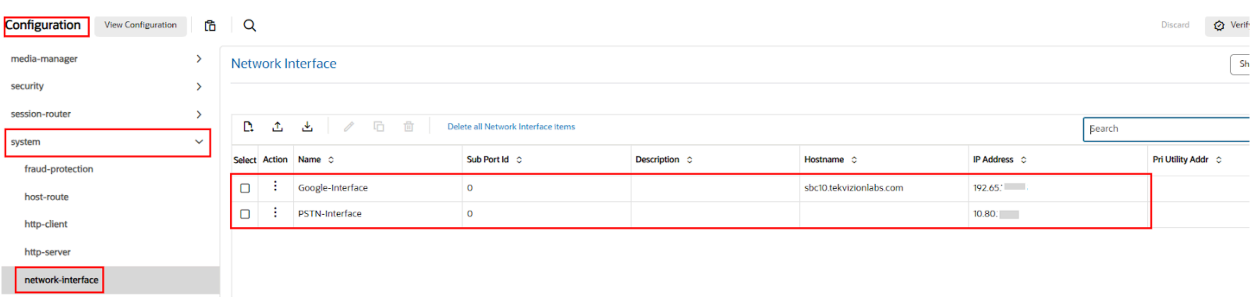

Figure 7: Network Interfaces

- Configure Network interface towards Google CES as shown below.

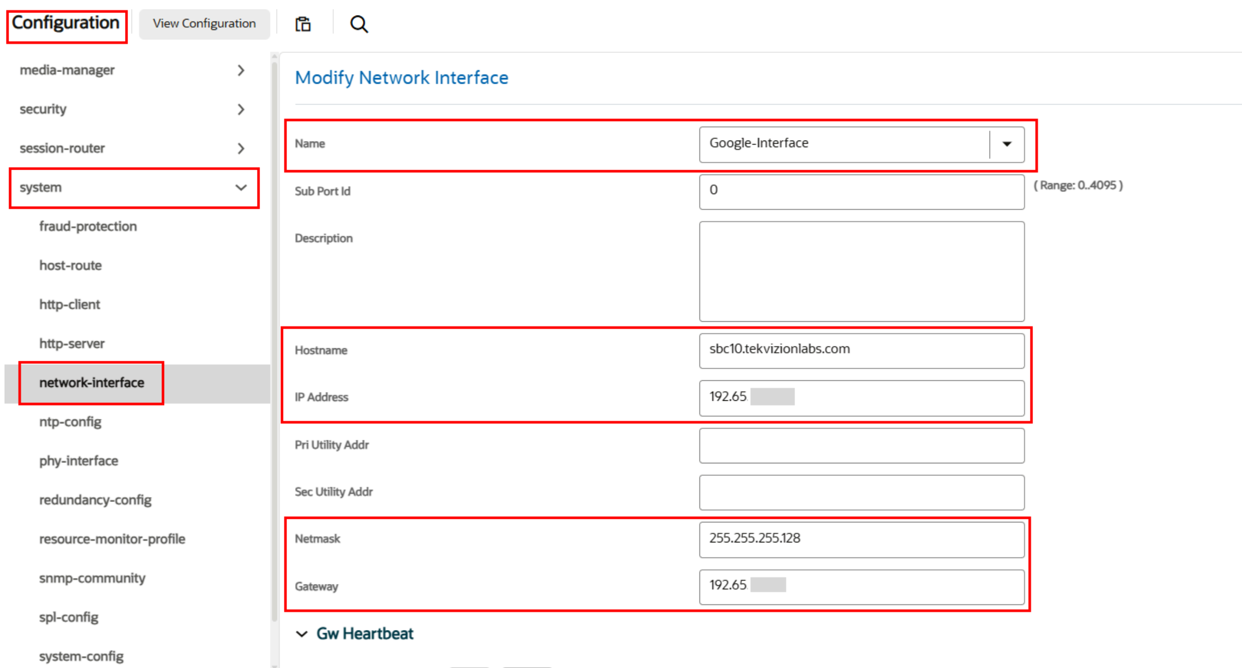

Figure 8: Network Interface towards Google CES

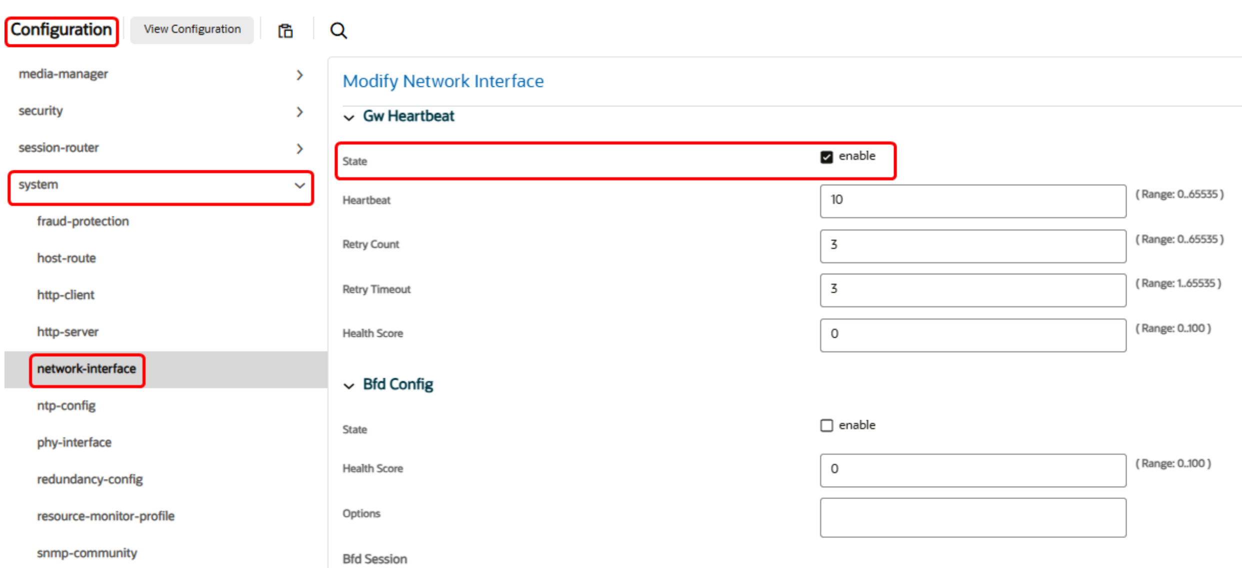

Figure 9: Network Interface towards Google CES (Cont.)

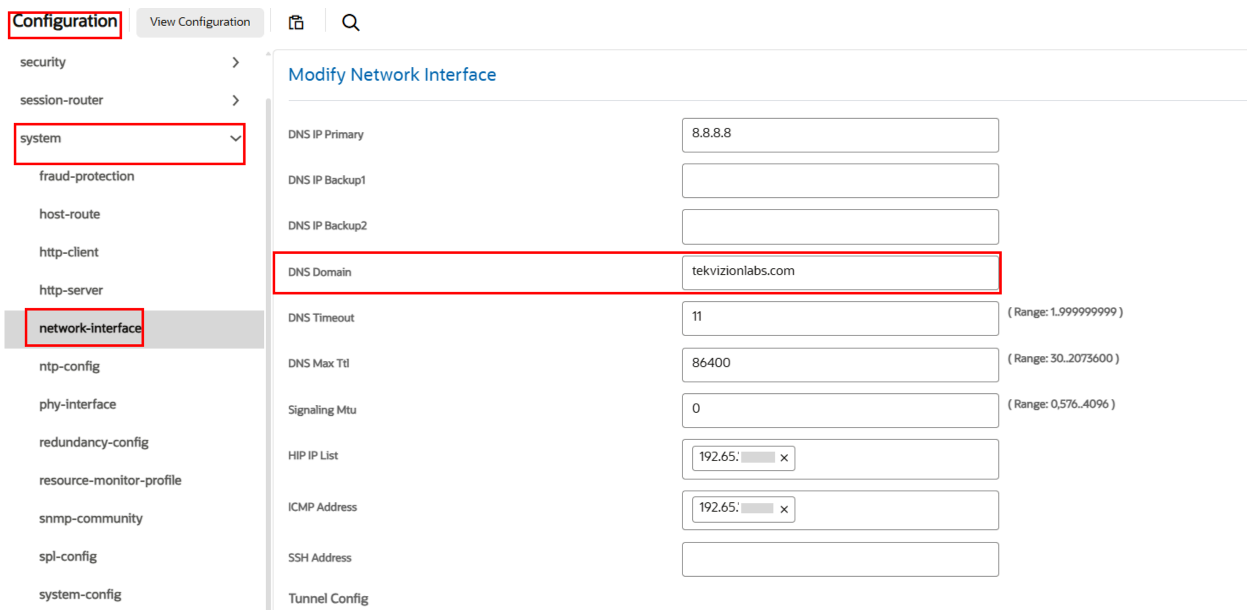

Figure 10: Network Interface towards Google CES (Cont.)

- Configure the Network interface towards OnPrem PBX and PSTN Gateway as shown below.

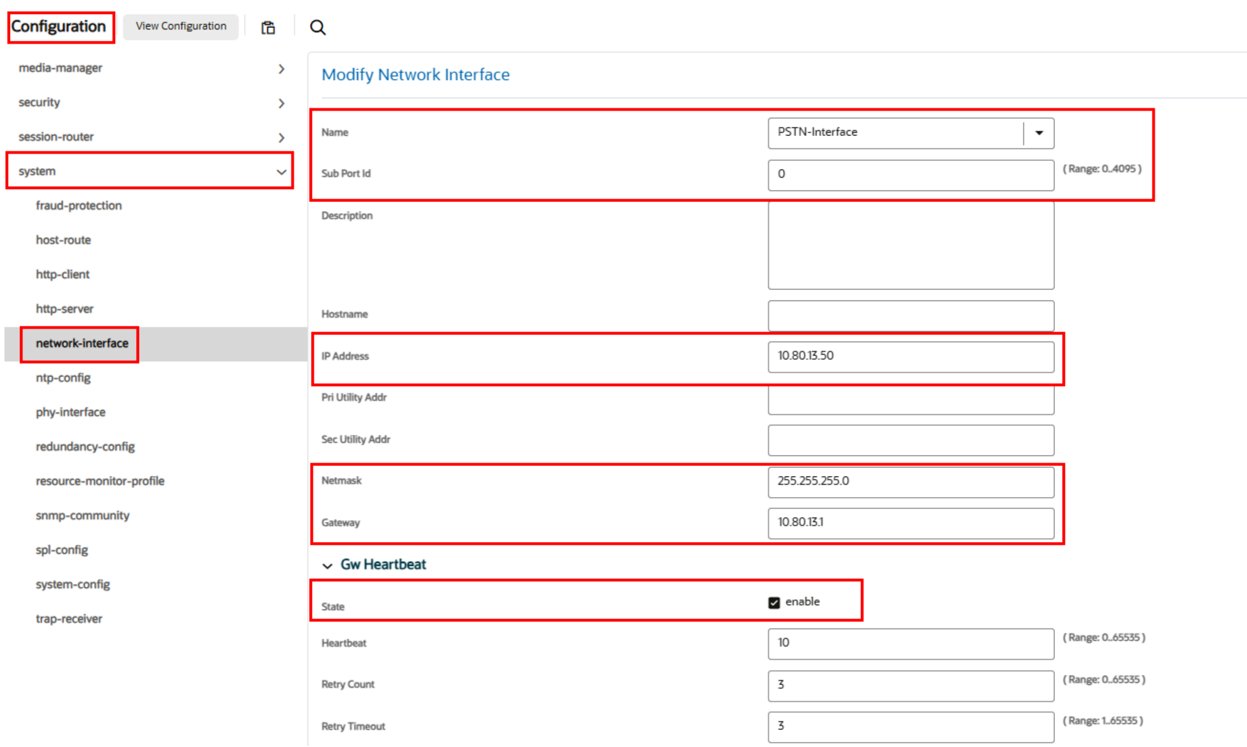

Figure 11: Network Interface towards OnPrem PBX and PSTN Gateway

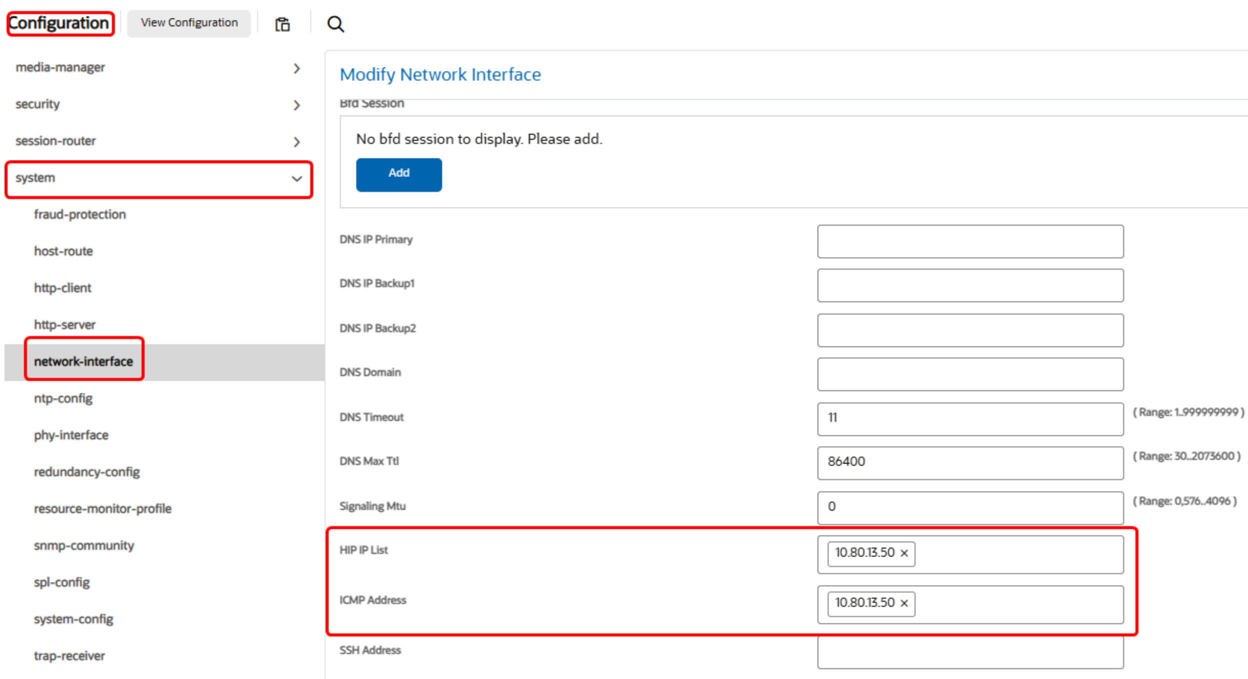

Figure 12: Network Interface towards OnPrem PBX and PSTN Gateway (Cont.)

- **Note:** ICMP IP and HIP IP addresses needs to be disabled in production environment.

7.4.4 SIP Config

- Navigate to **Configuration** ⎕ **session-router** ⎕ **sip-config** for SIP configuration as shown below.

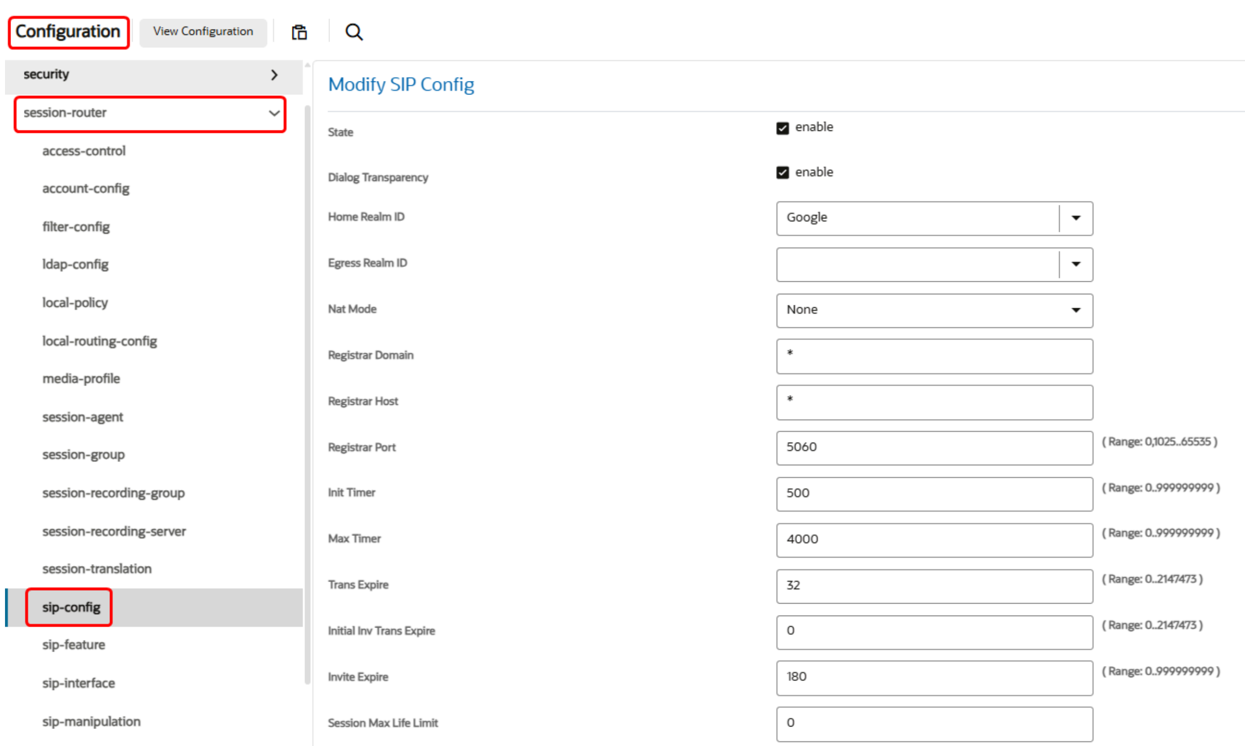

Figure 13: SIP-Config

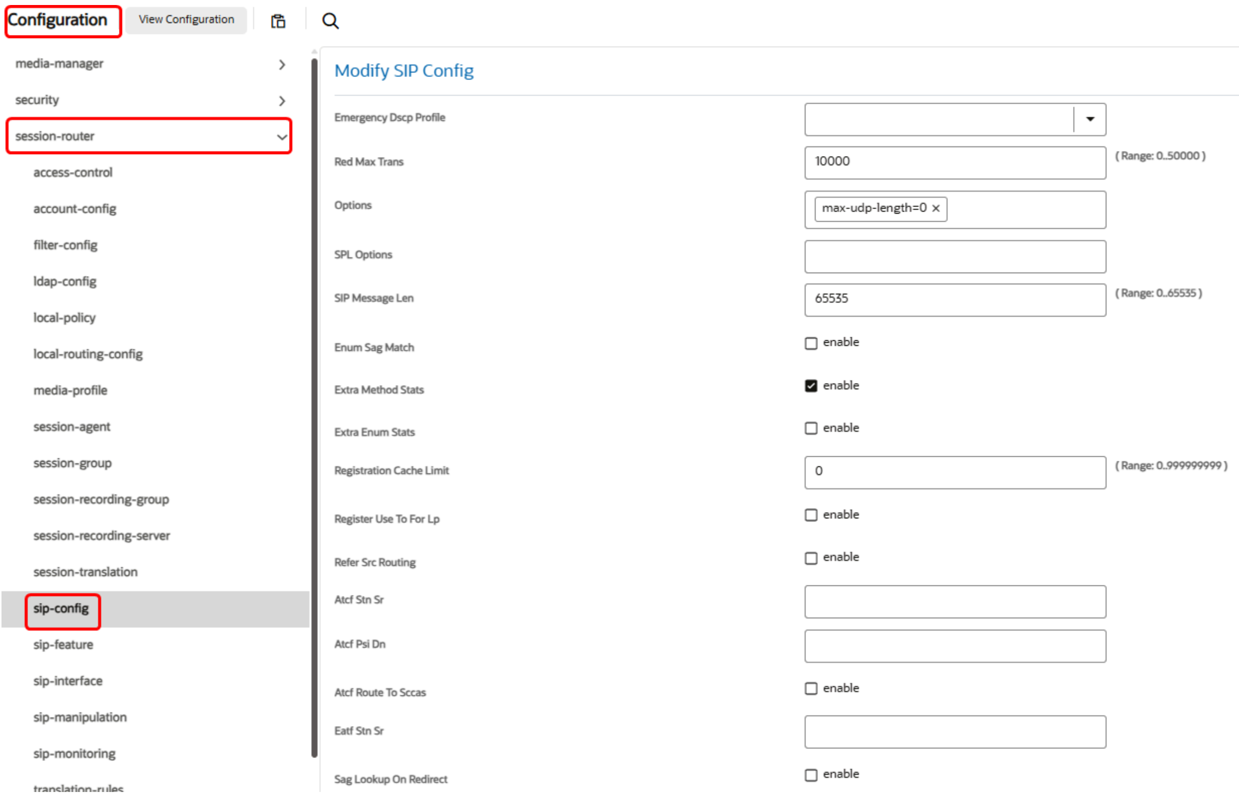

Figure 14: SIP-Config (Cont.)

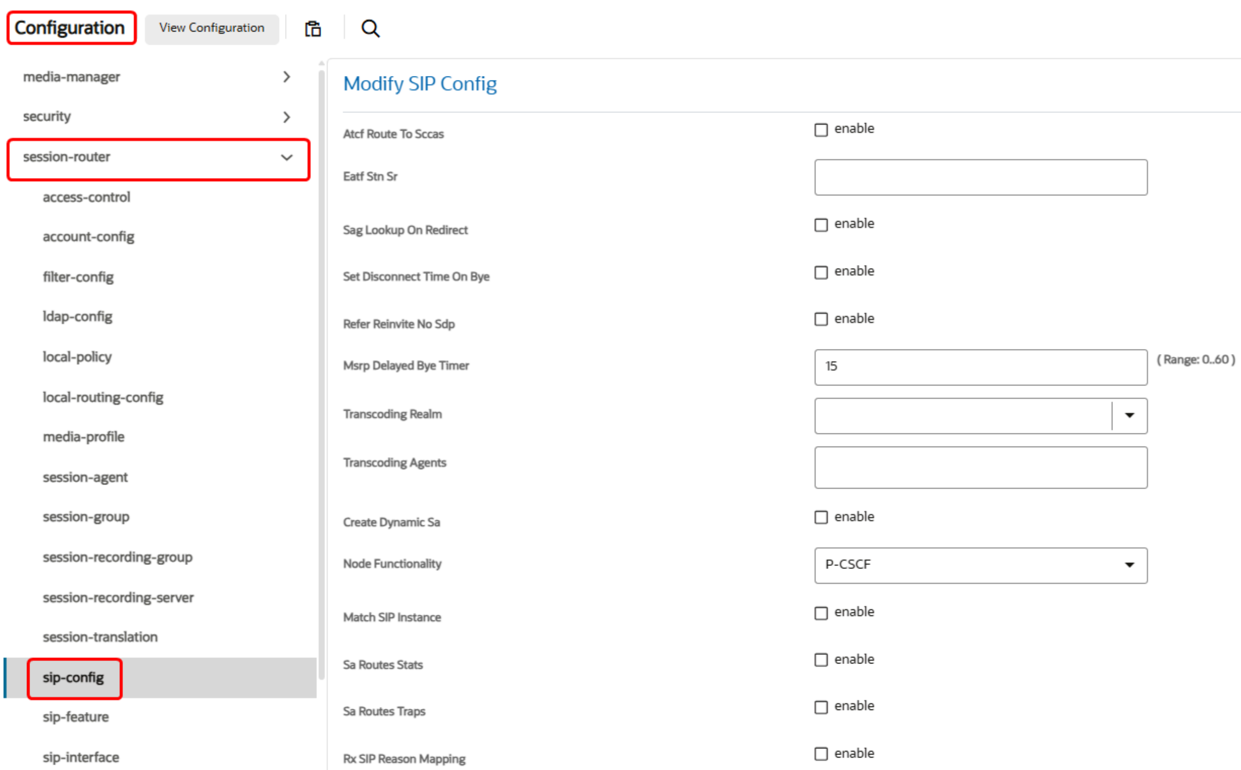

Figure 15: SIP-Config (Cont.)

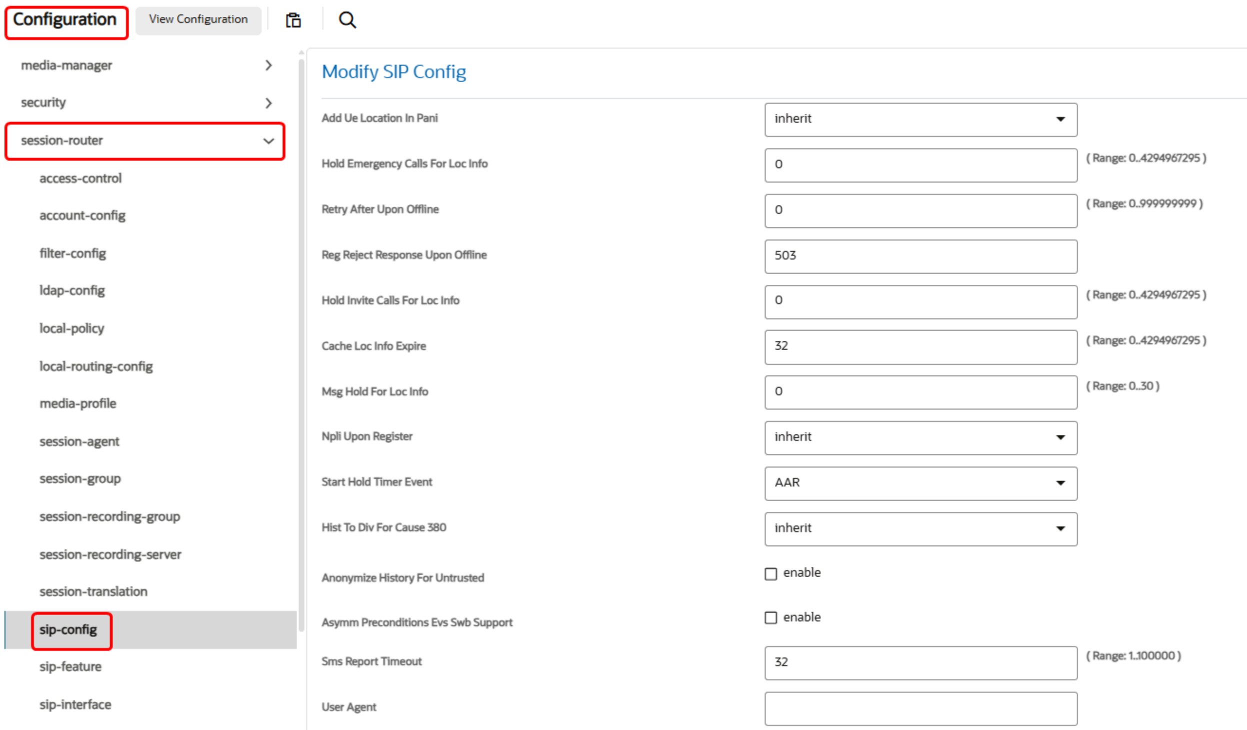

Figure 16: SIP-Config (Cont.)

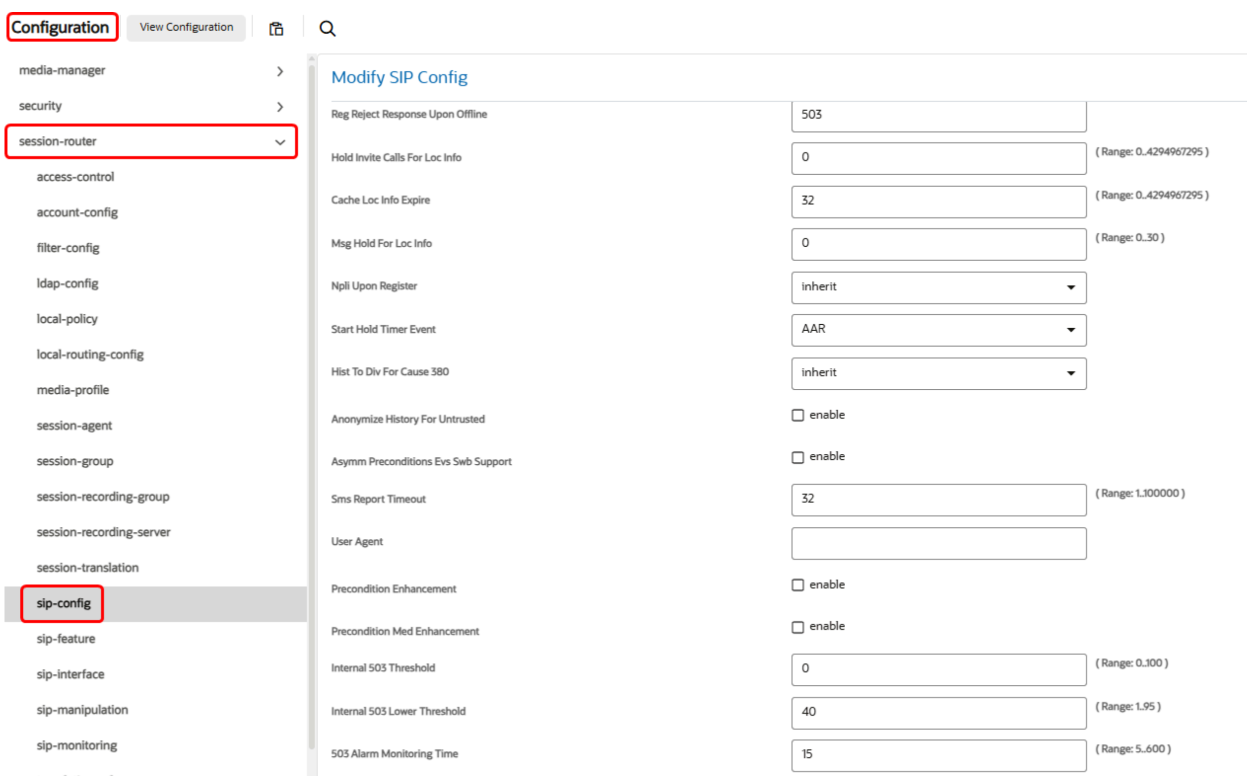

Figure 17: SIP-Config (Cont.)

7.4.5 System-Config

- Navigate to **Configuration** **system** **system-config** for system configuration as shown below.

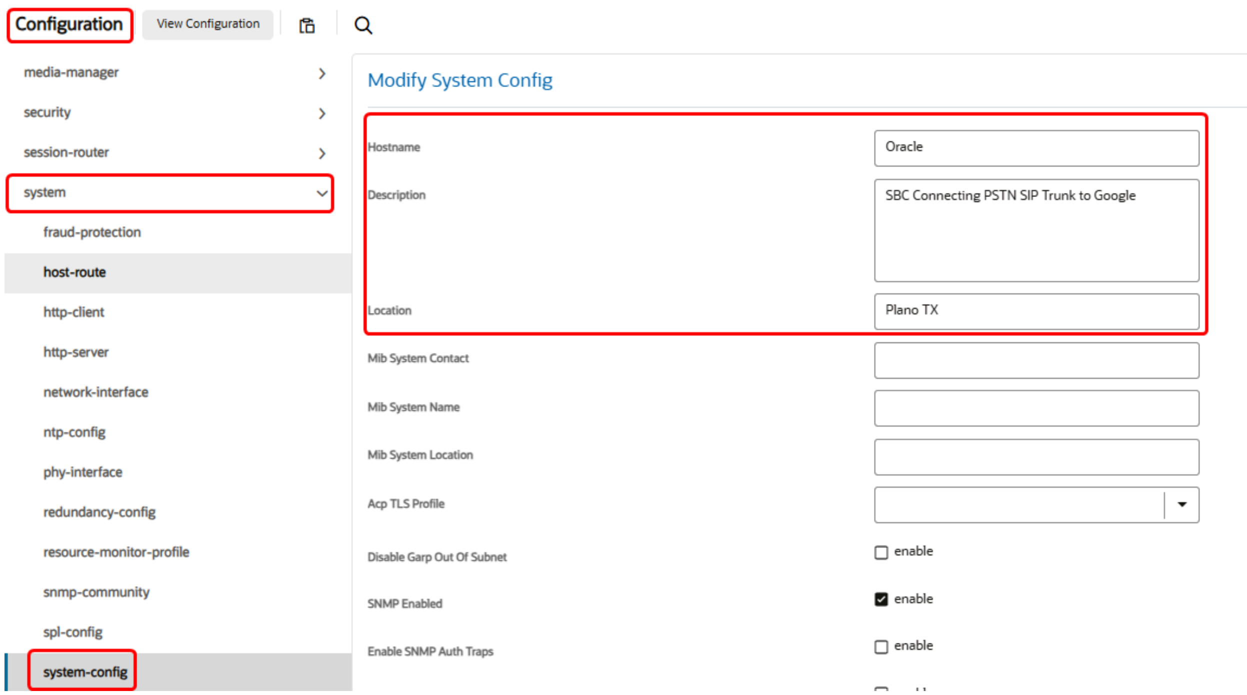

Figure 18: System-Config

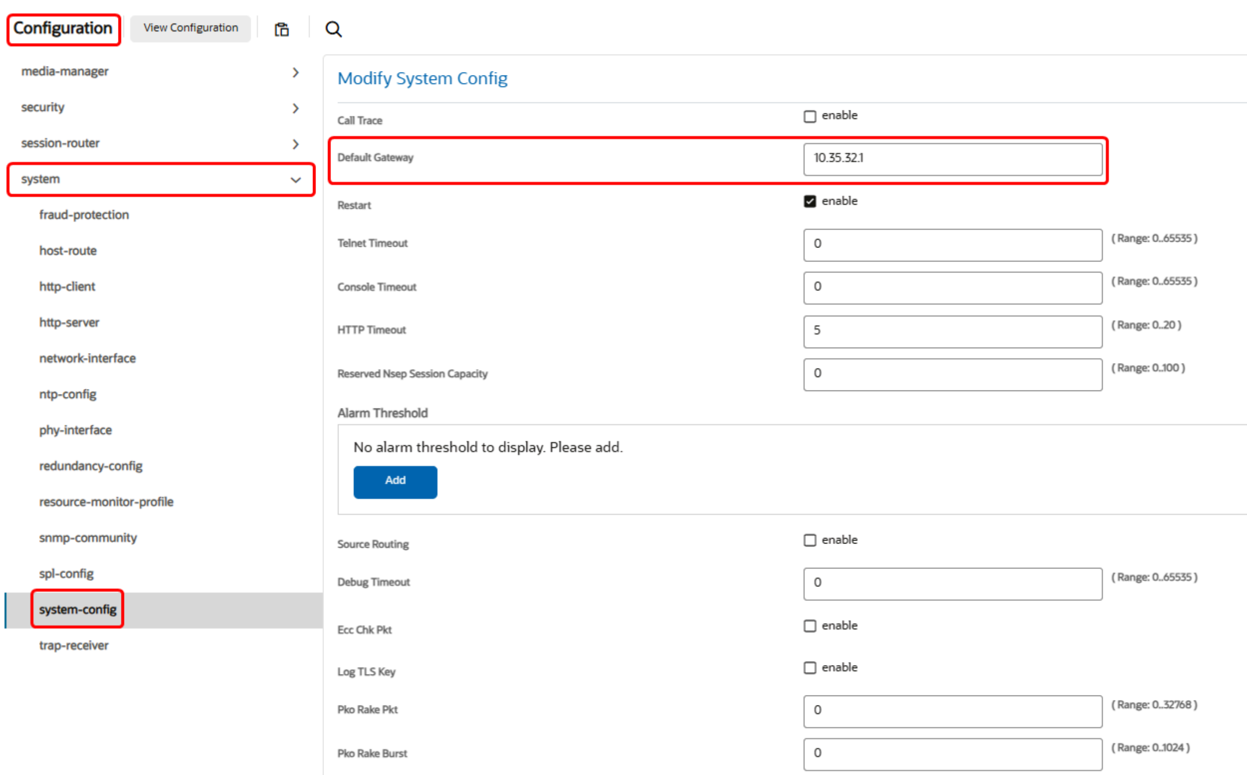

Figure 19: System-Config (Cont.)

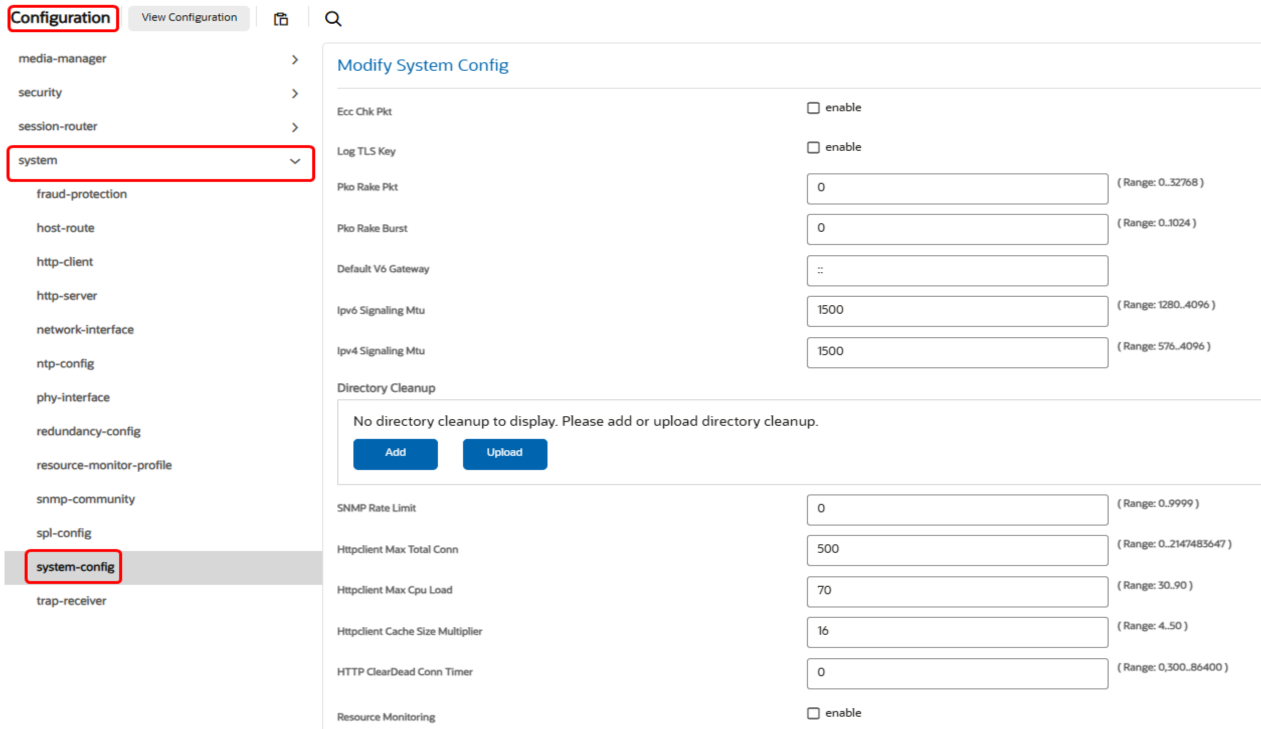

Figure 20: System-Config (Cont.)

7.4.6 SIP Monitoring

- Navigate to **Configuration** □ **session-router** □ **sip-monitoring** and configure SIP monitoring for capturing trace as shown below.

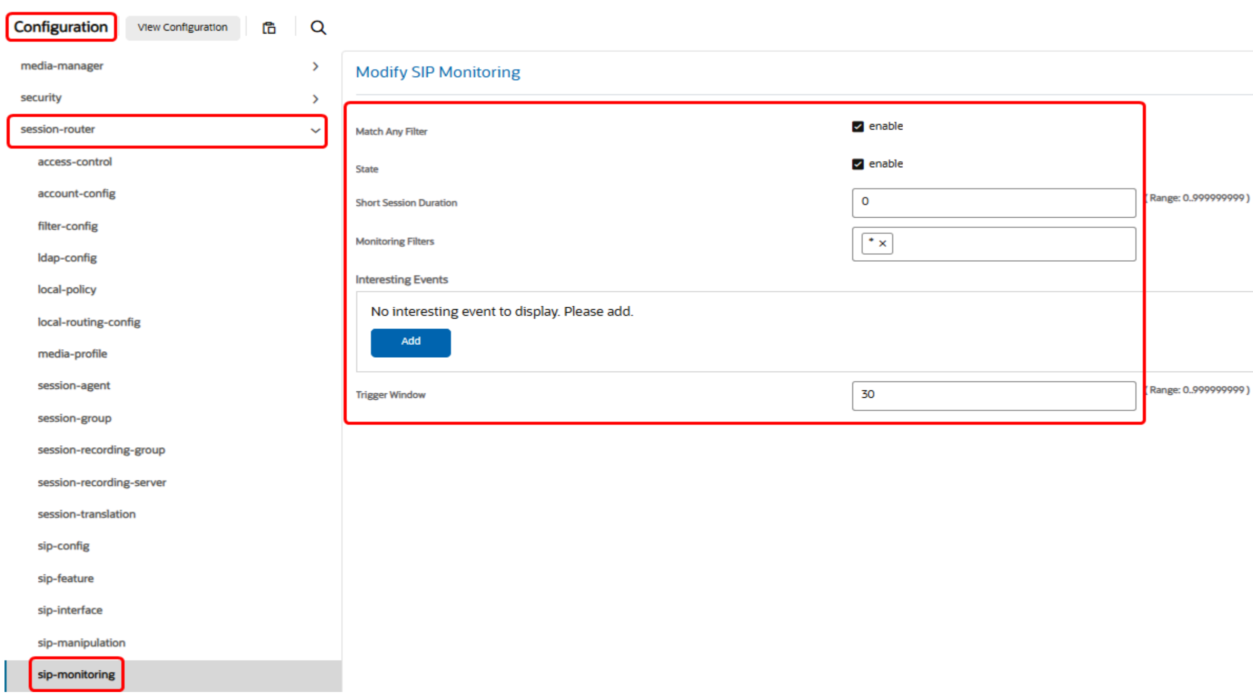

Figure 21: SIP Monitoring

7.4.7 HTTP Server

- Navigate to **Configuration** **system** **http-server** and configure HTTP Server for GUI access to Oracle E-SBC as shown below.

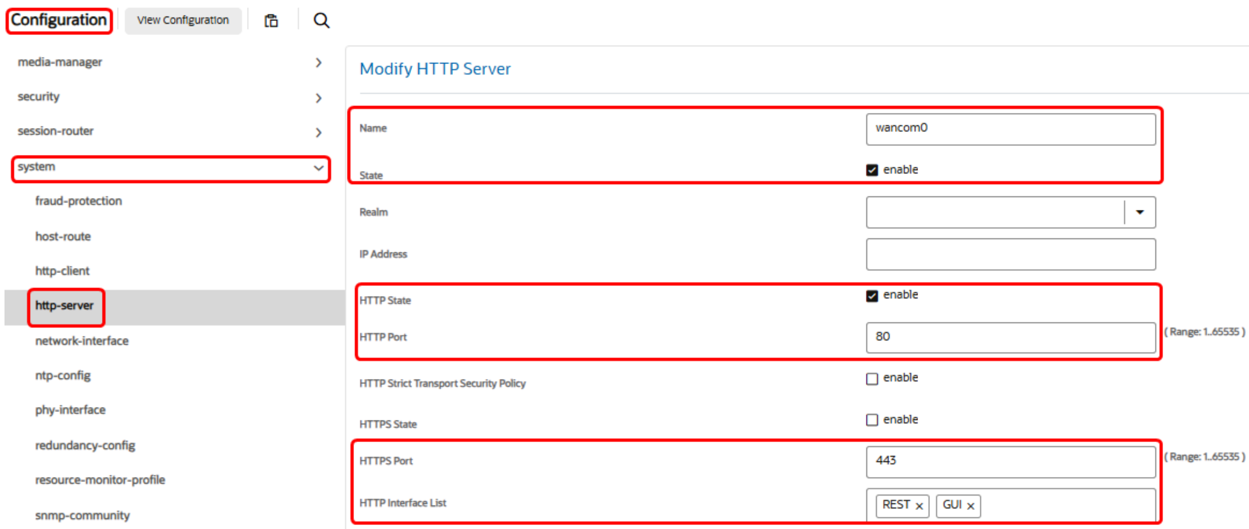

Figure 22: HTTP Server

7.4.8 Codec Policy

- Navigate to **Configuration** **media-manager** **codec-policy** and configure codec policy for Google CES as shown below.

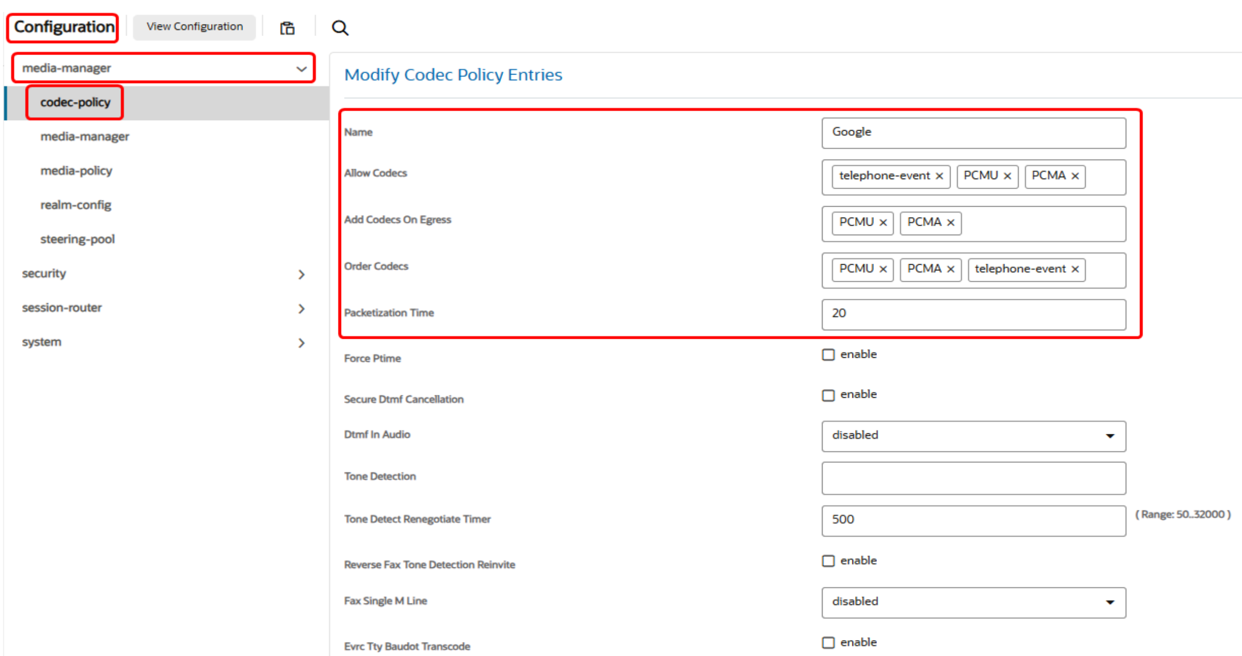

Figure 23: Codec Policy for Google CES

7.4.9 Translation Rules

- Navigate to **Configuration** → **session-router** → **translation-rules** and configure translation rules for Google CES as shown below.
- Translation rule is created to send E.164 number format towards Google CES.
- These translation rules (adding or removing plus) are further mapped in Session Translation Section 7.4.10

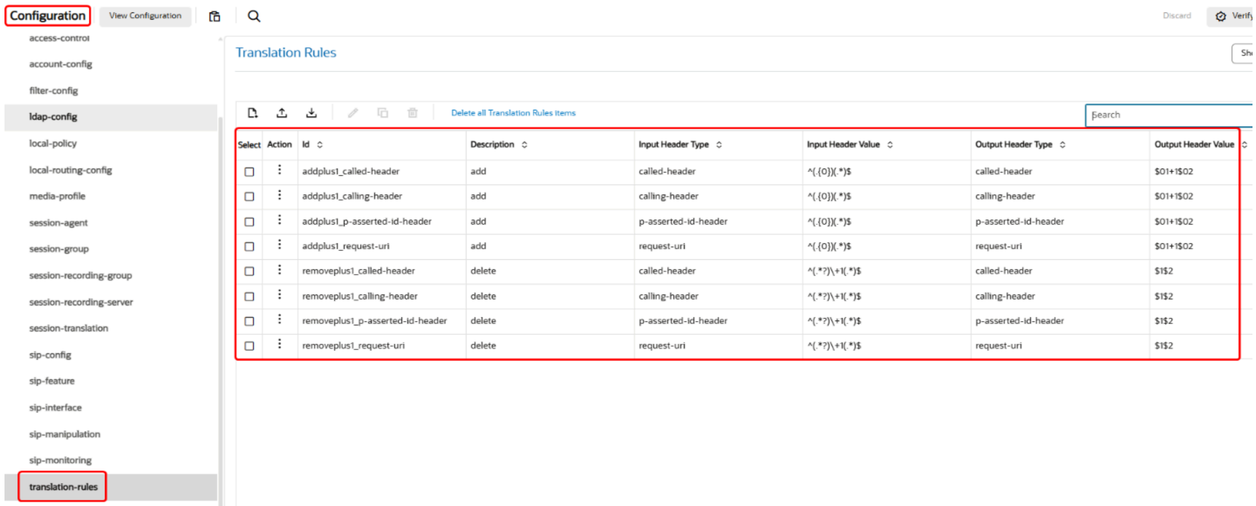

Figure 24: Translation Rule to add or remove E.164 format Google CES

7.4.10 Session Translation

- Navigate to **Configuration** □ **session-router** □ **session-translation**. The translation rules configured in Section 7.4.9 is mapped to Google CES is shown below.

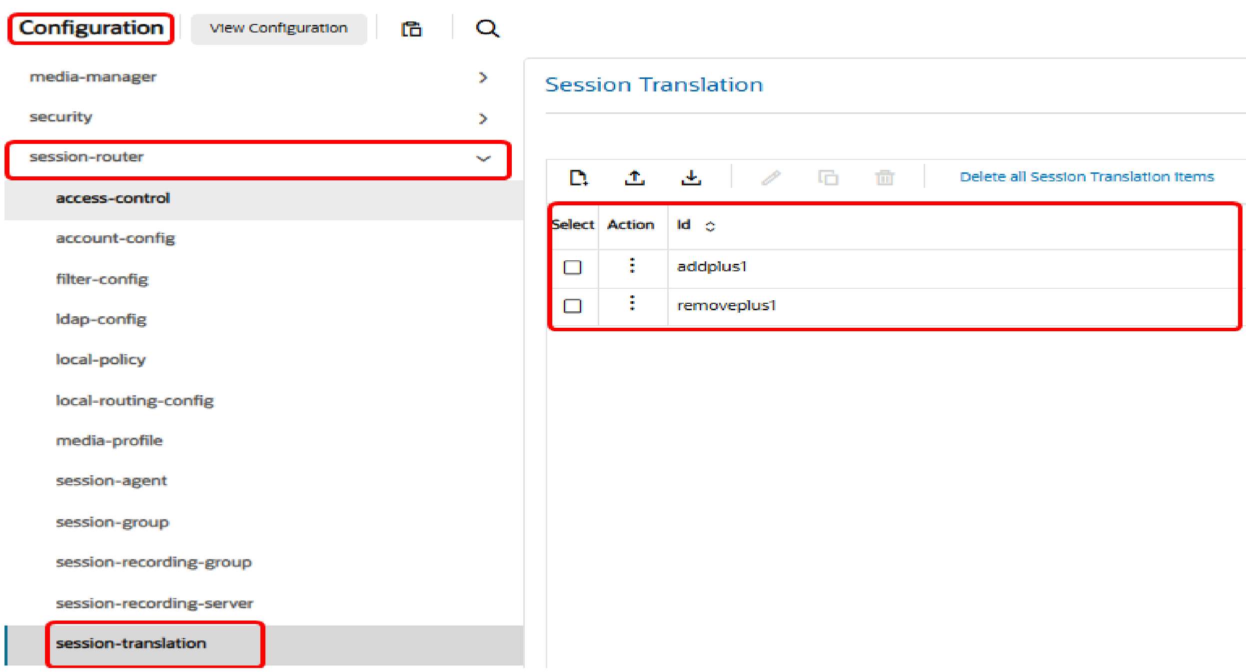

Figure 25: Session Translation towards Google CES

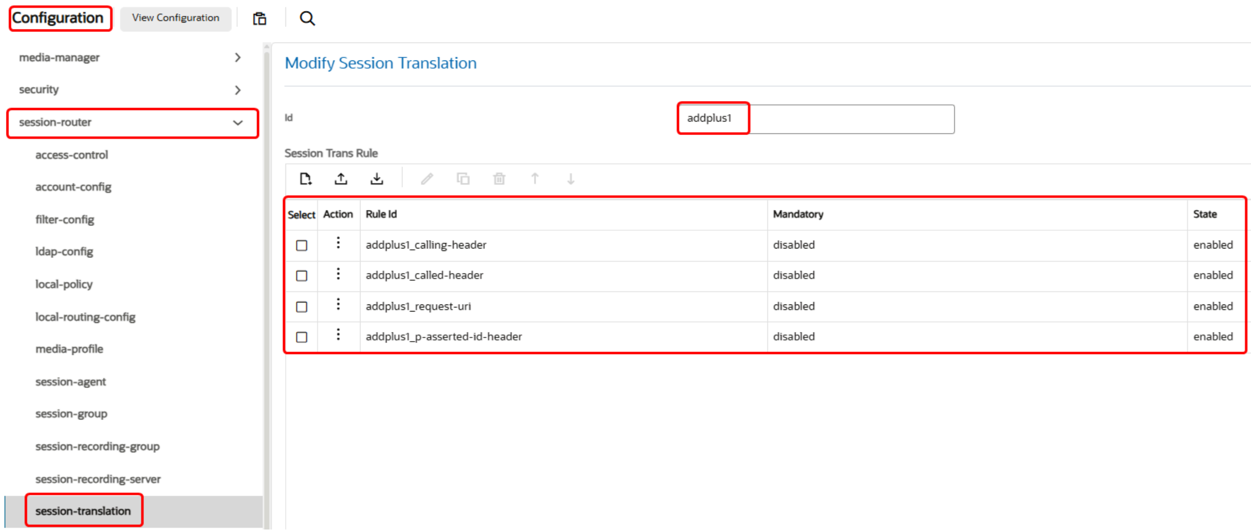

Figure 26: Session Translation for addplus1 towards Google CES (Cont.)

- Under removeplus1, we are removing the translation rules for created on Section 7.4.9

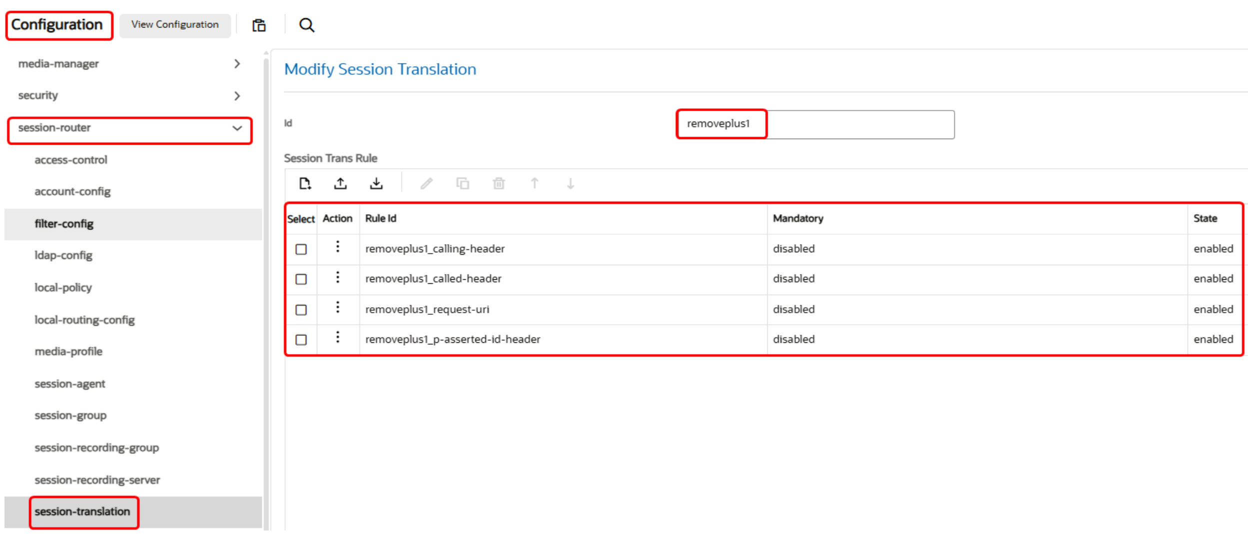

Figure 27: Session Translation for removeplus1 towards Google CES (Cont.)

7.4.11 Session Recording Server

- Navigate to **Configuration** □ **session-router** □ **session-recording-server** and select the destination as Google CES FQDN
- SIPREC profile for Google CES is created using the Session Recording Server.

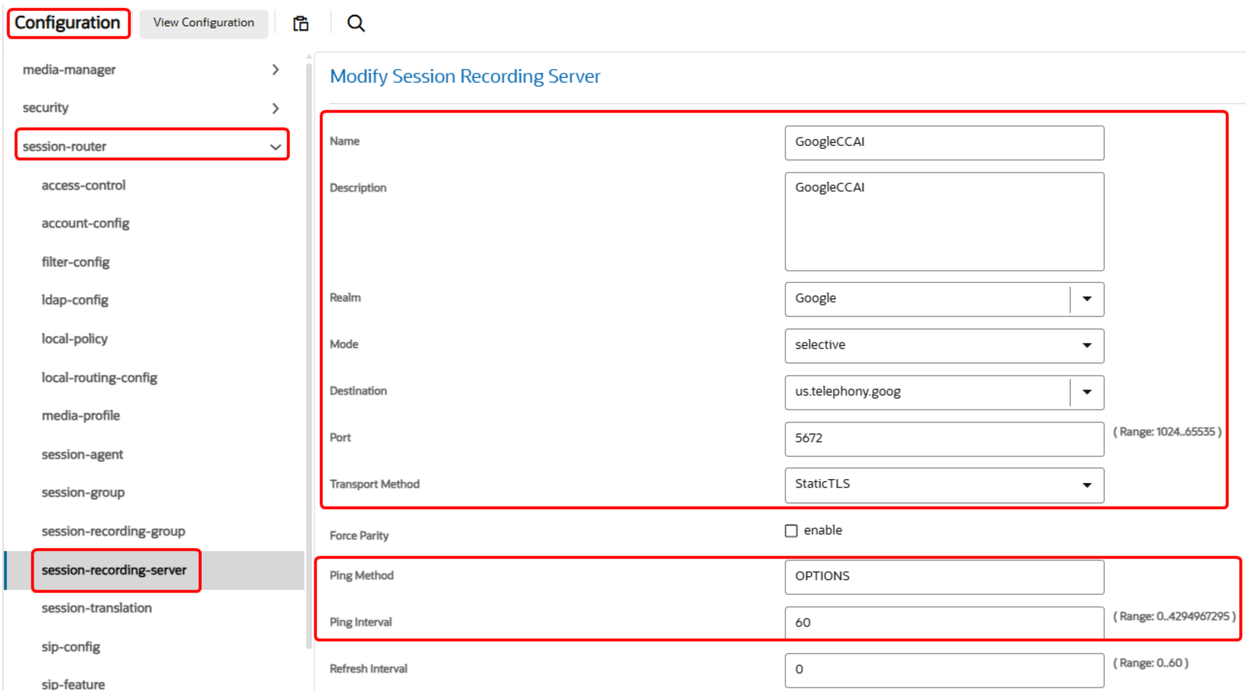

Figure 28: Session Recording Server towards Google CES

7.4.12 Realm Config

- Navigate to **Configuration** □ **media-manager** □ **realm-config.**

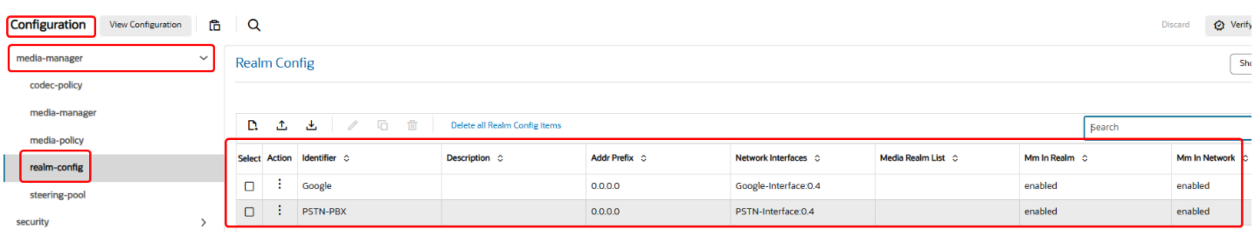

Figure 29: Realm Configuration

- Realm Config towards Google CES is shown below.

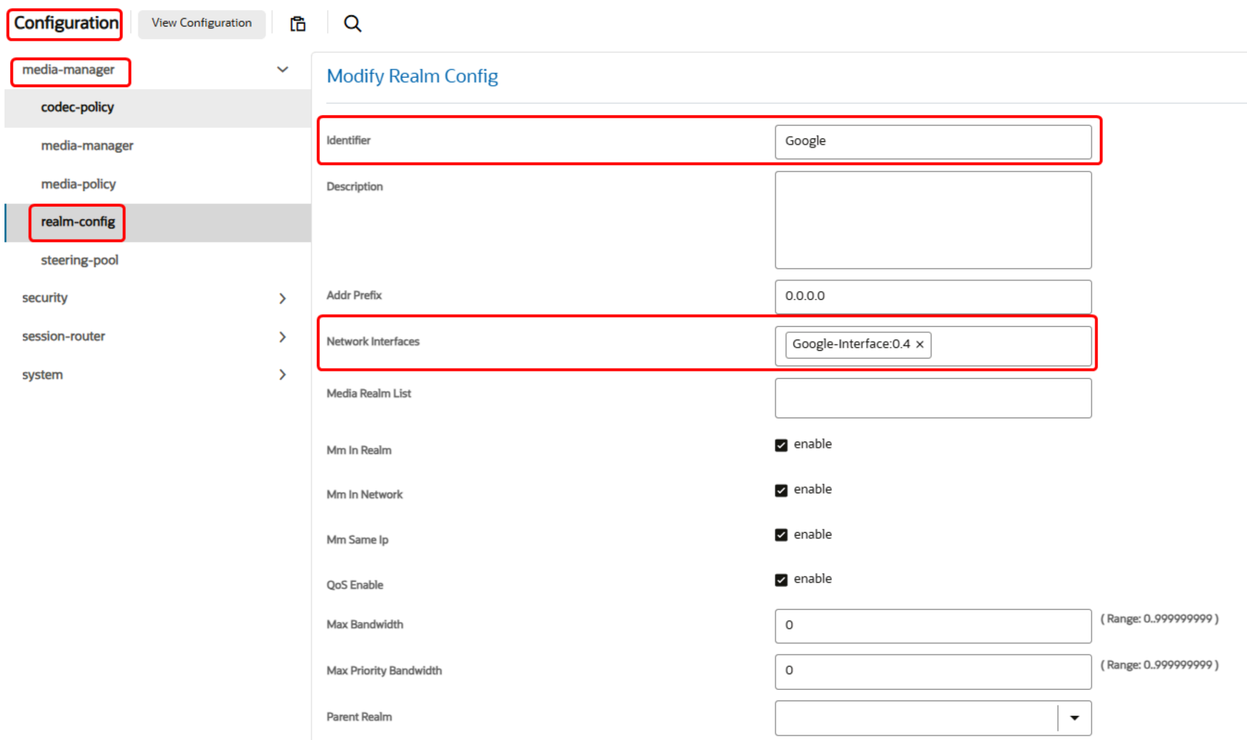

Figure 30: Realm Configuration towards Google CES (Cont.)

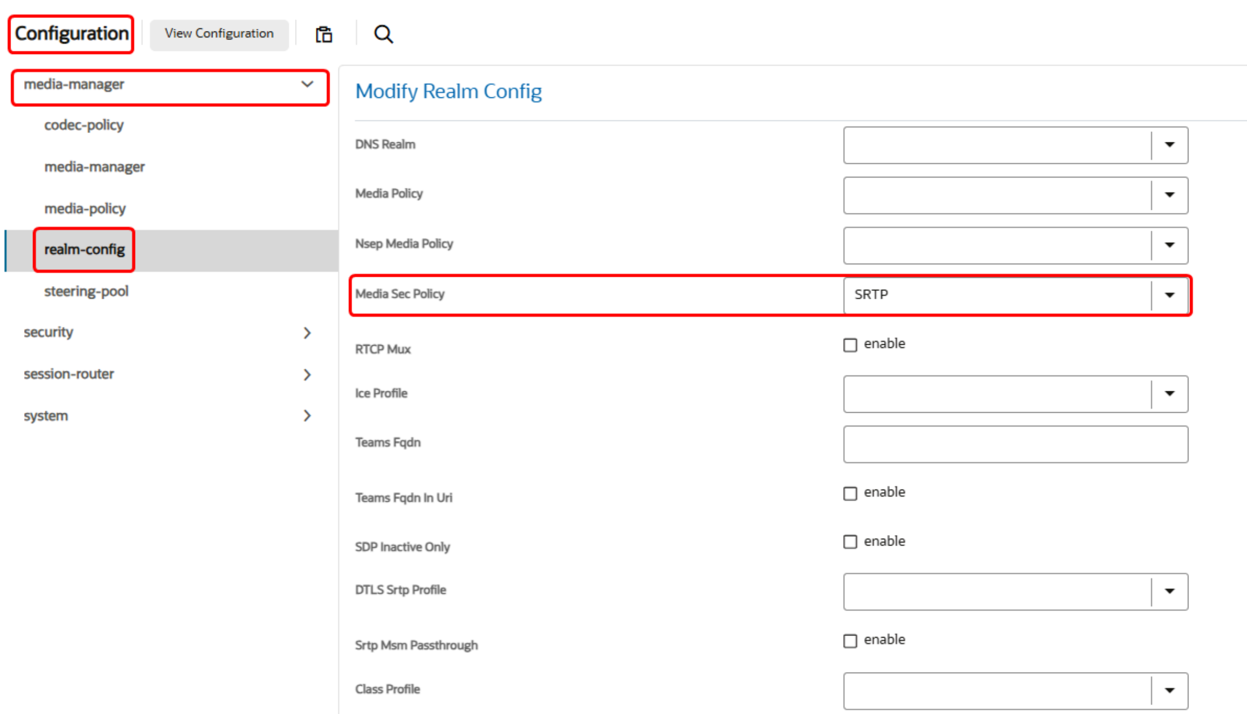

Figure 31: Realm Config towards Google CES (Cont.)

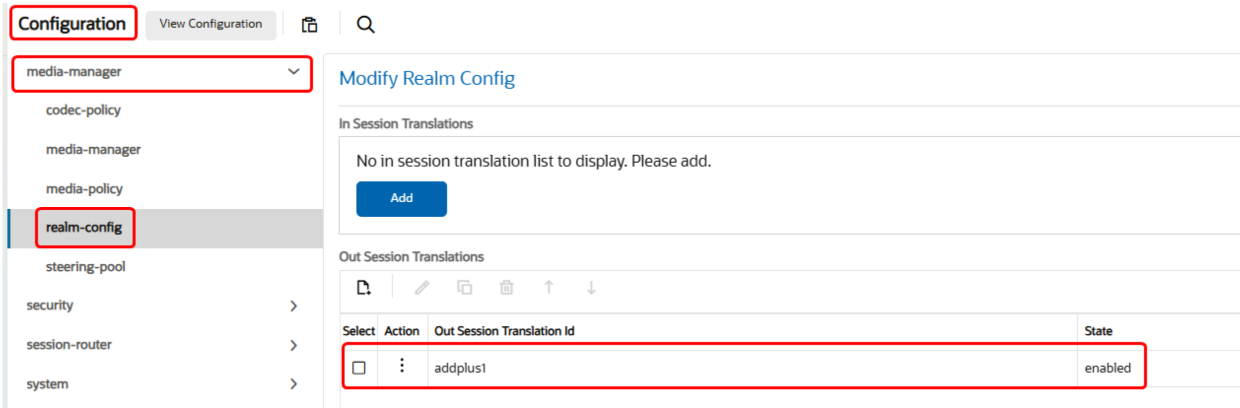

Figure 32: Realm Config towards Google CES (Cont.)

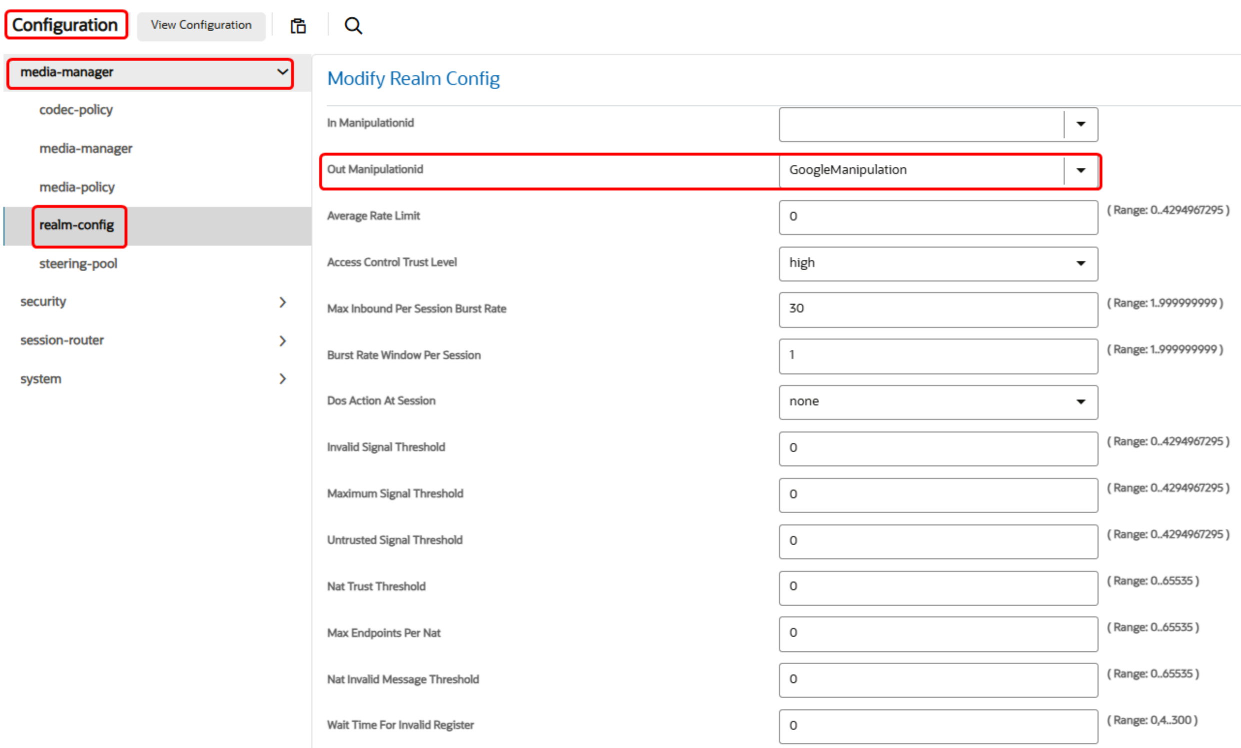

Figure 33: Realm Config towards Google CES (Cont.)

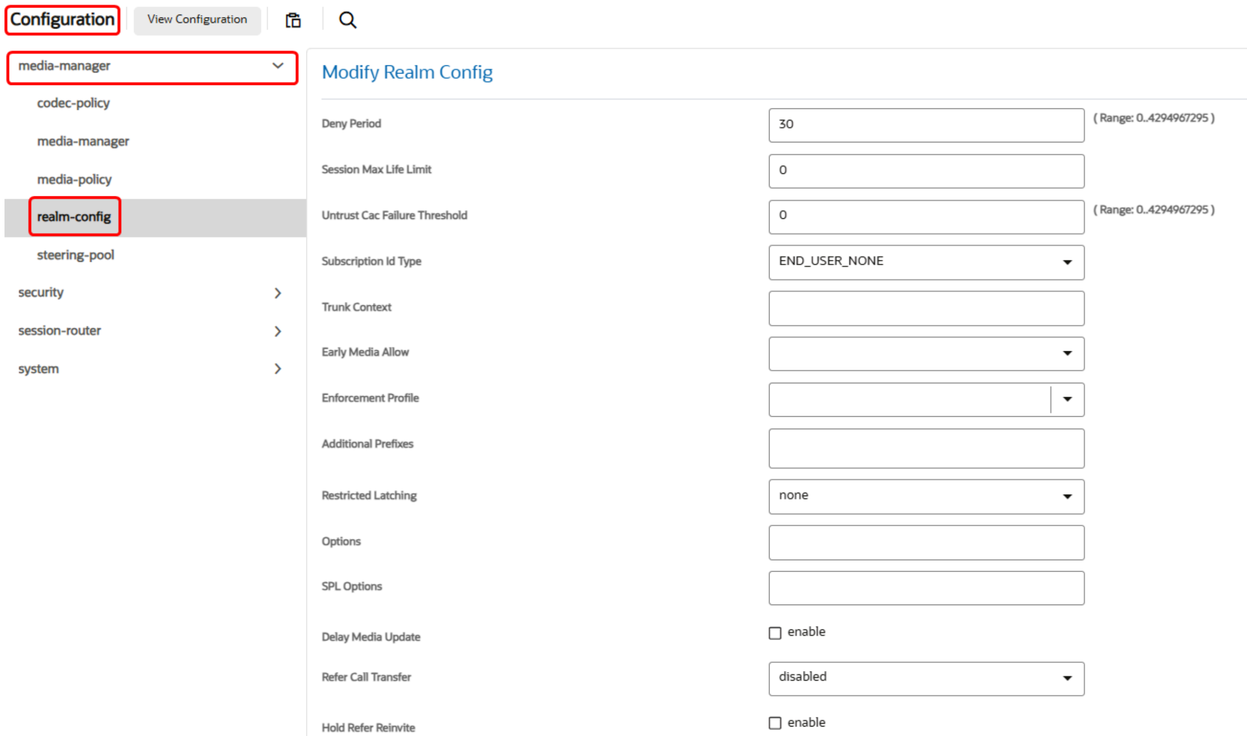

Figure 34: Realm Config towards Google CES (Cont.)

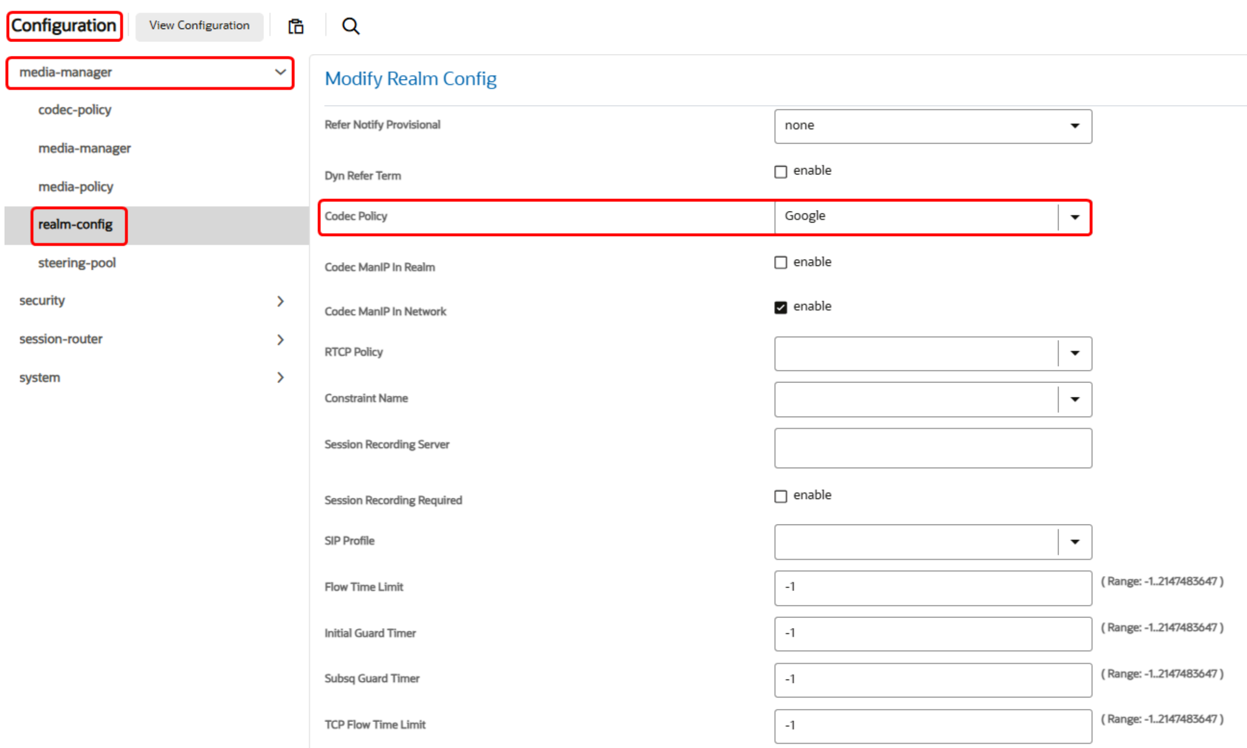

Figure 35: Realm Config towards Google CES (Cont.)

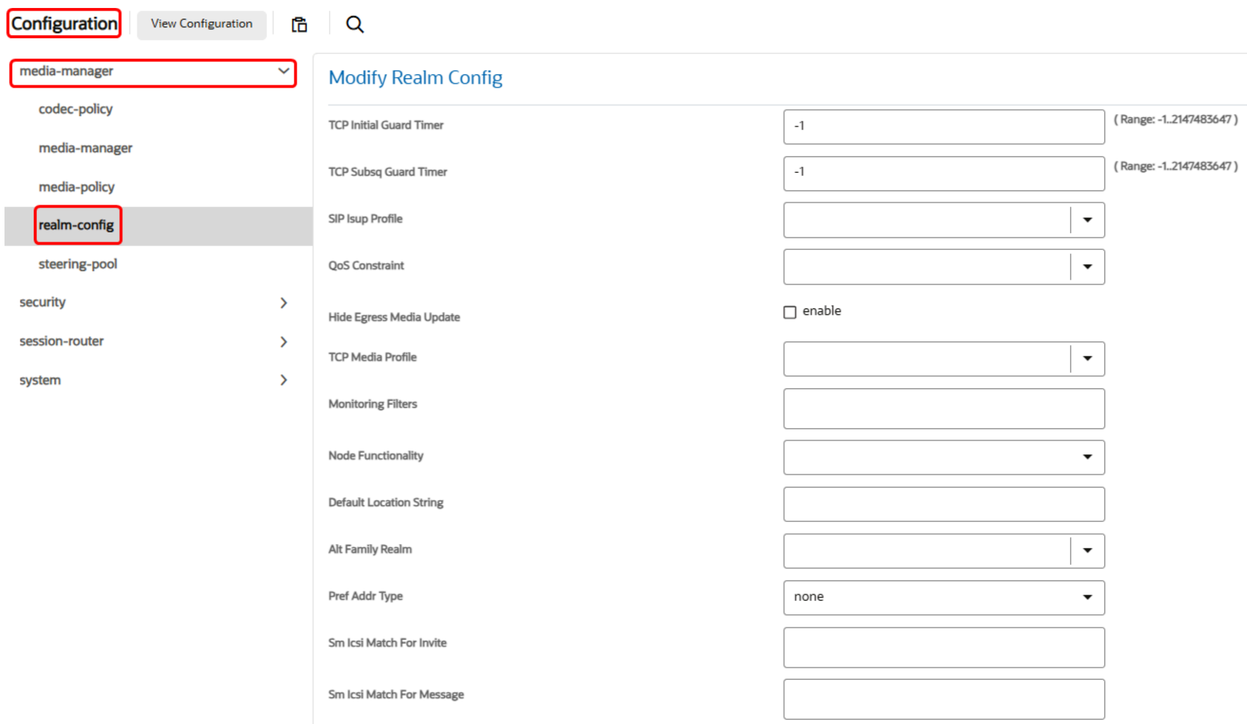

Figure 36: Realm Config towards Google CES (Cont.)

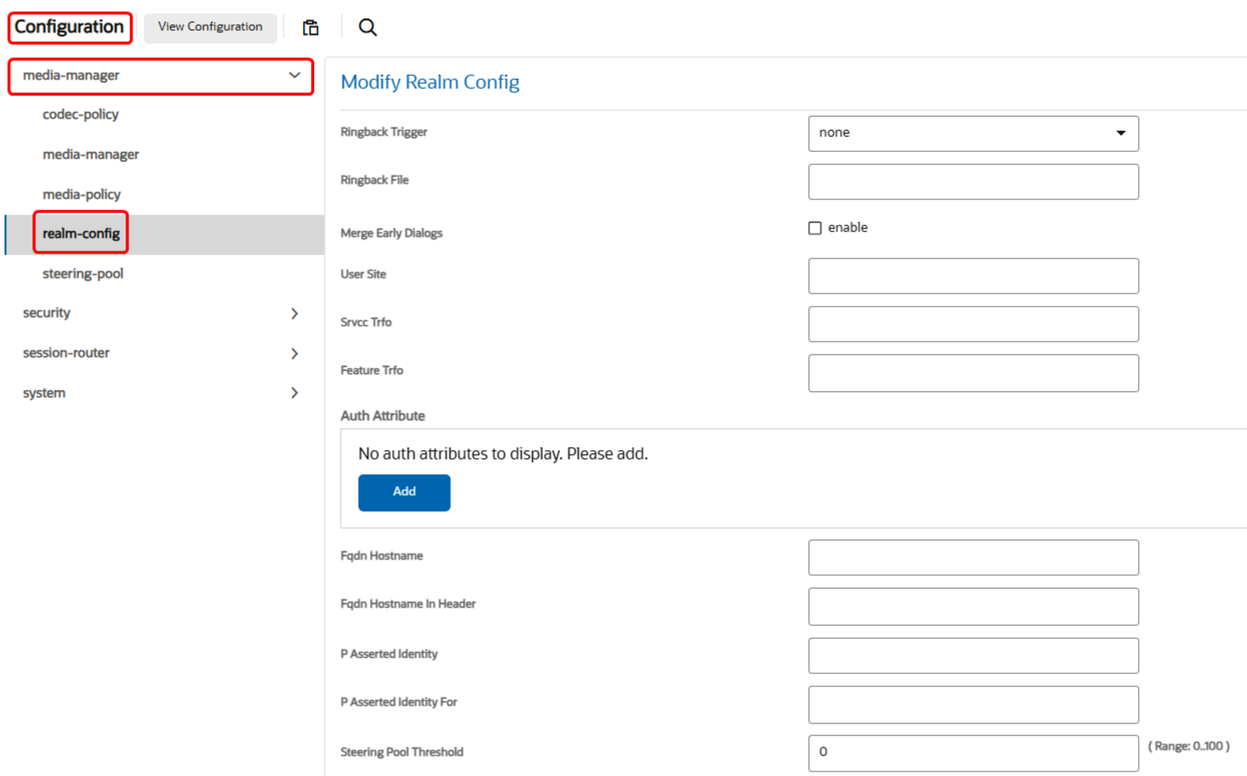

Figure 37: Realm Config towards Google CES (Cont.)

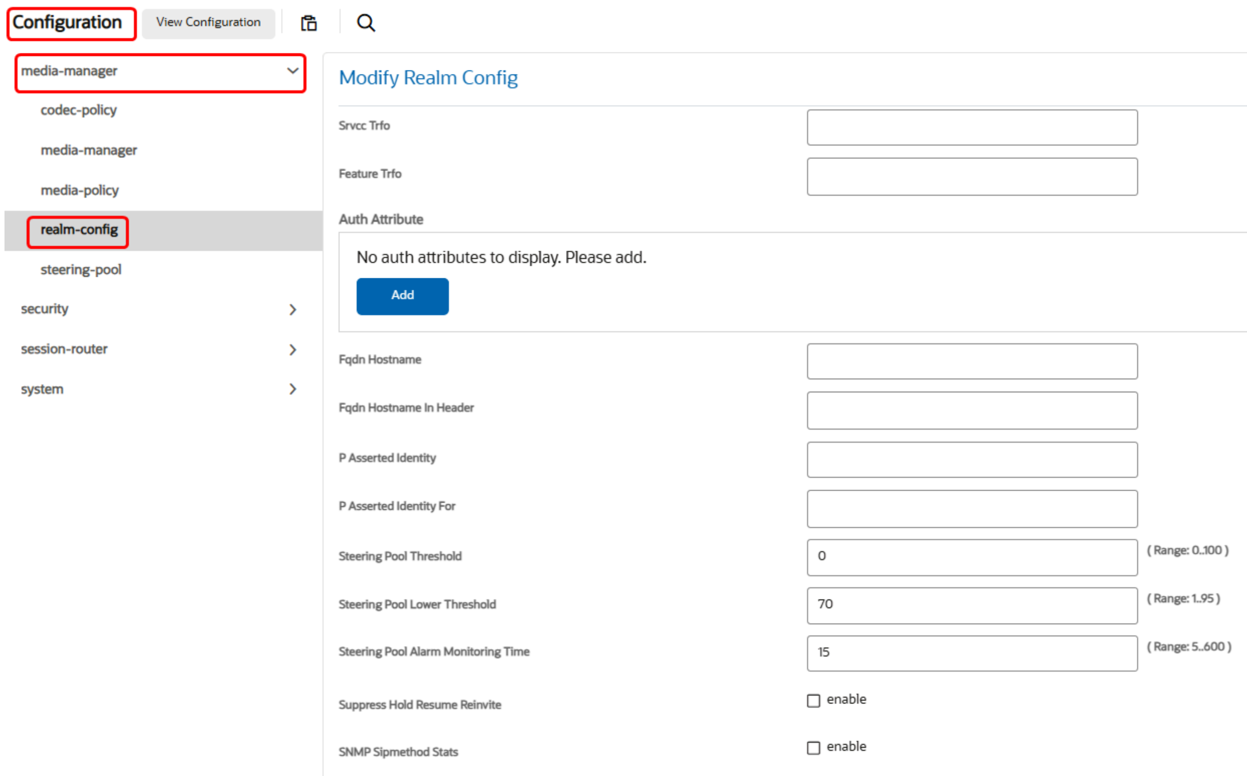

Figure 38: Realm Config towards Google CES (Cont.)

- Realm Config towards OnPrem PBX and PSTN Gateway is shown below.

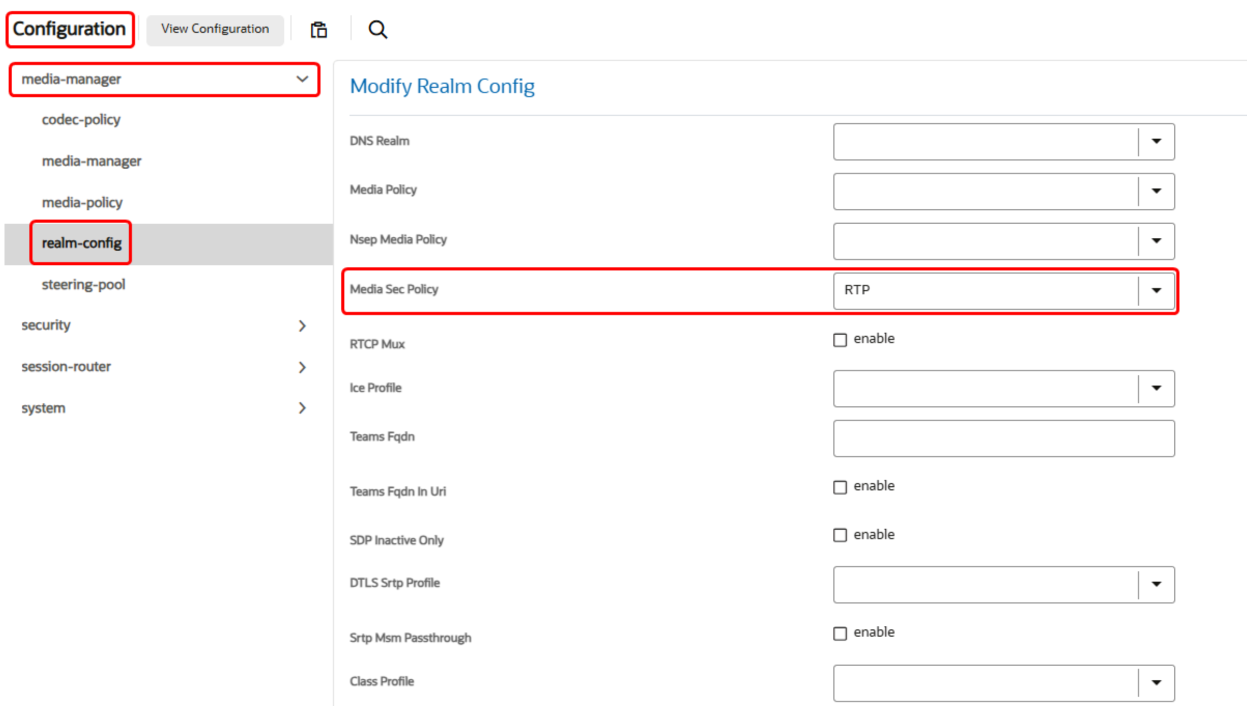

Figure 39: Realm Config towards OnPrem PBX and PSTN Gateway

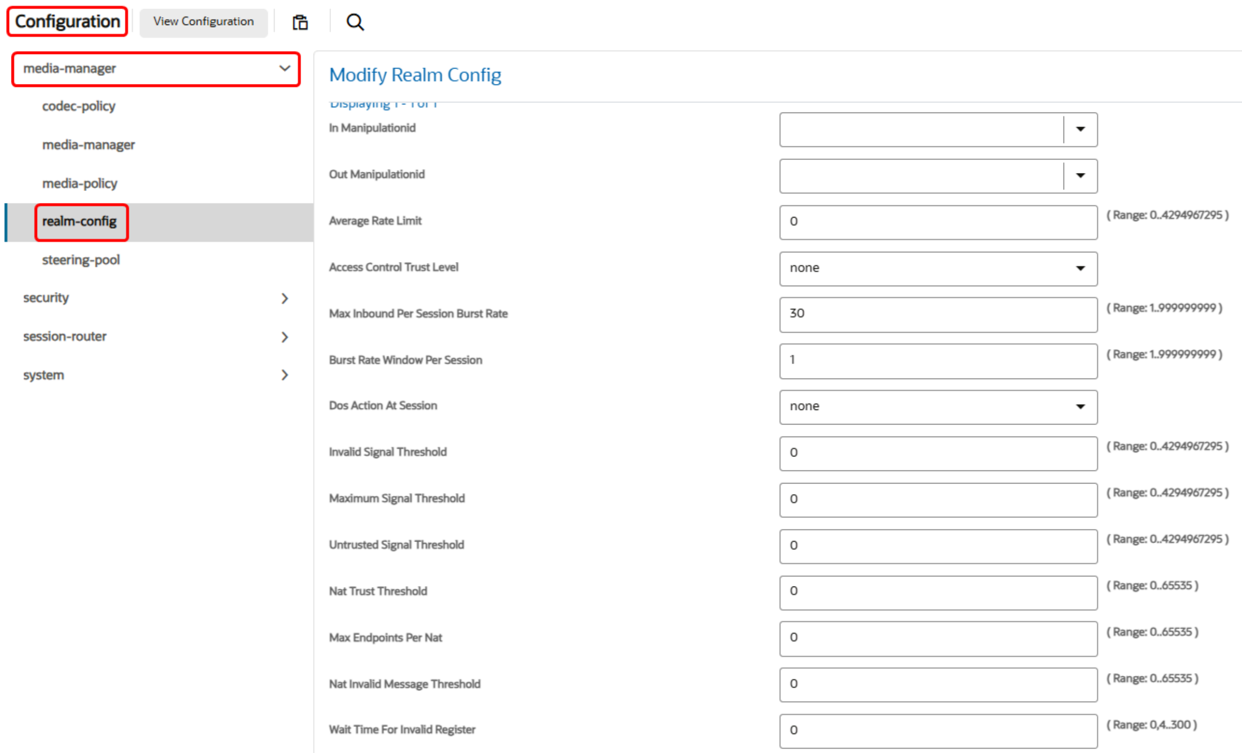

Figure 40: Realm Config towards OnPrem PBX and PSTN Gateway (Cont.)

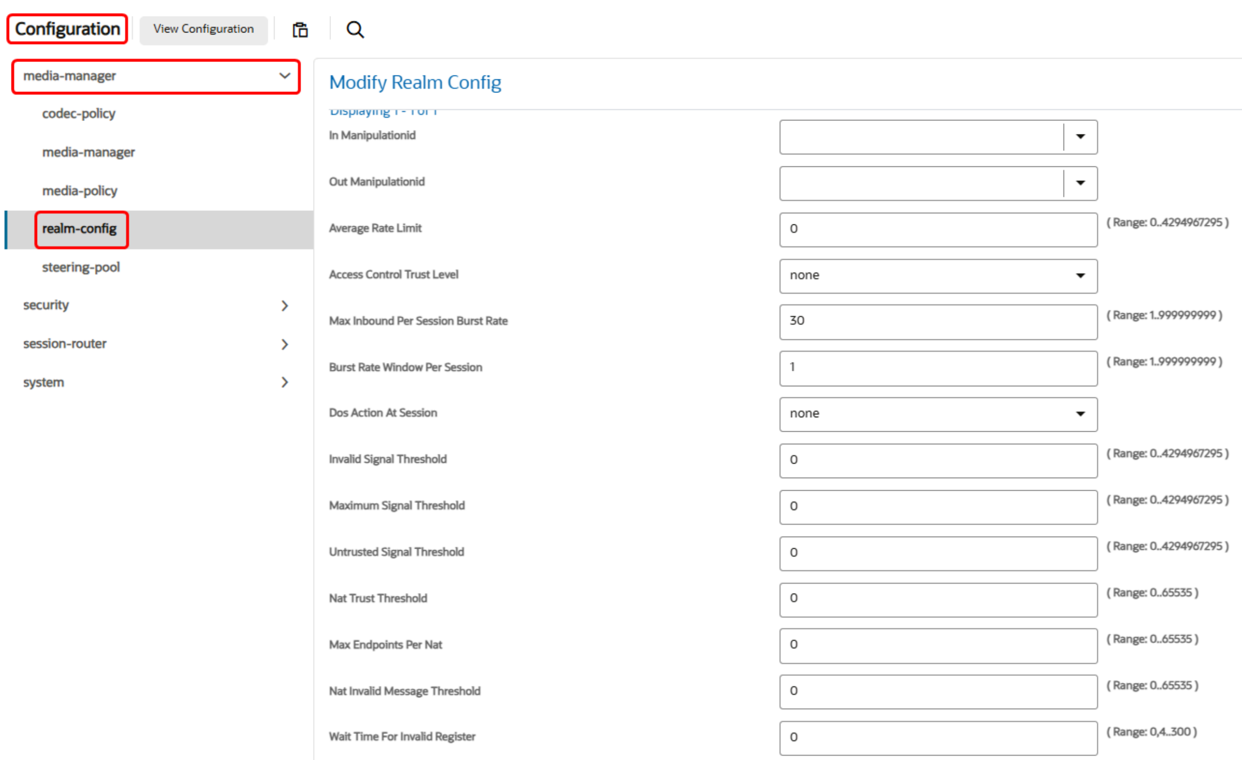

Figure 41: Realm Config towards OnPrem PBX and PSTN Gateway (Cont.)

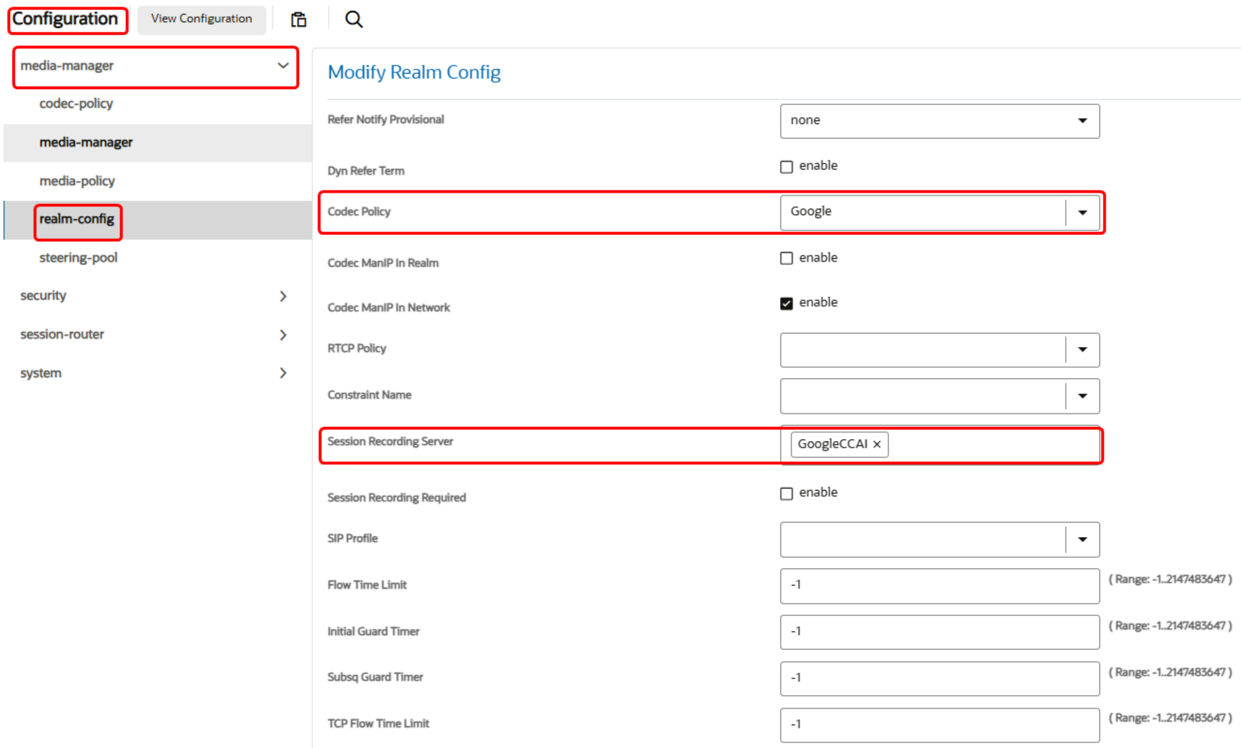

Figure 42: Realm Config towards OnPrem PBX and PSTN Gateway (Cont.)

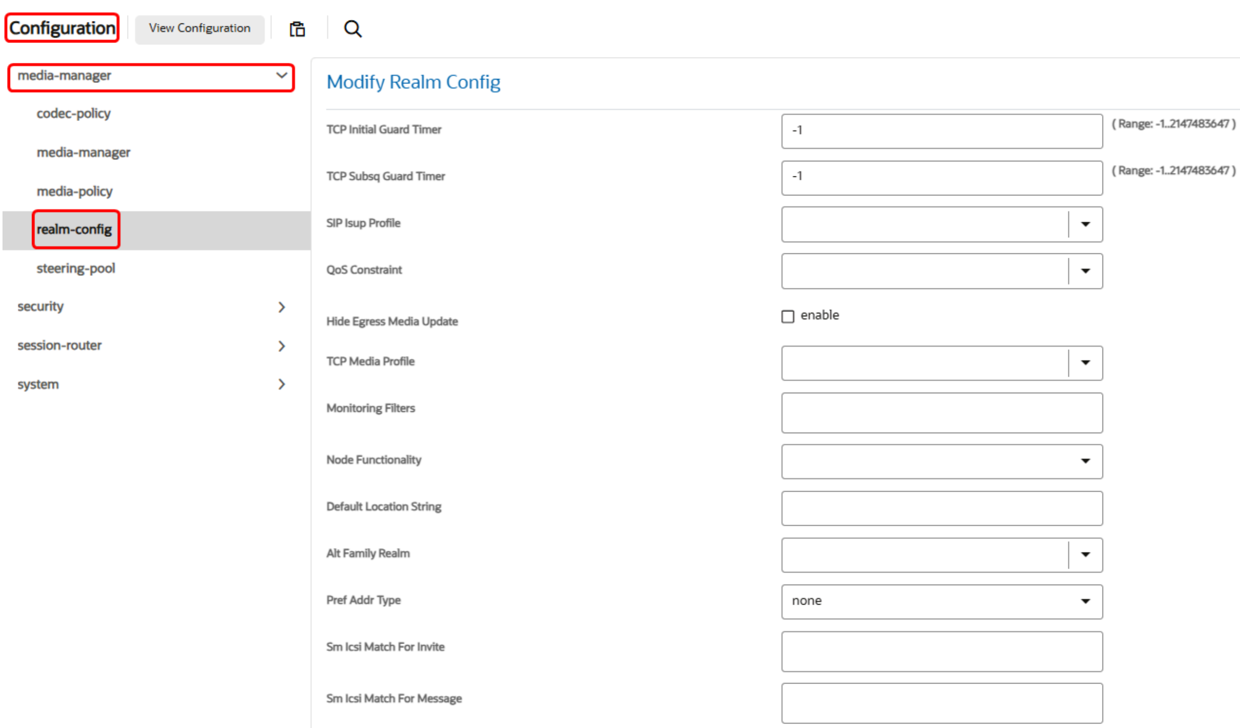

Figure 43: Realm Config towards OnPrem PBX and PSTN Gateway (Cont.)

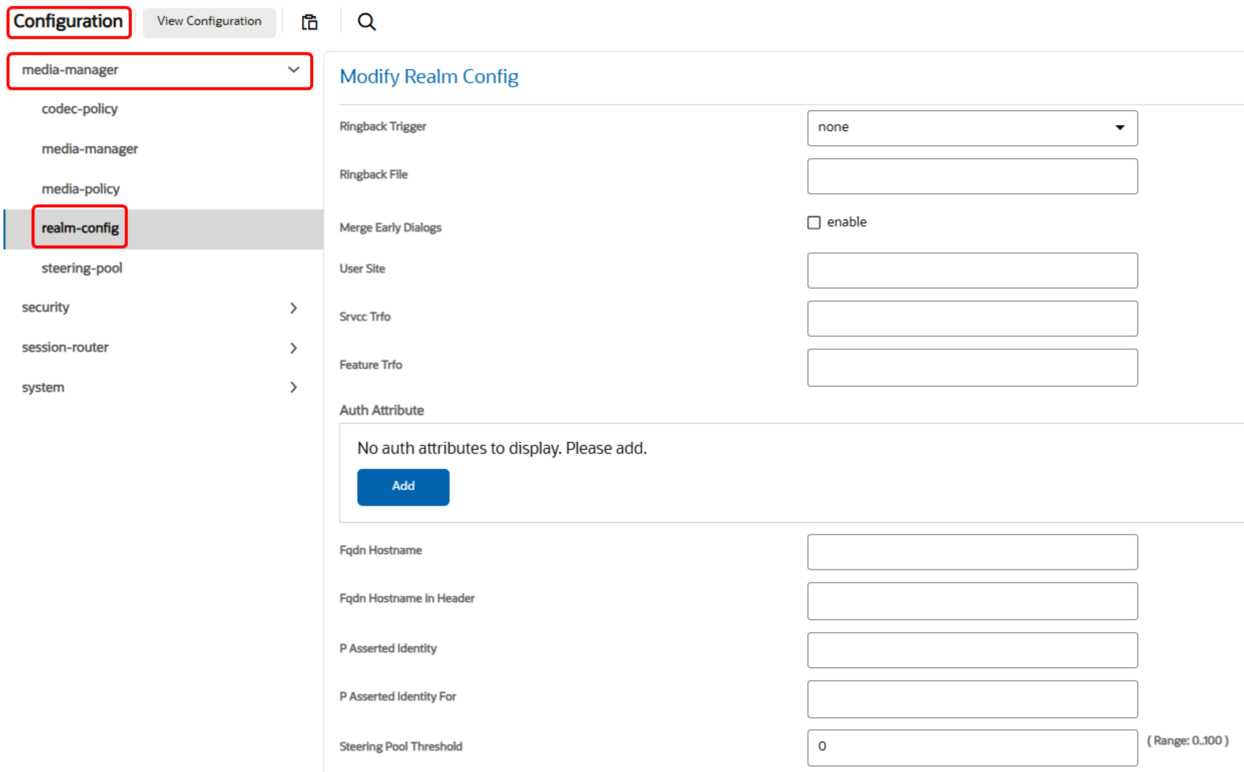

Figure 44: Realm Config towards OnPrem PBX and PSTN Gateway (Cont.)

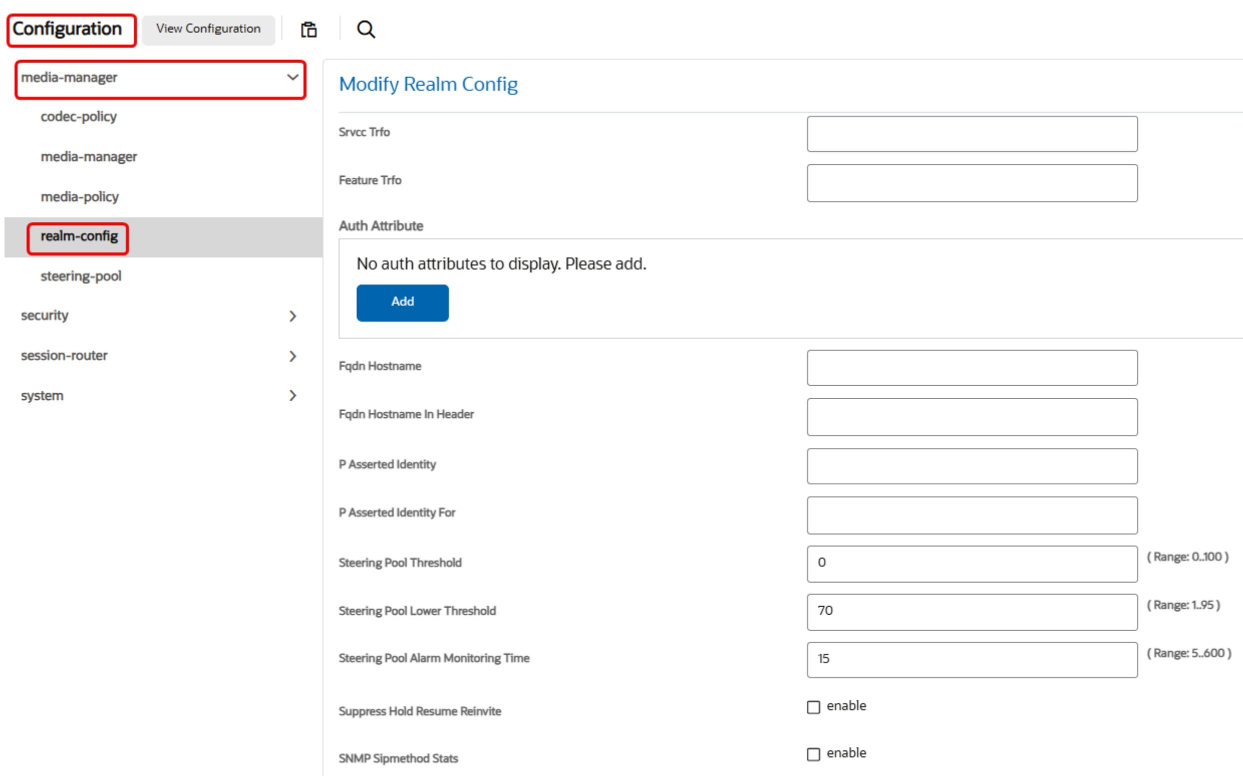

Figure 45: Realm Config towards OnPrem PBX and PSTN Gateway (Cont.)

7.4.13 Steering Pool

- Navigate to **Configuration** □ **media-manager** □ **steering-pool**.
- Steering pool allows configuration to assign IP address, ports, and a realm.
- Steering Pool Configuration towards OnPrem PBX and PSTN Gateway are shown below.

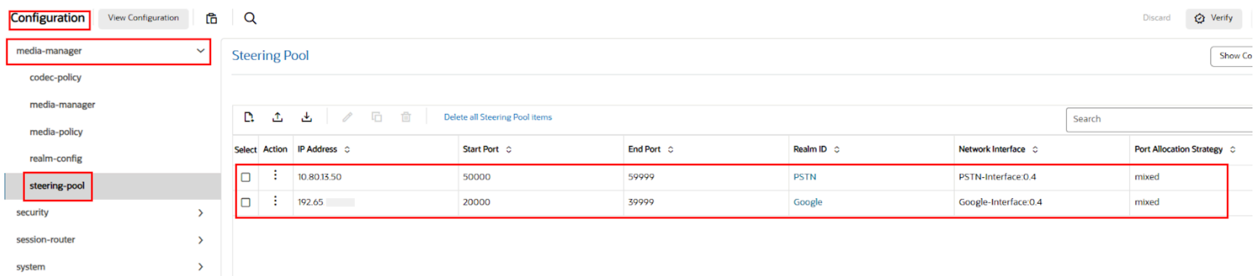

Figure 46: Steering Pool

- Steering Pool Configuration towards Google CES is shown below.

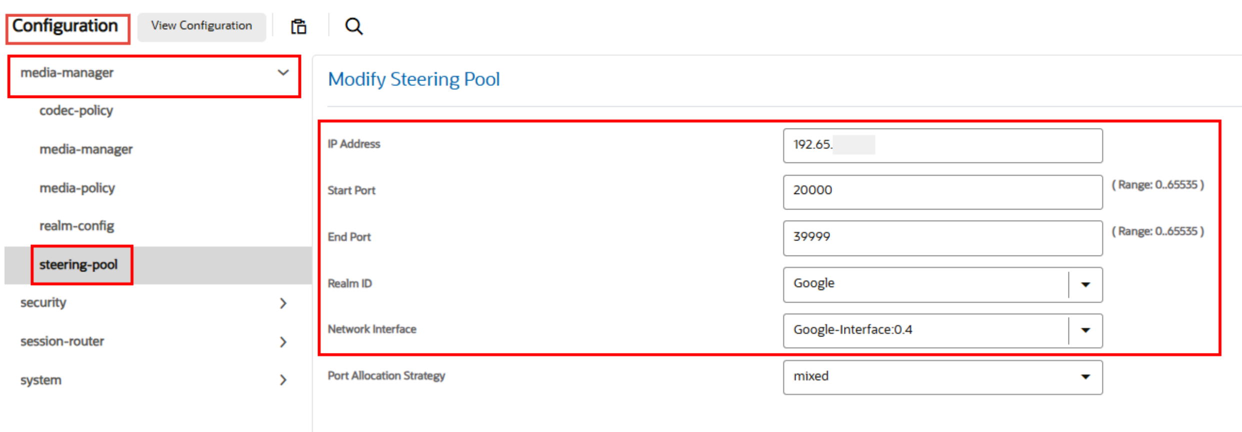

Figure 47: Steering Pool towards Google CES

- Steering Pool Configuration towards OnPrem PBX and PSTN Gateway is shown below.

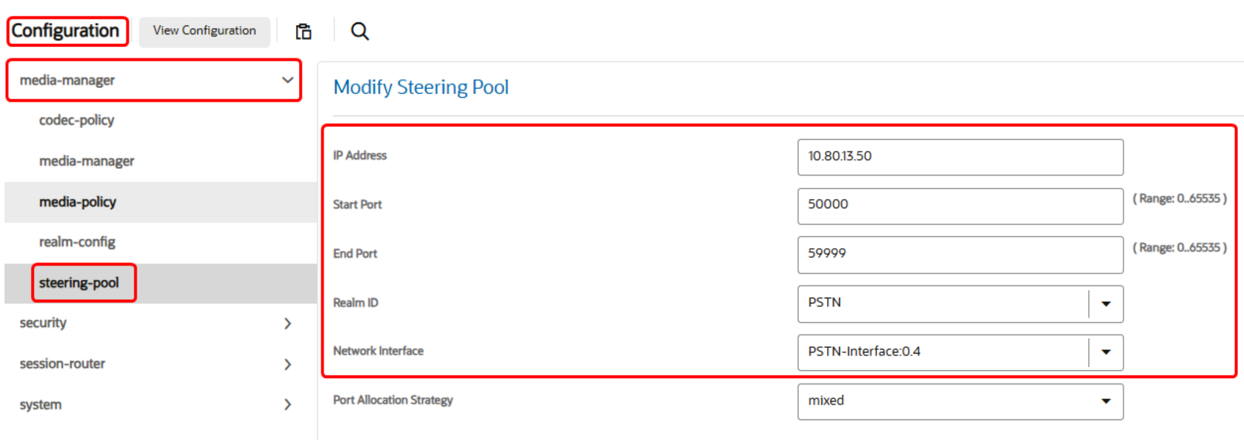

Figure 48: Steering Pool towards OnPrem PBX and PSTN

7.4.14 SDES Profile

- Navigate to **Configuration** □ **Security** □ **media-security** □ **sdes-profile** and con SDES profile as shown below.

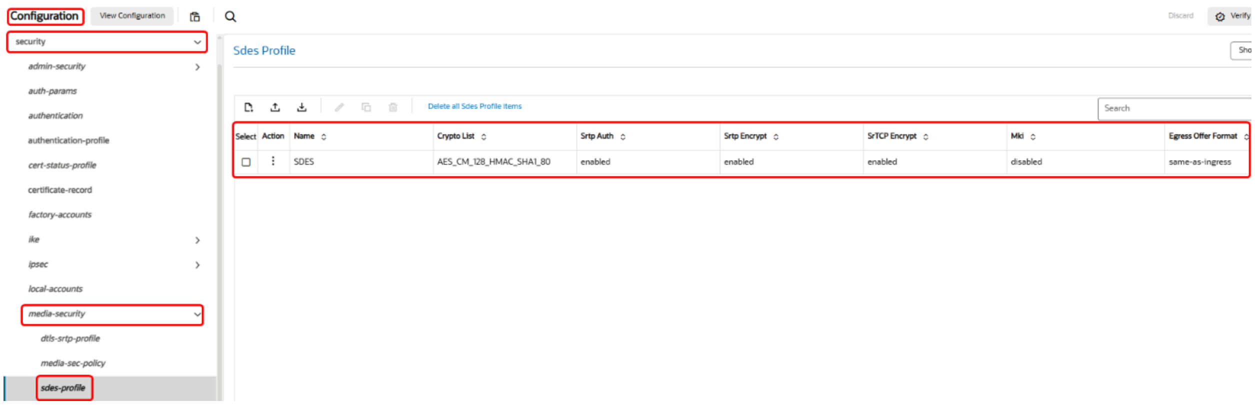

Figure 49: SDES Profile for TLS

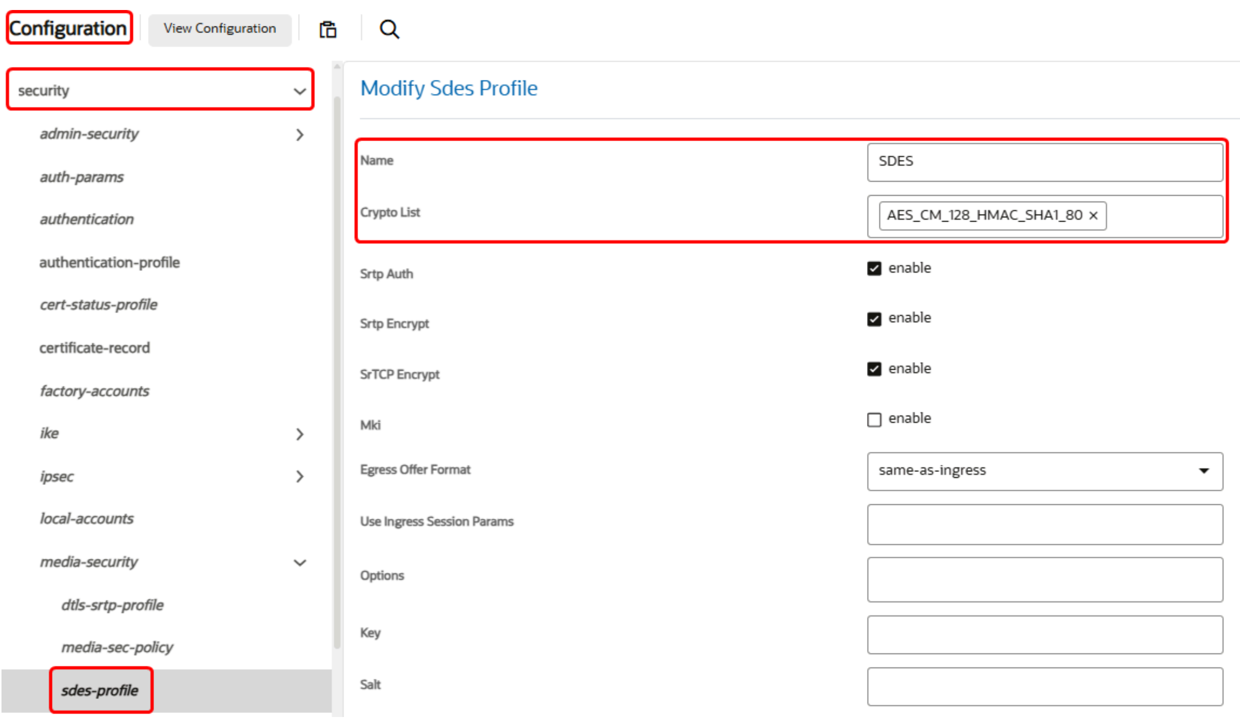

Figure 50: SDES Profile for TLS (Cont.)

7.4.15 Media Sec Policy

- Navigate to **Configuration** □ **security** □ **media-security** □ **media-sec-policy** and configure media security policy as shown below.

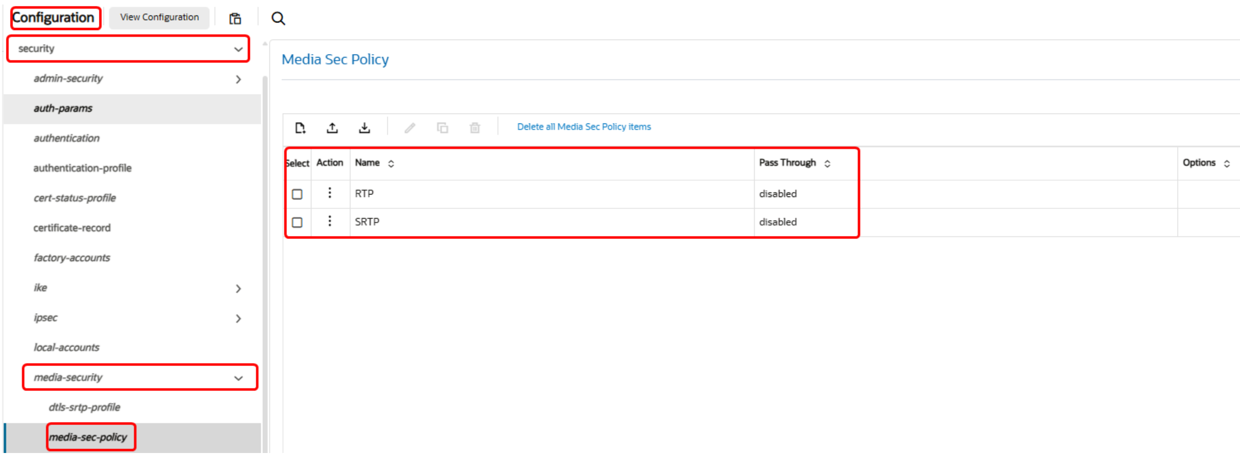

Figure 51: Media Security Policy

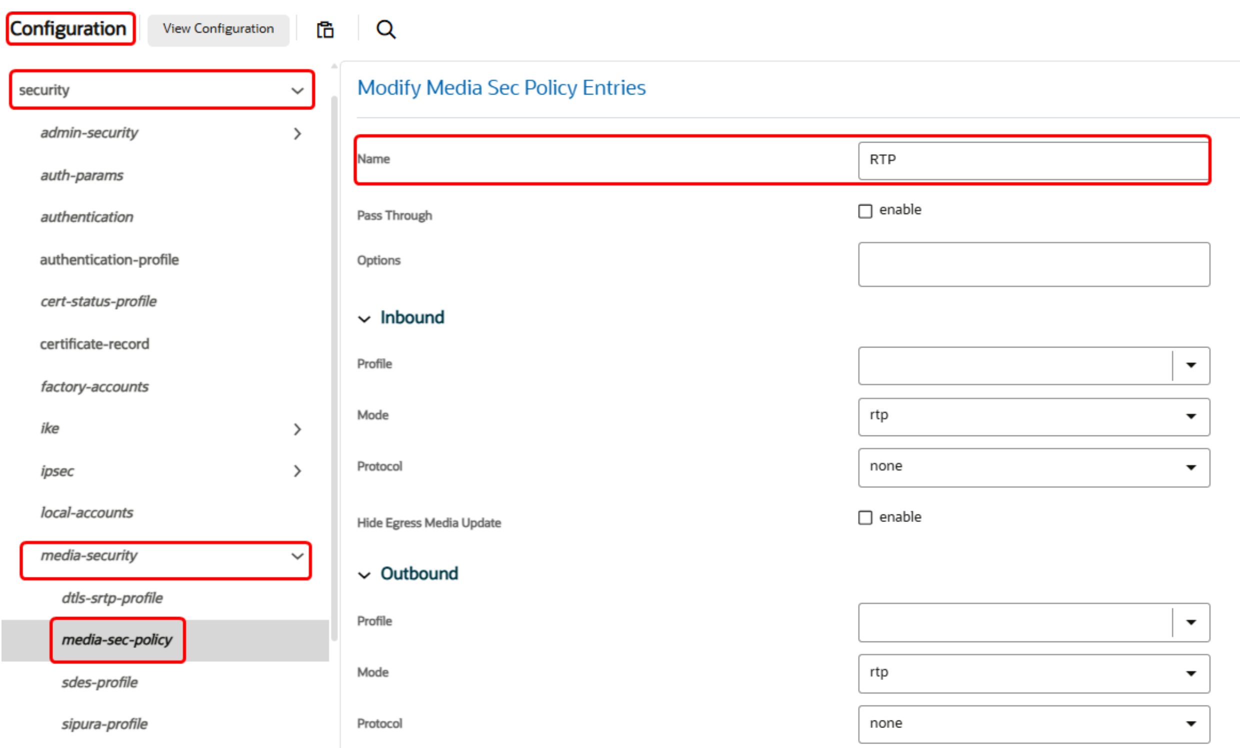

Figure 52: Media Security Policy for RTP

- SDES profile created in Section 7.4.14 is associated with Media Security Policy for SRTP below.

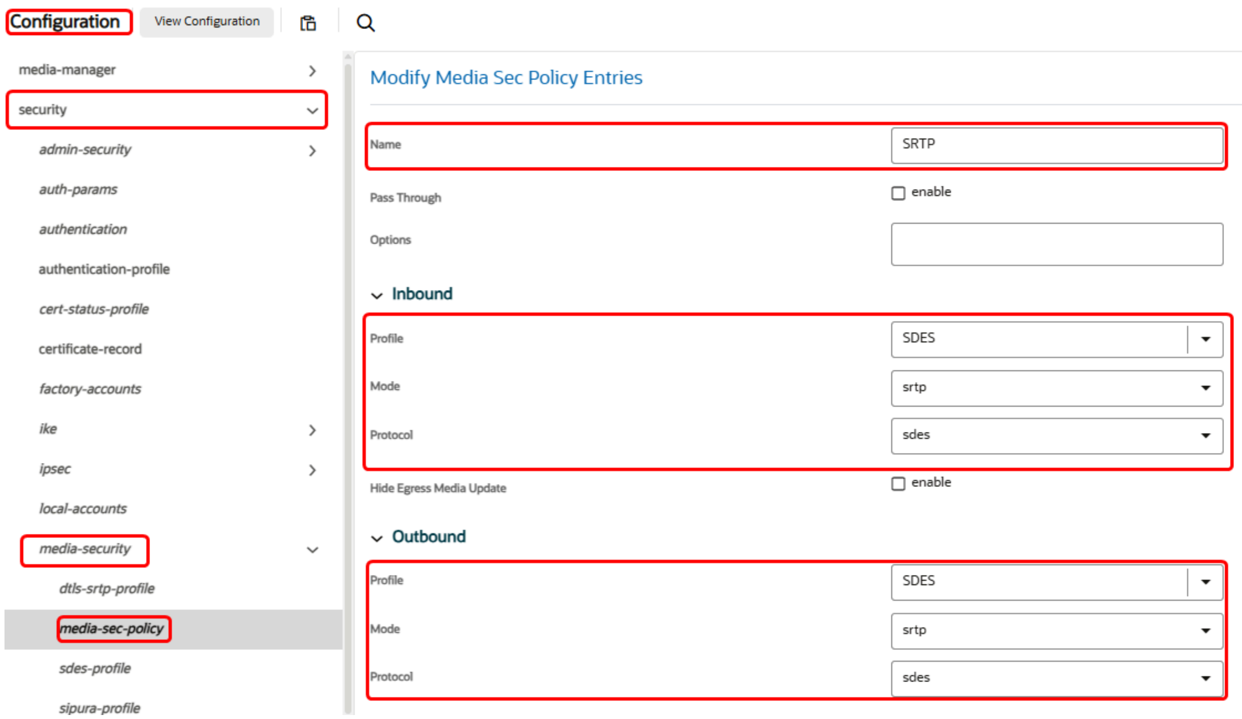

Figure 53: Media Security Policy for SRTP

7.4.16 TLS – Certificate Record

- Certificate Record are configuration elements on Oracle E-SBC which captures information for a TLS certificate such as common-name, key-size etc.
- Navigate to **Configuration** □ **security** □ **certificate-record**.

Certificate record for Oracle E-SBC:

- Create a certificate record for Oracle E-SBC as shown below.

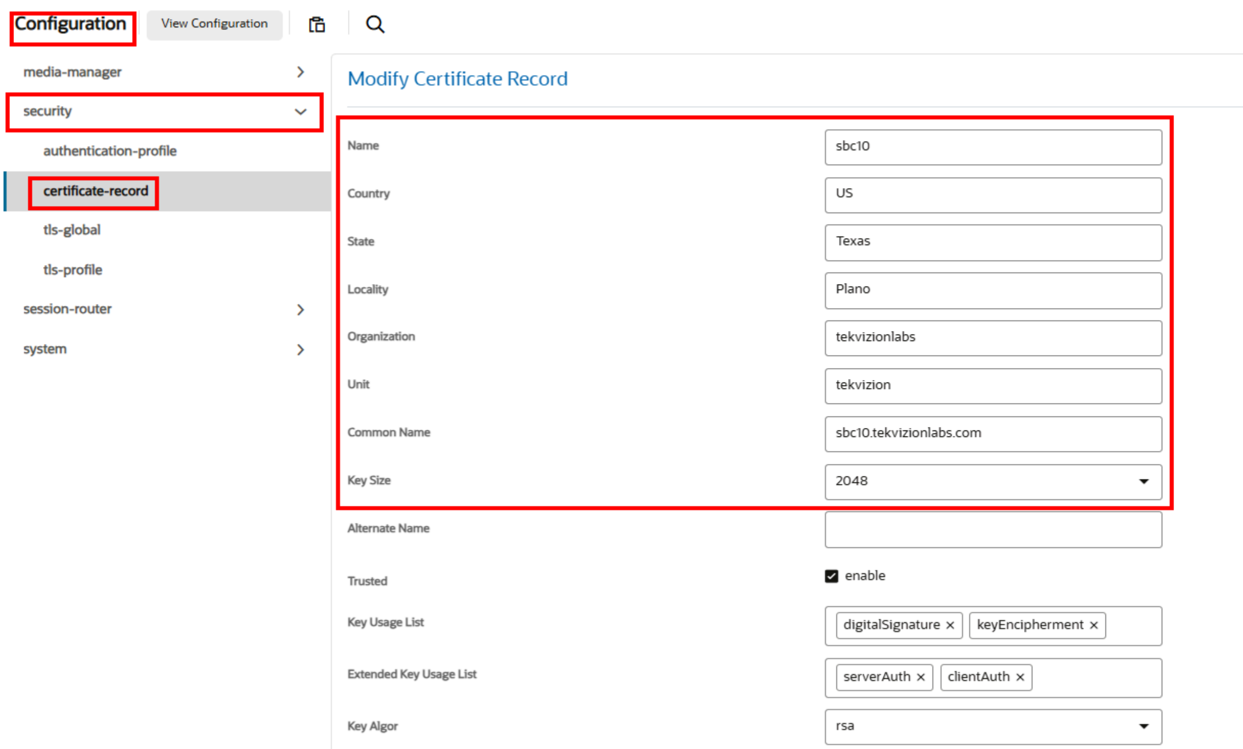

Figure 54: Create Certificate Record for Oracle E-SBC

- Select the Certificate record and Click Generate icon to generate CSR.

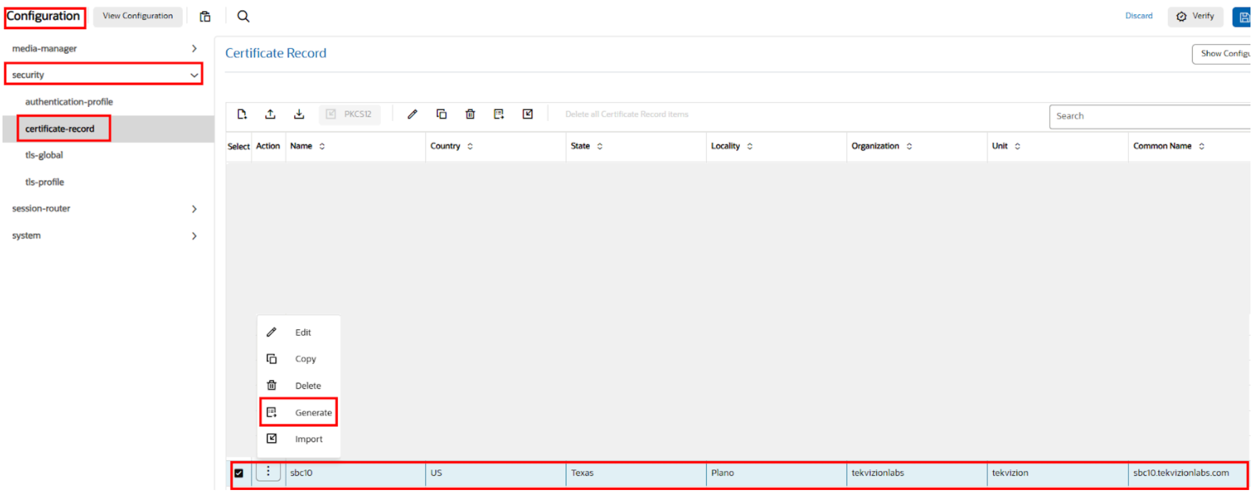

Figure 55: Generate Certificate Record for Oracle E-SBC

- Get the CSR signed by respective approved Cas and further uploaded by clicking Import to import the signed certificate.

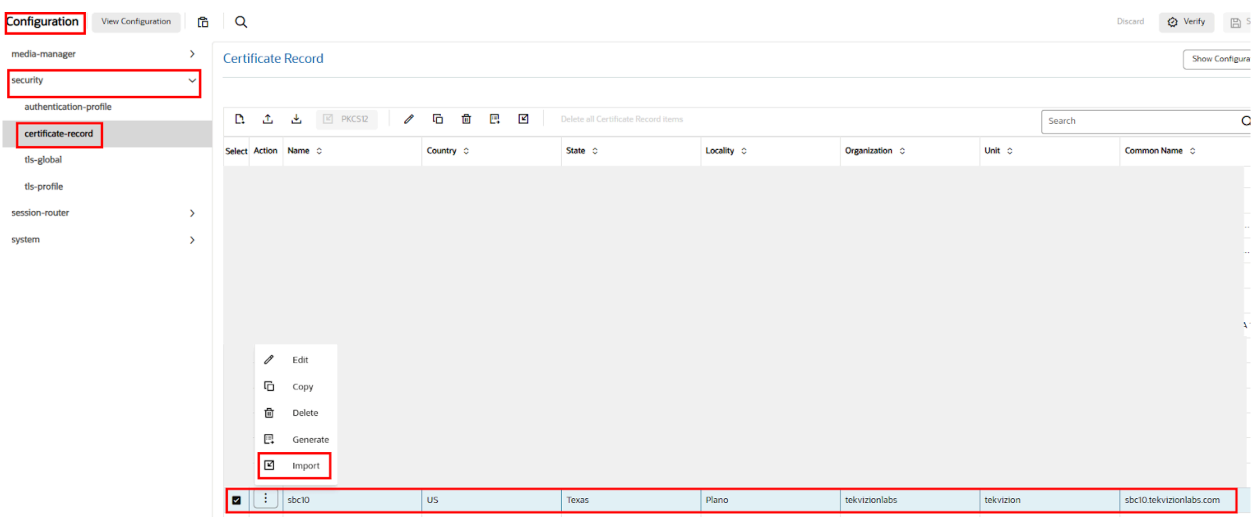

Figure 56: Import Certificate Record for Oracle E-SBC

- Import the root certificate stored in the local machine and click Import as shown below.

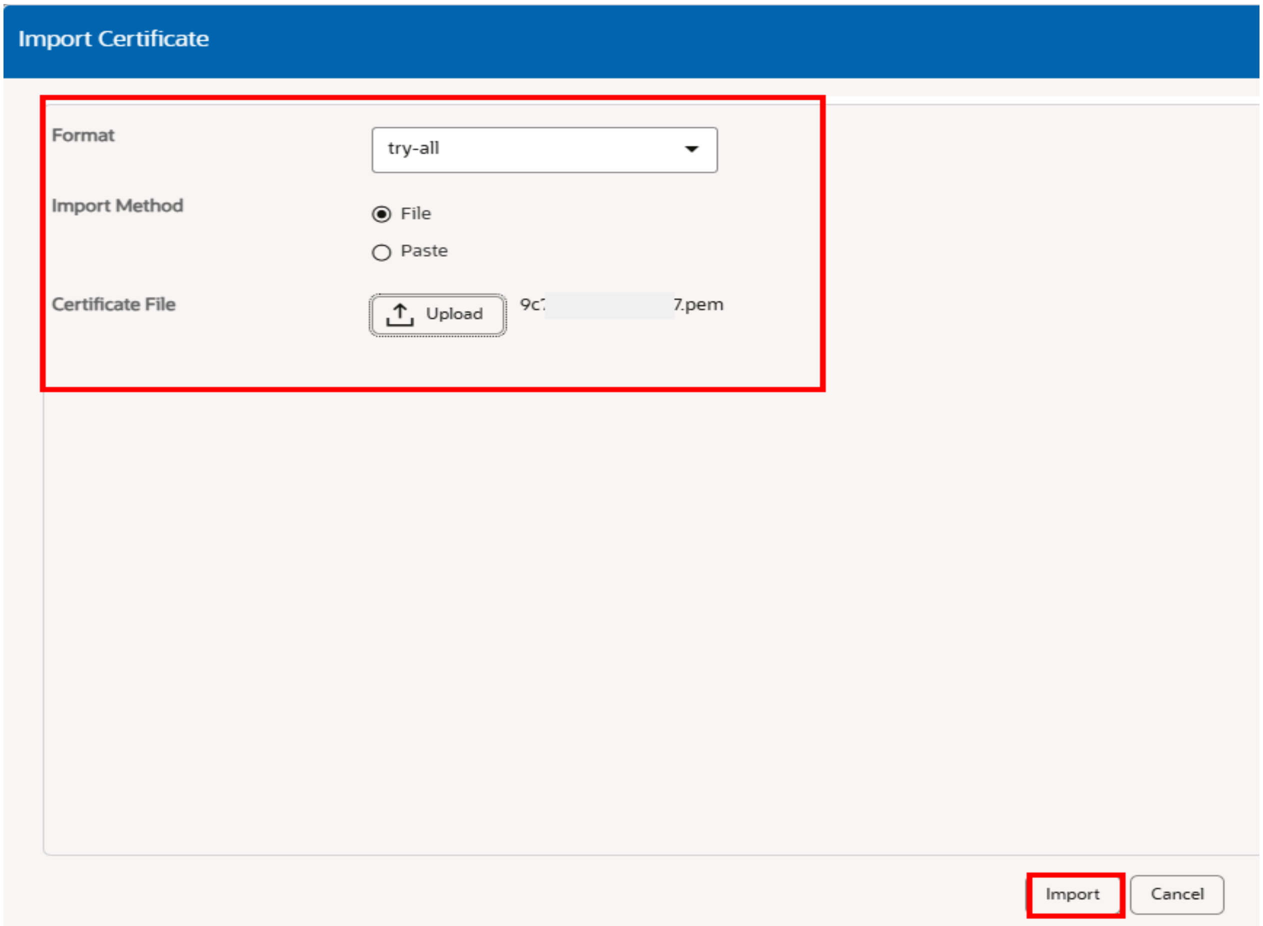

Figure 57: Import Certificate Record for Oracle E-SBC

Certificate record for Google Root CA:

- Visit Google certificate link via https://pki.goog/roots.pem and download the roots PEM file.
- Open the PEM file using notepad and copy the certificate under label “GTS Root R1”
- Create a certificate record GTS Root R1 for Google CES.

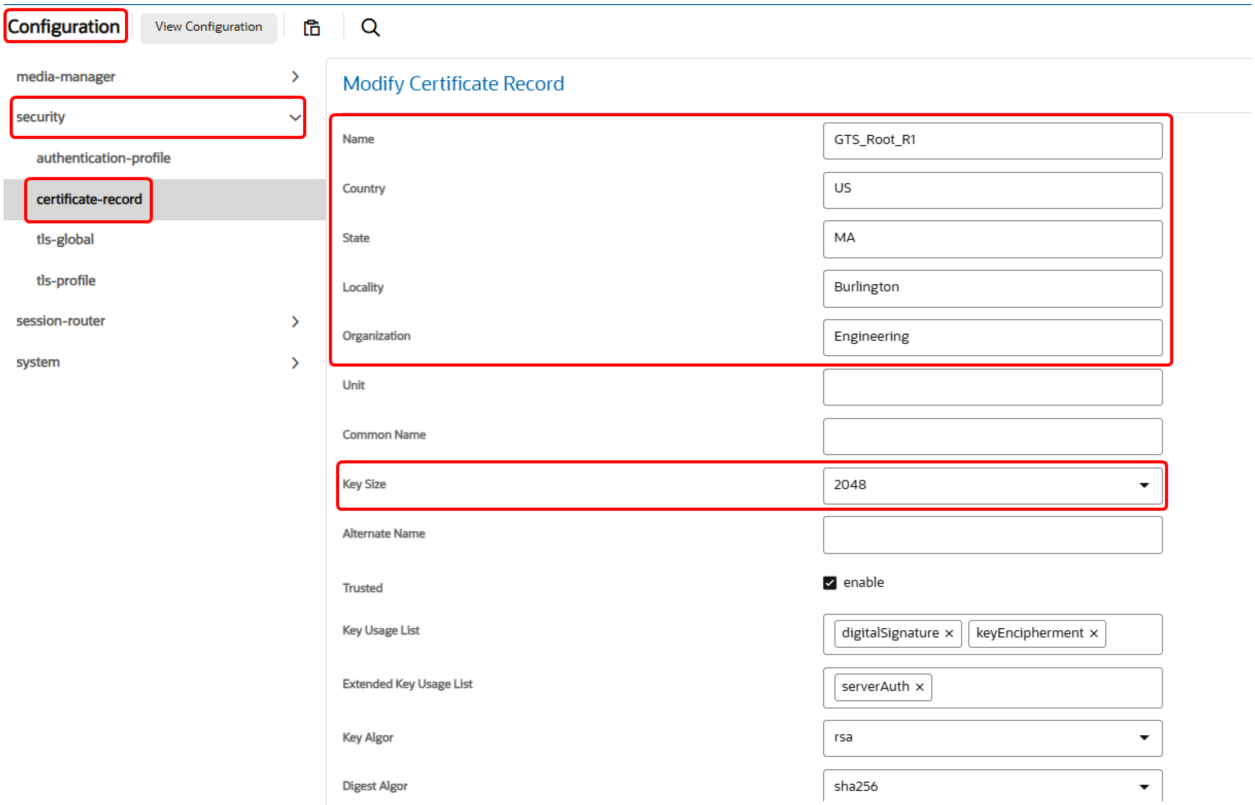

Figure 58: Create Certificate Record for Google GTS Root R1 certificate

- Right click on the Certificate Record and Click Import.

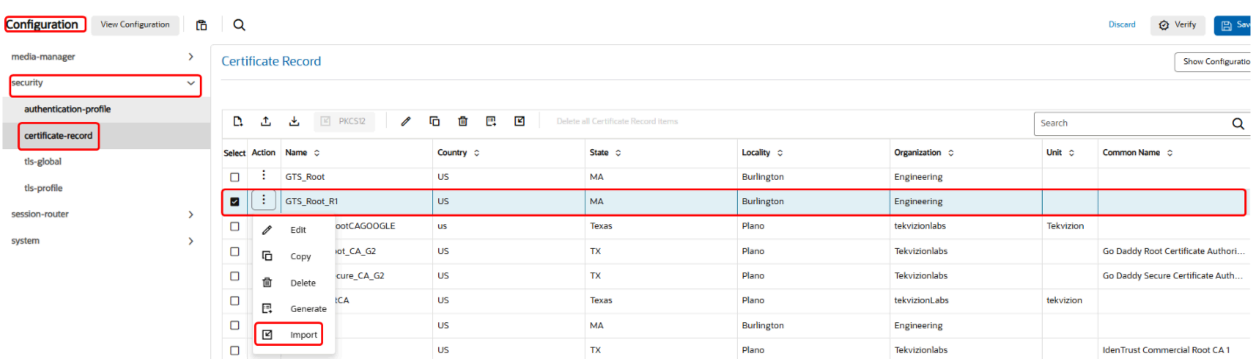

Figure 59: Import Google GTS Root R1 certificate

- Import the root certificate stored in the local machine and click Import as shown below.

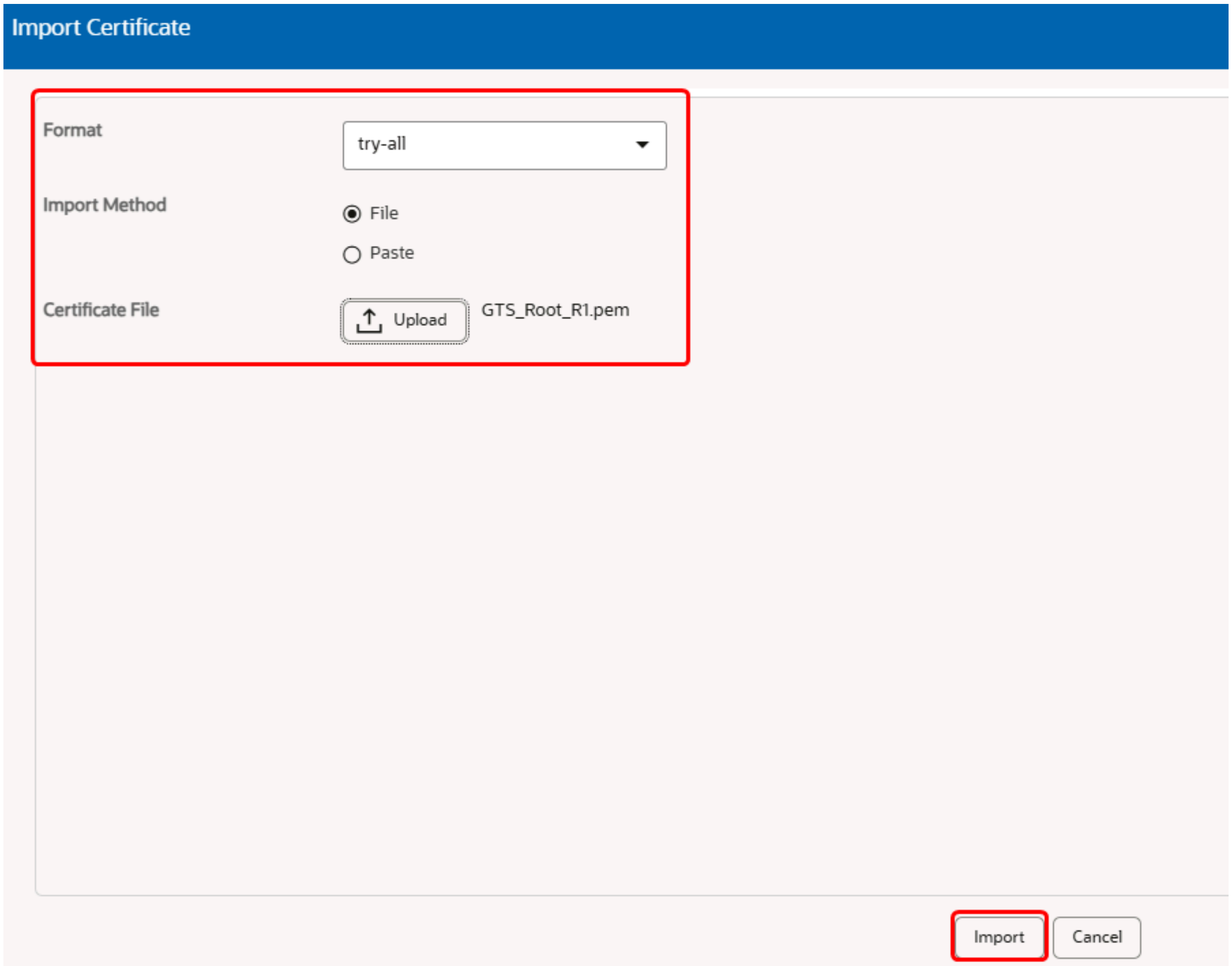

Figure 60: Import Google GTS Root R1 certificate (Cont.)

- Similarly create other certificate records for the Oracle E-SBC leaf certificate and the Certificate Authority Root certificate, ensuring the entire certificate chain from leaf to root is present as shown below. The following certificate-records are required on the Oracle E-SBC to connect with Google CES.

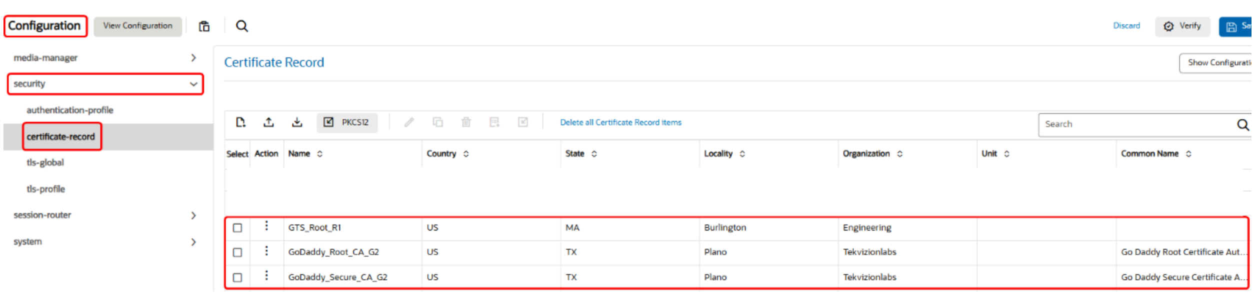

Figure 61: Certificate Records

7.4.17 TLS – TLS Profile

- A TLS profile configuration on the Orace E-SBC allows for specific certificates to be assigned.
- Navigate to **Configuration security tls-profile**
- Create a TLS profile for Google CES as shown below.

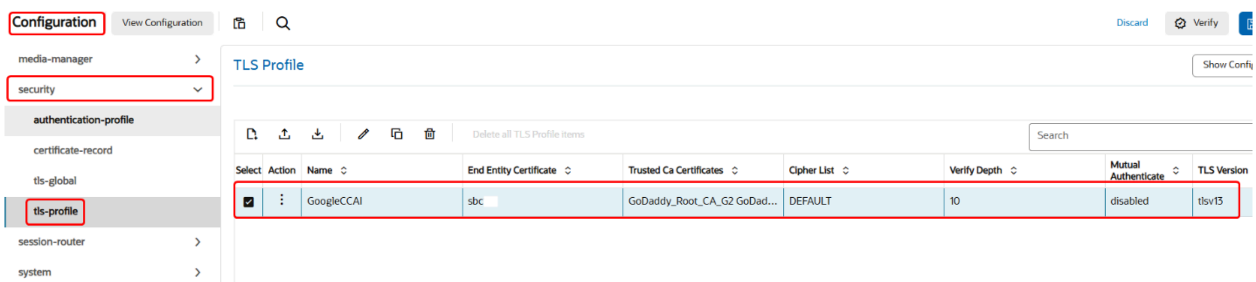

Figure 62: TLS Profile for Google CES

- Intermediate Certificates and Google GTS Root R1 certificate is added for TLS exchange.

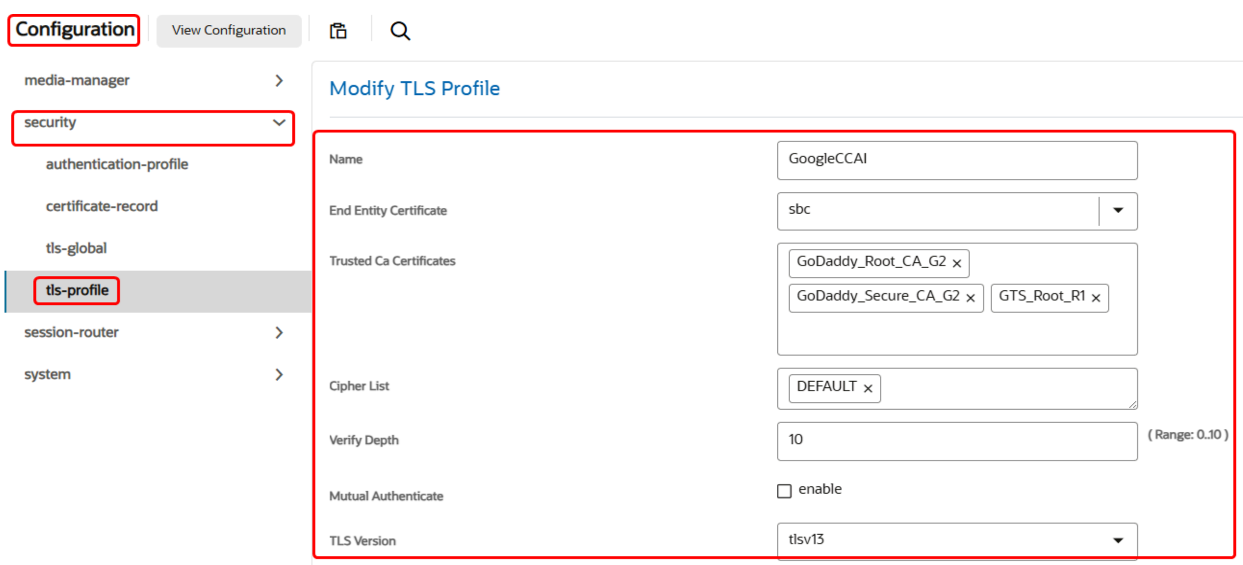

Figure 63: TLS Profile for Google CES (Cont.)

7.4.18 Session Timer

- Navigate to **Configuration session-router session-timer-profile.**
- Configure session timer for Google CES as shown below.

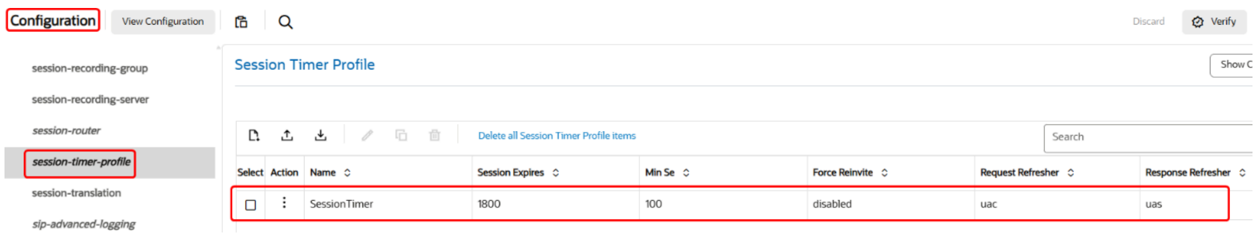

Figure 64: Session Timer

7.4.19 SIP Interface

- Navigate to **Configuration** □ **session-router** □ **sip-interface**.

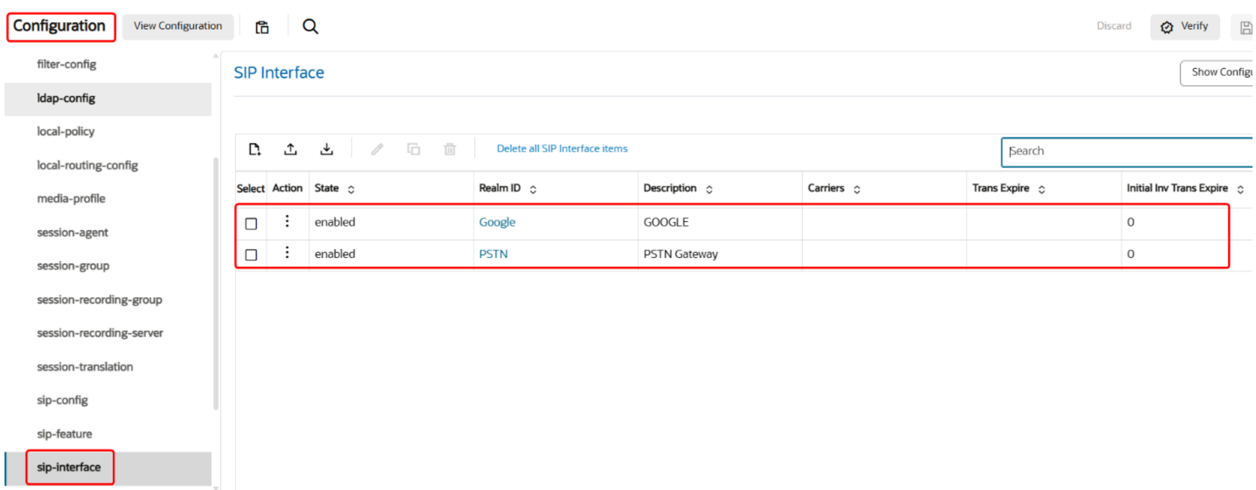

Figure 65: SIP Interface

- Create SIP interface towards PSTN Gateway and OnPrem PBX by adding SIP Ports as shown below.

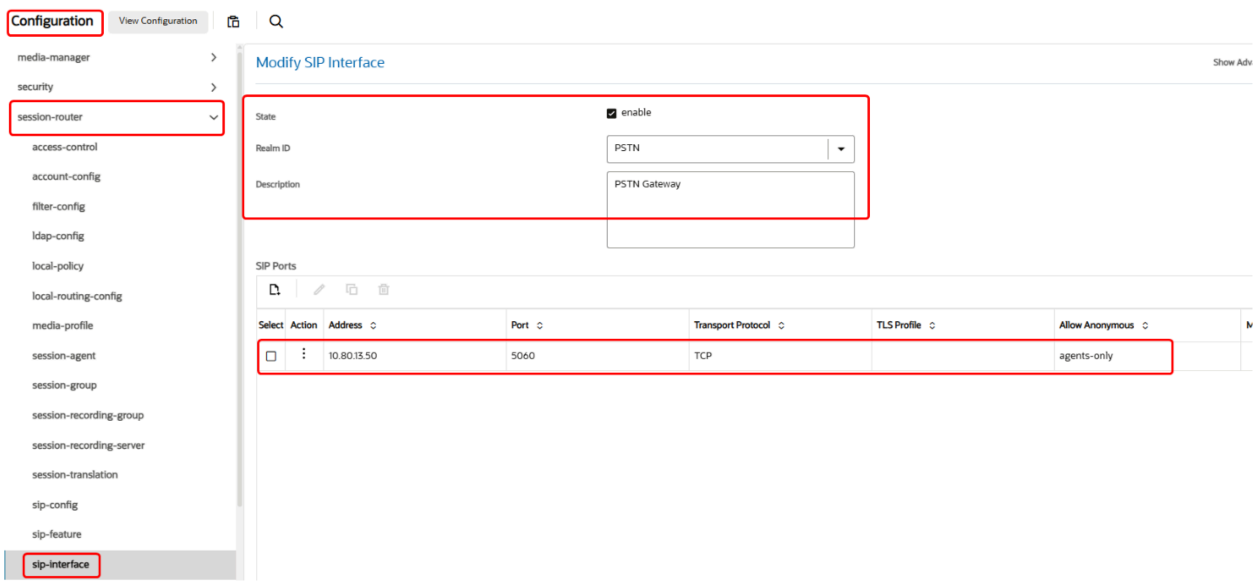

Figure 66: SIP Interface for PSTN Gateway and OnPrem PBX

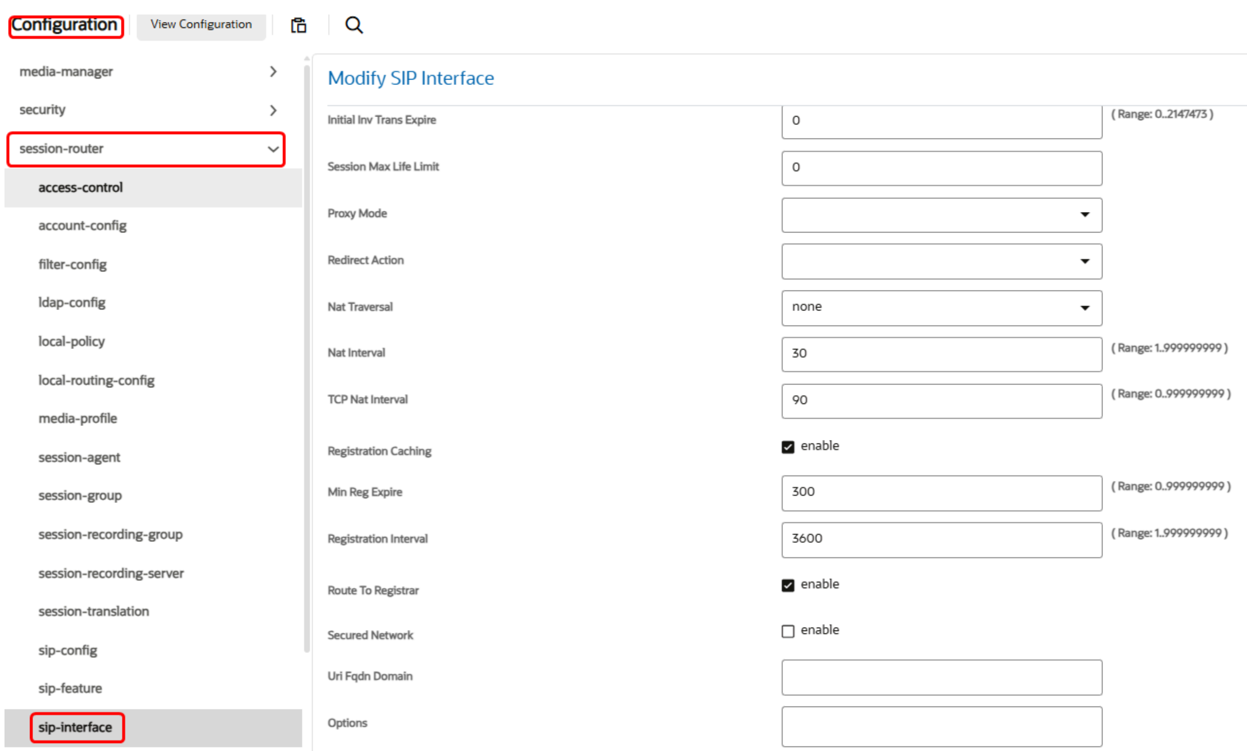

Figure 67: SIP Interface for PSTN Gateway and OnPrem PBX (Cont.)

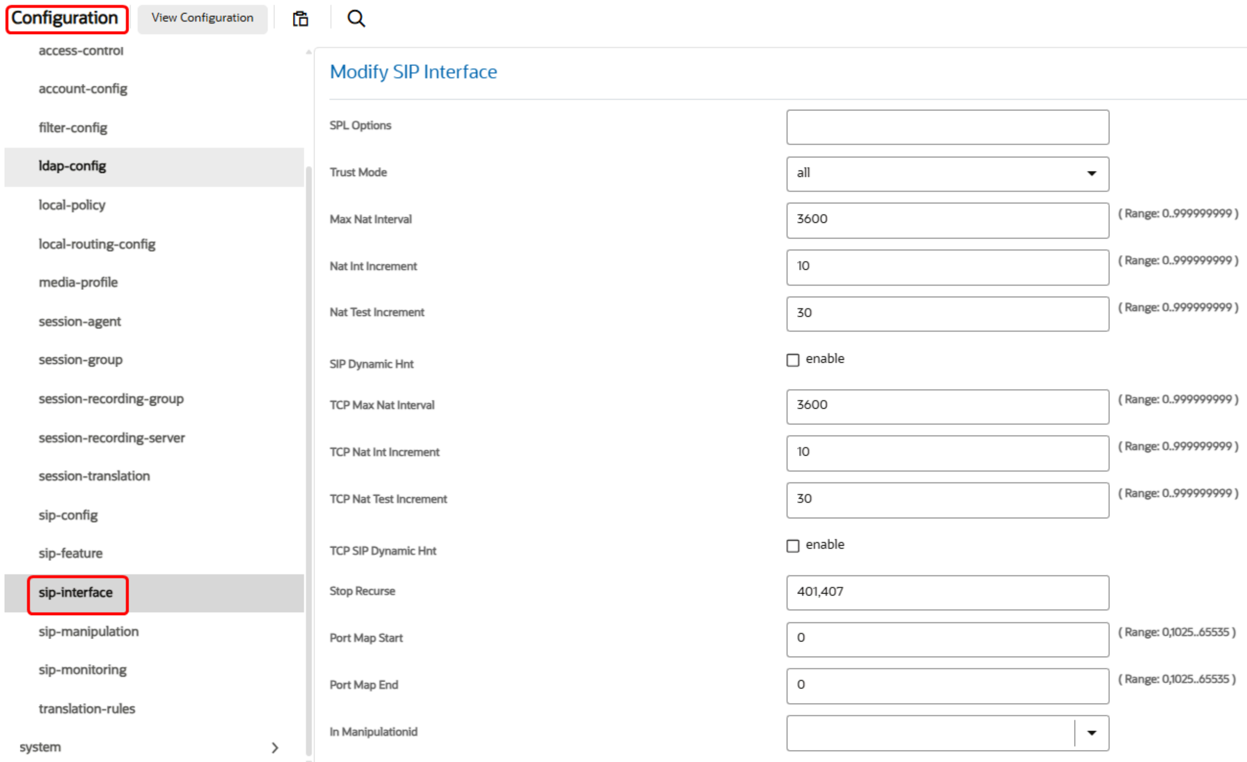

Figure 68: SIP Interface for PSTN Gateway and OnPrem PBX (Cont.)

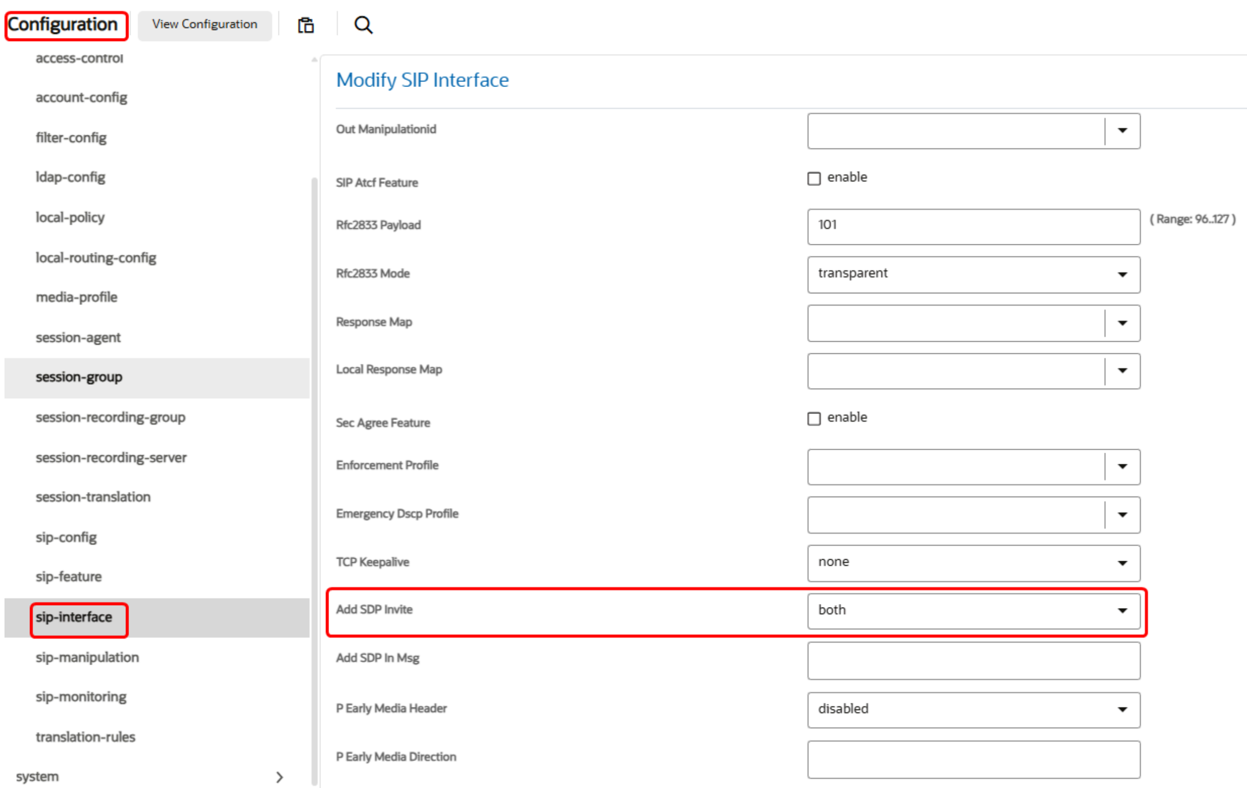

Figure 69: SIP Interface for PSTN Gateway and OnPrem PBX (Cont.)

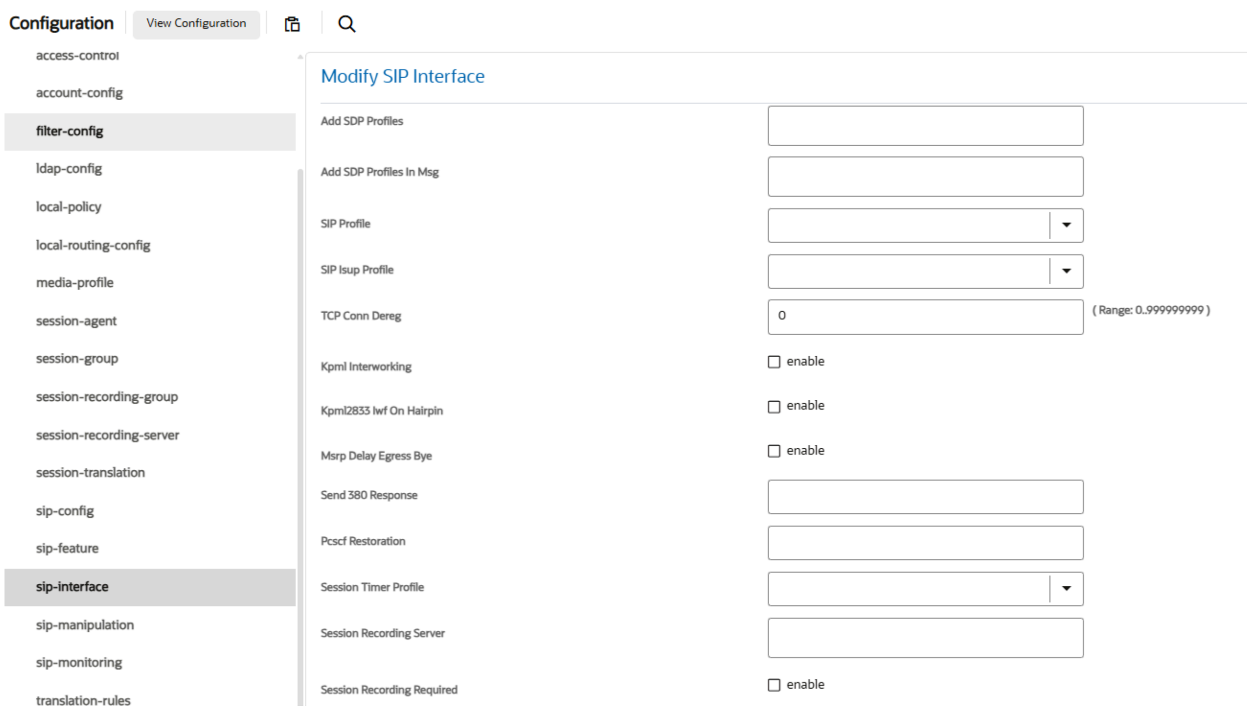

Figure 70: SIP Interface for PSTN Gateway and OnPrem PBX (Cont.)

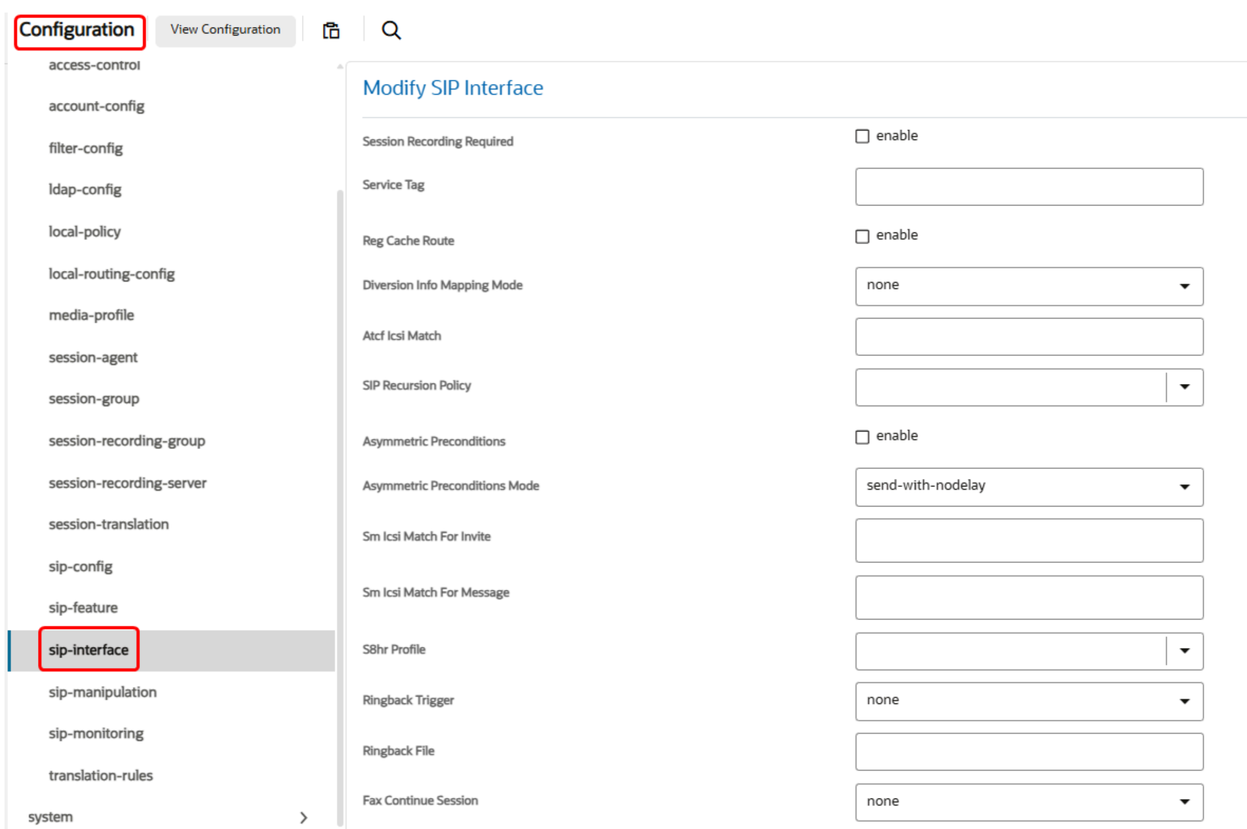

Figure 71: SIP Interface for PSTN Gateway and OnPrem PBX (Cont.)

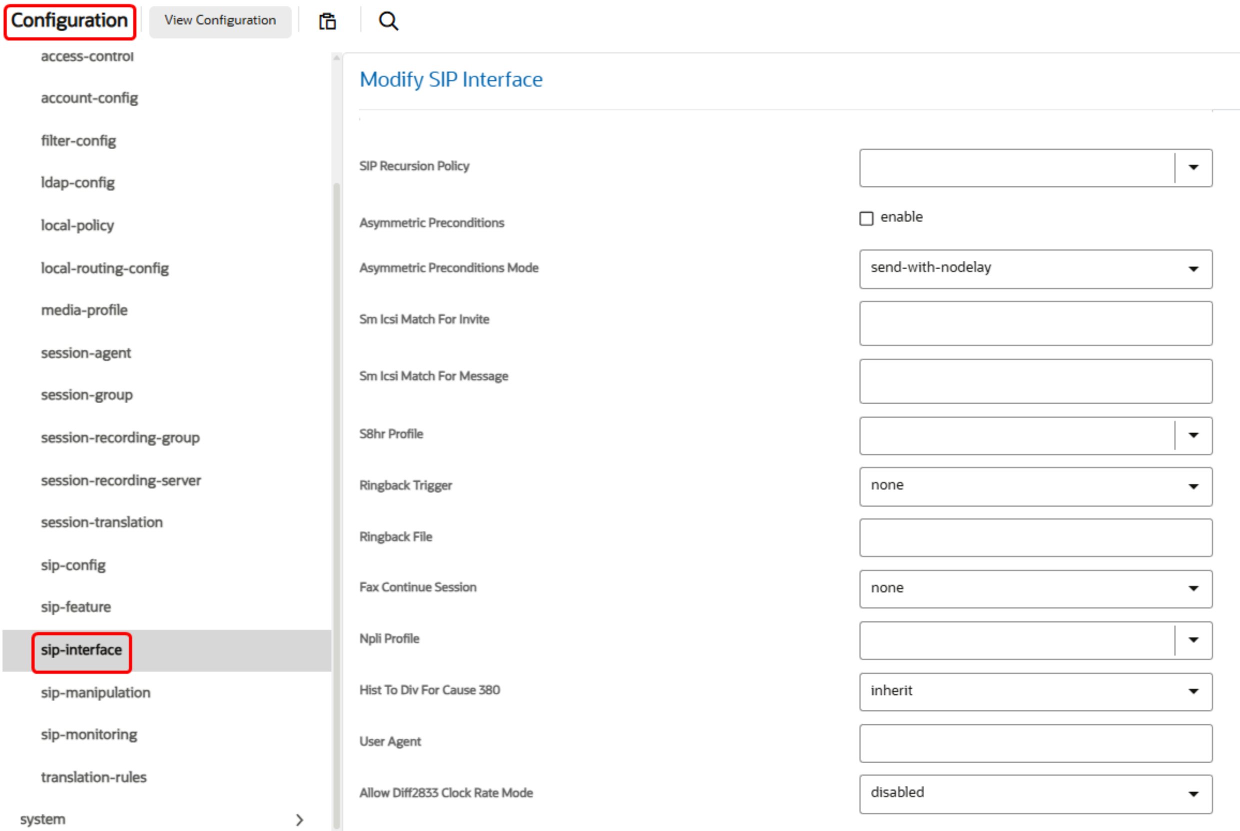

Figure 72: SIP Interface for PSTN Gateway and OnPrem PBX (Cont.)

- Create SIP interface towards Google CES by adding SIP Ports as shown below.

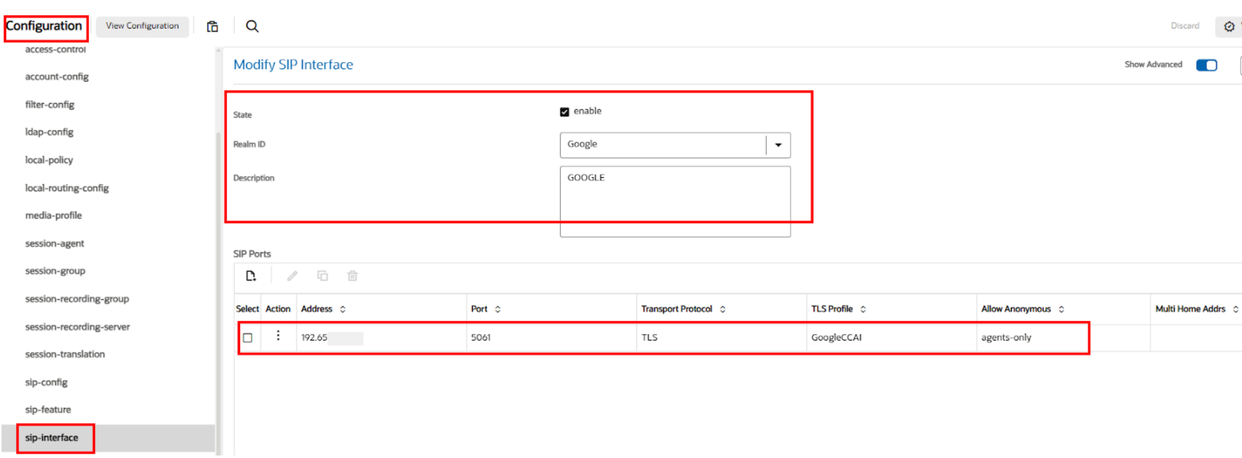

Figure 73: SIP Interface for Google CES

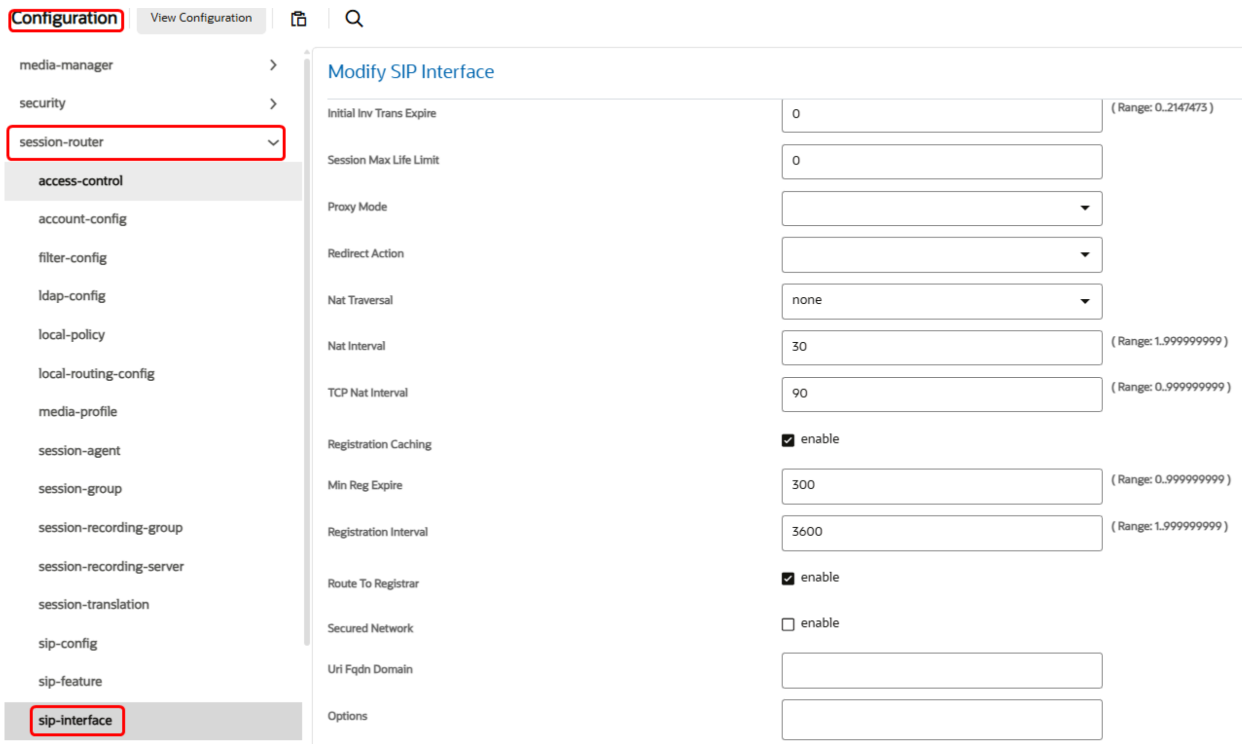

Figure 74: SIP Interface for Google CES (Cont.)

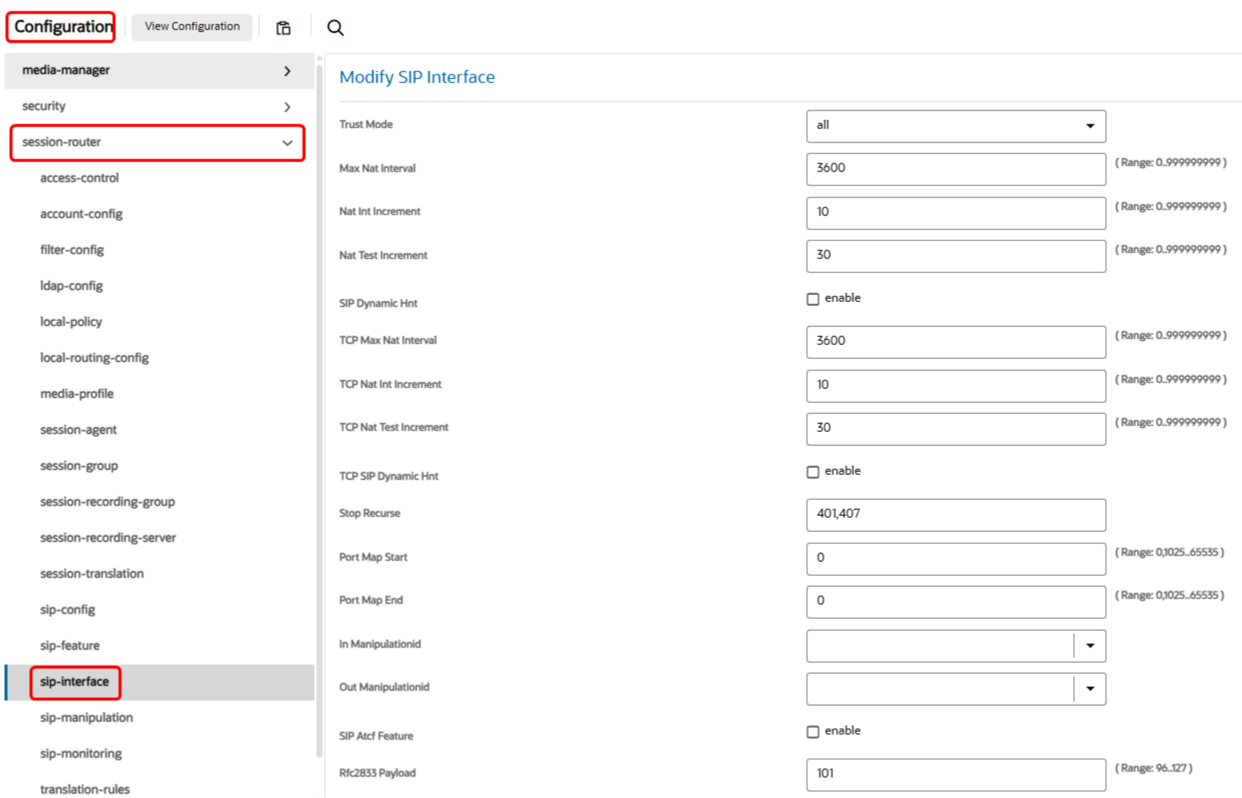

Figure 75: SIP Interface for Google CES (Cont.)

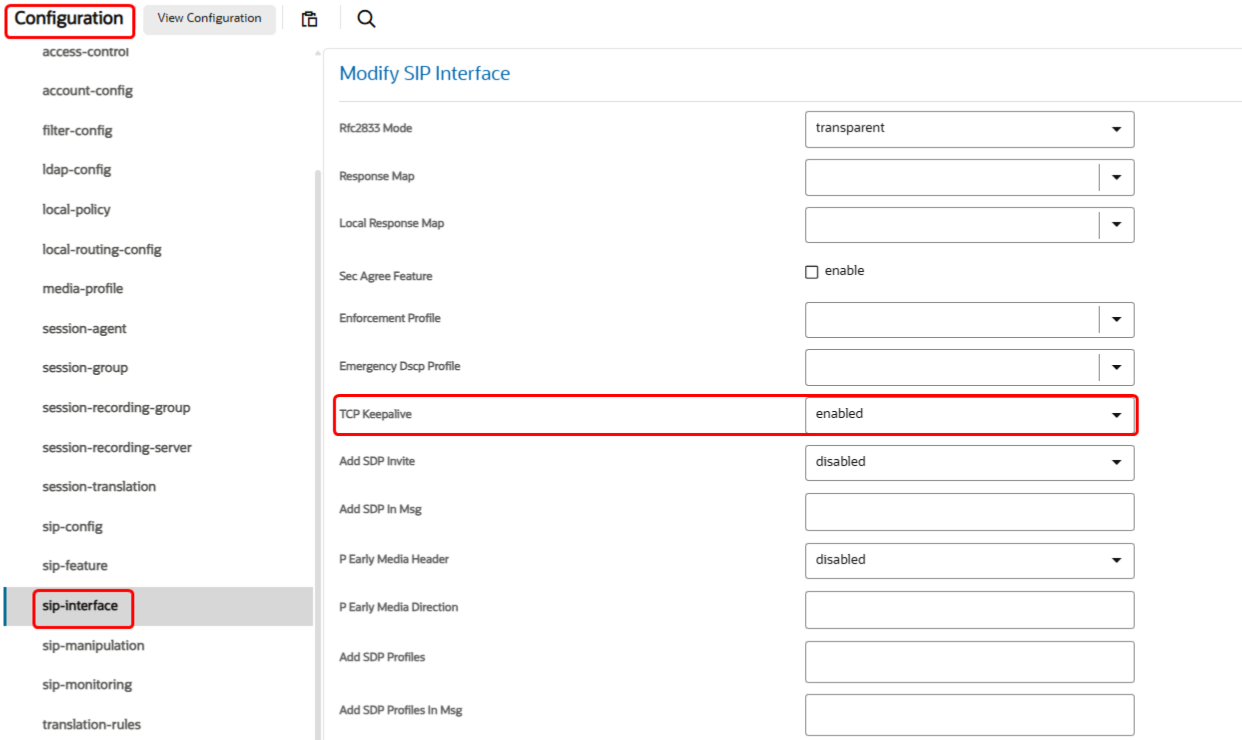

Figure 76: SIP Interface for Google CES (Cont.)

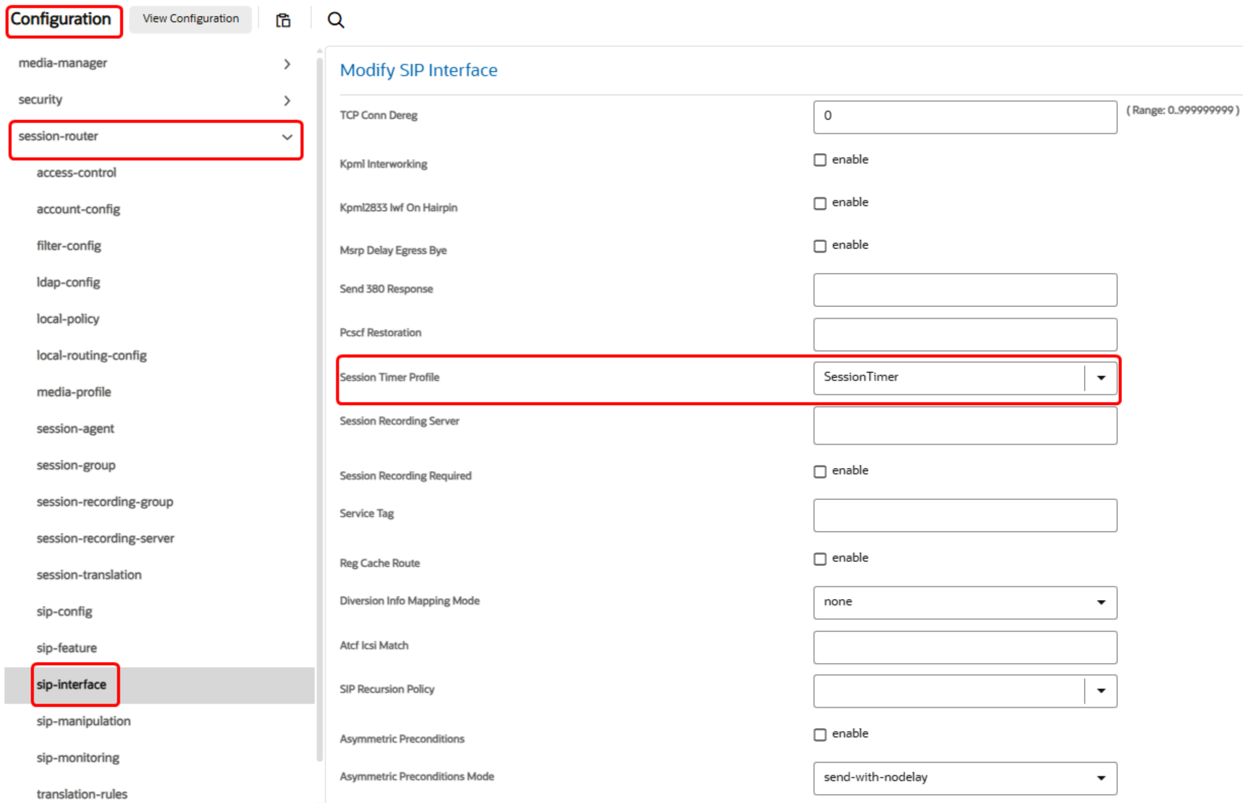

Figure 77: SIP Interface for Google CES (Cont.)

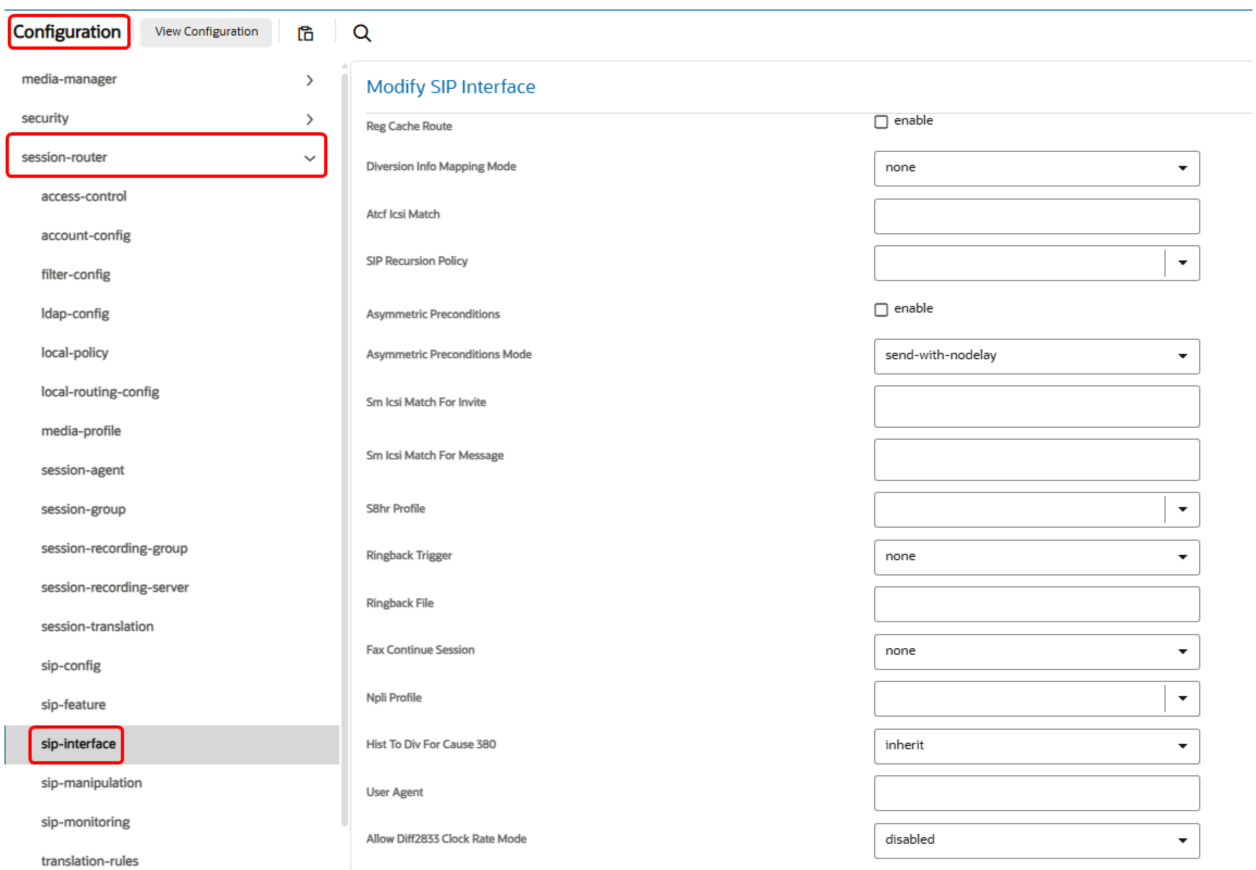

Figure 78: SIP Interface for Google CES (Cont.)

7.4.20 Session Agent

- Session-agents are config elements which are trusted agents which can send/receive traffic from the Oracle E-SBC with direct access to trusted data path.
- Navigate to **Configuration □ session-router □ session-agent**.
- Configure Session Agent for PSTN Gateway, OnPrem PBX and Google CES.

Configure the Session Agent for Google CES as shown below.

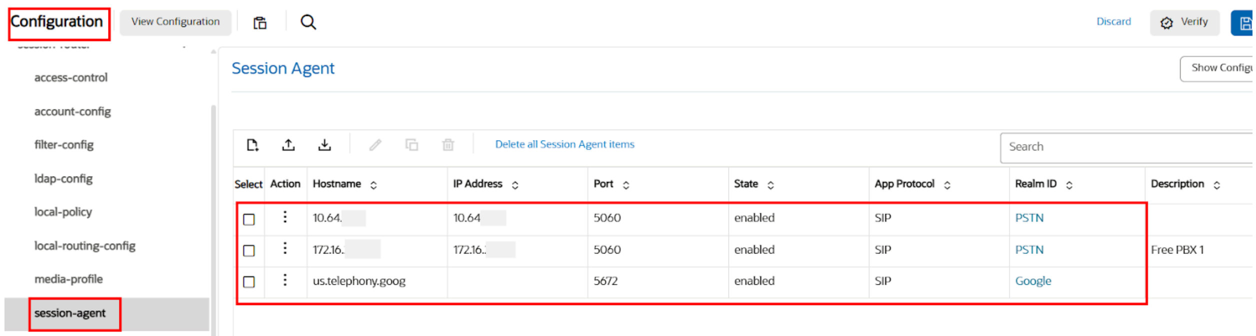

Figure 79: Session Agent

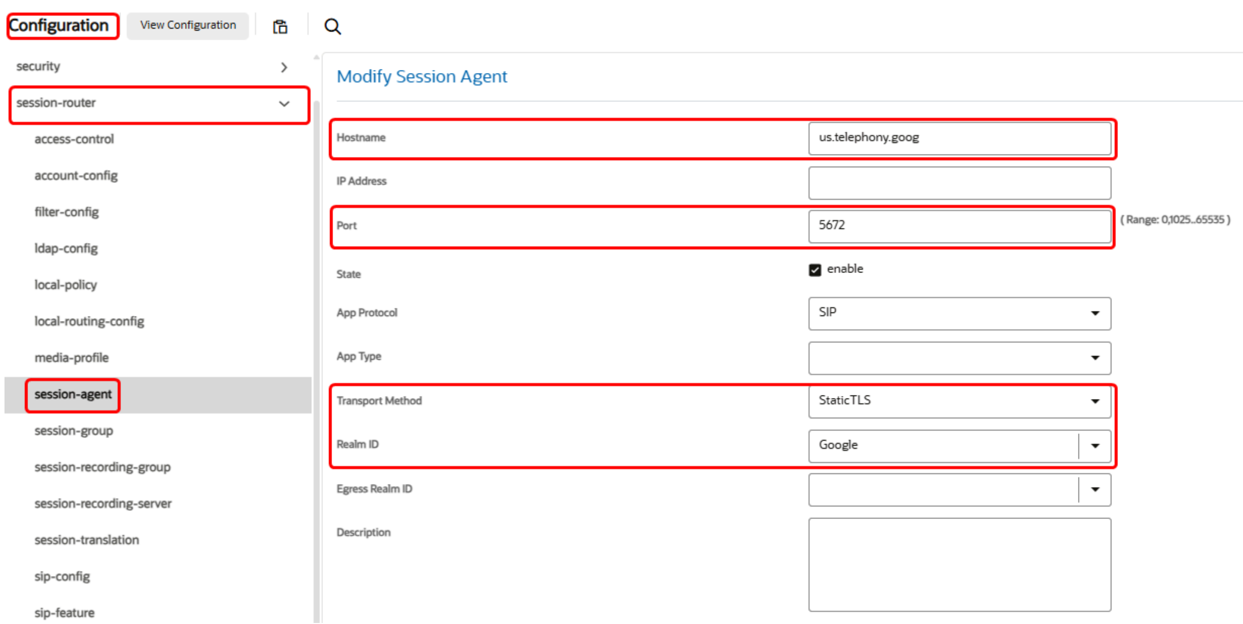

Figure 80: Session Agent for Google CES

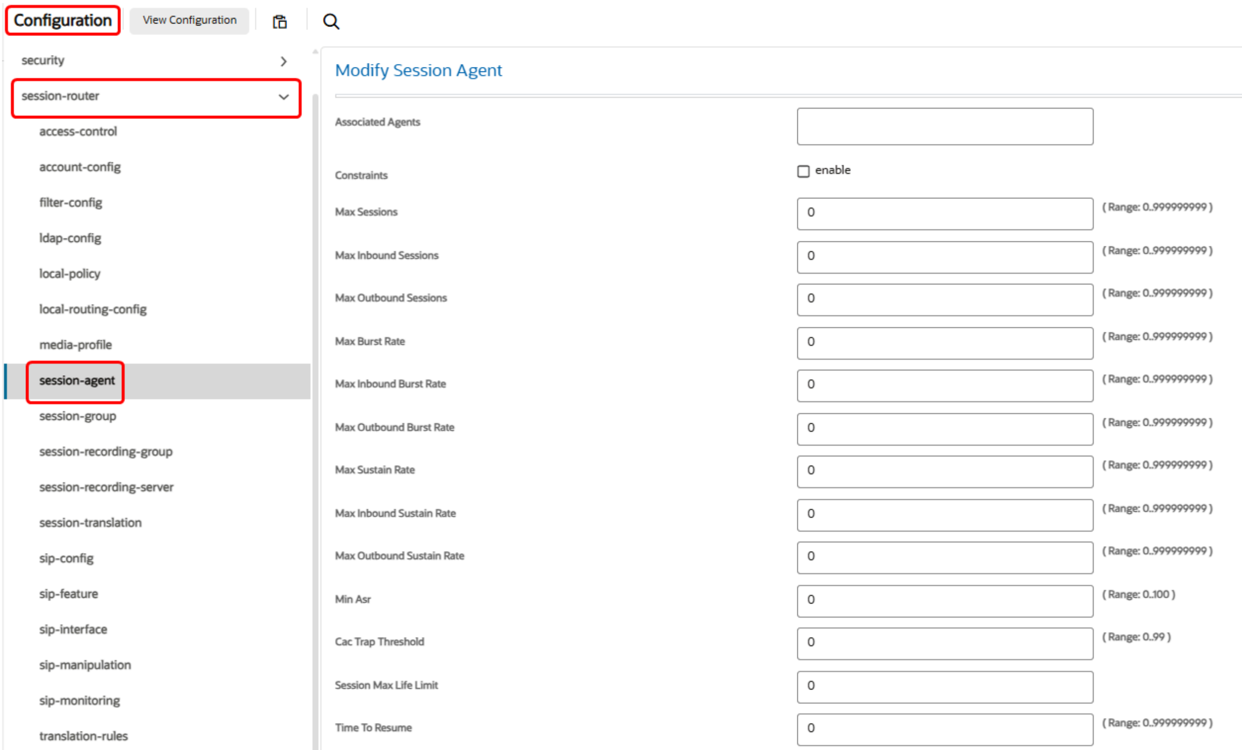

Figure 81: Session Agent for Google CES (Cont.)

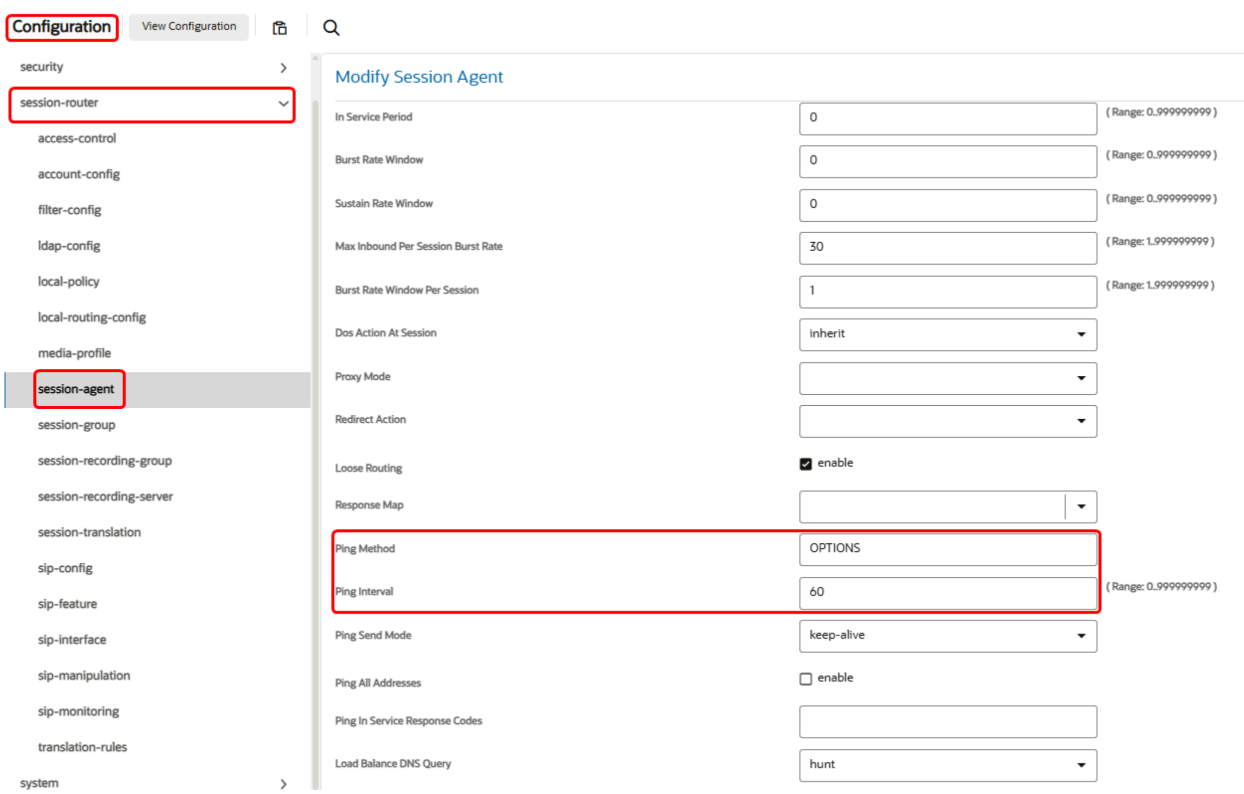

Figure 82: Session Agent for Google CES (Cont.)

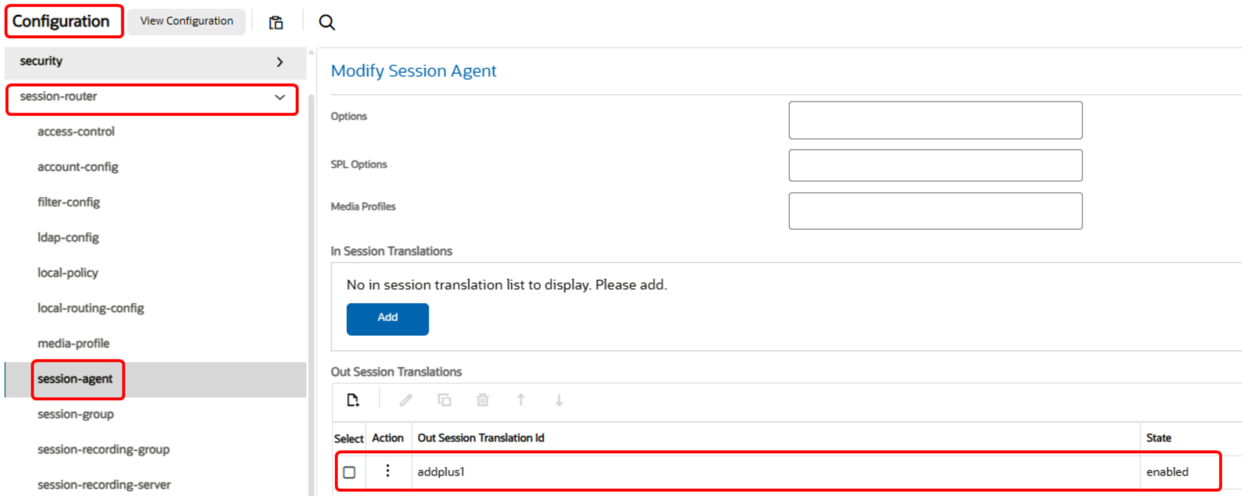

Figure 83: Session Agent for Google CES (Cont.)

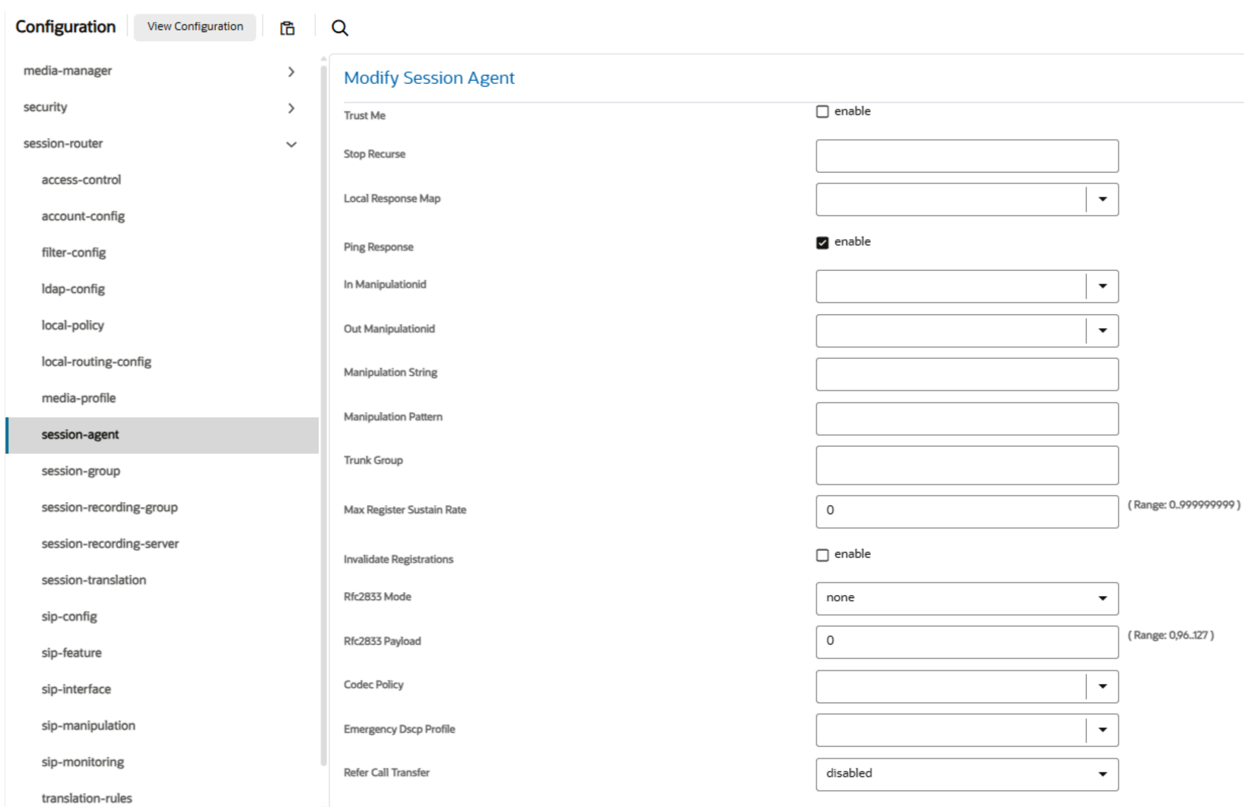

Figure 84: Session Agent for Google CES (Cont.)

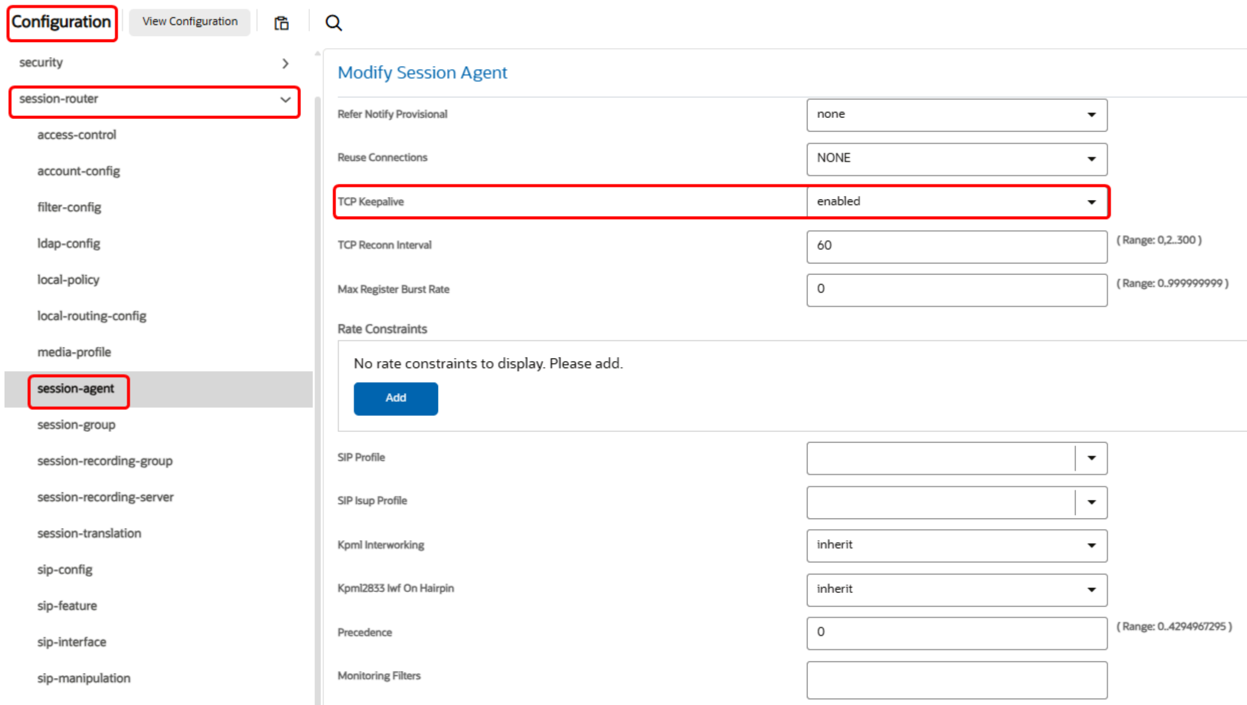

Figure 85: Session Agent for Google CES (Cont.)

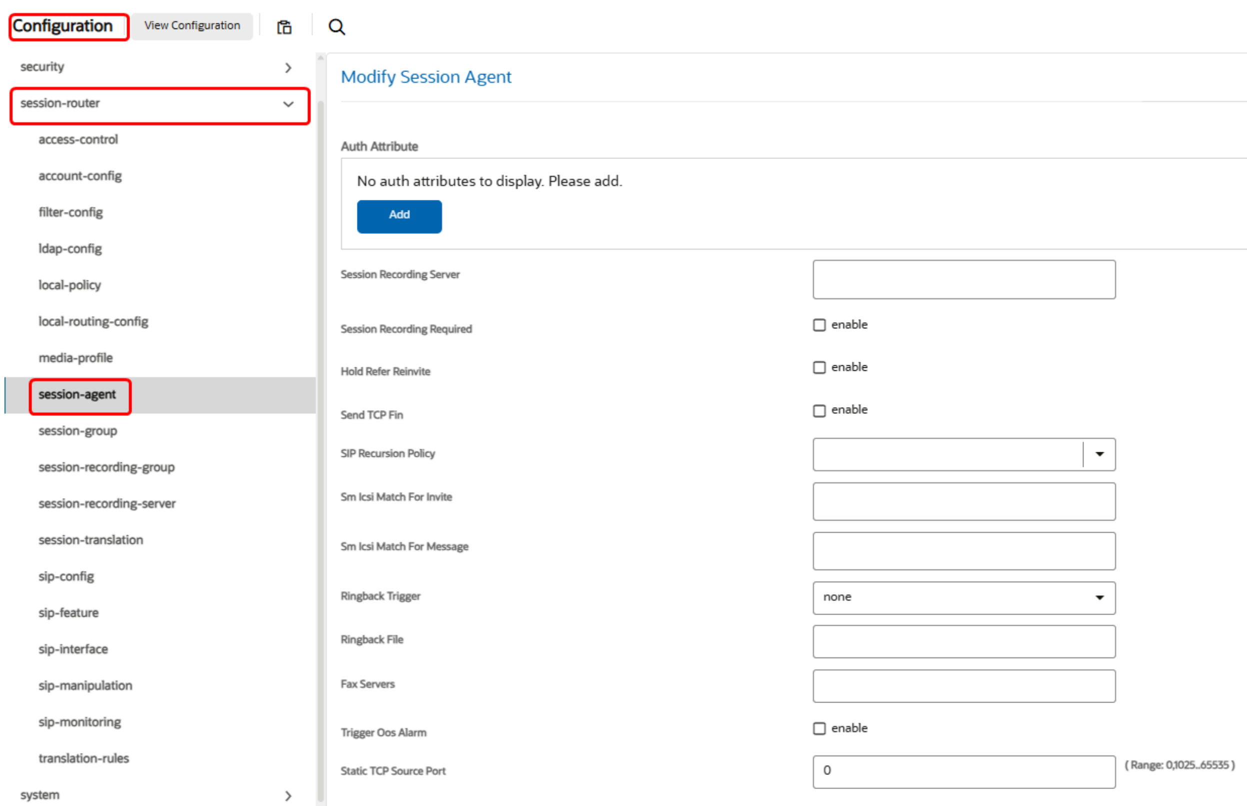

Figure 86: Session Agent for Google CES (Cont.)

- **Configure the Session Agent for OnPrem PBX as shown below.**

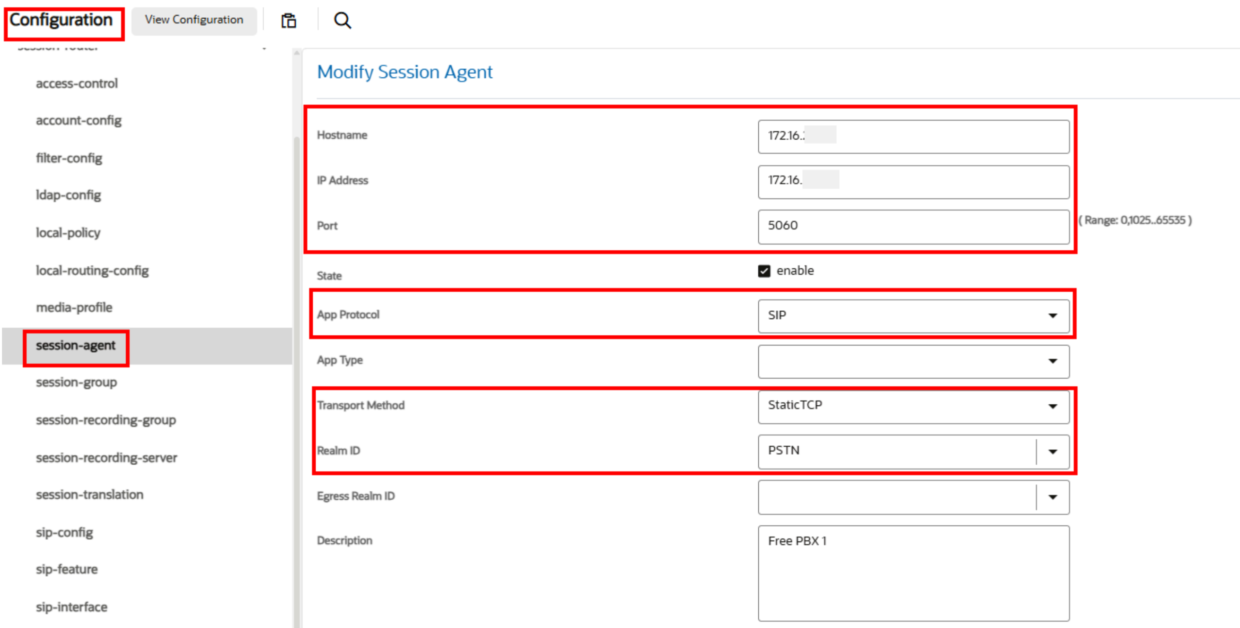

Figure 87: Session Agent for OnPrem PBX

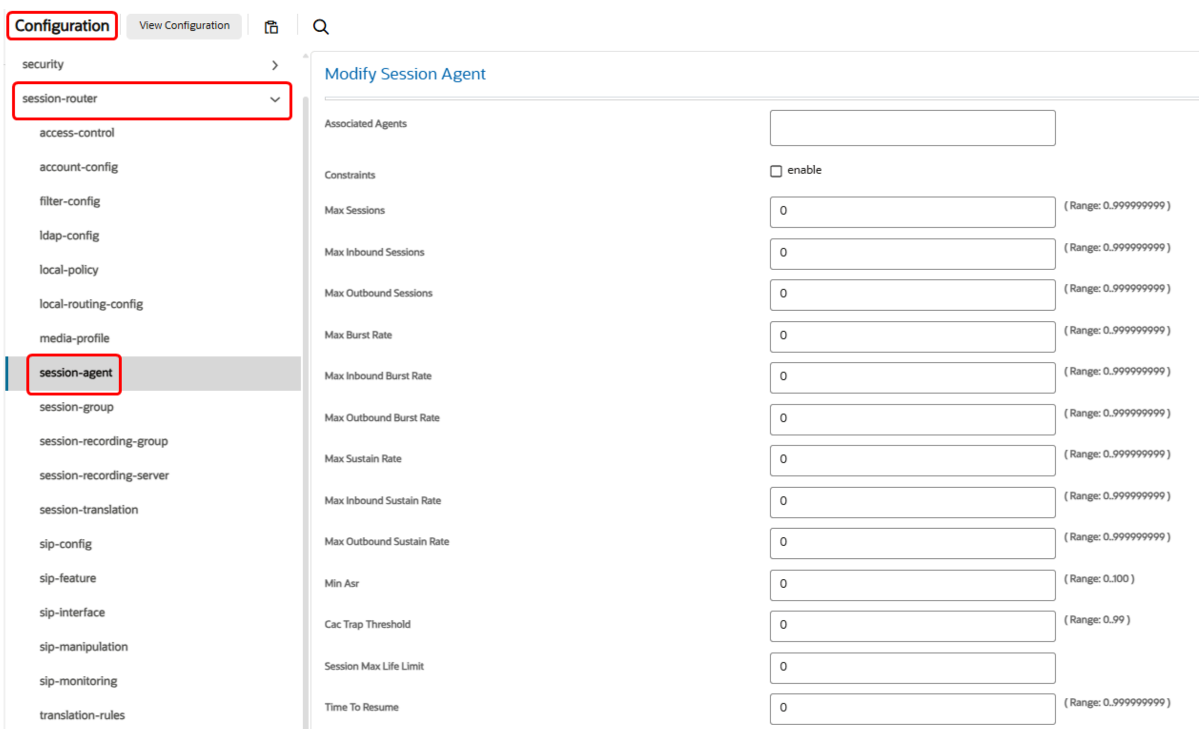

Figure 88: Session Agent for OnPrem PBX (Cont.)

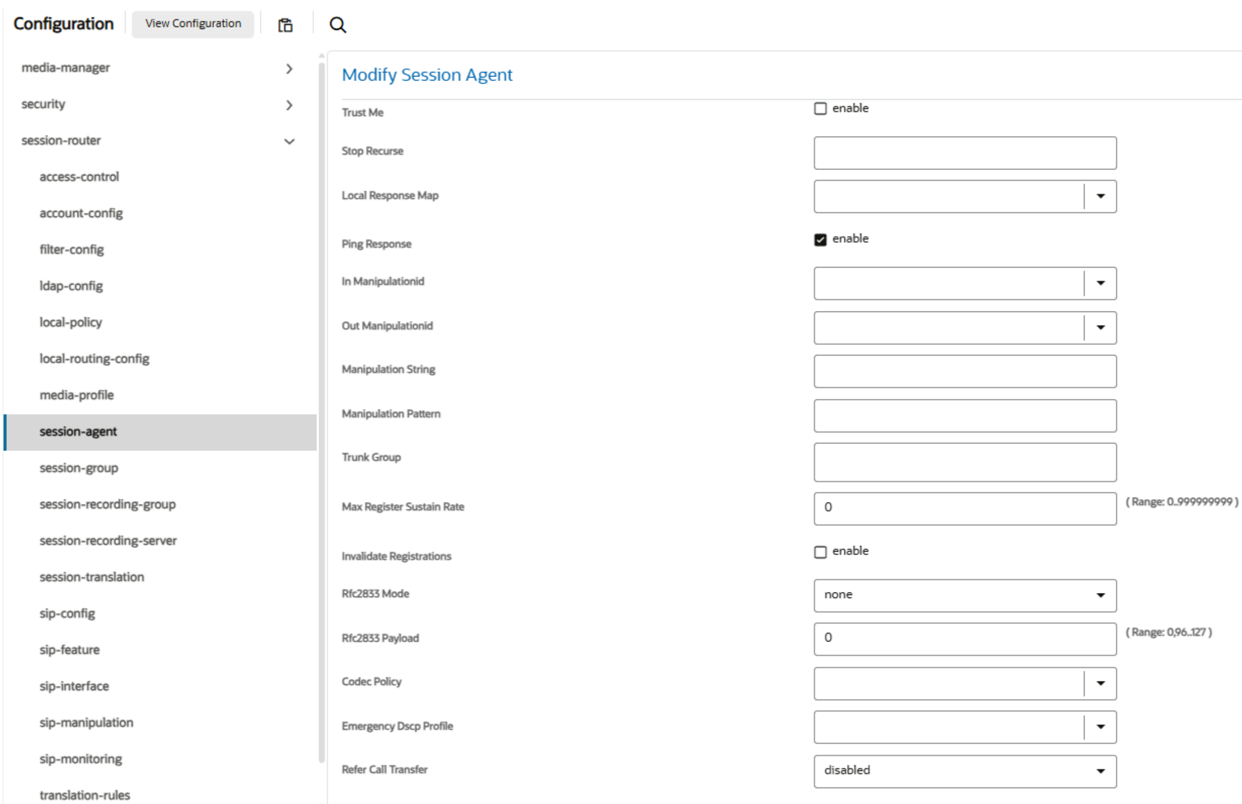

Figure 89: Session Agent for OnPrem PBX (Cont.)

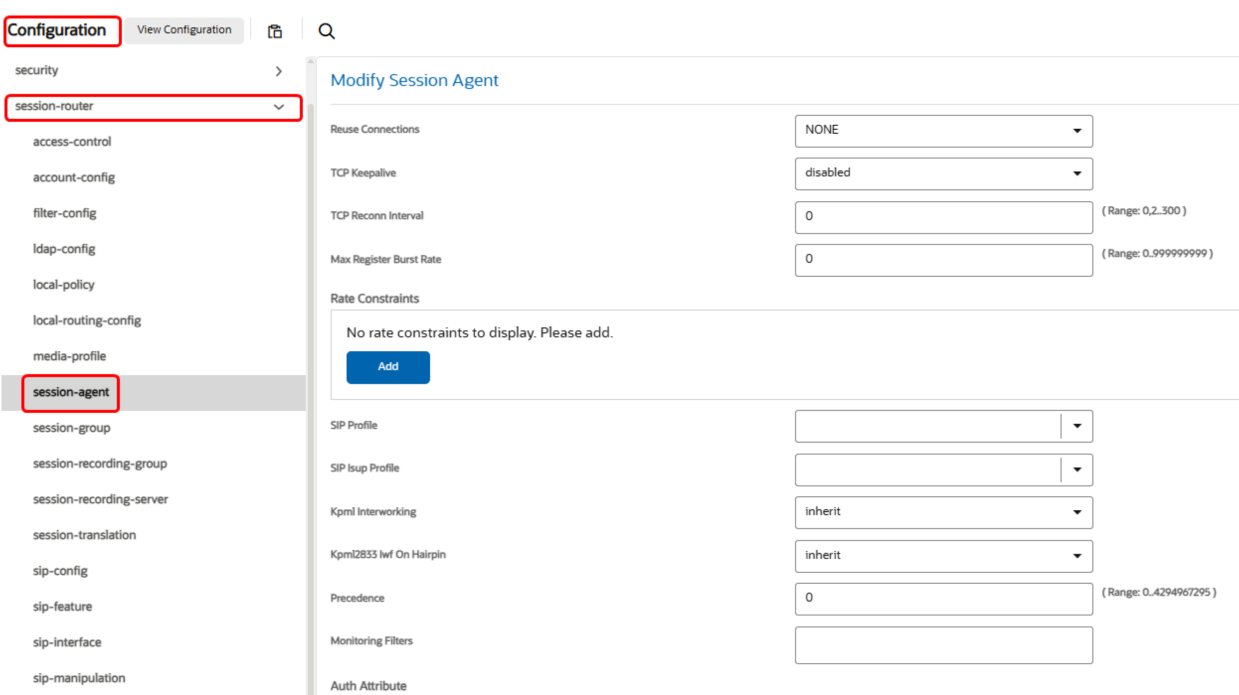

Figure 90: Session Agent for OnPrem PBX (Cont.)

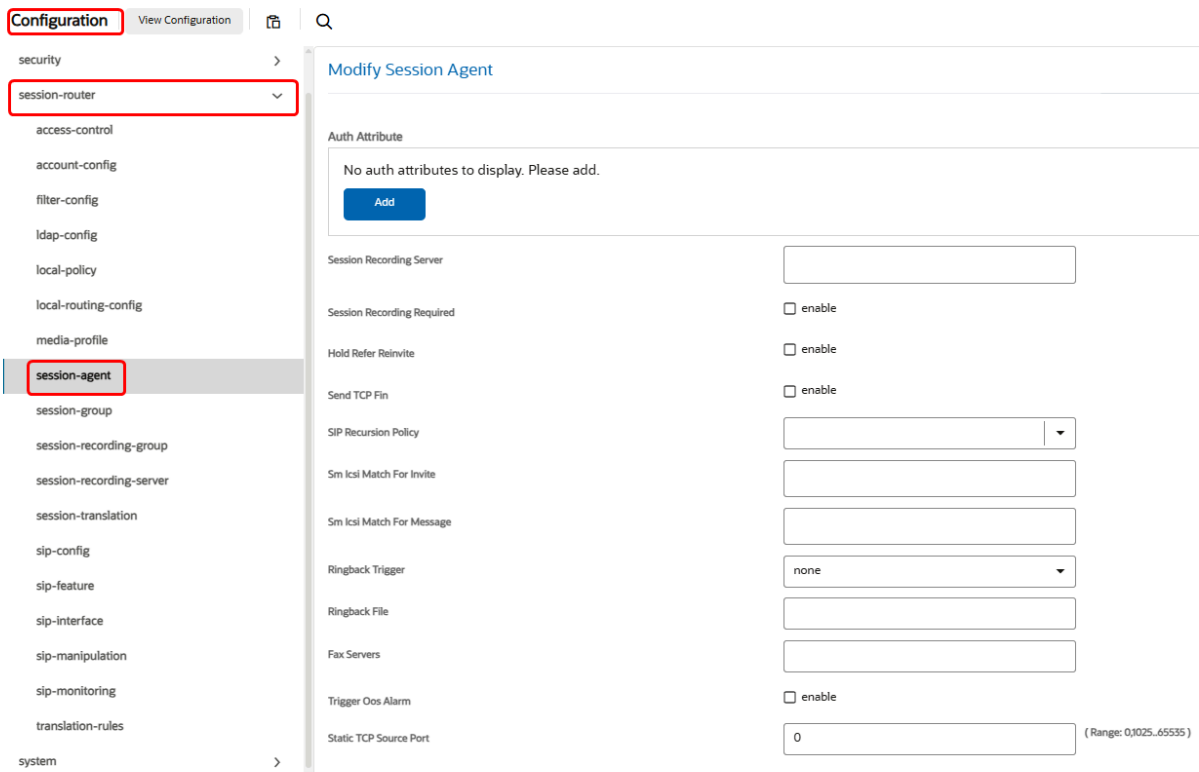

Figure 91: Session Agent for OnPrem PBX (Cont.)

- **Configure the Session agent for PSTN Gateway as shown below.**

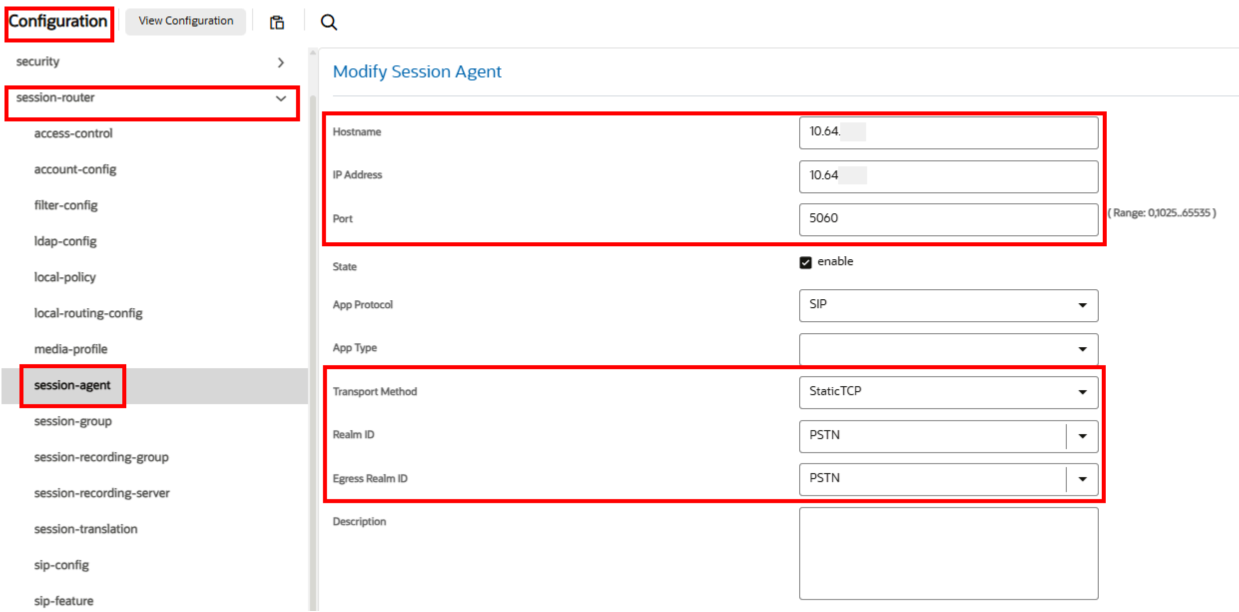

Figure 92: Session Agent for PSTN Gateway

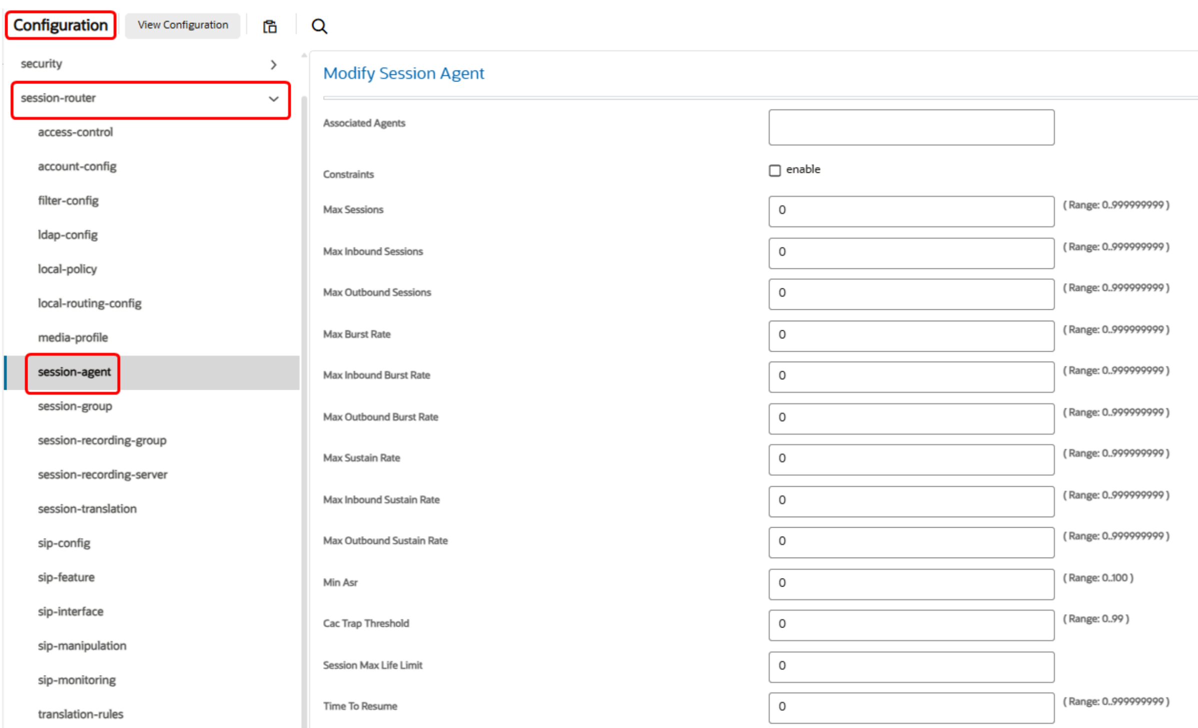

Figure 93: Session Agent for PSTN Gateway (Cont.)

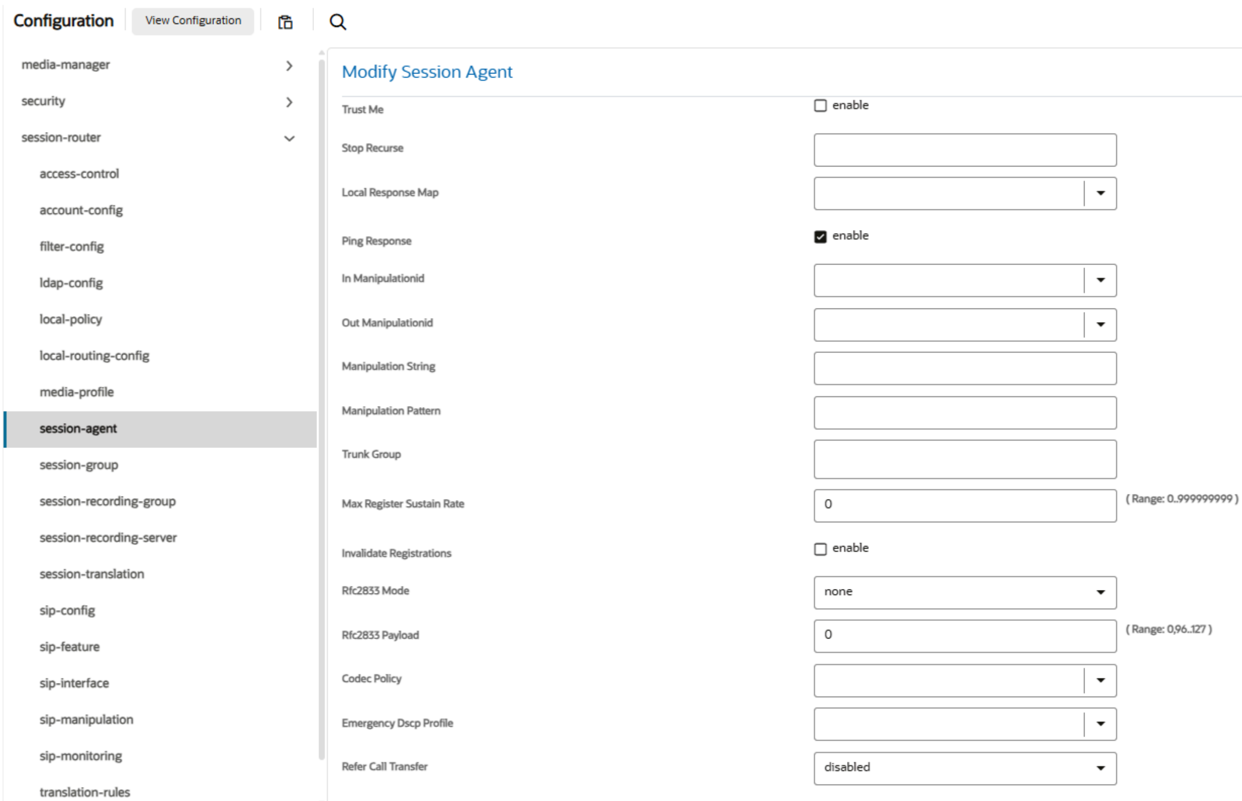

Figure 94: Session Agent for PSTN Gateway (Cont.)

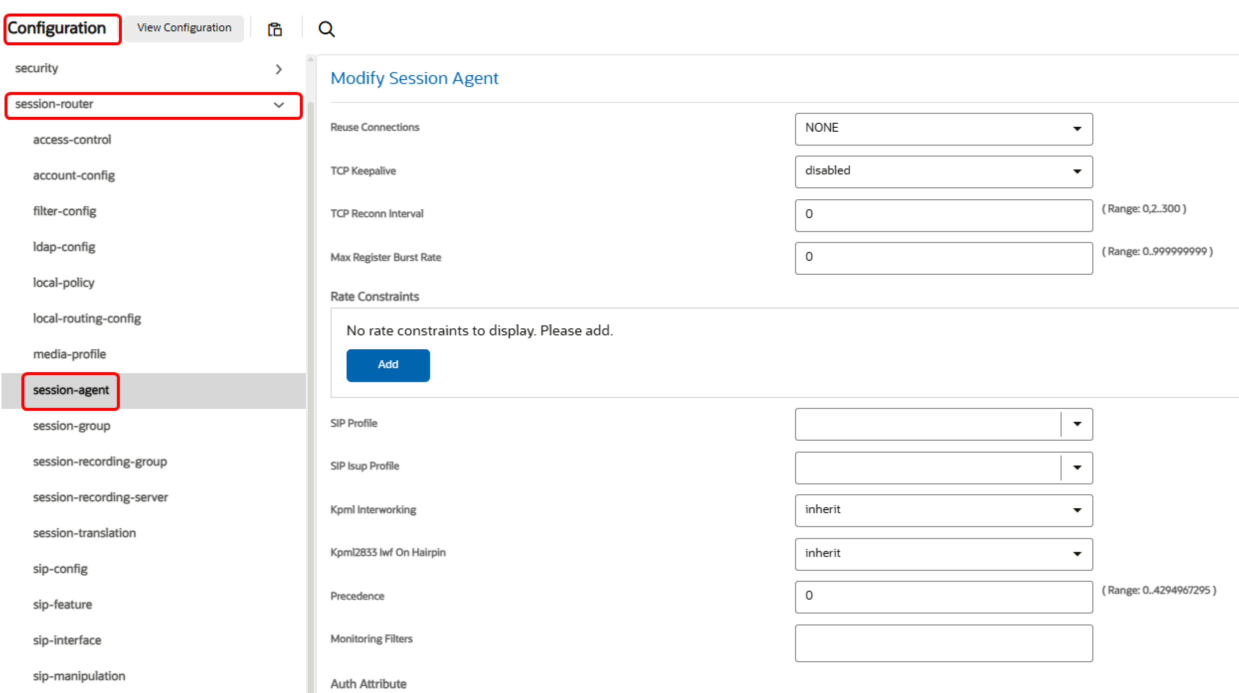

Figure 95: Session Agent for PSTN Gateway (Cont.)

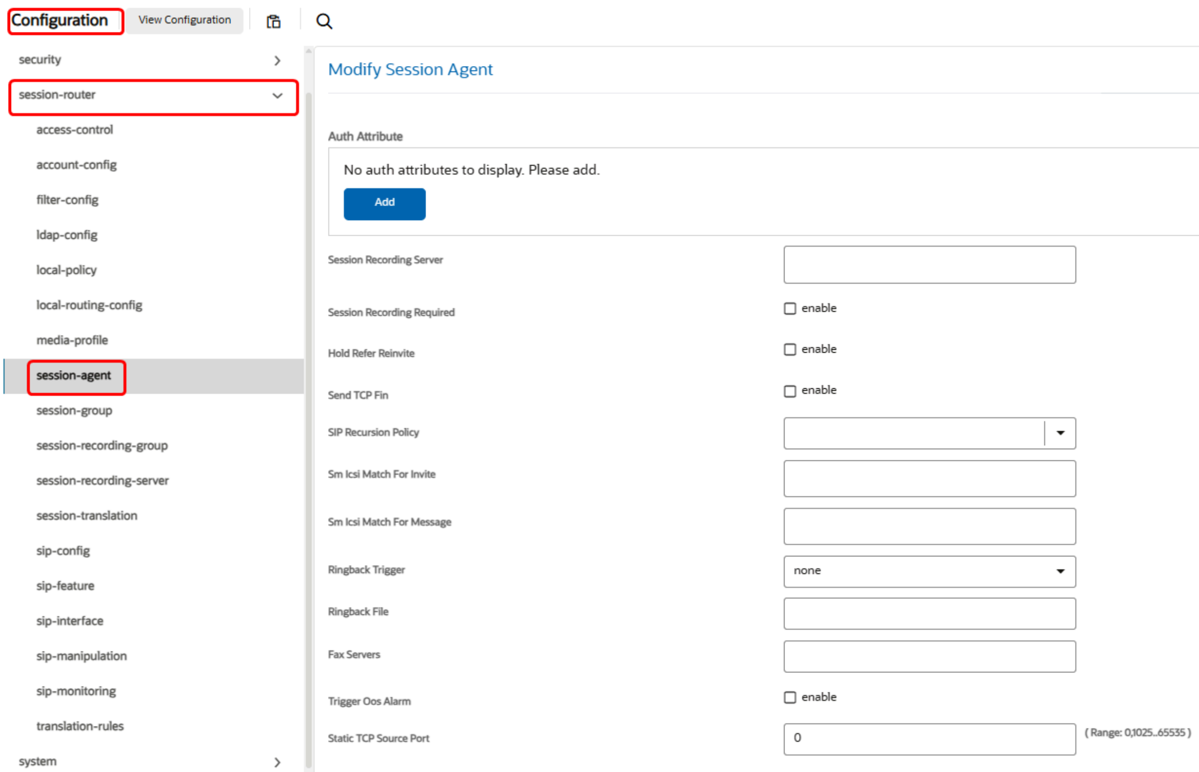

Figure 96: Session Agent for PSTN Gateway (Cont.)

7.4.21 Local Policy

- Local policy config allows for the Oracle E-SBC to route calls from one end of the network to the other based on routing criteria.
- Navigate to **Configuration** □ **session-router** □ **local-policy**.
- Configure local policy for Google CES, OnPrem PBX and PSTN Gateway as shown below.

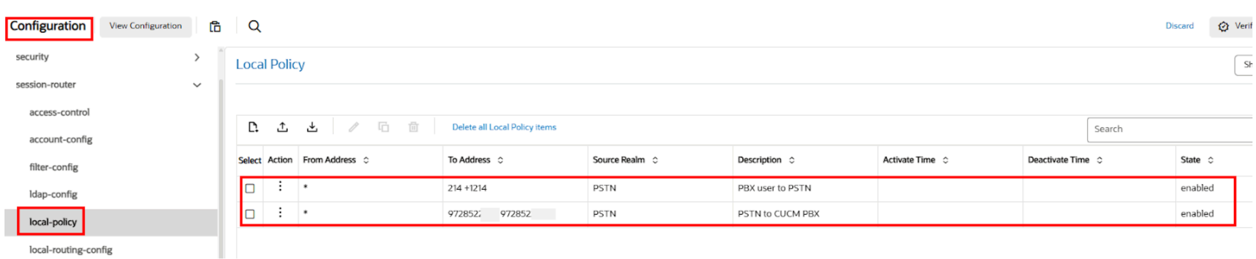

Figure 97: Local Policy

- Below Local Policy is used to route calls from OnPrem PBX to PSTN Gateway.

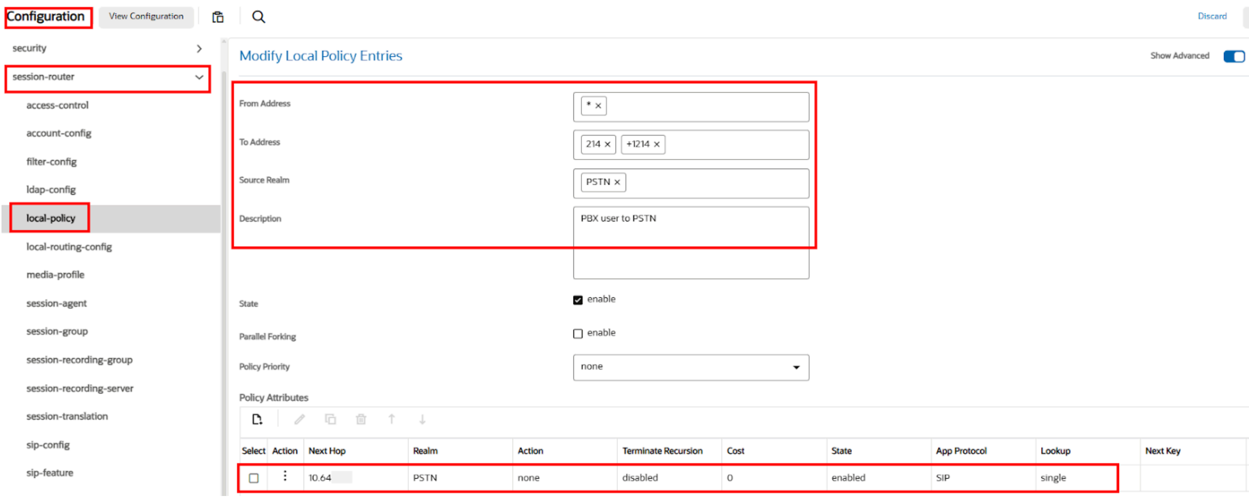

Figure 98: Local Policy routing from OnPrem PBX to PSTN Gateway

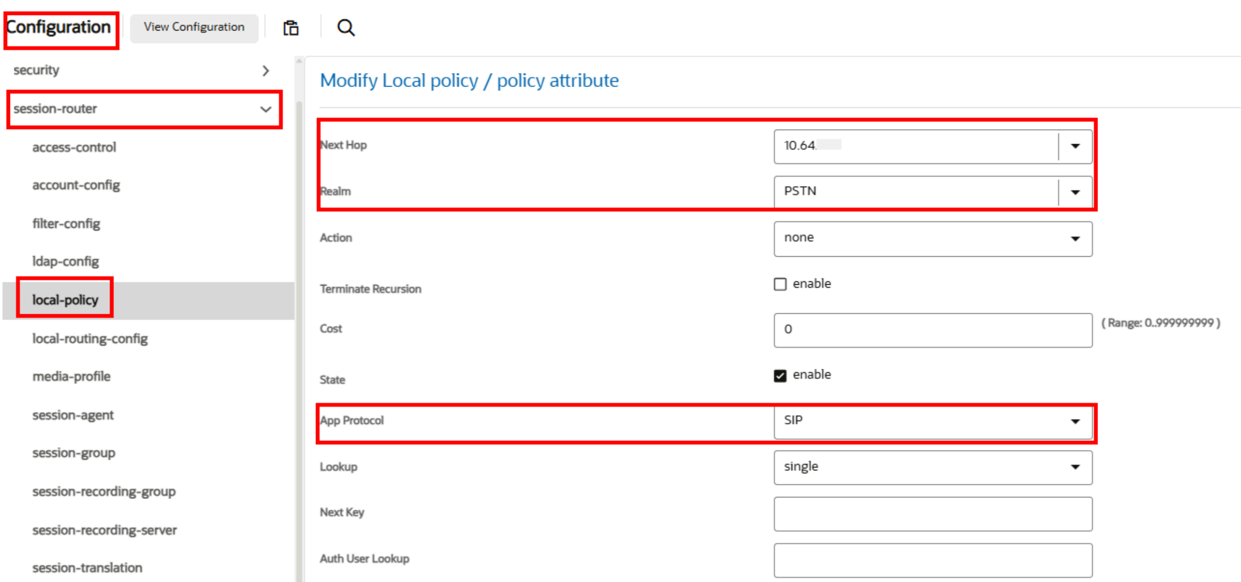

Figure 99: Local Policy routing attributes towards PSTN Gateway

- Below Local Policy is used to route calls from PSTN Gateway to OnPrem PBX.

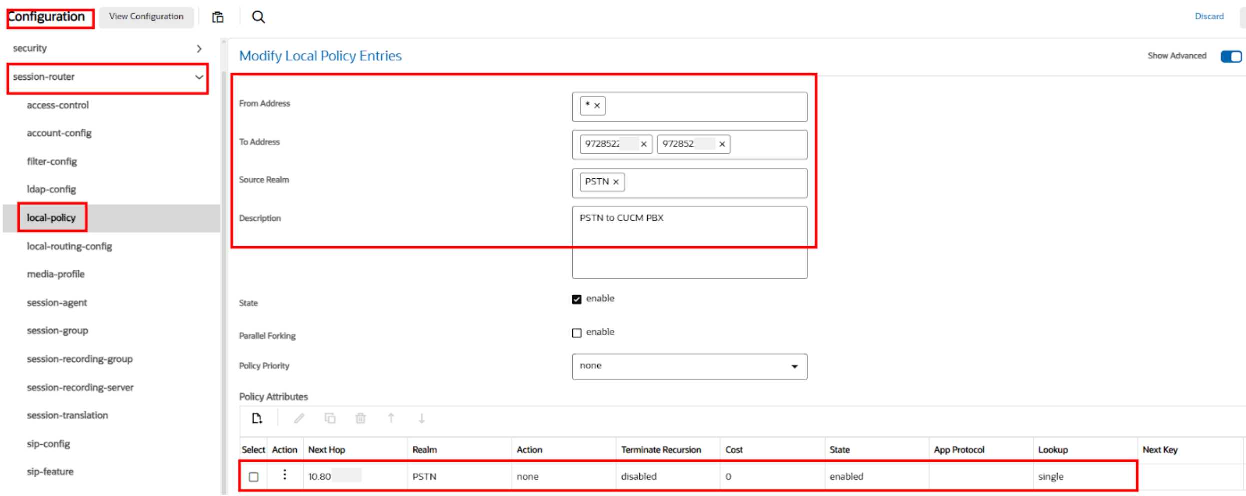

Figure 100: Local Policy routing Towards OnPrem PBX from PSTN Gateway

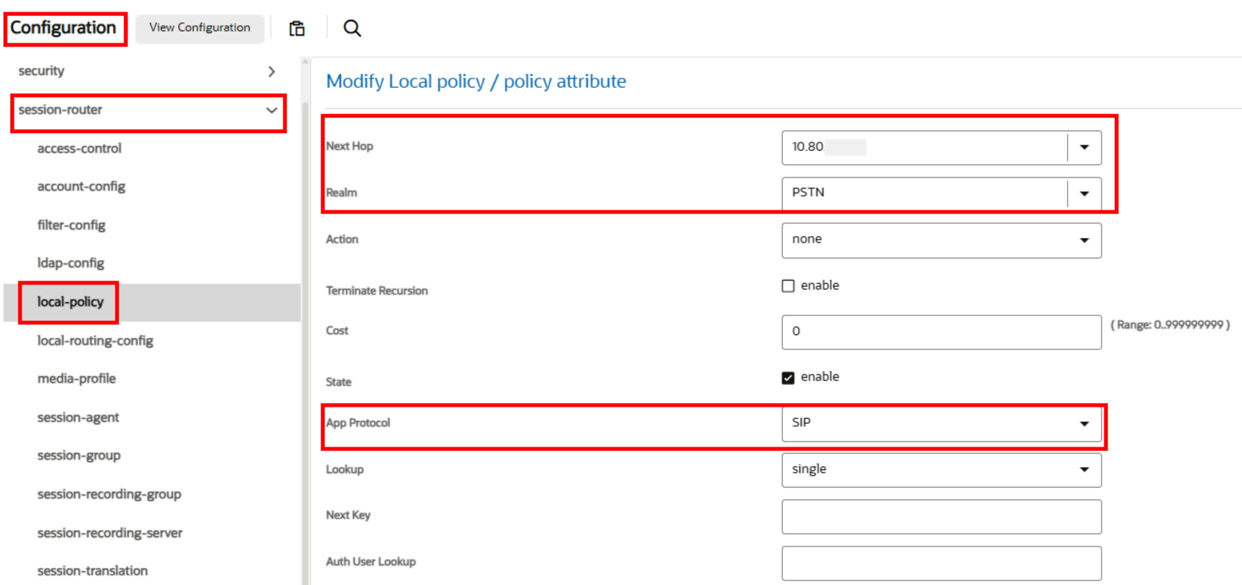

Figure 101: Local Policy routing attributes towards OnPrem PBX

7.4.22 SIP Manipulation

- Navigate to **Configuration □ session-router □ sip-manipulation.**
- Configure SIP manipulation towards Google CES as shown below.

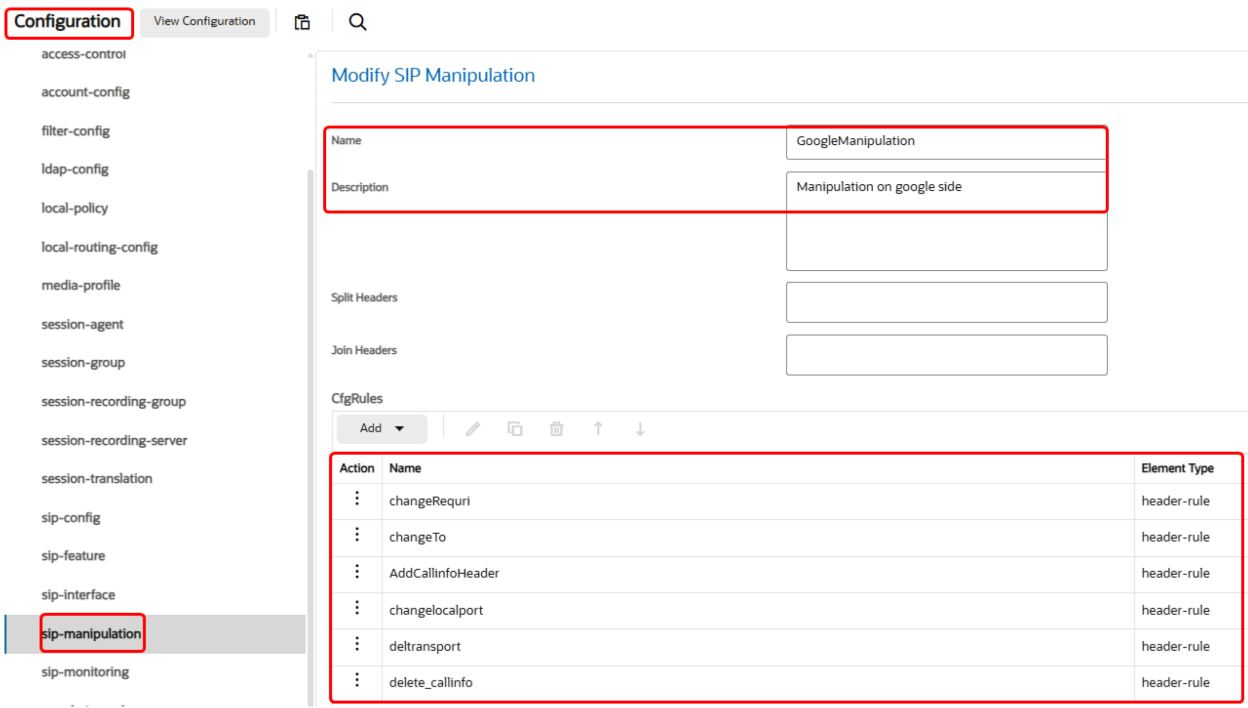

Figure 102: SIP Manipulation towards Google CES

- Add a header-rule for Google CES.

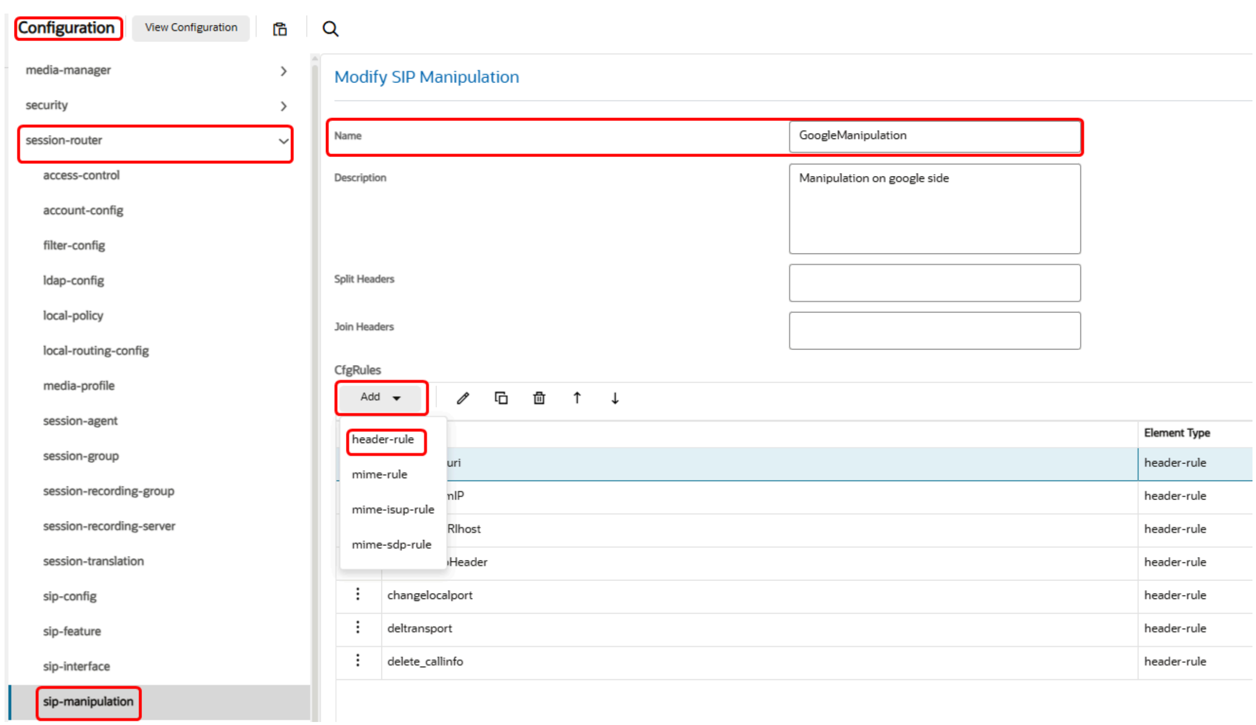

Figure 103: Header rule addition for SIP Manipulation towards Google CES

- Below header rule is created to change Request-URI host and user parts towards Google CES to us.telephony.goog:5672 and +**1361880XXXX**.

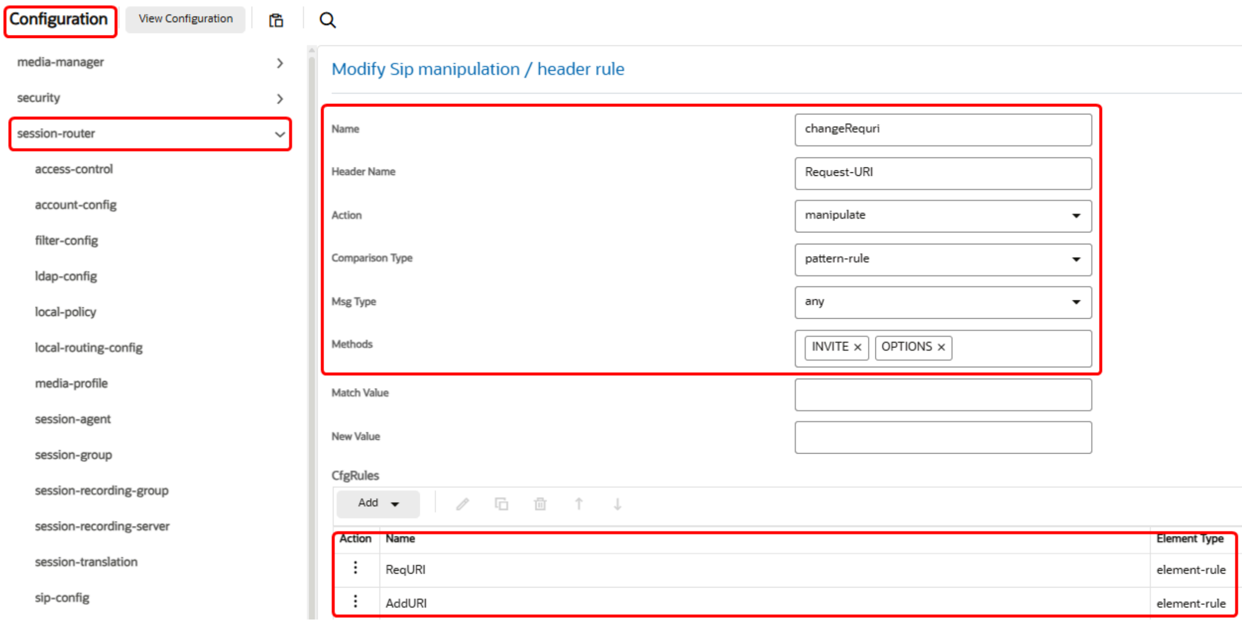

Figure 104: SIP Manipulation towards Google CES Request URI

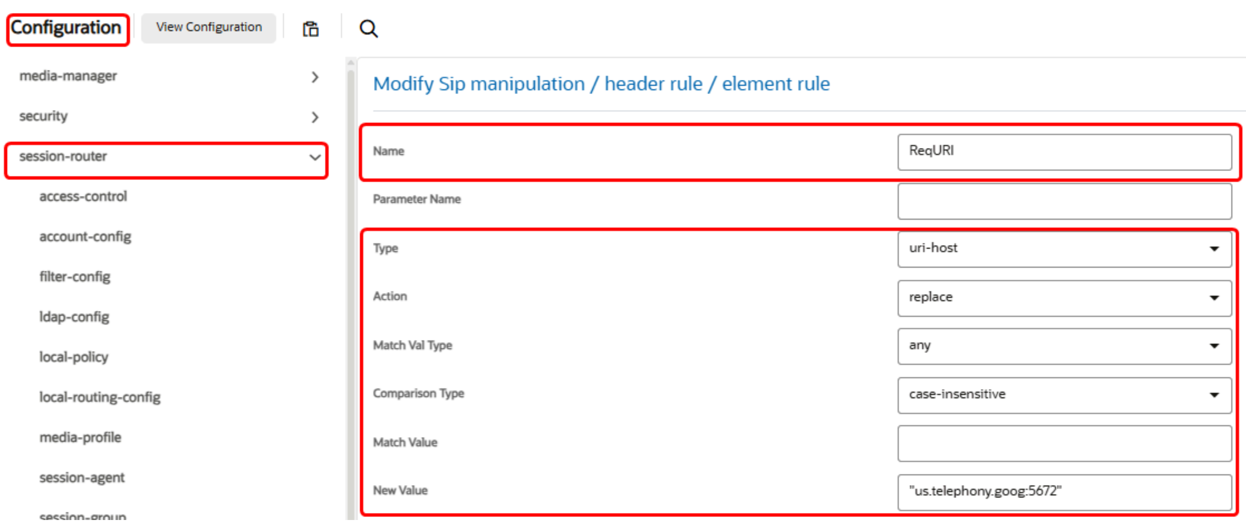

Figure 105: SIP Manipulation towards Google CES change Request URI-host

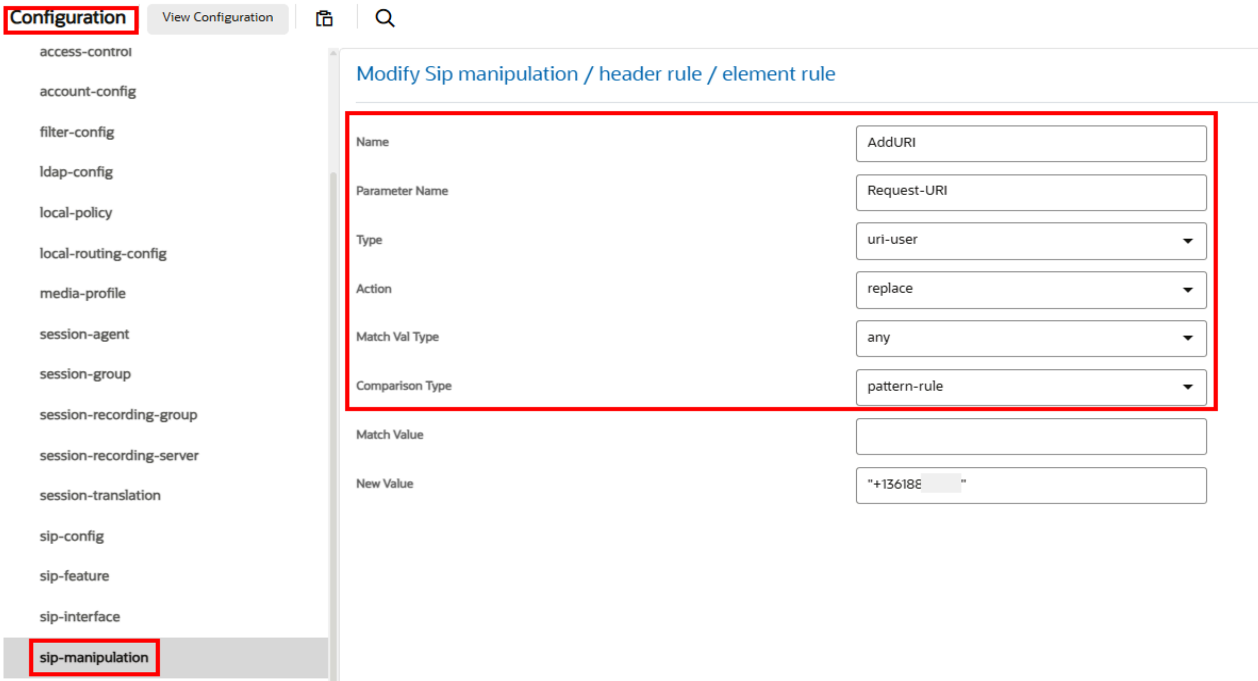

Figure 106: SIP Manipulation towards Google CES change Request URI-user

- Below header rule is created to change TO header host part towards Google CES to IP address of Google CES and user part with Google CES DID.

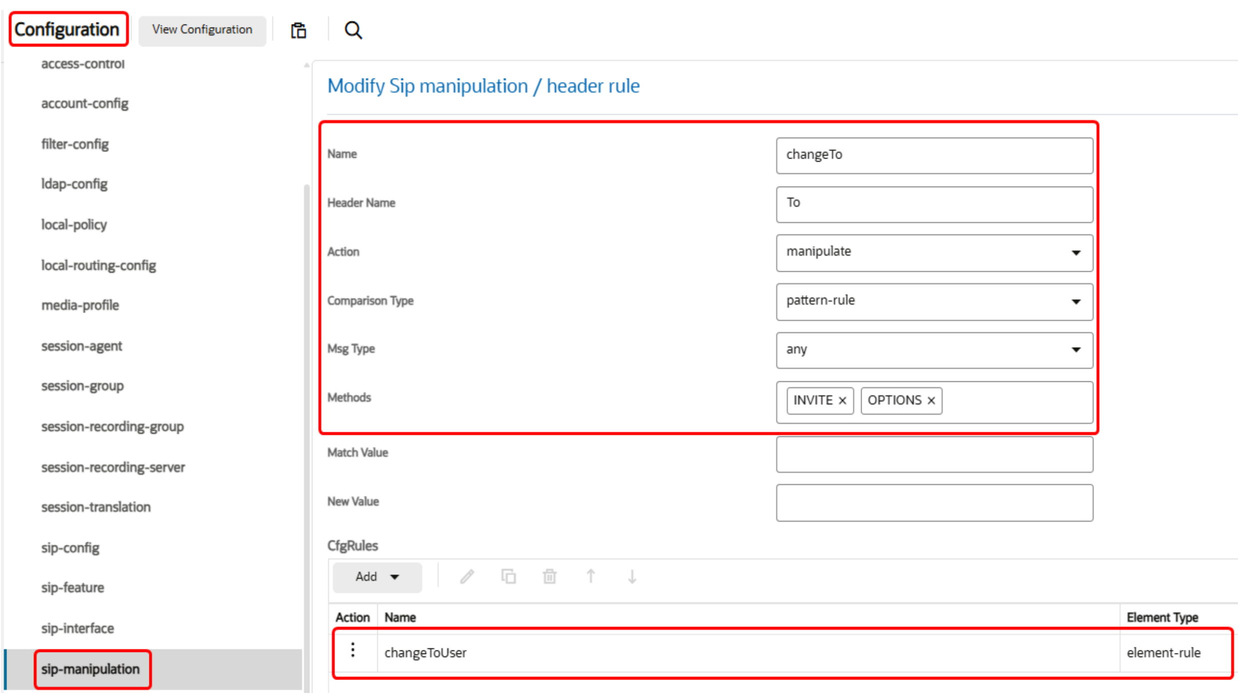

Figure 107: SIP Manipulation towards Google CES TO header

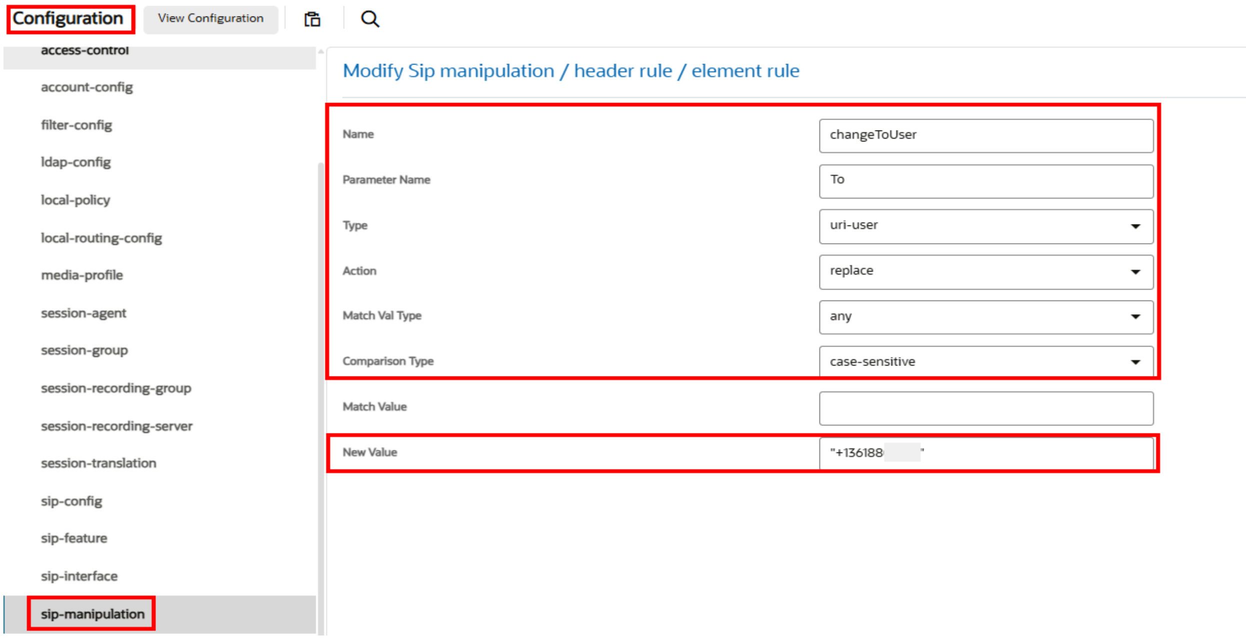

Figure 108: SIP Manipulation towards Google CES – Change TO header user

- Below header rule is created to add Call-Info header towards Google CES with the Dialog Flow API request along with the Conversation ID.
- Conversation on the Fly is set to True in Google CES using REST API. Conversation ID is randomly generated by Oracle E-SBC for each call.
- New Value is set to "<http://dialogflow.googleapis.com/v2beta1/projects/ccai-3898XX/conversations/OR_"+$CALL_ID.$0+">;purpose=Goog-ContactCenter-Conversation"

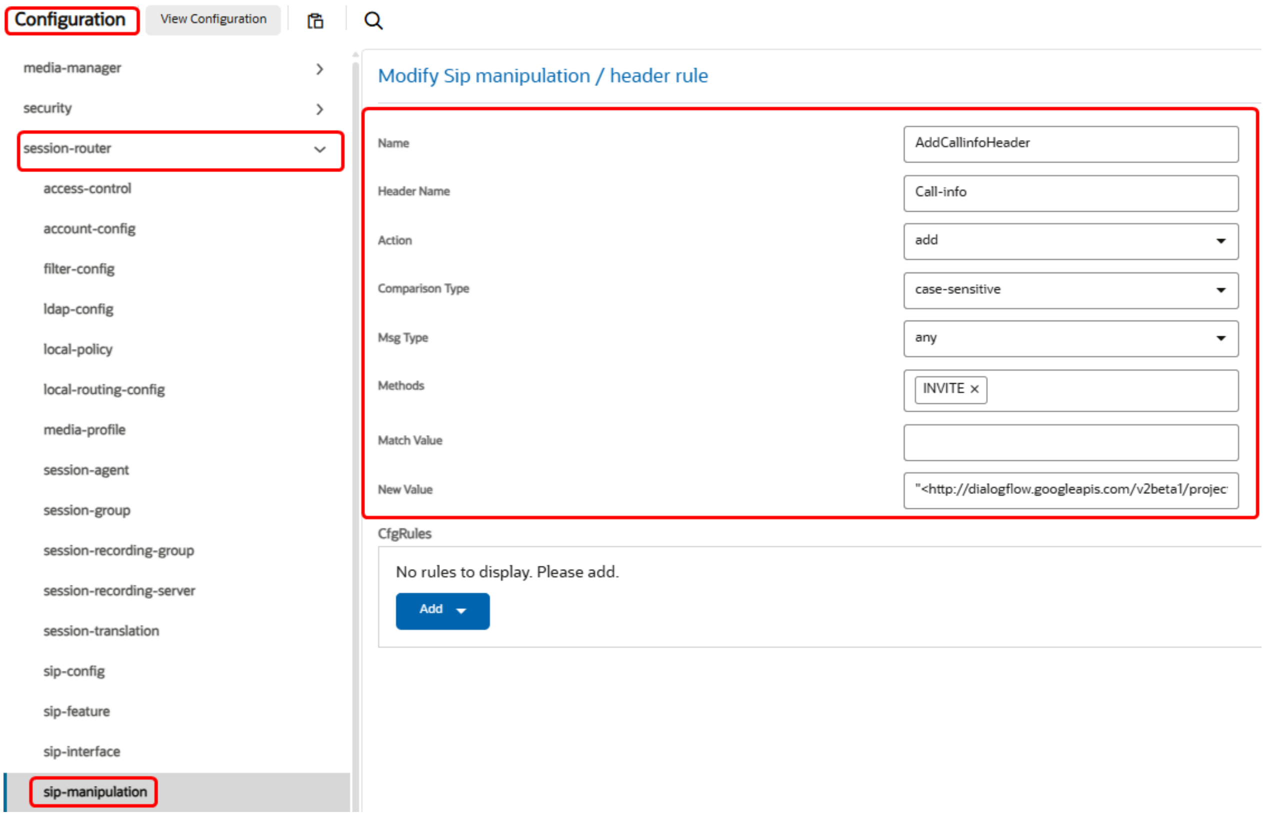

Figure 109: SIP Manipulation towards Google CES – Add Call-Info

SIP Manipulation Participation Label:

- The transcript recording files stored in the Google CES bucket include two participant roles "HUMAN_AGENT" and "END_USER".
- To map the participant roles to the transcripts generated, Google uses the participant labels provided in the call-info header. Use the below rule only if Participant labels are required in the setup.
- Sample call-info header with participant roles:
- Call-info:*"<http://dialogflow.googleapis.com/v2beta1/projects/ccai-389XX/conversations/OR_"+$CALL_ID.$0+"?roles=HUMAN_AGENT,END_USER>;purpose=Goog-ContactCenter-Conversation"*

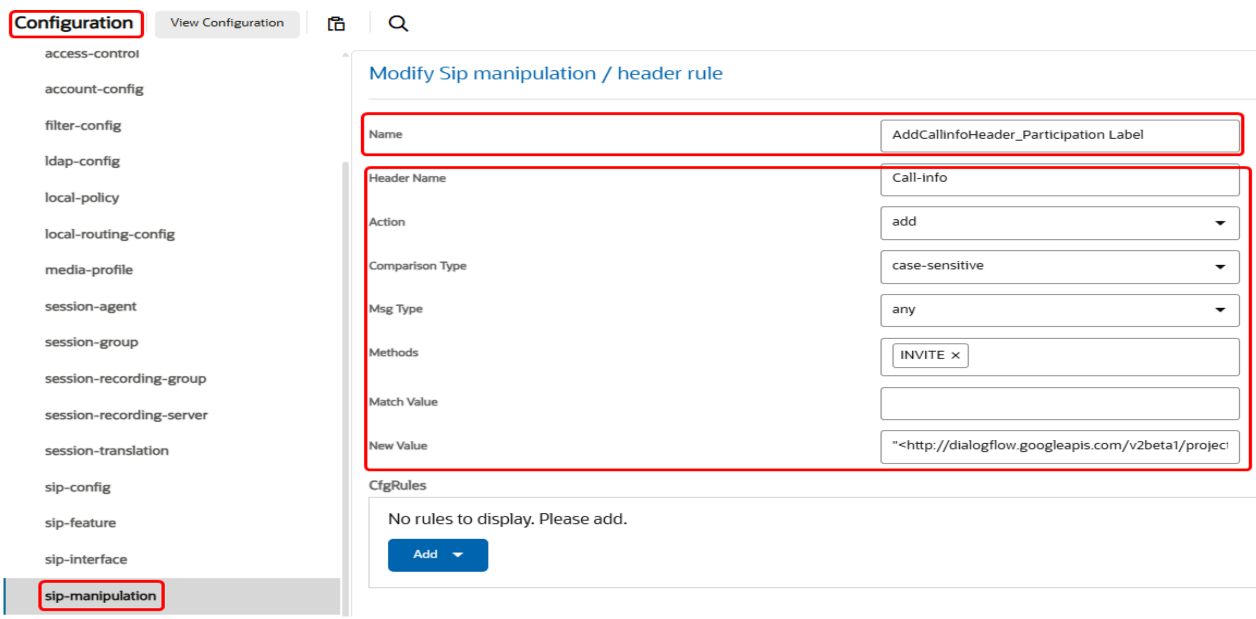

Figure 110: SIP Manipulation towards Google CES – Add Call-Info for Participation Label

- Below header rule is created to delete the Google CES FQDN generated by Oracle E-SBC during the creation of Conversation ID (this rule is applied only when Conversation on the Fly is set to True in Google CES).

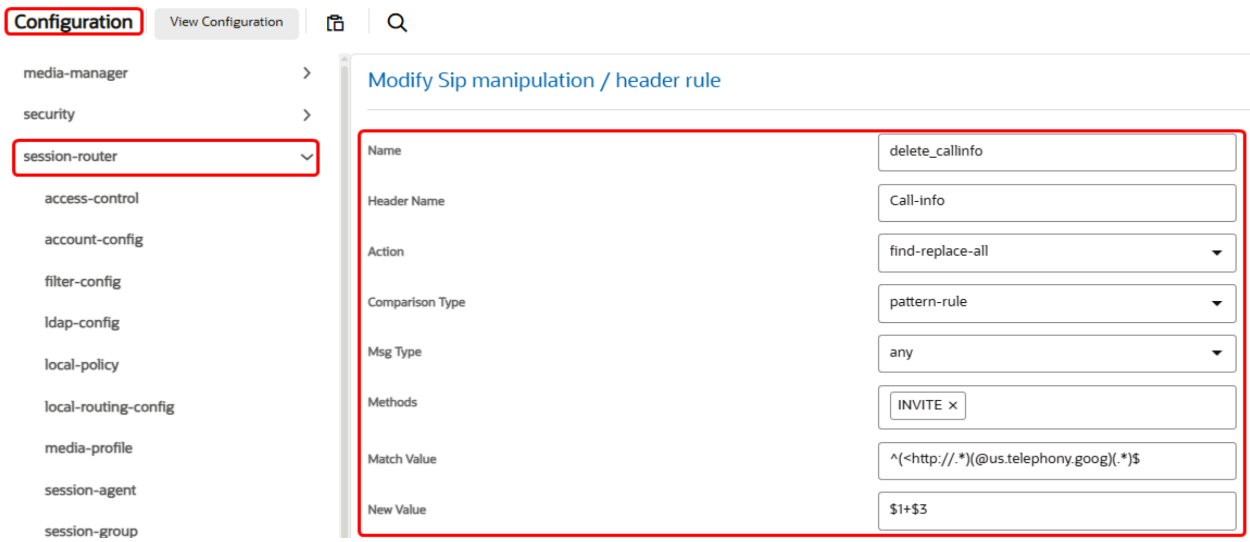

Figure 111: SIP Manipulation towards Google CES – Delete Call-Info host IP address

- Below header rule is created to change the port number in the Request URI towards Google CES.

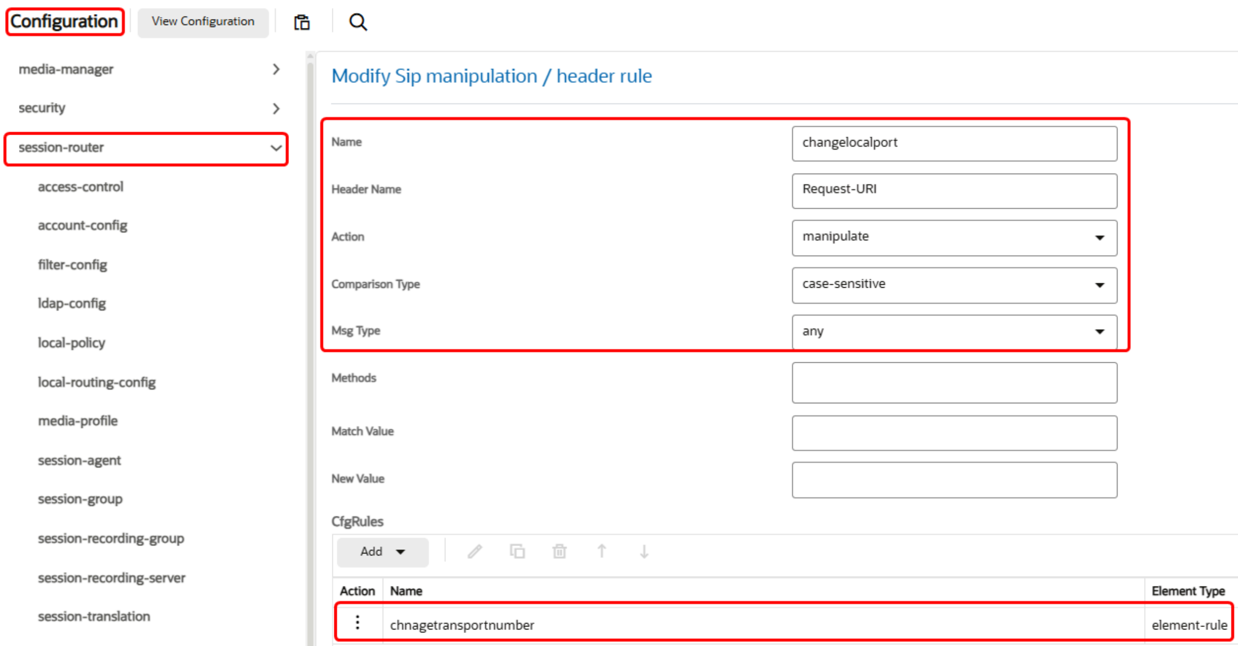

Figure 112: SIP Manipulation towards Google CES – Change Request URI Port number

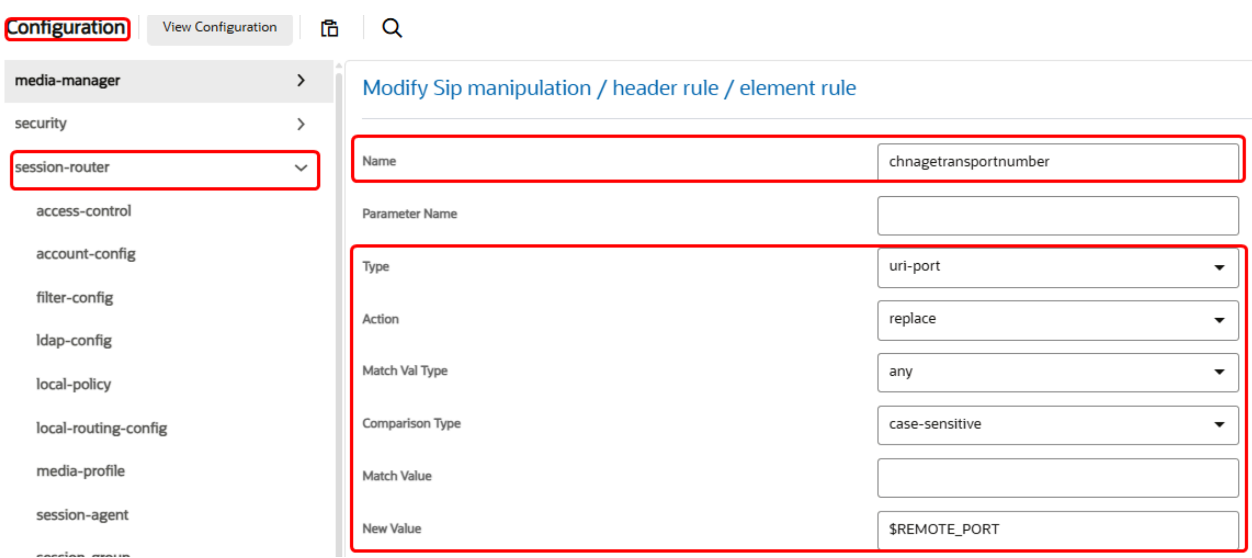

Figure 113: SIP Manipulation towards Google CES – Change Request URI Port number (Cont.)

- Below header rule is created to delete the transport parameter in the Request URI towards Google CES.

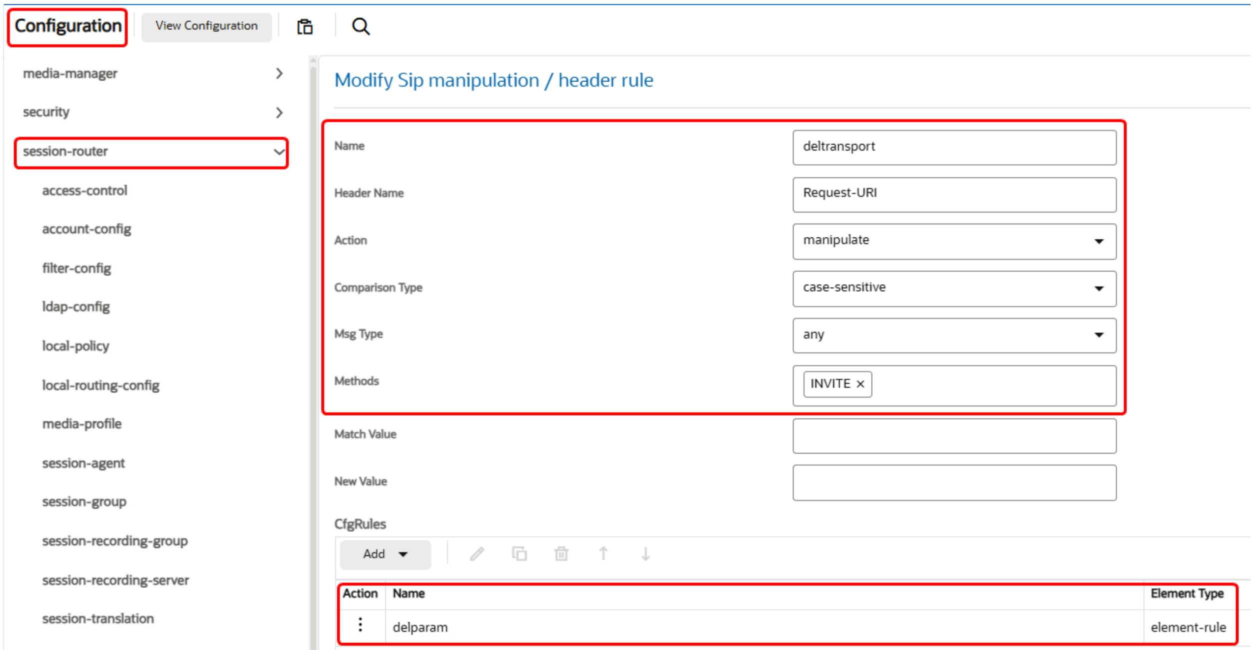

Figure 114: SIP Manipulation towards Google CES – Delete Transport parameter

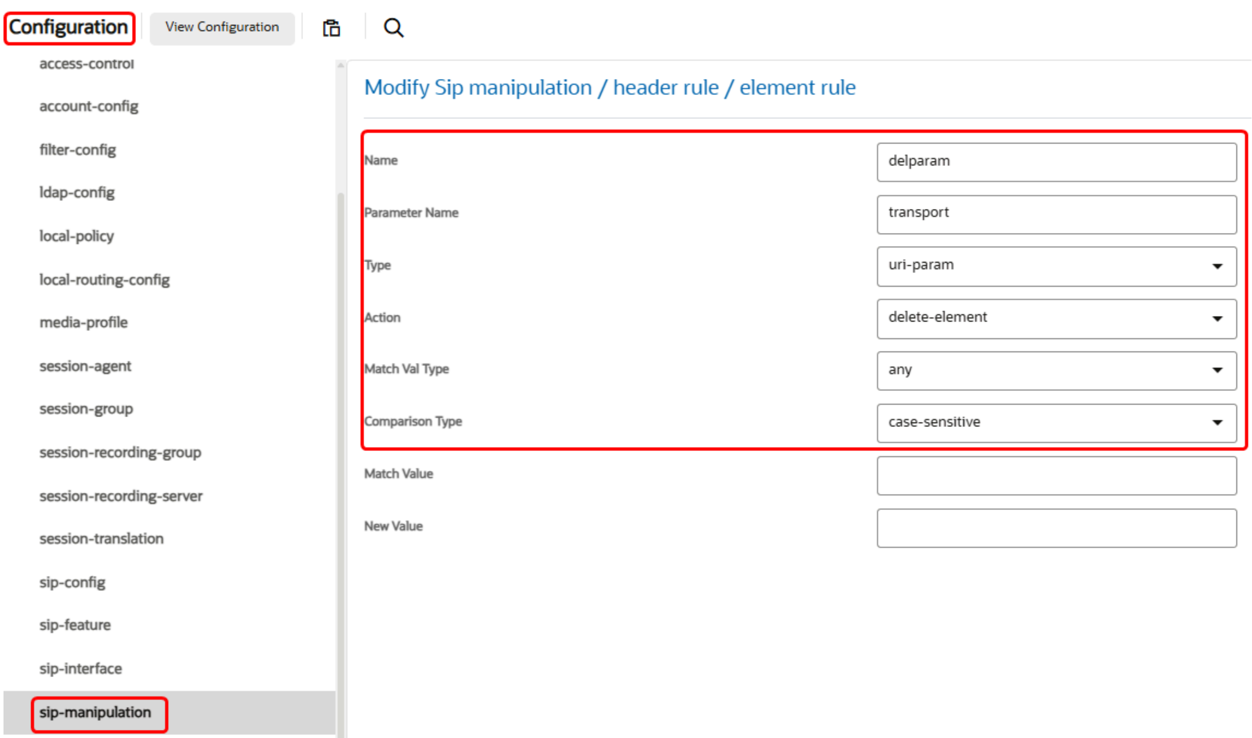

Figure 115: SIP Manipulation towards Google CES – Delete Transport parameter (Cont.)

8 SIP INVITE To GOOGLE CES

8.1 SIP INVITE for SIPREC call

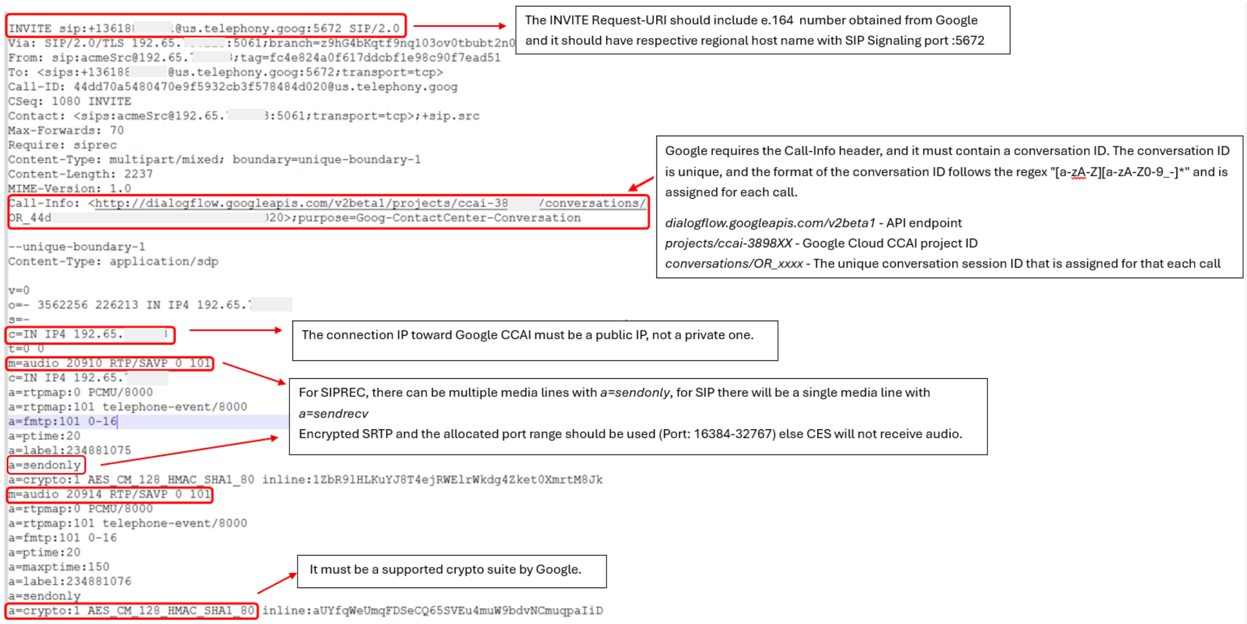

Figure 116: SIPREC Call

8.2 SIP INVITE for GTP call

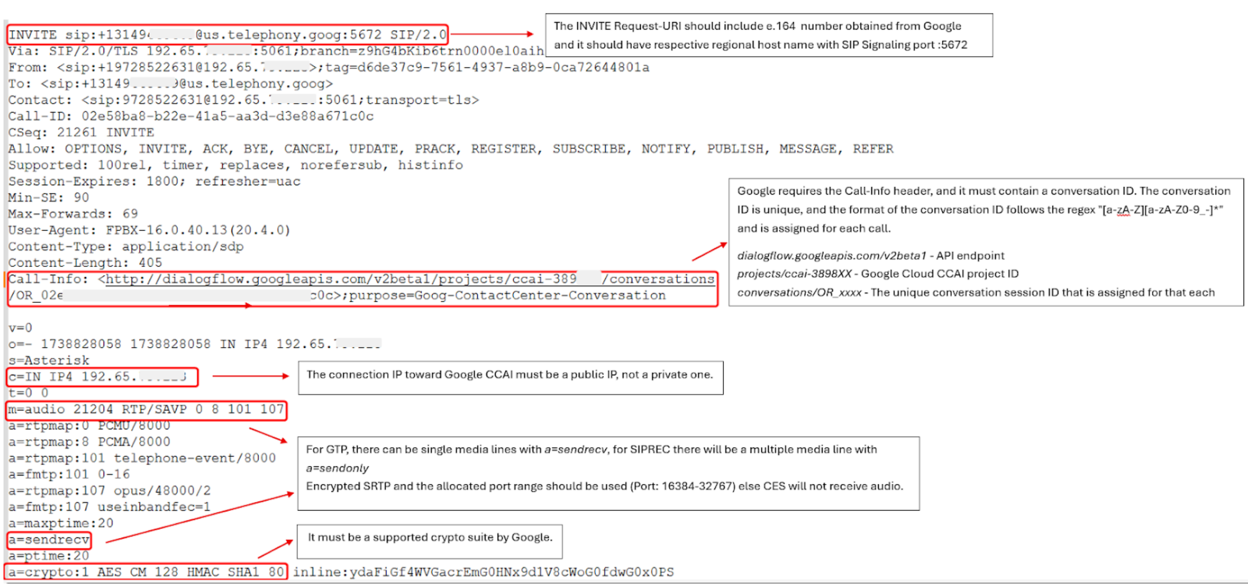

Figure 117: GTP Call

9 Oracle E-SBC Running configuration file

Attached is the Oracle E-SBC running configuration file.

Google_SIPREC_Running Config

10 Summary of Tests and Results

ID	Title	Description	Expected Results	Status (Passed or Failed etc)	Observations
SBC Configuration Verification					
1	SBC Configuration Verification	TLS connection setup. SBC initiates TLS connection with CES	Successful 4way handshake with Google CES. Validate the right certificates are being negotiated. SBC should be loaded with GTSR1 cert for Google. SBC should also send the certificate chain when sending its cert.	PASSED	TLS handshake is verified
2	SBC Configuration Verification	TCP Keep Alive. SBC will perform monitoring checks by attempting TCP Keep Alive to ensure Network Connectivity	Successful 3way handshake and thereafter termination	PASSED	
3	SBC Configuration Verification	TCP link is persistent. Establish calls, send multiple calls that should all use the same TCP transport connection	Persistent TCP connection, we should establish a single connection and multiplex all calls over that connection.	PASSED	
4	SBC Configuration Verification	Session Timer support. SBC should be initiator for the Session Refresh timer using Update or Re-Invite	every 900 secs the SBC should refresh the SIP session.	PASSED	re-INVITE is sent for Session refresh

ID	Title	Description	Expected Results	Status (Passed or Failed etc)	Observations
5	SBC Configuration Verification	SIP Header Manipulation (call-info header)	Validate if the Google requested header manipulation is present in the SIP INVITE. Ensure every SDP media has a label.	PASSED	
6	SBC Configuration Verification	*SBCs may need further Header manipulations based on SIP stack constraints. Verify required manipulation are added in SBC to support Google CES Example: FROM, TO header manipulations HOST part change in headers etc..,	All signaling in e.164 format	PASSED	
7	SBC Configuration Verification	SDES for SRTP. Configure the SDES parameters for crypto negotiation for the BYOT trunk	Validate the crypto is successfully negotiated and media is encrypted. All SBCs should support SDES for media encryption.	PASSED	
8	SBC Configuration Verification	DTLS for Media Encryption. Configure the DTLS parameters for crypto negotiation for the BYOT trunk, certificate for DTLS must be self-signed by the SBC.	Validate the crypto is successfully negotiated and media is encrypted. DTLS is not supported by Oracle and can be skipped.	NOT APPLICABLE	
Inbound					

ID	Title	Description	Expected Results	Status (Passed or Failed etc)	Observations
9	Inbound	SIP OPTIONS. SBC send SIP options every 60 seconds	Verify SBC sends SIP OPTIONS every 60 seconds and responds with 200 OK	PASSED	
10	Inbound	Inbound call: Calling Party disconnects the call. Inbound siprec call, ensure recordings are present, disconnect call from calling party and confirm proper disconnect	Verify Call is established with audio and transcripts from both participants Verify call is disconnected properly	PASSED	
11	Inbound	Inbound call: Called Party disconnects the call. Inbound siprec call, ensure recording are present, disconnect call from called party and confirm proper disconnect	Verify Call is established with audio and transcripts from both participants Verify call is disconnected properly	PASSED	

ID	Title	Description	Expected Results	Status (Passed or Failed etc)	Observations
12	Inbound	Long duration call-Outbound Call- 1 hour max. Long duration siprec call	Ensure siprec calls stay up for an hour, confirm transcripts are present for entire duration	PASSED	
13	Inbound	Long duration hold and resume (wait until session audit\session refresh occurs from DUT). Long duration siprec call, have the call placed on hold by agent, have call resume. Have customer place on hold then have call resume.	Call is connected, we have two active streams, confirm once a stream goes on hold, we receive corresponding signaling events, and that we no longer record transcripts for the participant on hold.	PASSED	
14	Inbound	Handling Error codes 603 decline. User A Calls PSTN A PSTN A rejects the incoming call	Verify SBC handles Call rejected properly	PASSED	
15	Inbound	Inbound call hold scenarios. Call starts out inactive for both participants; session moves to active	Validate if media is present when expected, confirm signaling events modify sdp properly, once call is move to active validate media and transcripts	PASSED	Call recording is deactivated using API command. Audio during the inactive state is not recorded.

ID	Title	Description	Expected Results	Status (Passed or Failed etc)	Observations
16	Inbound	Inbound call hold scenarios. call starts out as active for both participants, session move to inactive, and transitions back to active	Validate if media is present when expected, confirm signaling events modify sdp properly, once call is moved to active validate media and transcripts	PASSED	Recording was not present after deactivating conversation and recording resumed after activating conversation via API
17	Inbound	Update. Validate that update sent prior to call establishment do not contain SDP	Validate that update prior to call establishmen t do not contain SDP as expected	PASSED	Update is not sent, rather re-INVITE message is sent from SBC every 900 seconds without SDP
18	Inbound	Update. Validate that updates post call establishment contain SDP to modify session	If SBC uses update to modify sessions, ensure SDP is included	NOT APPLICABLE	re-INVITE message is sent from SBC every 900 seconds without SDP
19	Inbound	re-invites. Ensure re-invites that modify session include SDP	Ensure re-invites that modify session include SDP	PASSED	re-INVITE is sent to Google CES as part of session refresh, hold scenarios

ID	Title	Description	Expected Results	Status (Passed or Failed etc)	Observations
20	Inbound	Codec negotiation. Ensure that g711 u-law is preferred codec	Ensure we can prioritize g711 as preferred codec, note where SBC configures preferred codec	PASSED	
21	Inbound	3 way conference. Determine requirements, record all leg.	Determine requirements , record all legs	PASSED	
22	Inbound	CES cloud project setup. Establish CES cloud project, provision the project with a GTP phone number for access (Create conversations/participants on the fly through SIP headers)	Verify project is setup, functional test to confirm you can connect to the GTP access phone number	PASSED	
23	Inbound	CES cloud project setup. Establish CES cloud project, provision the project with a GTP phone number for access (Pre-creation of conversations/participants)	Verify project is setup, functional test to confirm you can connect to the GTP access phone number	NOT APPLICABLE	This test case is not applicable for call recording
24	Inbound	Consultative transfer. Consultative transfer from 1. PSTN > User1 > User2 2. PSTN > User1 > PSTN user2		PASSED	

ID	Title	Description	Expected Results	Status (Passed or Failed etc)	Observations
25	Inbound	Blind transfer. Blind transfer from 1. PSTN > User1 > User2 2. PSTN > User1 > PSTN user2		PASSED	
26	Use documentation to build trunk using self service model			PASSED	
27	Inbound call hold scenarios using A-law as codec	Call starts out inactive for both participants; session moves to active	Inbound call hold scenarios using A-law as codec	PASSED	
28	Inbound call: Called Party disconnects the call. using a a-law codec	Inbound siprec call, ensure recording are present , disconnect call from called party and confirm proper disconnect	Inbound call: Called Party disconnects the call. using a a-law codec	PASSED	
29	Long duration call-Outbound Call- 1 hour max using a-law codec	Long duration siprec call	Long duration call-Outbound Call- 1 hour max using a-law codec	PASSED	re-INVITE messages are sent from SBC to Google CES every 15min (900 seconds)
30	Inbound call: Configure trunk in non-default region,	Confirm call is processed within the region for signaling and media that corresponds to the region trunk was provisioned in	"Verify Call is established with audio and transcripts from both participants	PASSED	Testing conducted in US region

ID	Title	Description	Expected Results	Status (Passed or Failed etc)	Observations
31	Participant Labels test	Configure call info header to specify roles, ensure the media streams align	"Frist media stream HUMAN_AGENT role and	PASSED	When the roles are set to "HUMAN AGENT" and "END USER," Call-Info: <http://dialogflow.googleapis.com/v2beta1/projects/ccai-3898XX/conversations/OR_XXX?roles=HUMAN_AGENT,END_USER>;purpose=Goog-ContactCenter-Conversation the transcript shows the first media stream with the participation role as "HUMAN AGENT," followed by "END USER." The transcript indicates that HUMAN AGENT was listed first, followed by the END USER, in 5 out of 10 attempts.
32	DTLS test			NOT APPLICABLE	
33	Conference TEST	Conference call between PSTN and PBX users	Validate both-way audio	PASSED	Both-way audio for all users was present.
34	Validate Call recording			PASSED	