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Oracle Enterprise Session Border Controller – Acme Packet 4600 and Microsoft Skype for Business for Enterprise SIP Trunking

Technical Application Note

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Intended Audience

This document is intended for use by Oracle personnel, third party Systems Integrators, and end users of the Oracle Enterprise Session Border Controller (E-SBC). It assumes that the reader is familiar with basic operations of the Oracle Enterprise Session Border Controller – Acme Packet 4600.

Document Overview

Microsoft Skype for Business offers the ability to connect to SIP based telephony trunks using an IP communication. This reduces the cost and complexity of extending an enterprise's telephony system outside its network borders. Oracle Enterprise Session Border Controllers (E-SBCs) play an important role in SIP trunking as they are used by many trunk providers and some enterprises as part of their SIP trunking infrastructure.

This application note has been prepared as a means of ensuring that SIP trunking between Microsoft Skype for Business servers, Oracle E-SBCs and IP Trunking services are configured in the optimal manner.

It should be noted that the E-SBC configuration provided in this guide focuses strictly on the Skype for Business Server associated parameters. Many E-SBC users may have additional configuration requirements that are specific to other applications. These configuration items are not covered in this guide. Please contact your Oracle representative with any questions pertaining to this topic.

For additional information on Skype for Business Server, please visit http://www.skype.com/en/business/.

Introduction

Audience

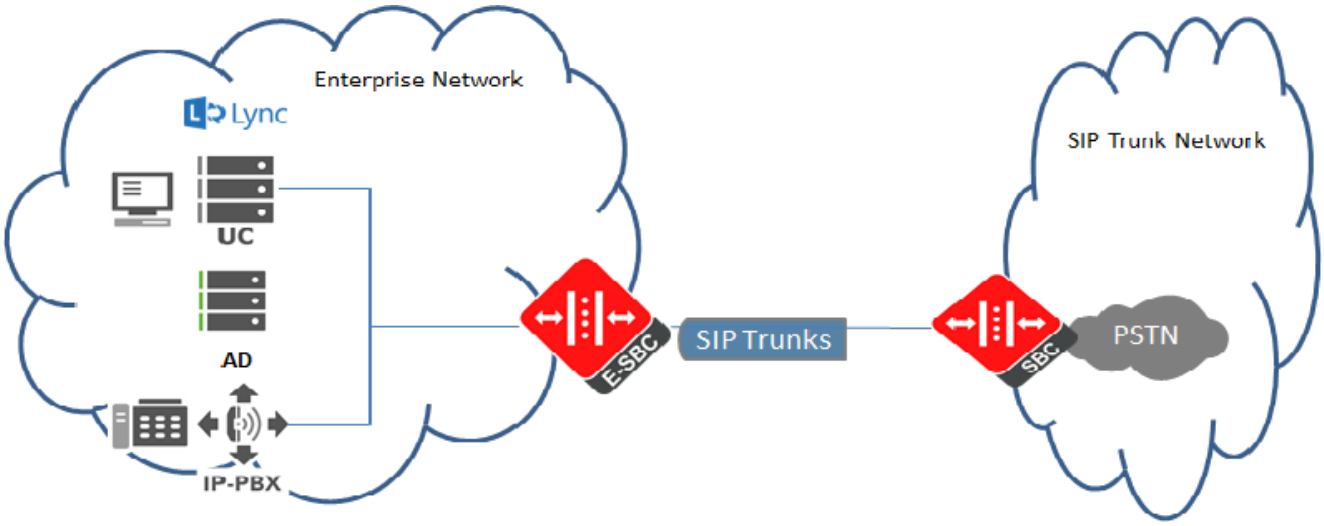
This is a technical document intended for telecommunications engineers with the purpose of configuring the Oracle Enterprise SBC and the Skype for Business Server. There will be steps that require navigating Microsoft Windows Server as well as the Acme Packet Command Line Interface (ACLI). Understanding the basic concepts of TCP/UDP, IP/Routing, and SIP/RTP are also necessary to complete the configuration and for troubleshooting, if necessary.

Requirements

- Fully functioning Skype for Business Server deployment, including Active Directory and DNS
- A dedicated Mediation Server for the SIP trunking connection
- Microsoft Skype for Business 2015 – Version 6.0.93190.0
- Skype for Business 2015 client, Version 15.0.4753.1000
- Oracle Enterprise Session Border Controller AP 4600 running Net-Net OS ECZ730p2.64.bz. Note: the configuration running on the SBC is backward/forward compatible with any release in the 7.3.0 stream.

Architecture

The following reference architecture shows a logical view of the connectivity between Skype for Business Server and the SBC.

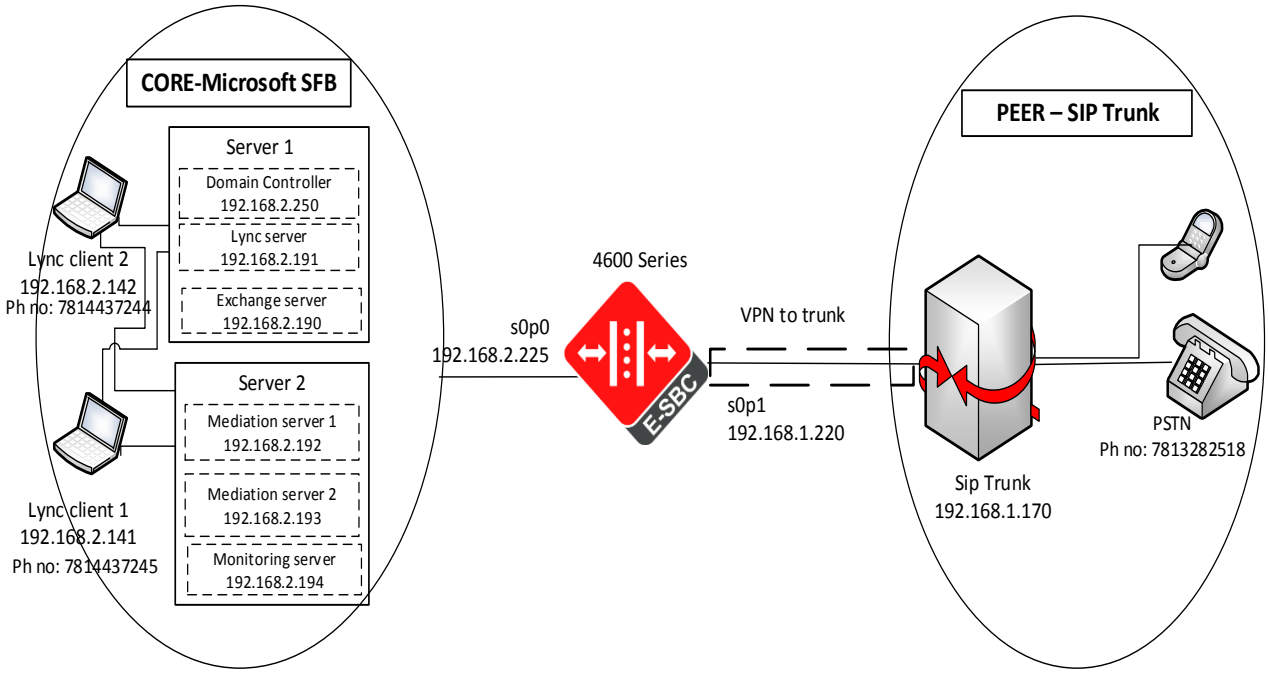


Area A represents the customer's on-premise infrastructure, which includes the Active Directory, DNS and Skype for Business Server systems. Area B represents the service provider infrastructure which provides PSTN service via the SIP trunk. Area C represents the integration of these two environments over an IP network. This could be, through a VPN tunnel over the Internet, an MPLS managed network, or even a dedicated physical connection. The SFB Mediation Server and the SBC are the edge components that form the boundary of the SIP trunk. The configuration, validation and troubleshooting of the areas B and C is the focus of this document and will be described in two phases:

- Phase 1 – Configure the Skype for Business Server
- Phase 2 – Configure the 4600

Lab Configuration

The following diagram, similar to the Reference Architecture described earlier in this document, illustrates the lab environment created to facilitate certification testing (IP addressing/Port below is only a reference, they can change per your network specification).



Phase 1 – Configuring the Skype for Business server

The enterprise will have a fully functioning Lync Server infrastructure with Enterprise Voice deployed and a Mediation Server dedicated to this installation. If there is no Mediation Server present for this purpose, one will have to be deployed.

There are two parts for configuring SFB Server to operate with the Oracle SBC:

- Adding the SBC as a PSTN gateway to the SFB Server infrastructure
- Creating a route within the SFB Server infrastructure to utilize the SIP trunk connected through the SBC.

To add the PSTN gateway, we will need:

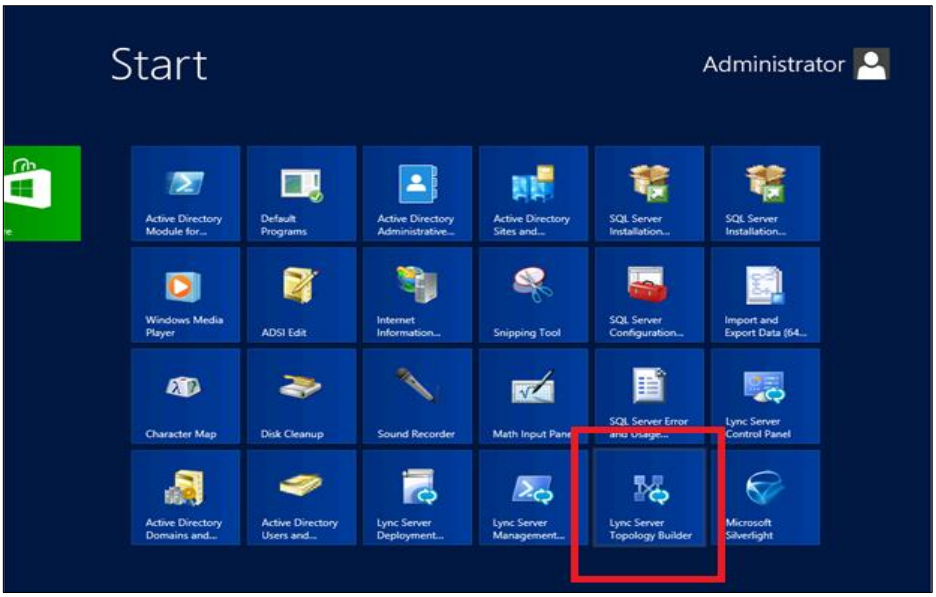
- IP addresses of the external facing NICs of the Mediation Servers
- IP address of the sip interface of the SBC facing the Mediation servers
- Rights to administer Lync Server Topology Builder
- Access to the Lync Server Topology Builder

Note: This section of the Application note only walks you through adding Oracle E-SBC to Microsoft's Skype for Business config, The assumption is that Microsoft's Skype for Business application is already installed and 100% functional.

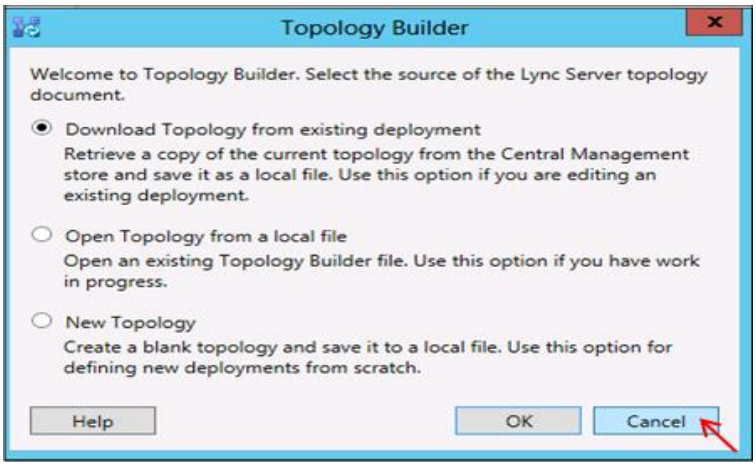
Adding the SBC as a PSTN gateway

The following process details the steps to add the SBC as the PSTN gateway

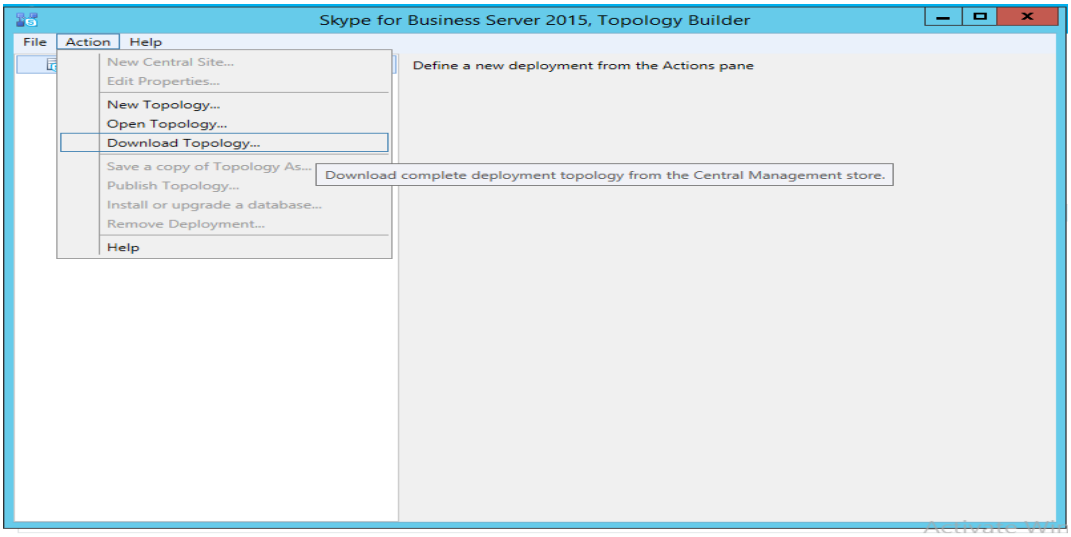
1. On the server where the Topology Builder is located, start the console.
2. From the **Start** bar, select **Lync Server Topology Builder**.



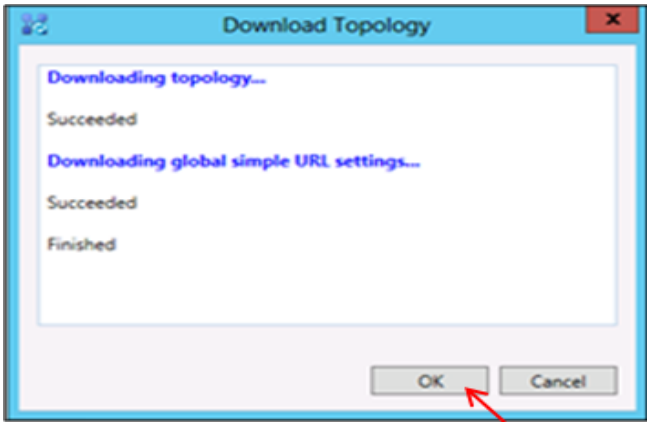
3. The opening screen of the Topology builder will be displayed. Click on the **Cancel** button.



4. The Topology Builder window will now be displayed. Click on **Action** and select **Download Topology**.

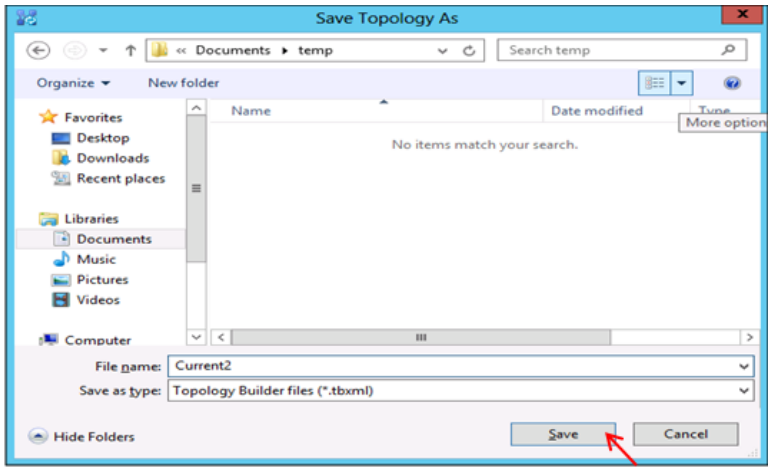


5. You will then see a screen showing that you have successfully imported the topology. Click the **Ok** button.

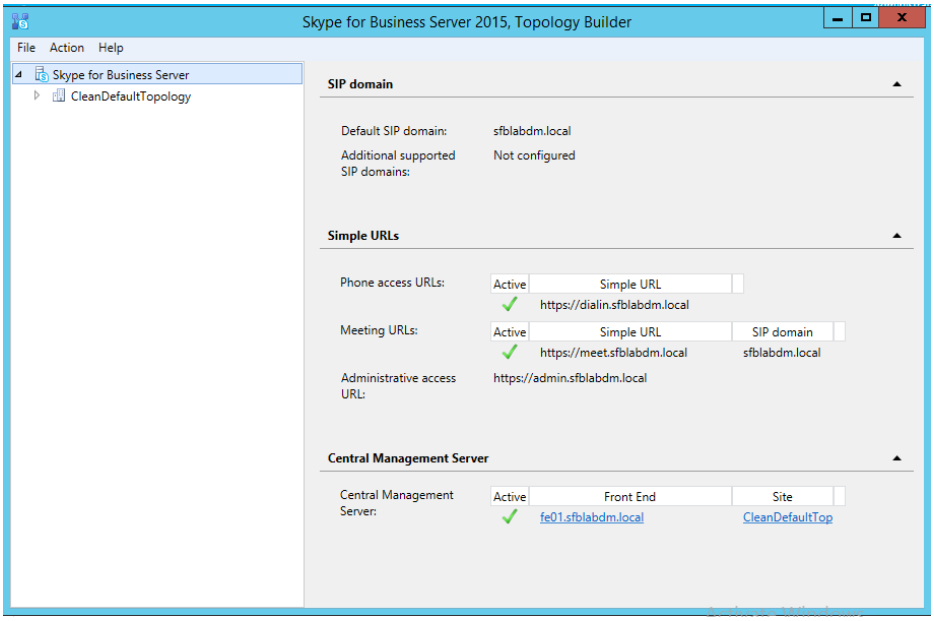


6. Next you will be prompted to save the topology which you have imported. You should revision the name or number of the topology according to the standards used within the enterprise. Click the **Save** button

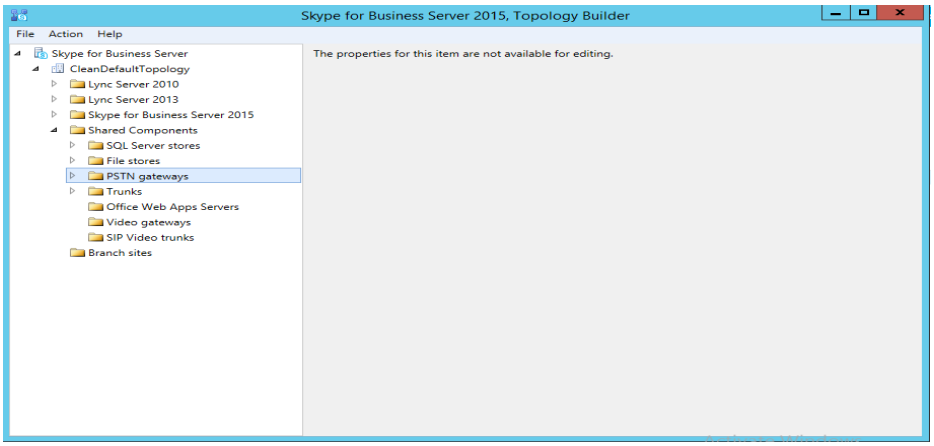
   Note: This keeps track of topology changes and, if desired, will allow you to fall back from any changes you make during this installation



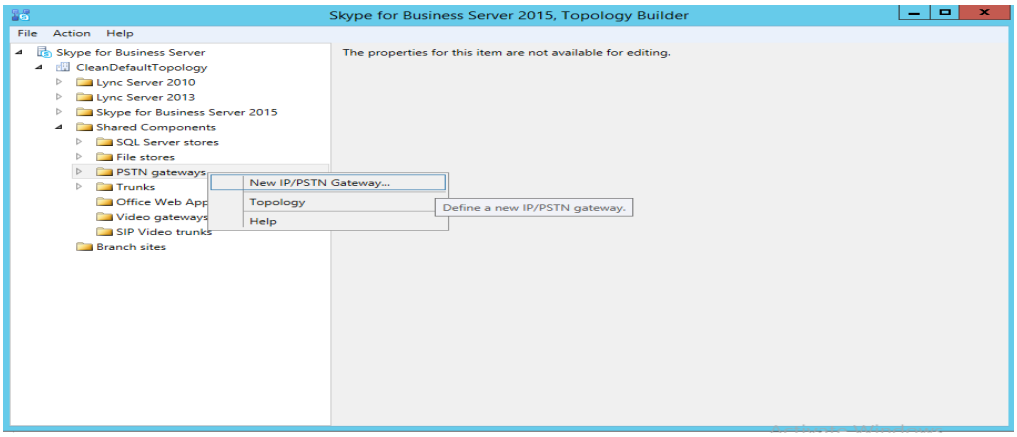
7. You will now see the topology builder screen with the enterprise's topology imported.



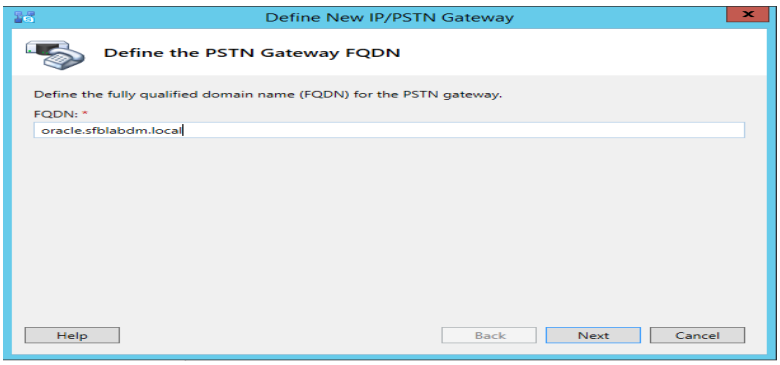
8. In the upper left hand corner, expand the site in which the PSTN gateway will be added. In our case, the site is **Bedford**. Then click on the **PSTN Gateways**



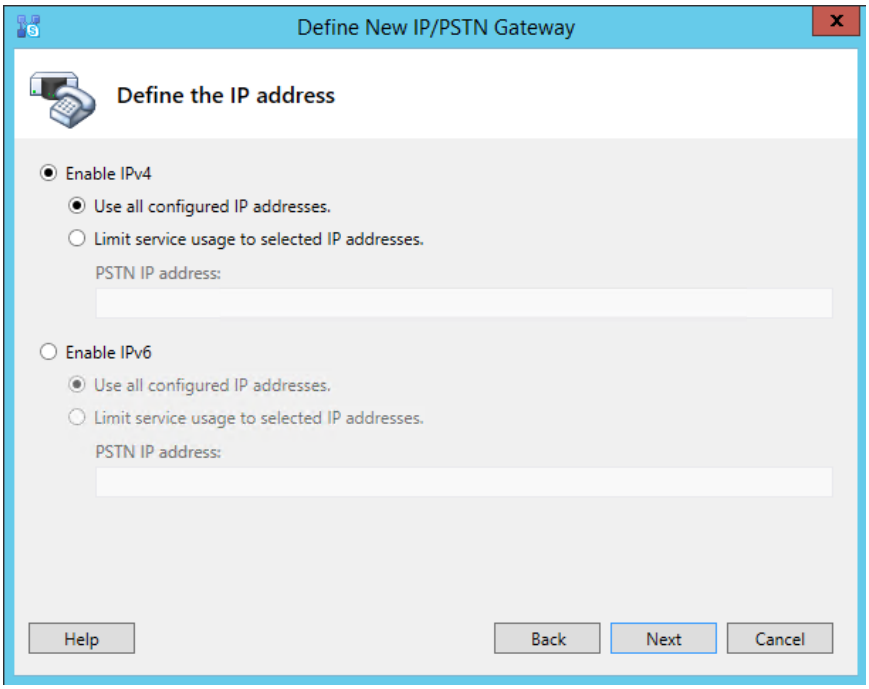
9. Right click on **PSTN gateways** and select **New IP/PSTN Gateway**.



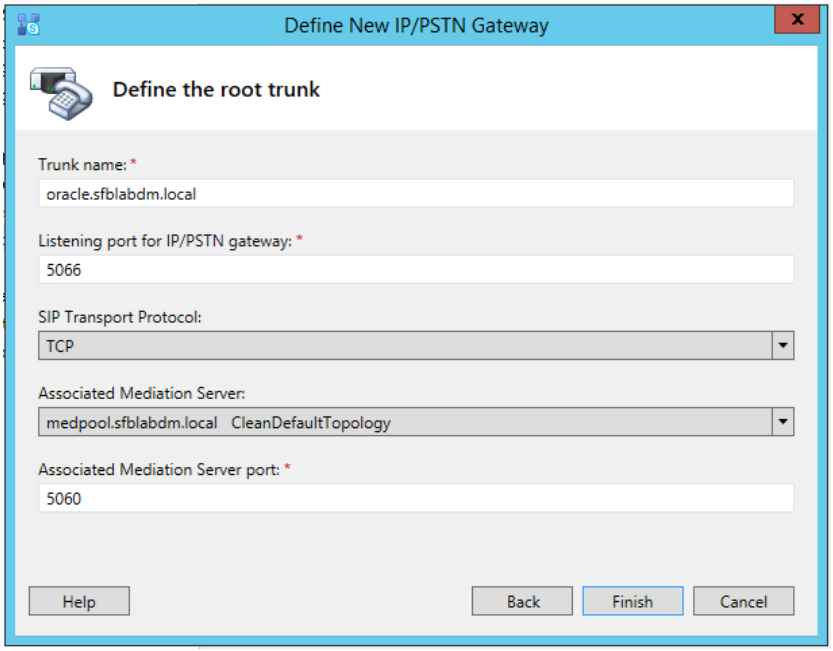
10. In the **Define New IP/PSTN Gateway** window, enter the ip address of the SIP interface of the SBC in the **FQDN** text box and click **Next**.



11. Select **Enable IPv4** in the **Define the IP address** section and click **Next**.



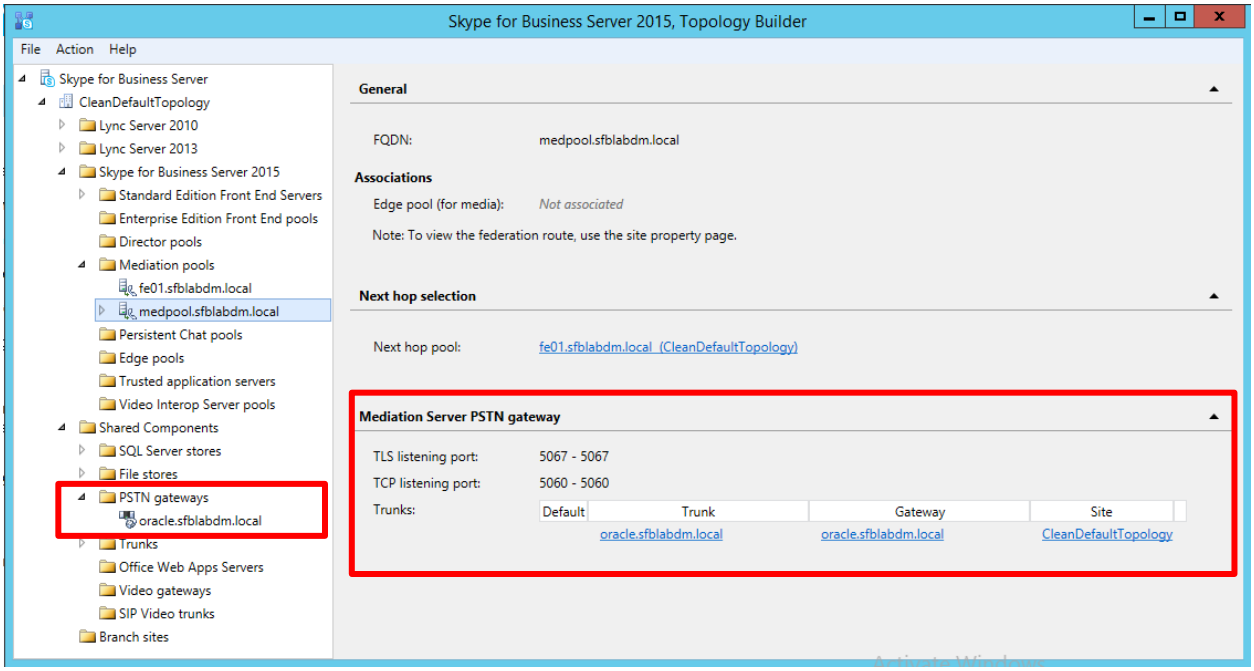
12. In the next section, enter the ip address of the SBC's sip interface under **Trunk name**. Configure the **Listening port for IP/PSTN gateway** as 5068, TCP as the **SIP Transport Protocol** and click **Finish**.



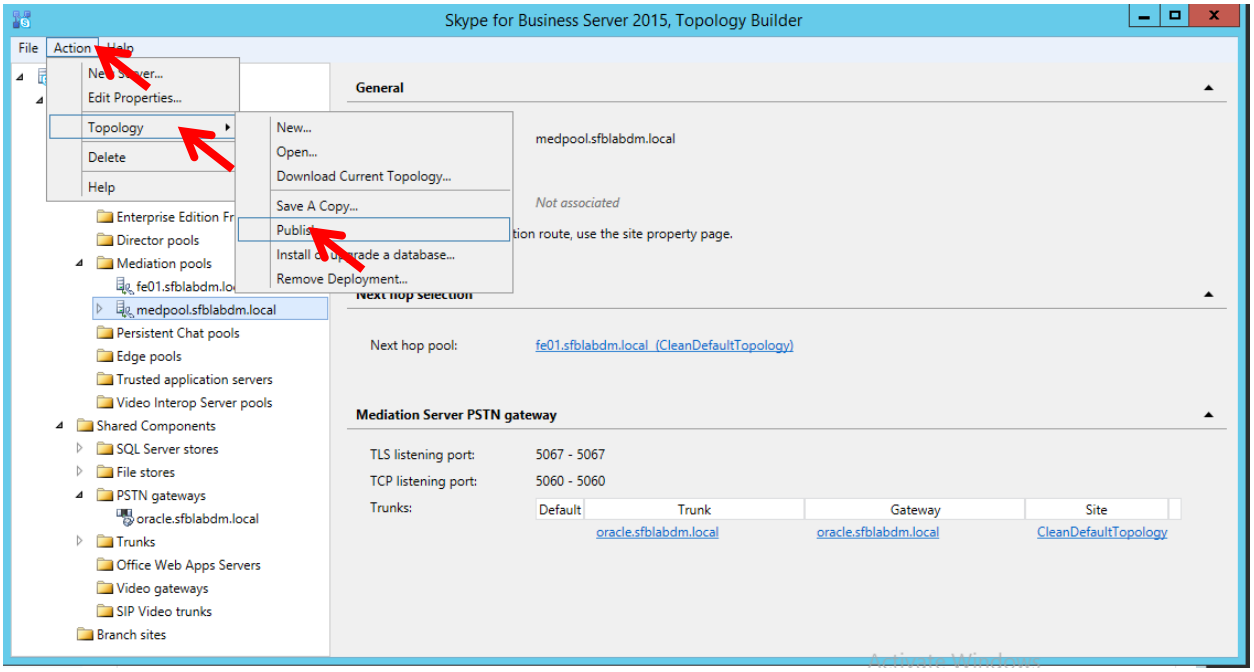
13. The PSTN gateway for the Lync server has been added. It will be listed under **PSTN gateways**.

    Expand the **Mediation Pool** list and click on the Mediation Server to be utilized. In our example the Mediation Server is **sfbmedpool.acmepacket.net**.

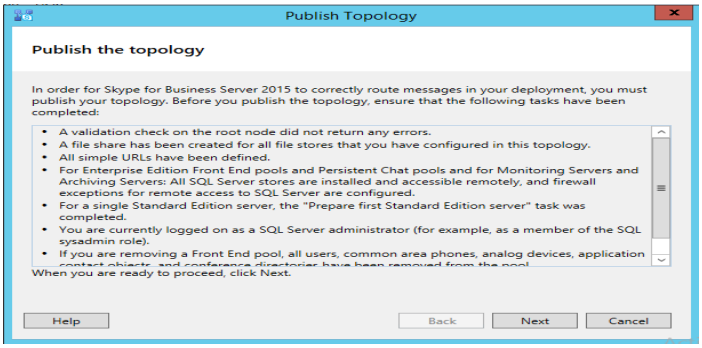
    You will see that the PSTN gateway is associated with the Mediation server.



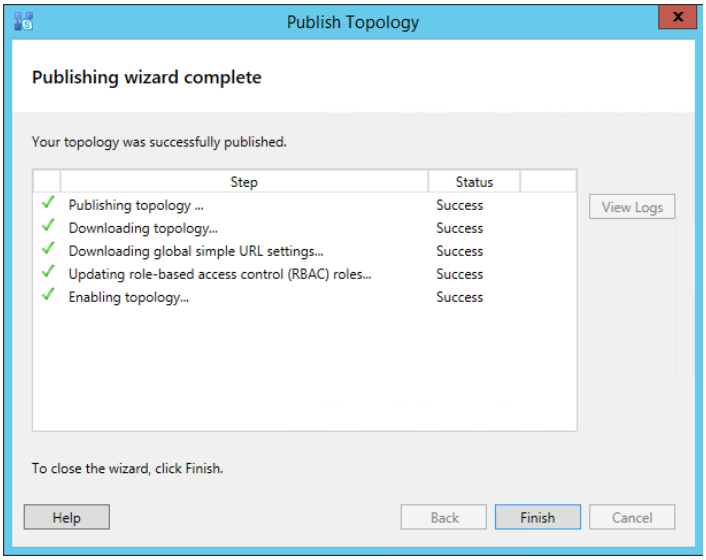
14. In the upper right hand corner of your screen under **Actions** select **Topology** then select **Publish**.



You will now see the **Publish Topology** window. Click on the **Next** button



You will now be at a window showing the databases associated with site. Click **Next**.



15. When complete you should see a window from Topology Builder stating that your topology was successfully published. Click the **Finish** button.

16. You will be at the Topology Builder main window, expand your site and double check that your PSTN entries are correct and that the appropriate Mediation Server has the PSTN gateway associated.

Creating a route within the Lync Server infrastructure

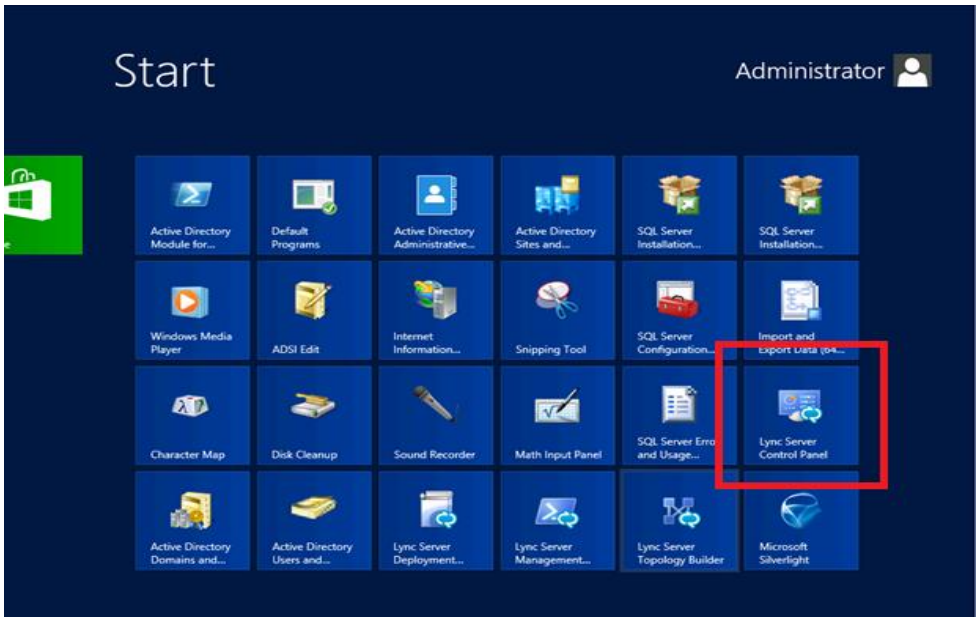
In order for the Lync Server Enterprise Voice clients to utilize the SIP trunking infrastructure that has been put in place, a route will need to be created to allow direction to this egress. Routes specify how Lync Server handles calls placed by enterprise voice users. When a user places a call, the server, if necessary, normalizes the phone number to the E.164 format and then attempts to match that phone number to a SIP Uniform Resource Identifier (URI). If the server is unable to make a match, it applies outgoing call routing logic based on the number. That logic is defined in the form of a separate voice route for each set of target phone numbers listed in the location profile for a locale. For this document we are only describing how to set up a route. Other aspects which apply to Lync Server Enterprise Voice deployments such as dial plans, voice policies, and PSTN usages are not covered.

To add the route we will need:

- Rights to administer Lync Server Control Panel
  - Membership in the CS Administrator Active Directory Group
- Access to the Lync Server Control Panel

The following process details the steps to create the route:

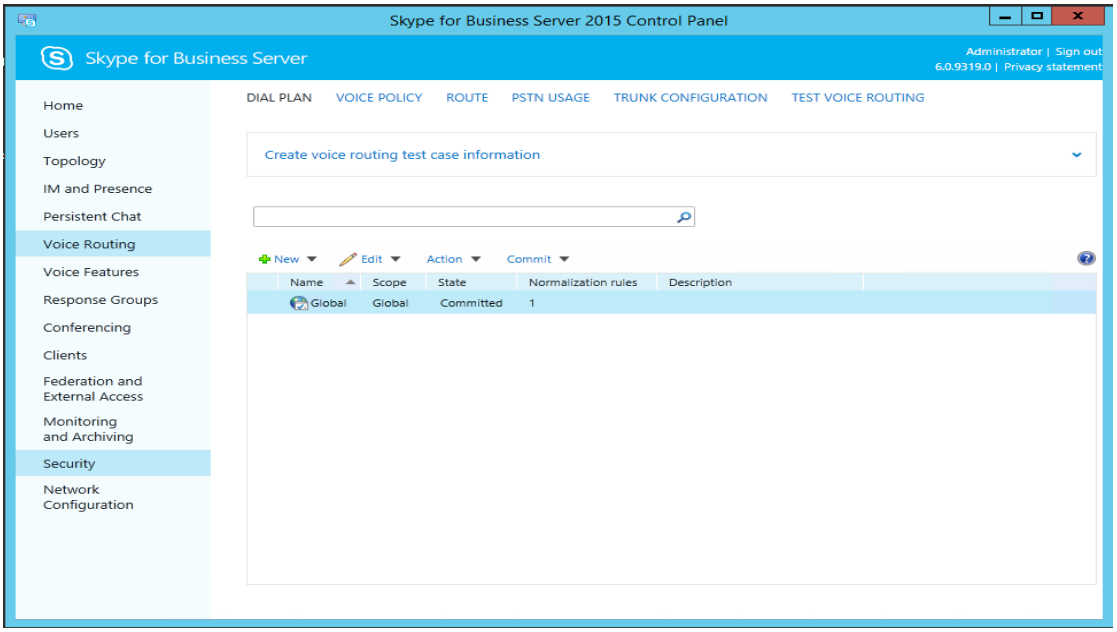
1. From the **Start** bar, select **Lync Server Control Panel**.



You will be prompted for credential, enter your domain username and password.

2. Once logged in, you will now be at the "Welcome Screen". On the left hand side of the window, click on **Voice Routing**.

3. The **Dial Plan** tab in the **Voice Routing** section will be displayed. On the content area toolbar, click **+New**.

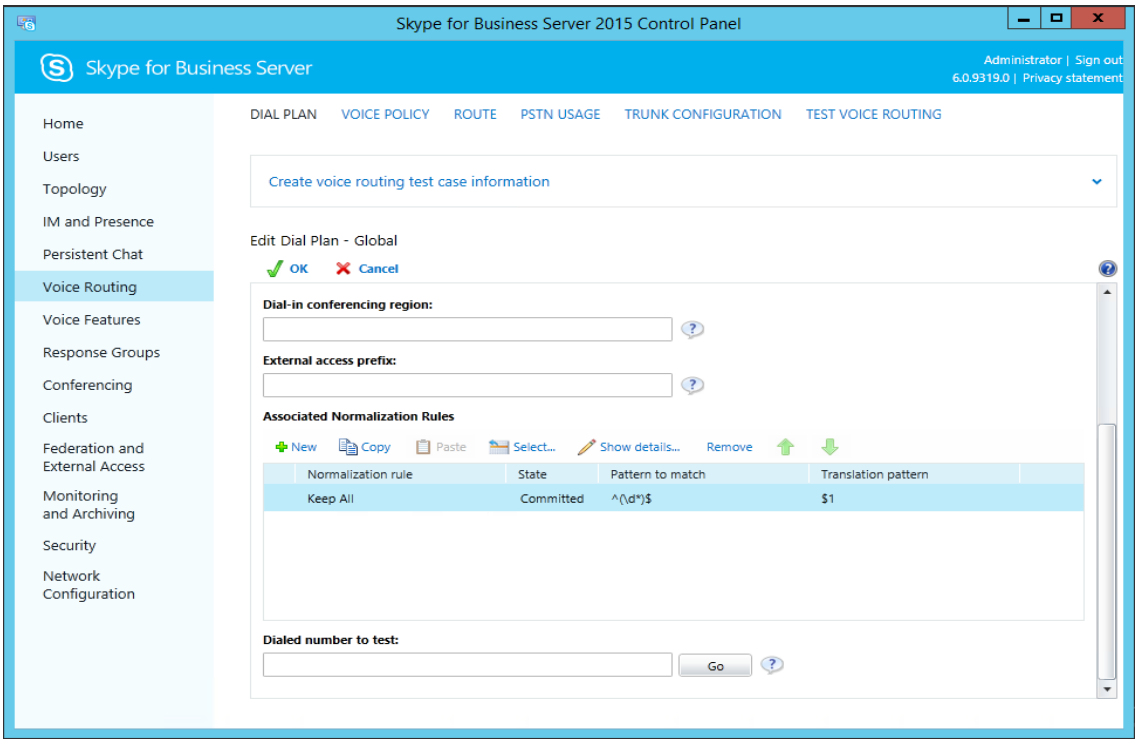


4. Next you build a Dial Plan and a translation rule for the phone numbers you want this route to handle. You have to create two separate dial plans for US and EMEA.

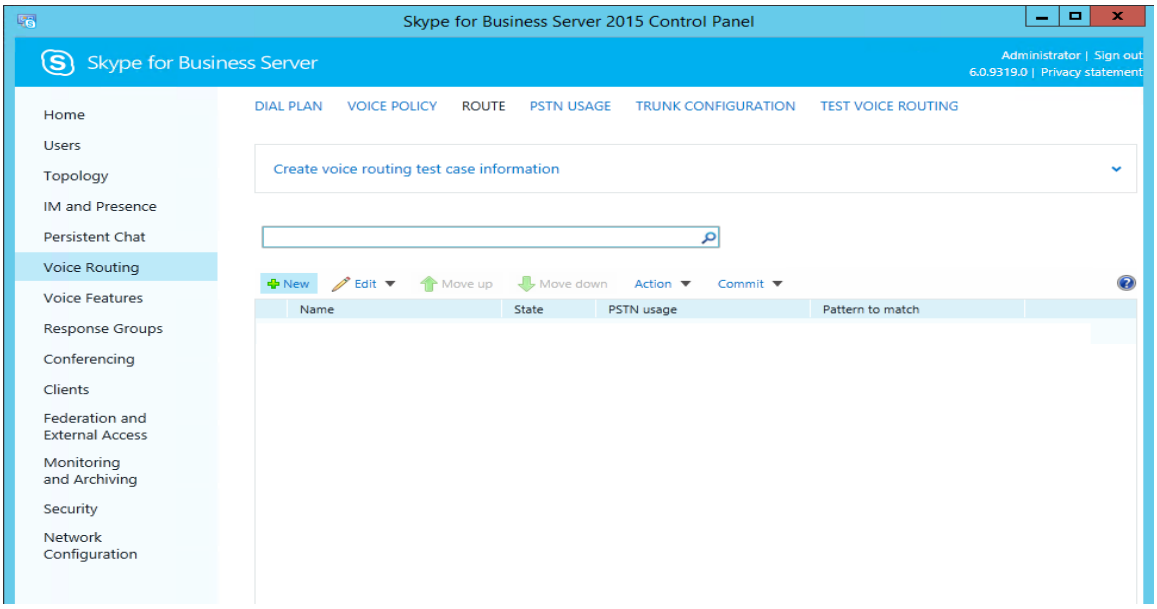
US Dial-plan

Match this pattern: ^(\d*)$

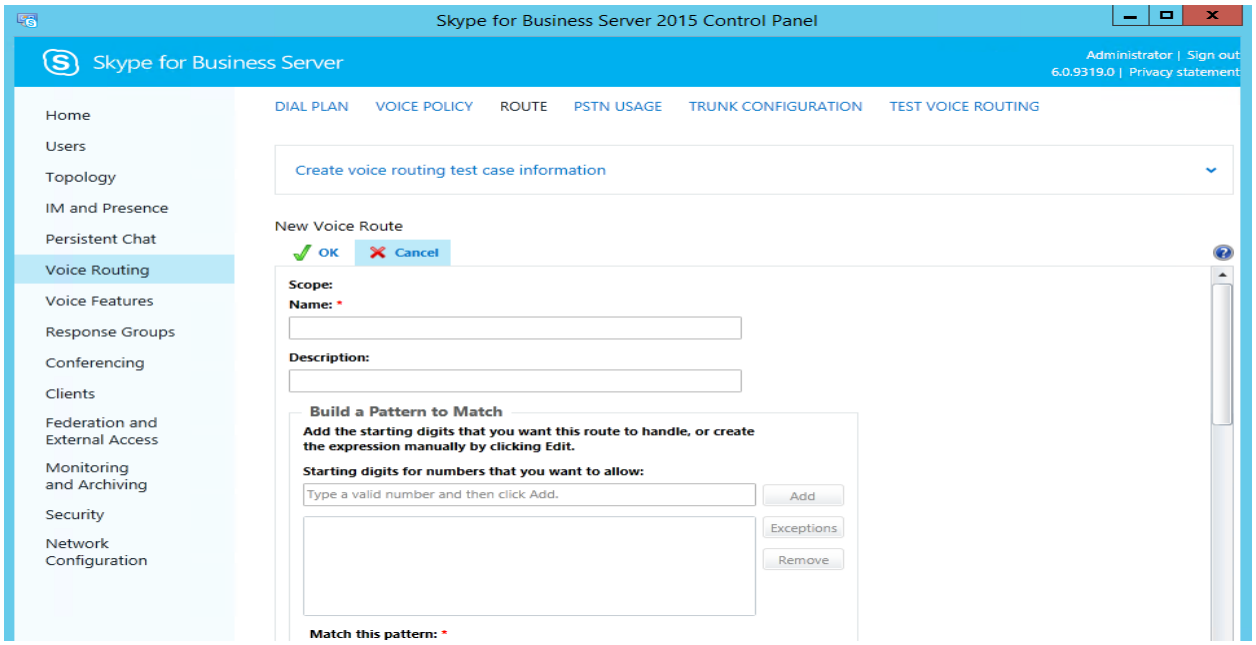
Translation rule: $1



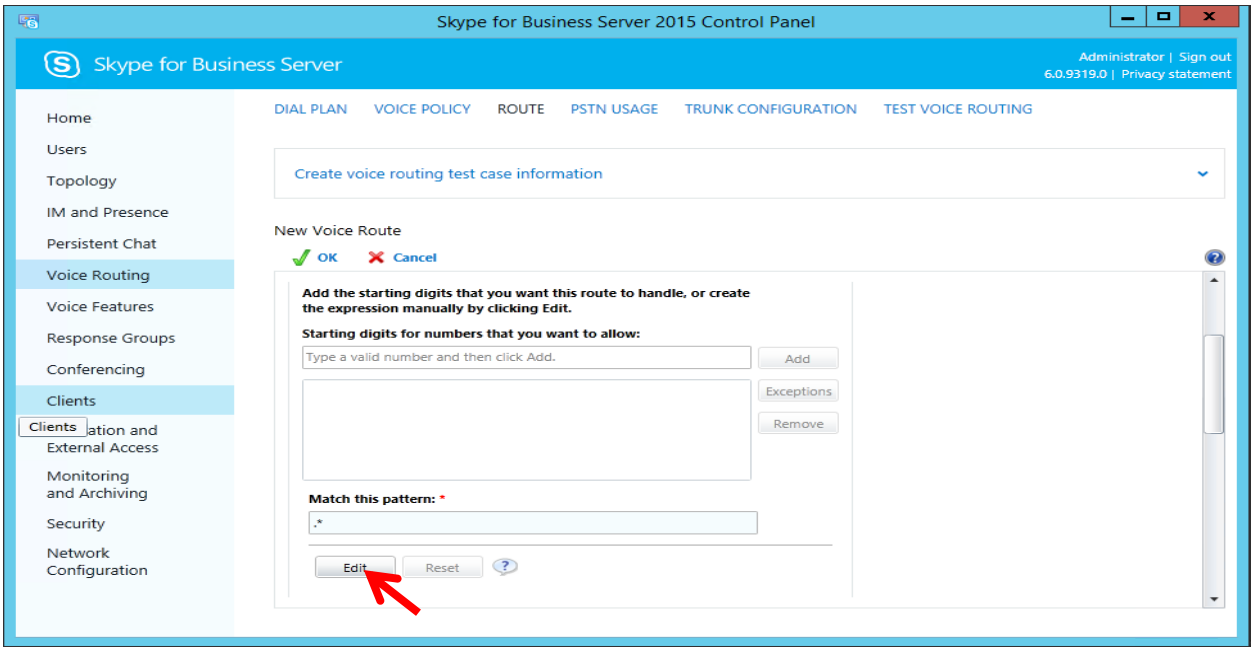
5. On the top row of the tabs, select **Route**. On the content area toolbar, click **+New**.



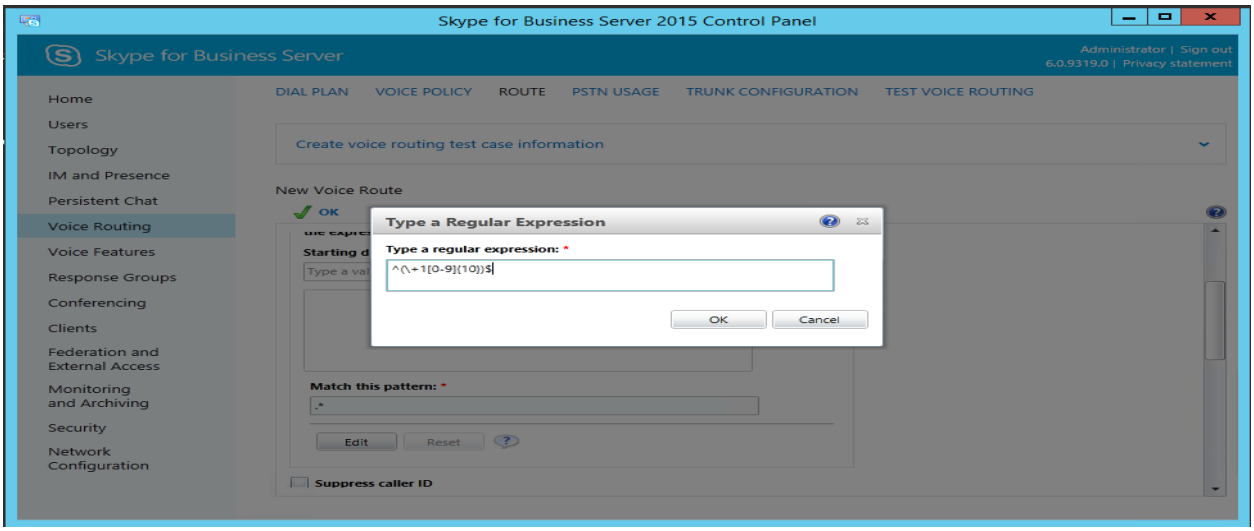
6. On the **New Voice Route** page, in the **Name** field, enter the name you have selected for the Route. In our example, it is US route.



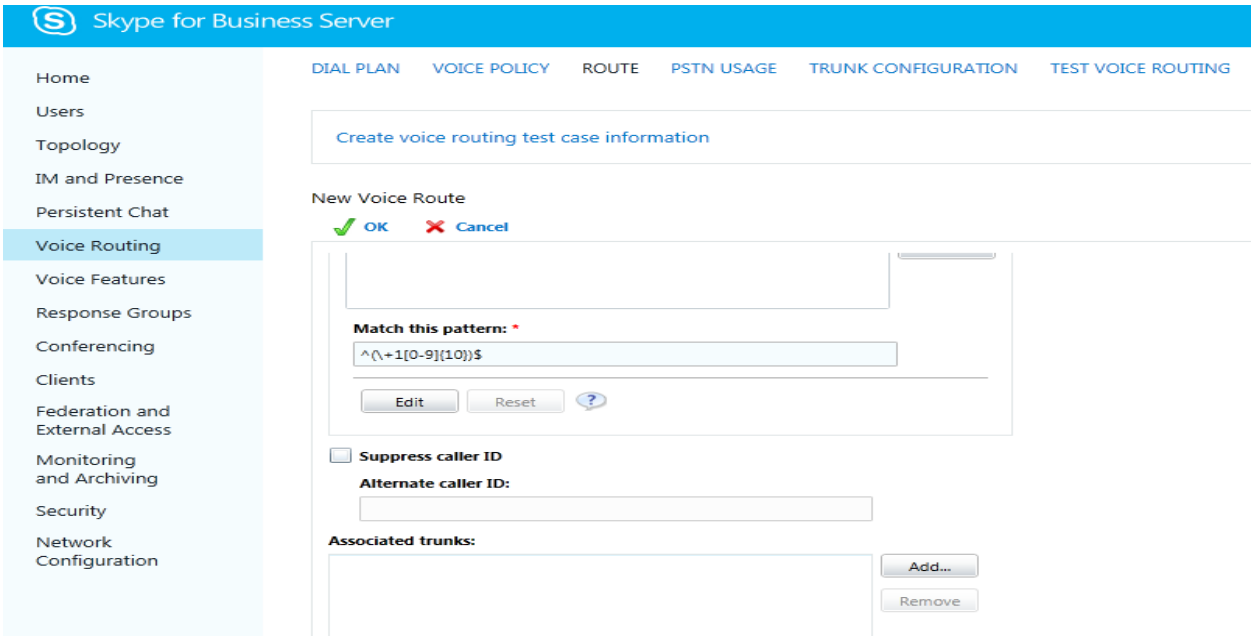
7. Next you build a Pattern Match for the phone numbers you want this route to handle. Click **Edit**.



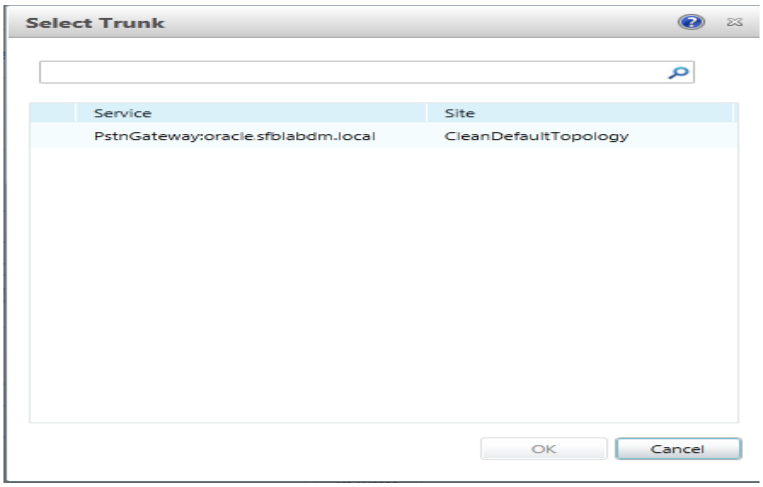
8. Enter the pattern for US - ^(\+1[0-9]{10})$ and click **OK**.



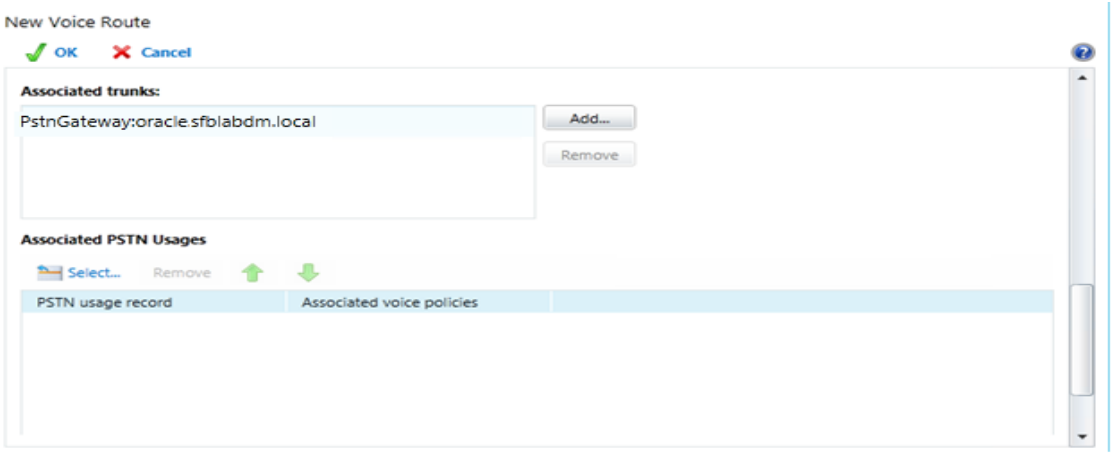
9. Next you want to associate the Voice Route with the **Trunk** you have just created. Scroll down to **Associated Trunks**, click on the **Add** button.



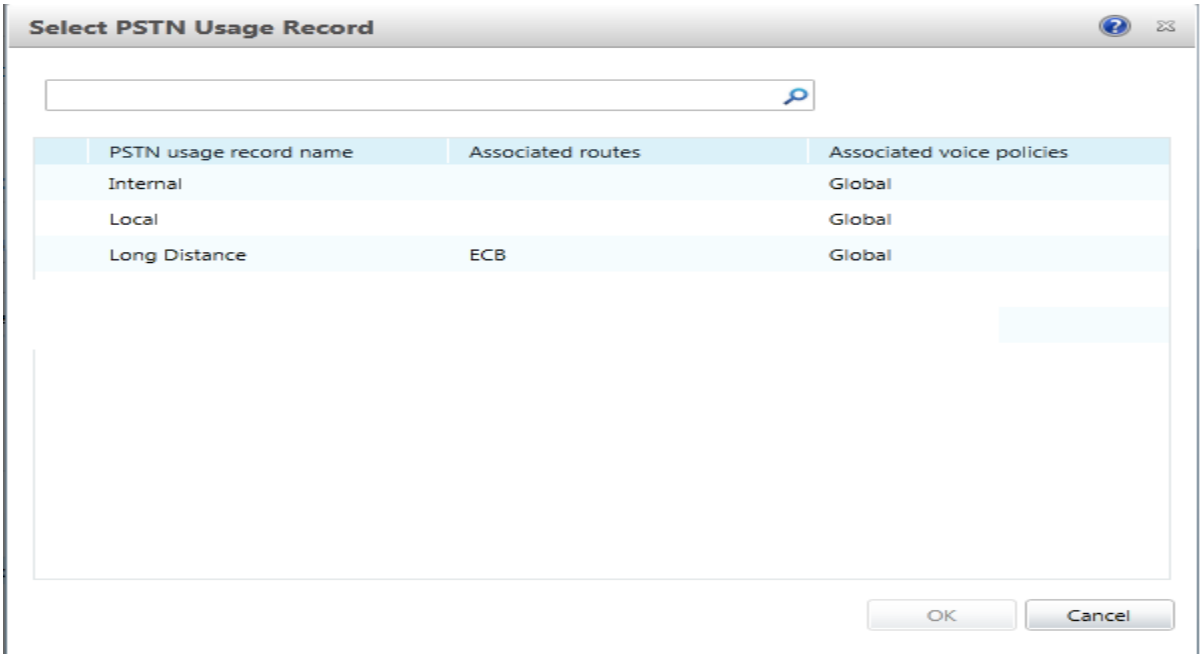
10. You will now be at a window showing available Trunks to associate your Voice Route. Click on the PSTN gateway that you just created and then click the **OK** button.



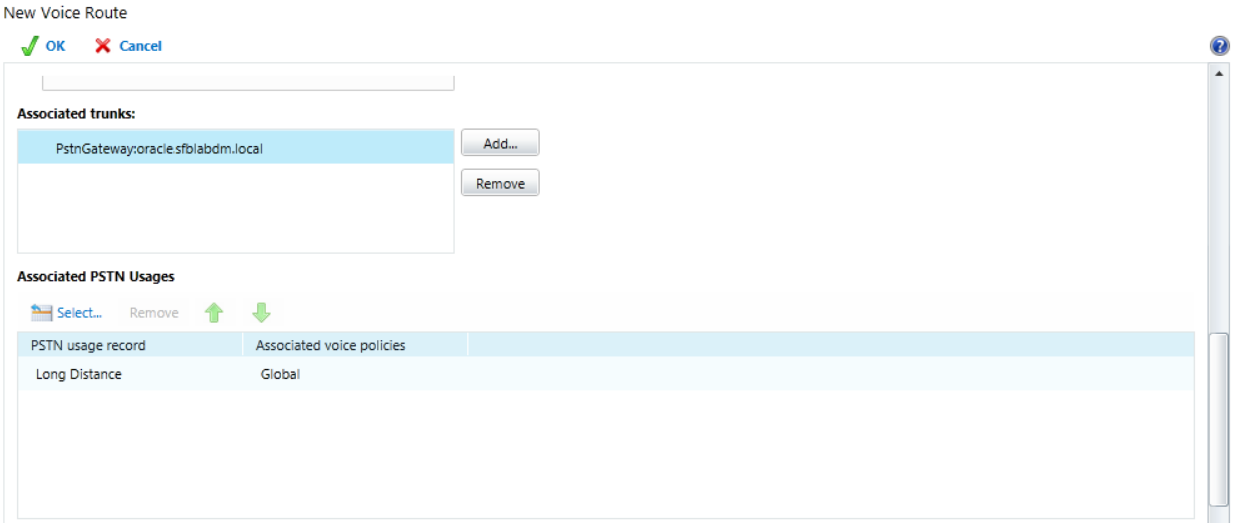
11. You can now see that you have associated your trunk with the route you created. An appropriate PSTN usage record will need to be assigned as well. In our example, we use one that was already created in the enterprise. Click on the **Select** button under **Associated PSTN Usages**.



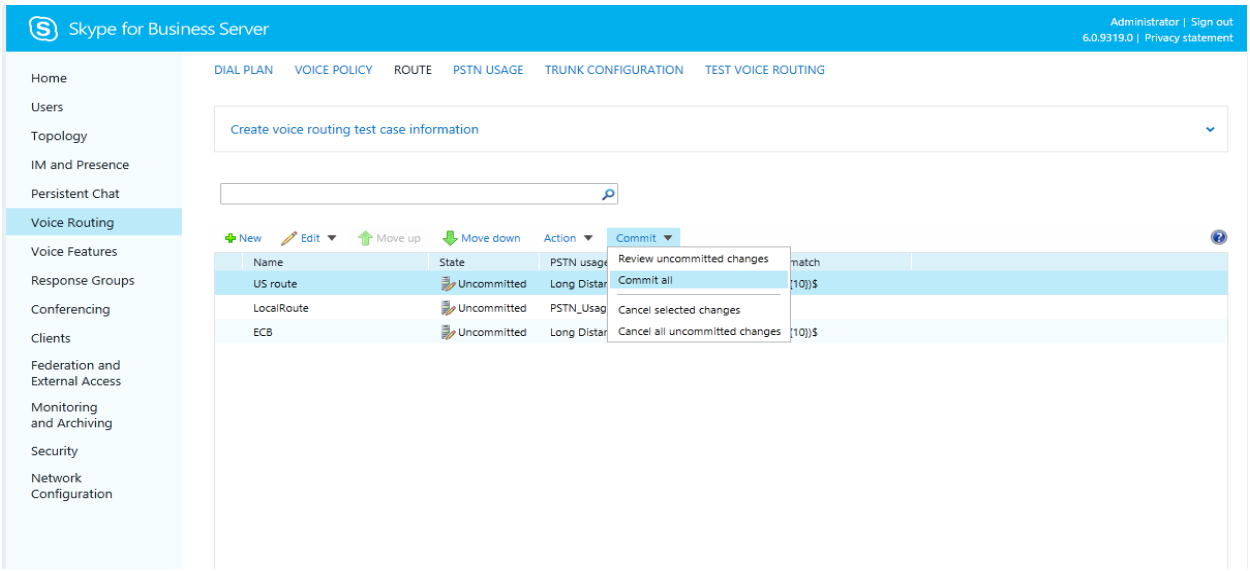
12. In the **Select PSTN Usage Record** window displayed, select the appropriate PSTN Usage Record and click **OK**.



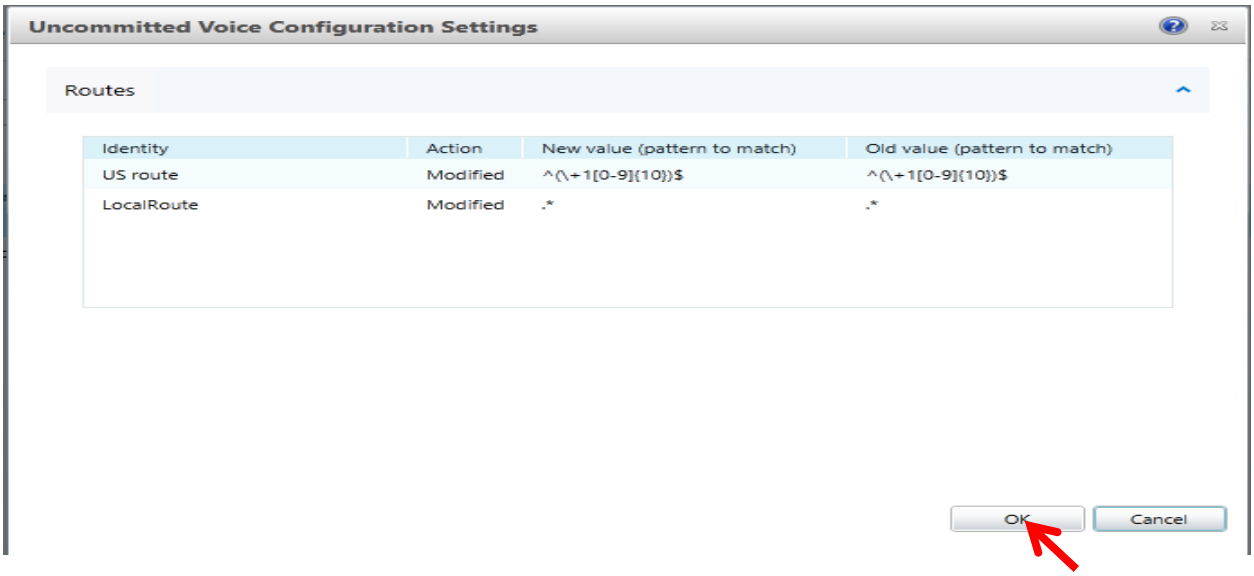
13. You will now see the Associated PSTN Usages which you have added. Click the **OK** button at the top of the **New Voice Route** screen.



14. You will now be at the Routes page showing the US route. Click the **Commit** drop-down menu, and then **Commit All**.



15. On the Uncommitted Voice Configuration Settings window, click OK.



If there are no errors, the new Voice Route has now been successfully created and the state will show as **Committed.**

Additional Steps

There are other aspects to a Lync Server Enterprise Voice deployment such as

- Site, local, and global dial plans
- Voice Policies
- Assigning Voice Policies to users
- PSTN usage policies

Refer to MSDN technet for relevant information.

Phase 2 – Configuring the Oracle Enterprise SBC

In this section we describe the steps for configuring an Oracle Enterprise SBC, formally known as an Acme Packet Net-Net Session Director ("SBC"), for use with Skype for Business Server in a SIP trunking scenario.

In Scope

The following guide configuring the Oracle SBC assumes that this is a newly deployed device dedicated to a single customer. If a service provider currently has the SBC deployed and is adding SFB Server customers, then please see the ACLI Configuration Guide on http://docs.oracle.com/cd/E61547_01/index.html for a better understanding of the Command Line Interface (CLI).

Note that Oracle offers several models of SBC. This document covers the setup for the 4600 platform series running Net-Net OS ECZ7.3.0 or later. If instructions are needed for other Oracle SBC models, please contact your Oracle representative.

Out of Scope

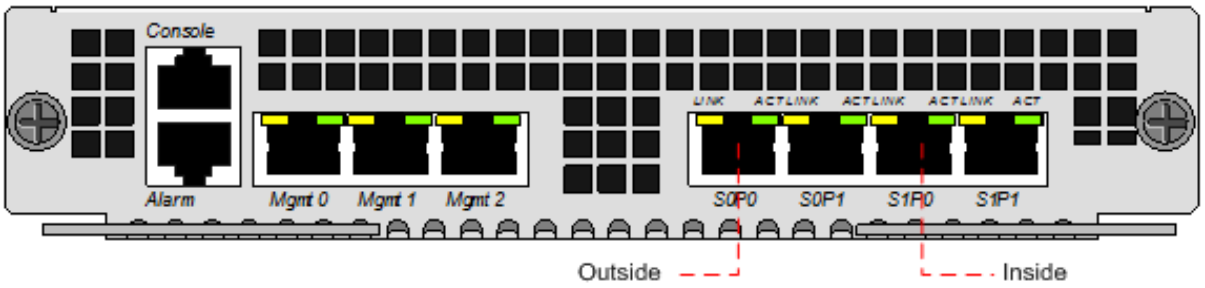
- Configuration of Network management including SNMP and RADIUS; and

What will you need

- Serial Console cross over cable with RJ-45 connector
- Terminal emulation application such as PuTTY or HyperTerm
- Passwords for the User and Superuser modes on the Oracle SBC
- IP address to be assigned to management interface (Wancom0) of the SBC - the Wancom0 management interface must be connected and configured to a management network separate from the service interfaces. Otherwise the SBC is subject to ARP overlap issues, loss of system access when the network is down, and compromising DDoS protection. Oracle does not support SBC configurations with management and media/service interfaces on the same subnet.
- IP address of Mediation Server external facing NIC
- IP addresses to be used for the SBC internal and external facing ports (Service Interfaces)
- IP address of the next hop gateway in the service provider network
- IP address of the enterprise DNS server

SBC- Getting Started

Once the Oracle SBC is racked and the power cable connected, you are ready to set up physical network connectivity. **Note: use the console port on the front of the SBC, not the one on the back.**



Plug the slot 0 port 0 (s0p0) interface into your outside (gateway facing) network and the slot 0 port 1 (s1p0) interface into your inside (SFB server-facing) network. Once connected, perform you are ready to power on and perform the following steps.

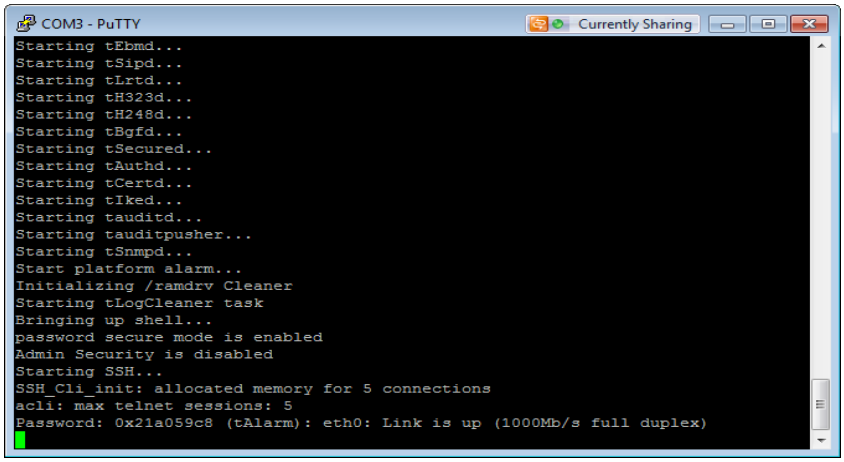
All commands are in bold, such as **`configure terminal`**; parameters in bold red such as oraclesbc1 are parameters which are specific to an individual deployment. **Note:** The ACLI is case sensitive.

Establish the serial connection and logging in the SBC

Confirm the SBC is powered off and connect one end of a straight-through Ethernet cable to the front console port (which is active by default) on the SBC and the other end to console adapter that ships with the SBC, connect the console adapter (a DB-9 adapter) to the DB-9 port on a workstation, running a terminal emulator application such as PuTTY. Start the terminal emulation application using the following settings:

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

Power on the SBC and confirm that you see the following output from the bootup sequence.



Enter the following commands to login to the SBC and move to the configuration mode. Note that the default SBC password is "**acme**" and the default super user password is "**packet**".

```
Password: acme
oraclesbc1> enable
Password: packet
oraclesbc1# configure terminal
oraclesbc1(configure)#
```

You are now in the global configuration mode.

Initial Configuration – Assigning the management Interface an IP address

To assign an IP address, one has to configure the bootparams on the SBC by going to

oraclesbc1#configure terminal --- >bootparams

- Once you type "bootparam" you have to use "carriage return" key to navigate down
- A reboot is required if changes are made to the existing bootparams

```
ACMESYSTEM(configure)# bootparam

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

```
Boot File               : /boot/nnECZ730p2.64.bz
IP Address              : 192.65.79.44
VLAN                    :
Netmask                 : 255.255.255.224
Gateway                 : 192.65.79.33
IPv6 Address            :
IPv6 Gateway            :
Host IP                 : 0.0.0.0
FTP username            : vxftp
FTP password            : vxftp123
Flags                   :
Target Name             : ACMESYSTEM
Console Device          : COM1
Console Baudrate        : 115200
Other                   :

NOTE: These changed parameters will not go into
effect until reboot.
Also, be aware that some boot parameters may also
be changed through
PHY and Network Interface Configurations.
```

Configuring the SBC

The following section walks you through configuring the Oracle Enterprise SBC required to work with Skype for Business (SFB) and a SIP trunk. The information below is split into three sections:

- The transport protocol for signaling/media between SBC and SFB is TLS and SRTP – the SIP trunk used doesn't support these transport mechanisms, the SBC interworks TLS & SRTP to UDP & RTP.
- The transport protocol for signaling/media between SBC and SFB is TCP and RTP – the SIP trunk used doesn't support these transport mechanisms, the SBC interworks TCP to UDP for signaling traffic.
- A third section depicts only the IPv6 configuration which includes two sections:
    - TLS with SFB and IPv4 using UDP transport towards the trunk. *Note this configuration requires the "IPv4-v6 Interworking" license.*
    - TCP with SFB and IPv4 using UDP transport towards the trunk. *Note this configuration requires the "IPv4-v6 Interworking" license.*

It is outside the scope of this document to include all the interoperability working information as it will differ in every deployment.

High Availability

The Mgmt1 and Mgmt2 (labeled wancom1 and wancom2 in the configuration) ports which are on the rear panel of the SBC are used for the purpose of High Availability on the 4600s. Crossover cables must be connected between these ports on the SBCs, i.e. Mgmt1 to Mgmt1 and Mgmt2 to Mgmt2. Please refer to the "High Availability Nodes" in the ACLI configuration guide for ECZ730 for more details.

We have also configured some options and sip-manipulations which are specific to any SFB deployment with the Oracle Communications SBC. They are explained below

SIP PRACK interworking

In order to establish an early media session for outbound calls, Skype for Business gateway specification mandates the PSTN gateways to offer a reliable provisional response and for inbound calls offer INVITEs with a supported header. The SBC interworks

the messaging and provide RFC 3262 PRACK interworking towards SFB and it is a mandatory configuration in all Oracle ESBC–Microsoft SFB deployments. The following need to be configured on ESBC

- Configure option 100rel-interworking on the sip-interface facing mediation server
- Configure a sip-feature to pass the 100rel in supported and require headers
- Configure a sip-manipulation (ForEarlyMedia) to add a Require:100rel header in incoming SIP INVITE from mediation server and delete the Supported:100rel header

SIP manipulations

Skype for Business typically sends mediation server FQDN in the Contact header with no username in the SIP URI which when the SBC forwards, is not acceptable by SIP trunk providers. The SBC therefore rewrites the Contact header to include the username appropriately. A sip-manipulation, ChangeContact, will need to be configured to change the format of the CONTACT header. Another sip-manipulation NATting is configured which is referenced in the NATandChangeContact rule which is mainly for NATting the To, From, and Request-URI headers and is applied on the out-manipulationid for both the sip-interfaces. Other sip-manipulations are also outlined in the configuration below.

SFB and SIP trunk carry their own SIP and SDP design – not always these implementation methods align, causing a lot of mis-match in SIP and SDP signaling and call flow. The ESBC helps resolve these issues with SIP manipulation feature. Here are a list of manipulations that were created to make SFB complaint to the SIP Trunk and vice versa.

1. Addpcmato183 --- Adds PCMA to a 183 response
2. ChangeContact --- Fixes the contact header offered by SFB before the message is sent to Trunk
3. Changeinactosendonly ---- SBC changes SDP from inactive to sendonly on INVITEs for hold (required to trigger audio playback from SIP Trunk)
4. Check183 --- Check the response to INVITE is 183 session progress
5. Modcline --- Check if the SDP contains IP of the mediation server – if it does, don't change 183 to 180
6. NATting --- NAT From & To header with correct IP information
7. OptionsResponseLocally --- Respond to OPTIONS locally on the SBC.
8. addPAIonCallForwards --- Add P-Asserted-Identity header to INVITE on call transfers
9. convert183to180 --- Convert 183 to 180 for triggering early media
10. fix183sdp --- If PCMA is offered, fix the SDP with PCMA + PCMU
11. modcontact --- Modify contact for anonymous calls
12. outManipToSFB --- a few manipulations before message is delivered to SFB
13. replacemptimewithptime --- change maxptime to ptime
14. ForEarlyMedia --- To locally handle PRACK interworking
15. NATandChangeContact --- Manipulate few headers with correct IP information
16. addPAIRefers --- Add P-Asserted-Identity header to INVITE if the REFER message contains Referred-by header

Local REFER handling by the SBC

In event of transferring calls from a SFB client (calls could be initially placed between 2 SFB Clients, but then transferred out to PSTN), SFB has two OPTIONS:

- Transfer using re-INVITE approach
- Transfer using REFER method --- the info below is required when REFER based transfer is enabled.

Oracle E-SBC supports REFER method termination when received from SFB. After termination the ESBC uses the info in refer-to header and sends a newly generated INVITE towards the SFB Mediation server. SFB then processes the INVITE, authorizes the call transfer and sends a new INVITE (for calls transferred to PSTN) to the SBC or transfers call internally to the transferred SFB client

To handle the call transfer and refer scenarios – when SFB client 1 refers/transfers the call to SFB Client 2 or to a party on the PSTN, we will need two routes to route to the two mediation servers depending on the referred party:

```
local-policy
        from-address                            *
        to-address                              sfbmedpool.acmepacket.net
        source-realm                            SIP-Trunk
        description                             For referred party header
        activate-time
        deactivate-time
        state                                   enabled
        policy-priority                         none
        policy-attribute
                next-hop                        sfbmedpool.acmepacket.net
                realm                                   towards-sfb
                action                                  replace-uri
                terminate-recursion                     disabled
                carrier
                start-time                              0000
                end-time                                2400
                days-of-week                            U-S
                cost                                    0
                state                                   enabled
                app-protocol                            SIP
                methods
                media-profiles
                lookup                                  single
                next-key
                eloc-str-lkup                           disabled
                eloc-str-match
```

Ring-back tone during Transfers

During call transfer to a PSTN party, the transfer completes but the calling party does not hear a ring back tone during transfer. The INVITE Lync sends to the SBC to initiate the transfer contains the SDP attribute, a=inactive which is forwarded to the trunk and as a result of which the SBC cannot play the ring back tone to the original PSTN caller (while call is being transferred). A sendonly attribute is required for MoH and transfer scenarios for the calling party to be able to hear ringback or MoH when it is kept on hold. The SBC is able to signal appropriately towards the SIP trunk by changing the “a=inactive” SDP attribute in the INVITE to sendonly towards PSTN.

Sip manipulations are configured to make the necessary changes. The manipulation ForEarlyMedia is configured to change the SDP attribute from a=inactive to a=sendonly in the INVITEs sent to the calling party for transfer

```
sip-manipulation
        name                            Changeinactosendonly
        description                     Change inactive to sendonly for transfer
        split-headers
        join-headers
        header-rule
                name                            changeSDP
                header-name                     Content-Type
                action                          manipulate
                comparison-type                 case-sensitive
                msg-type                        request
                methods                         INVITE
                match-value
                new-value
                element-rule
                        name                            inacttosendonly
                        parameter-name                  application/sdp
```

```
                        type                            mime
                        action                          find-replace-all
                        match-val-type                  any
                        comparison-type                 pattern-rule
                        match-value                     a=inactive
                        new-value                       a=sendonly
```

We utilize the local playback feature of the SBC to play ring back tone during transfers. The ringback tone is played based on REFER termination. You must upload an audio file (in .raw format) to /code/media onto the ESBC for the media you want played during the transfer. A separate file is required for each different codec type, even if the media itself is the same.

The playback configuration is defined listing the media files that you want to play. The playback-config element is configured under media-manager.

```
playback-config
        name                                    transferrbt
        entry
                encoding                                PCMU
                filename                                US_ringbackPCMU.raw
                bytes-per-sec                           8000
```

The playback options can be applied to realms, sip-interfaces or session agents using the `spl-options` command.

```
oraclesbc1(session-router)# sip-interface
oraclesbc1(sip-interface)# sel
<realm-id>:
1: towards-sfb  192.168.2.225:5060
2: SIP-trunk 192.168.1.220:5060

selection: 1
oraclesbc1(sip-interface)# spl-options  playback-on-refer="transferrbt"
oraclesbc1(sip-interface)# done
```

SBC Configurations

IPv4 based signaling for communication between Skype for Business and Oracle ESBC

IPv4 with TLS/SRTP

Following is the complete TLS/SRTP configuration of the SBC:

```
certificate-record
        name                                    CAcert
        country                                 US
        state                                   MA
        locality                                Burlington
        organization                            Tekvizion
        unit
        common-name                             sfblabdm-DC-CA-1
        key-size                                2048
        alternate-name
        trusted                                 enabled
        key-usage-list                          digitalSignature
                                                keyEncipherment
        extended-key-usage-list                 serverAuth
        options
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-18 15:19:22
certificate-record
```

```
        name                                    SBCcert1
        country                                 US
        state                                   MA
        locality                                Burlington
        organization                            Tekvizion
        unit
        common-name                             oracle.sfblabdm.local
        key-size                                2048
        alternate-name                          oraclepool.sfblabdm.local
        trusted                                 enabled
        key-usage-list                          digitalSignature
                                                keyEncipherment
        extended-key-usage-list                 serverAuth
        options
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-18 15:06:39
codec-policy
        name                                    For488
        allow-codecs                            G729 PCMU:no telephone-event PCMA:no
        add-codecs-on-egress
        order-codecs                            G729 telephone-event
        packetization-time                      20
        force-ptime                             disabled
        dtmf-in-audio                           disabled
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-16 17:15:37
codec-policy
        name                                    TC
        allow-codecs                            PCMA telephone-event PCMU:no
        add-codecs-on-egress                    PCMA telephone-event G729:no
        order-codecs                            PCMA telephone-event G729:no
        packetization-time                      20
        force-ptime                             disabled
        dtmf-in-audio                           disabled
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-11 14:32:23
codec-policy
        name                                    TCPCMU
        allow-codecs                            PCMU telephone-event PCMA:no
        add-codecs-on-egress
        order-codecs                            PCMU telephone-event
        packetization-time                      20
        force-ptime                             disabled
        dtmf-in-audio                           disabled
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-11 14:25:11
local-policy
        from-address                            *
        to-address                              *
        source-realm                            SIP-Trunk
        description
        activate-time
        deactivate-time
        state                                   enabled
        policy-priority                         none
        policy-attribute
```

```
                next-hop                                Medpool.sfblabdm.local
                realm                                   towards-sfb
                action                                  replace-uri
                terminate-recursion                     disabled
                carrier
                start-time                              0000
                end-time                                2400
                days-of-week                            U-S
                cost                                    0
                state                                   enabled
                app-protocol                            SIP
                methods
                media-profiles
                lookup                                  single
                next-key
                eloc-str-lkup                           disabled
                eloc-str-match
        last-modified-by                        web_admin@IP
        last-modified-date                      2015-09-21 13:23:44
local-policy
        from-address                            *
        to-address                              med1.sfblabdm.local
        source-realm                            SIP-Trunk
        description                             For Referred-Party Header
        activate-time
        deactivate-time
        state                                   enabled
        policy-priority                         none
        policy-attribute
                next-hop                                med1.sfblabdm.local
                realm                                   towards-sfb
                action                                  replace-uri
                terminate-recursion                     disabled
                carrier
                start-time                              0000
                end-time                                2400
                days-of-week                            U-S
                cost                                    0
                state                                   enabled
                app-protocol                            SIP
                methods
                media-profiles
                lookup                                  single
                next-key
                eloc-str-lkup                           disabled
                eloc-str-match
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-01 12:31:09
local-policy
        from-address                            *
        to-address                              med2.sfblabdm.local
        source-realm                            SIP-Trunk
        description
        activate-time
        deactivate-time
        state                                   enabled
```

```
        policy-priority                         none
        policy-attribute
                next-hop                                med2.sfblabdm.local
                realm                                   towards-sfb
                action                                  replace-uri
                terminate-recursion                     disabled
                carrier
                start-time                              0000
                end-time                                2400
                days-of-week                            U-S
                cost                                    0
                state                                   enabled
                app-protocol
                methods
                media-profiles
                lookup                                  single
                next-key
                eloc-str-lkup                           disabled
                eloc-str-match
        last-modified-by                        web_admin@IP
        last-modified-date                      2015-09-01 13:01:08
local-policy
        from-address                            *
        to-address                              *
        source-realm                            towards-sfb
        description
        activate-time
        deactivate-time
        state                                   enabled
        policy-priority                         none
        policy-attribute
                next-hop                                63.87.147.48
                realm                                   SIP-Trunk
                action                                  replace-uri
                terminate-recursion                     disabled
                carrier
                start-time                              0000
                end-time                                2400
                days-of-week                            U-S
                cost                                    0
                state                                   enabled
                app-protocol                            SIP
                methods
                media-profiles
                lookup                                  single
                next-key
                eloc-str-lkup                           disabled
                eloc-str-match
        last-modified-by                        web_admin@IP
        last-modified-date                      2015-09-01 13:01:21
media-manager
        state                                   enabled
        latching                                enabled
        flow-time-limit                         86400
        initial-guard-timer                     300
        subsq-guard-timer                       300
```

```
        tcp-flow-time-limit                     86400
        tcp-initial-guard-timer                 300
        tcp-subsq-guard-timer                   300
        tcp-number-of-ports-per-flow            2
        hnt-rtcp                                disabled
        algd-log-level                          NOTICE
        mbcd-log-level                          NOTICE
        options
        red-flow-port                           1985
        red-mgcp-port                           1986
        red-max-trans                           10000
        red-sync-start-time                     5000
        red-sync-comp-time                      1000
        media-policing                          enabled
        max-signaling-bandwidth                 10000000
        max-untrusted-signaling                 100
        min-untrusted-signaling                 30
        tolerance-window                        30
        trap-on-demote-to-deny                  disabled
        trap-on-demote-to-untrusted             disabled
        syslog-on-demote-to-deny                disabled
        syslog-on-demote-to-untrusted           disabled
        rtcp-rate-limit                         0
        anonymous-sdp                           disabled
        arp-msg-bandwidth                       32000
        rfc2833-timestamp                       disabled
        default-2833-duration                   100
        rfc2833-end-pkts-only-for-non-sig       enabled
        translate-non-rfc2833-event             disabled
        media-supervision-traps                 disabled
        dnsalg-server-failover                  disabled
        syslog-on-call-reject                   disabled
        last-modified-by                        admin@IP
        last-modified-date                      2014-11-17 11:33:36
media-sec-policy
        name                                    rtp
        pass-through                            disabled
        options
        inbound
                profile
                mode                                    rtp
                protocol                                none
        outbound
                profile
                mode                                    rtp
                protocol                                none
        last-modified-by                        admin@IP
        last-modified-date                      2015-03-02 09:17:50
media-sec-policy
        name                                    sfb-srtp
        pass-through                            disabled
        options
        inbound
                profile                                 sdes-profile
                mode                                    srtp
                protocol                                sdes
```

```
        outbound
                profile                                 sdes-profile
                mode                                    srtp
                protocol                                sdes
        last-modified-by                        admin@IP
        last-modified-date                      2015-03-02 09:17:30
network-interface
        name                                    s0p0
        sub-port-id                             0
        description                             For SIP-Trunk
        hostname
        ip-address                              192.65.79.126
        pri-utility-addr
        sec-utility-addr
        netmask                                 255.255.255.224
        gateway                                 192.65.79.97
        sec-gateway
        gw-heartbeat
                state                                   disabled
                heartbeat                               0
                retry-count                             0
                retry-timeout                           1
                health-score                            0
        dns-ip-primary
        dns-ip-backup1
        dns-ip-backup2
        dns-domain
        dns-timeout                             11
        signaling-mtu                           0
        hip-ip-list                             192.65.79.126
        ftp-address
        icmp-address                            192.65.79.126
        snmp-address
        telnet-address
        ssh-address
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-02 10:06:42
network-interface
        name                                    s1p0
        sub-port-id                             0
        description                             Facing Skype for Business
        hostname                                oracle.sfblabdm.local
        ip-address                              10.64.3.163
        pri-utility-addr
        sec-utility-addr
        netmask                                 255.255.0.0
        gateway                                 10.64.1.1
        sec-gateway
        gw-heartbeat
                state                                   disabled
                heartbeat                               0
                retry-count                             0
                retry-timeout                           1
                health-score                            0
        dns-ip-primary                          172.16.29.42
        dns-ip-backup1
```

```
        dns-ip-backup2
        dns-domain                              sfblabdm.local
        dns-timeout                             11
        signaling-mtu                           0
        hip-ip-list                             10.64.3.163
        ftp-address
        icmp-address                            10.64.3.163
        snmp-address
        telnet-address
        ssh-address                             10.64.3.163
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-11 14:51:42
network-interface
        name                                    wancom1
        sub-port-id                             0
        description
        hostname
        ip-address
        pri-utility-addr                        169.254.1.1
        sec-utility-addr                        169.254.1.2
        netmask                                 255.255.255.252
        gateway
        sec-gateway
        gw-heartbeat
                state                                   disabled
                heartbeat                               0
                retry-count                             0
                retry-timeout                           1
                health-score                            0
        dns-ip-primary
        dns-ip-backup1
        dns-ip-backup2
        dns-domain
        dns-timeout                             11
        signaling-mtu                           0
        hip-ip-list
        ftp-address
        icmp-address
        snmp-address
        telnet-address
        ssh-address
        last-modified-by                        admin@IP
        last-modified-date                      2014-11-17 11:49:35
network-interface
        name                                    wancom2
        sub-port-id                             0
        description
        hostname
        ip-address
        pri-utility-addr                        169.254.2.1
        sec-utility-addr                        169.254.2.2
        netmask                                 255.255.255.252
        gateway
        sec-gateway
        gw-heartbeat
                state                                   disabled
```

```
                heartbeat                               0
                retry-count                             0
                retry-timeout                           1
                health-score                            0
        dns-ip-primary
        dns-ip-backup1
        dns-ip-backup2
        dns-domain
        dns-timeout                             11
        signaling-mtu                           0
        hip-ip-list
        ftp-address
        icmp-address
        snmp-address
        telnet-address
        ssh-address
        last-modified-by                        admin@IP
        last-modified-date                      2014-11-17 11:50:25
phy-interface
        name                                    s0p0
        operation-type                          Media
        port                                    0
        slot                                    0
        virtual-mac                             00:08:25:04:0d:1e
        admin-state                             enabled
        auto-negotiation                        enabled
        duplex-mode                             FULL
        speed                                   100
        wancom-health-score                     50
        overload-protection                     disabled
        last-modified-by                        admin@IP
        last-modified-date                      2014-11-17 11:53:04
phy-interface
        name                                    s1p0
        operation-type                          Media
        port                                    0
        slot                                    1
        virtual-mac                             00:08:25:04:0d:1f
        admin-state                             enabled
        auto-negotiation                        enabled
        duplex-mode                             FULL
        speed                                   100
        wancom-health-score                     50
        overload-protection                     disabled
        last-modified-by                        admin@IP
        last-modified-date                      2014-11-17 11:53:40
phy-interface
        name                                    wancom1
        operation-type                          Control
        port                                    1
        slot                                    0
        virtual-mac
        admin-state                             enabled
        auto-negotiation                        enabled
        duplex-mode
        speed
```

```
        wancom-health-score                   8
        overload-protection                   disabled
        last-modified-by                      admin@IP
        last-modified-date                    2014-11-17 11:54:41
phy-interface
        name                                  wancom2
        operation-type                        Control
        port                                  2
        slot                                  0
        virtual-mac
        admin-state                           enabled
        auto-negotiation                      enabled
        duplex-mode
        speed
        wancom-health-score                   9
        overload-protection                   disabled
        last-modified-by                      admin@IP
        last-modified-date                    2014-11-17 11:55:46
playback-config
        name                                  transferrbt
        entry
                encoding                              PCMU
                filename                              US_ringbackPCMU.raw
                bytes-per-sec                         8000
        last-modified-by                      admin@IP
        last-modified-date                    2014-11-17 12:04:41
realm-config
        identifier                            SIP-Trunk
        description
        addr-prefix                           0.0.0.0
        network-interfaces                    s0p0:0
        mm-in-realm                           enabled
        mm-in-network                         enabled
        mm-same-ip                            enabled
        mm-in-system                          enabled
        bw-cac-non-mm                         disabled
        msm-release                           disabled
        qos-enable                            disabled
        max-bandwidth                         0
        fallback-bandwidth                    0
        max-priority-bandwidth                0
        max-latency                           0
        max-jitter                            0
        max-packet-loss                       0
        observ-window-size                    0
        parent-realm
        dns-realm
        media-policy
        media-sec-policy                      rtp
        srtp-msm-passthrough                  disabled
        class-profile
        in-translationid
        out-translationid
        in-manipulationid
        out-manipulationid
        average-rate-limit                    0
```

```
        access-control-trust-level              none
        invalid-signal-threshold                0
        maximum-signal-threshold                0
        untrusted-signal-threshold              0
        nat-trust-threshold                     0
        max-endpoints-per-nat                   0
        nat-invalid-message-threshold           0
        wait-time-for-invalid-register          0
        deny-period                             30
        cac-failure-threshold                   0
        untrust-cac-failure-threshold           0
        ext-policy-svr
        diam-e2-address-realm
        subscription-id-type                    END_USER_NONE
        symmetric-latching                      disabled
        pai-strip                               disabled
        trunk-context
        device-id
        early-media-allow
        enforcement-profile
        additional-prefixes
        restricted-latching                     none
        restriction-mask                        32
        user-cac-mode                           none
        user-cac-bandwidth                      0
        user-cac-sessions                       0
        icmp-detect-multiplier                  0
        icmp-advertisement-interval             0
        icmp-target-ip
        monthly-minutes                         0
        options
        spl-options
        accounting-enable                       enabled
        net-management-control                  disabled
        delay-media-update                      disabled
        refer-call-transfer                     disabled
        hold-refer-reinvite                     disabled
        refer-notify-provisional                none
        dyn-refer-term                          disabled
        codec-policy
        codec-manip-in-realm                    disabled
        codec-manip-in-network                  enabled
        rtcp-policy
        constraint-name
        session-recording-server
        session-recording-required              disabled
        manipulation-string
        manipulation-pattern
        stun-enable                             disabled
        stun-server-ip                          0.0.0.0
        stun-server-port                        3478
        stun-changed-ip                         0.0.0.0
        stun-changed-port                       3479
        sip-profile
        sip-isup-profile
        match-media-profiles
```

```
        qos-constraint
        block-rtcp                          disabled
        hide-egress-media-update            disabled
        tcp-media-profile
        monitoring-filters
        node-functionality
        default-location-string
        alt-family-realm
        pref-addr-type                      none
        last-modified-by                    admin@IP
        last-modified-date                  2015-09-18 15:37:41
realm-config
        identifier                          towards-sfb
        description
        addr-prefix                         0.0.0.0
        network-interfaces                  s1p0:0
        mm-in-realm                         enabled
        mm-in-network                       enabled
        mm-same-ip                          enabled
        mm-in-system                        enabled
        bw-cac-non-mm                       disabled
        msm-release                         disabled
        qos-enable                          disabled
        max-bandwidth                       0
        fallback-bandwidth                  0
        max-priority-bandwidth              0
        max-latency                         0
        max-jitter                          0
        max-packet-loss                     0
        observ-window-size                  0
        parent-realm
        dns-realm
        media-policy
        media-sec-policy                    sfb-srtp
        srtp-msm-passthrough                disabled
        class-profile
        in-translationid
        out-translationid
        in-manipulationid
        out-manipulationid
        average-rate-limit                  0
        access-control-trust-level          none
        invalid-signal-threshold            0
        maximum-signal-threshold            0
        untrusted-signal-threshold          0
        nat-trust-threshold                 0
        max-endpoints-per-nat               0
        nat-invalid-message-threshold       0
        wait-time-for-invalid-register      0
        deny-period                         30
        cac-failure-threshold               0
        untrust-cac-failure-threshold       0
        ext-policy-svr
        diam-e2-address-realm
        subscription-id-type                END_USER_NONE
        symmetric-latching                  disabled
```

```
        pai-strip                               disabled
        trunk-context
        device-id
        early-media-allow
        enforcement-profile
        additional-prefixes
        restricted-latching                     none
        restriction-mask                        32
        user-cac-mode                           none
        user-cac-bandwidth                      0
        user-cac-sessions                       0
        icmp-detect-multiplier                  0
        icmp-advertisement-interval             0
        icmp-target-ip
        monthly-minutes                         0
        options
        spl-options
        accounting-enable                       enabled
        net-management-control                  disabled
        delay-media-update                      disabled
        refer-call-transfer                     enabled
        hold-refer-reinvite                     disabled
        refer-notify-provisional                none
        dyn-refer-term                          disabled
        codec-policy
        codec-manip-in-realm                    disabled
        codec-manip-in-network                  enabled
        rtcp-policy
        constraint-name
        session-recording-server
        session-recording-required              disabled
        manipulation-string
        manipulation-pattern
        stun-enable                             disabled
        stun-server-ip                          0.0.0.0
        stun-server-port                        3478
        stun-changed-ip                         0.0.0.0
        stun-changed-port                       3479
        sip-profile
        sip-isup-profile
        match-media-profiles
        qos-constraint
        block-rtcp                              disabled
        hide-egress-media-update                disabled
        tcp-media-profile
        monitoring-filters
        node-functionality
        default-location-string
        alt-family-realm
        pref-addr-type                          none
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-18 15:38:06
redundancy-config
        state                                   enabled
        log-level                               INFO
        health-threshold                        75
```

```
        emergency-threshold                   50
        port                                  9090
        advertisement-time                    500
        percent-drift                         210
        initial-time                          1250
        becoming-standby-time                 180000
        becoming-active-time                  100
        cfg-port                              1987
        cfg-max-trans                         10000
        cfg-sync-start-time                   5000
        cfg-sync-comp-time                    1000
        gateway-heartbeat-interval            0
        gateway-heartbeat-retry               0
        gateway-heartbeat-timeout             1
        gateway-heartbeat-health              0
        media-if-peercheck-time               0
        peer
                name                                  Acmesystem1
                state                                 enabled
                type                                  Primary
                destination
                        address                               169.254.1.1:9090
                        network-interface                     wancom1:0
                destination
                        address                               169.254.2.1:9090
                        network-interface                     wancom2:0
        peer
                name                                  acmesystem3
                state                                 enabled
                type                                  Secondary
                destination
                        address                               169.254.1.2:9090
                        network-interface                     wancom1:0
                destination
                        address                               169.254.2.2:9090
                        network-interface                     wancom2:0
        last-modified-by                      admin@IP
        last-modified-date                    2014-11-17 12:27:59
response-map
        name                                  change183to180
        entries
                recv-code                             183
                xmit-code                             180
                reason                                Ringing
                method
                register-response-expires
        last-modified-by                      admin@IP
        last-modified-date                    2015-02-20 10:37:37
sdes-profile
        name                                  sdes-profile
        crypto-list                           AES_CM_128_HMAC_SHA1_80
        srtp-auth                             enabled
        srtp-encrypt                          enabled
        srtcp-encrypt                         enabled
        mki                                   disabled
        egress-offer-format                   same-as-ingress
```

```
        use-ingress-session-params
        options
        key
        salt
        srtp-rekey-on-re-invite                 disabled
        last-modified-by                        admin@IP
        last-modified-date                      2015-03-04 11:18:36
session-agent
        hostname                                63.87.147.48
        ip-address                              63.87.147.48
        port                                    5071
        state                                   enabled
        app-protocol                            SIP
        app-type
        transport-method                        UDP
        realm-id                                SIP-Trunk
        egress-realm-id
        description
        carriers
        allow-next-hop-lp                       enabled
        constraints                             disabled
        max-sessions                            0
        max-inbound-sessions                    0
        max-outbound-sessions                   0
        max-burst-rate                          0
        max-inbound-burst-rate                  0
        max-outbound-burst-rate                 0
        max-sustain-rate                        0
        max-inbound-sustain-rate                0
        max-outbound-sustain-rate               0
        min-seizures                            5
        min-asr                                 0
        time-to-resume                          0
        ttr-no-response                         0
        in-service-period                       0
        burst-rate-window                       0
        sustain-rate-window                     0
        req-uri-carrier-mode                    None
        proxy-mode
        redirect-action
        loose-routing                           enabled
        send-media-session                      enabled
        response-map
        ping-method                             OPTIONS
        ping-interval                           30
        ping-send-mode                          keep-alive
        ping-all-addresses                      disabled
        ping-in-service-response-codes
        out-service-response-codes
        load-balance-dns-query                  hunt
        options
        spl-options
        media-profiles
        in-translationid
        out-translationid                       stripplus1
        trust-me                                disabled
```

```
        request-uri-headers
        stop-recurse
        local-response-map
        ping-to-user-part
        ping-from-user-part
        in-manipulationid
        out-manipulationid
        manipulation-string
        manipulation-pattern
        p-asserted-id
        trunk-group
        max-register-sustain-rate               0
        early-media-allow
        invalidate-registrations                disabled
        rfc2833-mode                            none
        rfc2833-payload                         0
        codec-policy
        enforcement-profile
        refer-call-transfer                     disabled
        refer-notify-provisional                none
        reuse-connections                       NONE
        tcp-keepalive                           none
        tcp-reconn-interval                     0
        max-register-burst-rate                 0
        register-burst-window                   0
        sip-profile
        sip-isup-profile
        kpml-interworking                       inherit
        monitoring-filters
        session-recording-server
        session-recording-required              disabled
        hold-refer-reinvite                     disabled
        send-tcp-fin                            disabled
        last-modified-by                        web_admin@IP
        last-modified-date                      2015-09-17 12:54:39
session-agent
        hostname                                Medpool.sfblabdm.local
        ip-address
        port                                    5067
        state                                   enabled
        app-protocol                            SIP
        app-type
        transport-method                        StaticTLS
        realm-id                                towards-sfb
        egress-realm-id
        description
        carriers
        allow-next-hop-lp                       enabled
        constraints                             disabled
        max-sessions                            0
        max-inbound-sessions                    0
        max-outbound-sessions                   0
        max-burst-rate                          0
        max-inbound-burst-rate                  0
        max-outbound-burst-rate                 0
        max-sustain-rate                        0
```

```
        max-inbound-sustain-rate                0
        max-outbound-sustain-rate               0
        min-seizures                            5
        min-asr                                 0
        time-to-resume                          0
        ttr-no-response                         0
        in-service-period                       0
        burst-rate-window                       0
        sustain-rate-window                     0
        req-uri-carrier-mode                    None
        proxy-mode
        redirect-action
        loose-routing                           enabled
        send-media-session                      enabled
        response-map
        ping-method                             OPTIONS
        ping-interval                           60
        ping-send-mode                          keep-alive
        ping-all-addresses                      disabled
        ping-in-service-response-codes
        out-service-response-codes
        load-balance-dns-query                  hunt
        options
        spl-options
        media-profiles
        in-translationid
        out-translationid                       addplus1
        trust-me                                disabled
        request-uri-headers
        stop-recurse                            480
        local-response-map
        ping-to-user-part
        ping-from-user-part
        in-manipulationid
        out-manipulationid
        manipulation-string
        manipulation-pattern
        p-asserted-id
        trunk-group
        max-register-sustain-rate               0
        early-media-allow
        invalidate-registrations                disabled
        rfc2833-mode                            none
        rfc2833-payload                         0
        codec-policy
        enforcement-profile
        refer-call-transfer                     enabled
        refer-notify-provisional                none
        reuse-connections                       NONE
        tcp-keepalive                           disabled
        tcp-reconn-interval                     0
        max-register-burst-rate                 0
        register-burst-window                   0
        sip-profile
        sip-isup-profile
        kpml-interworking                       inherit
```

```
        monitoring-filters
        session-recording-server
        session-recording-required              disabled
        hold-refer-reinvite                     disabled
        send-tcp-fin                            disabled
        last-modified-by                        web_admin@IP
        last-modified-date                      2015-09-21 11:03:47
session-agent
        hostname                                med1.sfblabdm.local
        ip-address                              172.16.29.44
        port                                    5067
        state                                   enabled
        app-protocol                            SIP
        app-type
        transport-method                        StaticTLS
        realm-id                                towards-sfb
        egress-realm-id
        description
        carriers
        allow-next-hop-lp                       enabled
        constraints                             disabled
        max-sessions                            0
        max-inbound-sessions                    0
        max-outbound-sessions                   0
        max-burst-rate                          0
        max-inbound-burst-rate                  0
        max-outbound-burst-rate                 0
        max-sustain-rate                        0
        max-inbound-sustain-rate                0
        max-outbound-sustain-rate               0
        min-seizures                            5
        min-asr                                 0
        time-to-resume                          0
        ttr-no-response                         0
        in-service-period                       0
        burst-rate-window                       0
        sustain-rate-window                     0
        req-uri-carrier-mode                    None
        proxy-mode
        redirect-action
        loose-routing                           enabled
        send-media-session                      enabled
        response-map
        ping-method                             OPTIONS
        ping-interval                           60
        ping-send-mode                          keep-alive
        ping-all-addresses                      disabled
        ping-in-service-response-codes
        out-service-response-codes
        load-balance-dns-query                  hunt
        options
        spl-options
        media-profiles
        in-translationid
        out-translationid                       addplus1
        trust-me                                disabled
```

```
        request-uri-headers
        stop-recurse
        local-response-map
        ping-to-user-part
        ping-from-user-part
        in-manipulationid
        out-manipulationid
        manipulation-string
        manipulation-pattern
        p-asserted-id
        trunk-group
        max-register-sustain-rate               0
        early-media-allow
        invalidate-registrations                disabled
        rfc2833-mode                            none
        rfc2833-payload                         0
        codec-policy
        enforcement-profile
        refer-call-transfer                     enabled
        refer-notify-provisional                none
        reuse-connections                       NONE
        tcp-keepalive                           none
        tcp-reconn-interval                     0
        max-register-burst-rate                 0
        register-burst-window                   0
        sip-profile
        sip-isup-profile
        kpml-interworking                       inherit
        monitoring-filters
        session-recording-server
        session-recording-required              disabled
        hold-refer-reinvite                     disabled
        send-tcp-fin                            disabled
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-21 12:56:40
session-agent
        hostname                                med2.sfblabdm.local
        ip-address                              172.16.29.45
        port                                    5067
        state                                   enabled
        app-protocol                            SIP
        app-type
        transport-method                        StaticTLS
        realm-id                                towards-sfb
        egress-realm-id
        description
        carriers
        allow-next-hop-lp                       enabled
        constraints                             disabled
        max-sessions                            0
        max-inbound-sessions                    0
        max-outbound-sessions                   0
        max-burst-rate                          0
        max-inbound-burst-rate                  0
        max-outbound-burst-rate                 0
        max-sustain-rate                        0
```

```
        max-inbound-sustain-rate                0
        max-outbound-sustain-rate               0
        min-seizures                            5
        min-asr                                 0
        time-to-resume                          0
        ttr-no-response                         0
        in-service-period                       0
        burst-rate-window                       0
        sustain-rate-window                     0
        req-uri-carrier-mode                    None
        proxy-mode
        redirect-action
        loose-routing                           enabled
        send-media-session                      enabled
        response-map
        ping-method                             OPTIONS
        ping-interval                           60
        ping-send-mode                          keep-alive
        ping-all-addresses                      disabled
        ping-in-service-response-codes
        out-service-response-codes
        load-balance-dns-query                  hunt
        options
        spl-options
        media-profiles
        in-translationid
        out-translationid                       addplus1
        trust-me                                disabled
        request-uri-headers
        stop-recurse
        local-response-map
        ping-to-user-part
        ping-from-user-part
        in-manipulationid
        out-manipulationid
        manipulation-string
        manipulation-pattern
        p-asserted-id
        trunk-group
        max-register-sustain-rate               0
        early-media-allow
        invalidate-registrations                disabled
        rfc2833-mode                            none
        rfc2833-payload                         0
        codec-policy
        enforcement-profile
        refer-call-transfer                     enabled
        refer-notify-provisional                none
        reuse-connections                       NONE
        tcp-keepalive                           none
        tcp-reconn-interval                     0
        max-register-burst-rate                 0
        register-burst-window                   0
        sip-profile
        sip-isup-profile
        kpml-interworking                       inherit
```

```
        monitoring-filters
        session-recording-server
        session-recording-required              disabled
        hold-refer-reinvite                     disabled
        send-tcp-fin                            disabled
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-21 12:57:06
session-translation
        id                                      addplus1
        rules-calling                           addplus1
        rules-called                            addplus1
        last-modified-by                        admin@IP
        last-modified-date                      2015-03-05 12:14:27
session-translation
        id                                      stripplus1
        rules-calling                           stripplus1
        rules-called                            stripplus1
        last-modified-by                        admin@10.64.204.12
        last-modified-date                      2015-08-28 12:00:43
sip-config
        state                                   enabled
        operation-mode                          dialog
        dialog-transparency                     enabled
        home-realm-id                           towards-sfb
        egress-realm-id
        auto-realm-id
        nat-mode                                None
        registrar-domain                        *
        registrar-host                          *
        registrar-port                          0
        register-service-route                  always
        init-timer                              500
        max-timer                               4000
        trans-expire                            32
        initial-inv-trans-expire                0
        invite-expire                           180
        inactive-dynamic-conn                   32
        enforcement-profile
        pac-method
        pac-interval                            10
        pac-strategy                            PropDist
        pac-load-weight                         1
        pac-session-weight                      1
        pac-route-weight                        1
        pac-callid-lifetime                     600
        pac-user-lifetime                       3600
        red-sip-port                            1988
        red-max-trans                           10000
        red-sync-start-time                     5000
        red-sync-comp-time                      1000
        options                                 max-udp-length=0
        add-reason-header                       disabled
        sip-message-len                         4096
        enum-sag-match                          disabled
        extra-method-stats                      disabled
        extra-enum-stats                        disabled
```

```
        rph-feature                             disabled
        nsep-user-sessions-rate                 0
        nsep-sa-sessions-rate                   0
        registration-cache-limit                0
        register-use-to-for-lp                  disabled
        refer-src-routing                       disabled
        add-ucid-header                         disabled
        proxy-sub-events
        allow-pani-for-trusted-only             disabled
        atcf-stn-sr
        atcf-psi-dn
        atcf-route-to-sccas                     disabled
        eatf-stn-sr
        pass-gruu-contact                       disabled
        sag-lookup-on-redirect                  disabled
        set-disconnect-time-on-bye              disabled
        msrp-delayed-bye-timer                  15
        transcoding-realm
        transcoding-agents
        create-dynamic-sa                       disabled
        node-functionality                      P-CSCF
        match-sip-instance                      disabled
        sa-routes-stats                         disabled
        sa-routes-traps                         disabled
        rx-sip-reason-mapping                   disabled
        add-ue-location-in-pani                 disabled
        hold-emergency-calls-for-loc-info       0
        last-modified-by                        web_admin@IP
        last-modified-date                      2015-09-17 12:42:41
sip-feature
        name                                    100rel
        realm                                   SIP-Trunk
        support-mode-inbound                    Pass
        require-mode-inbound                    Pass
        proxy-require-mode-inbound              Pass
        support-mode-outbound                   Pass
        require-mode-outbound                   Pass
        proxy-require-mode-outbound             Pass
        last-modified-by                        admin@10.64.204.12
        last-modified-date                      2015-08-28 14:56:44
sip-interface
        state                                   enabled
        realm-id                                SIP-Trunk
        description
        sip-port
                address                                 192.65.79.126
                port                                    5060
                transport-protocol                      UDP
                tls-profile
                allow-anonymous                         all
                multi-home-addrs
                ims-aka-profile
        carriers
        trans-expire                            0
        initial-inv-trans-expire                0
        invite-expire                           0
```

```
        max-redirect-contacts                   0
        proxy-mode
        redirect-action
        contact-mode                            none
        nat-traversal                           none
        nat-interval                            30
        tcp-nat-interval                        90
        registration-caching                    disabled
        min-reg-expire                          300
        registration-interval                   3600
        route-to-registrar                      disabled
        secured-network                         disabled
        teluri-scheme                           disabled
        uri-fqdn-domain
        options
        spl-options
        trust-mode                              all
        max-nat-interval                        3600
        nat-int-increment                       10
        nat-test-increment                      30
        sip-dynamic-hnt                         disabled
        stop-recurse                            401,407
        port-map-start                          0
        port-map-end                            0
        in-manipulationid
        out-manipulationid                      NATandChangeContact
        sip-ims-feature                         disabled
        sip-atcf-feature                        disabled
        subscribe-reg-event                     disabled
        operator-identifier
        anonymous-priority                      none
        max-incoming-conns                      0
        per-src-ip-max-incoming-conns           0
        inactive-conn-timeout                   0
        untrusted-conn-timeout                  0
        network-id
        ext-policy-server
        ldap-policy-server
        default-location-string
        term-tgrp-mode                          none
        charging-vector-mode                    pass
        charging-function-address-mode          pass
        ccf-address
        ecf-address
        implicit-service-route                  disabled
        rfc2833-payload                         101
        rfc2833-mode                            transparent
        constraint-name
        response-map
        local-response-map
        sec-agree-feature                       disabled
        sec-agree-pref                          ipsec3gpp
        enforcement-profile
        route-unauthorized-calls
        tcp-keepalive                           none
        add-sdp-invite                          disabled
```

```
        p-early-media-header                    disabled
        p-early-media-direction
        add-sdp-profiles
        manipulation-string
        manipulation-pattern
        sip-profile
        sip-isup-profile
        tcp-conn-dereg                          0
        tunnel-name
        register-keep-alive                     none
        kpml-interworking                       disabled
        msrp-delay-egress-bye                   disabled
        send-380-response
        pcscf-restoration
        session-timer-profile
        session-recording-server
        session-recording-required              disabled
        service-tag
        reg-cache-route                         disabled
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-08 17:49:21
sip-interface
        state                                   enabled
        realm-id                                towards-sfb
        description
        sip-port
                address                                 10.64.3.163
                port                                    5067
                transport-protocol                      TLS
                tls-profile                             sfb-tls-profile
                allow-anonymous                         all
                multi-home-addrs
                ims-aka-profile
        carriers
        trans-expire                            0
        initial-inv-trans-expire                0
        invite-expire                           0
        max-redirect-contacts                   0
        proxy-mode
        redirect-action
        contact-mode                            none
        nat-traversal                           none
        nat-interval                            30
        tcp-nat-interval                        90
        registration-caching                    disabled
        min-reg-expire                          300
        registration-interval                   3600
        route-to-registrar                      disabled
        secured-network                         disabled
        teluri-scheme                           disabled
        uri-fqdn-domain
        options                                 100rel-interworking
        spl-options
        trust-mode                              all
        max-nat-interval                        3600
        nat-int-increment                       10
```

```
        nat-test-increment                  30
        sip-dynamic-hnt                     disabled
        stop-recurse                        401,407
        port-map-start                      0
        port-map-end                        0
        in-manipulationid                   ForEarlyMedia
        out-manipulationid                  outManipToSFB
        sip-ims-feature                     disabled
        sip-atcf-feature                    disabled
        subscribe-reg-event                 disabled
        operator-identifier
        anonymous-priority                  none
        max-incoming-conns                  0
        per-src-ip-max-incoming-conns       0
        inactive-conn-timeout               0
        untrusted-conn-timeout              0
        network-id
        ext-policy-server
        ldap-policy-server
        default-location-string
        term-tgrp-mode                      none
        charging-vector-mode                pass
        charging-function-address-mode      pass
        ccf-address
        ecf-address
        implicit-service-route              disabled
        rfc2833-payload                     101
        rfc2833-mode                        transparent
        constraint-name
        response-map
        local-response-map
        sec-agree-feature                   disabled
        sec-agree-pref                      ipsec3gpp
        enforcement-profile
        route-unauthorized-calls
        tcp-keepalive                       none
        add-sdp-invite                      disabled
        p-early-media-header                disabled
        p-early-media-direction
        add-sdp-profiles
        manipulation-string
        manipulation-pattern
        sip-profile
        sip-isup-profile
        tcp-conn-dereg                      0
        tunnel-name
        register-keep-alive                 none
        kpml-interworking                   disabled
        msrp-delay-egress-bye               disabled
        send-380-response
        pcscf-restoration
        session-timer-profile
        session-recording-server
        session-recording-required          disabled
        service-tag
        reg-cache-route                     disabled
```

```
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-18 15:21:36
sip-manipulation
        name                                    Addpcmato183
        description
        split-headers
        join-headers
        header-rule
                name                                    check1for83
                header-name                             @status-line
                action                                  manipulate
                comparison-type                         pattern-rule
                msg-type                                any
                methods
                match-value
                new-value
                element-rule
                        name                                    isit183
                        parameter-name
                        type                                    status-code
                        action                                  sip-manip
                        match-val-type                          any
                        comparison-type                         pattern-rule
                        match-value                             183
                        new-value                               fix183sdp
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-10 12:26:47
sip-manipulation
        name                                    ChangeContact
        description
        split-headers
        join-headers
        header-rule
                name                                    StoreFromnumber
                header-name                             From
                action                                  manipulate
                comparison-type                         case-sensitive
                msg-type                                any
                methods
                match-value
                new-value
                element-rule
                        name                                    StoreFromnumber_er
                        parameter-name
                        type                                    uri-user-only
                        action                                  store
                        match-val-type                          any
                        comparison-type                         case-sensitive
                        match-value
                        new-value
        header-rule
                name                                    ChangeContact
                header-name                             Contact
                action                                  manipulate
                comparison-type                         case-sensitive
                msg-type                                any
```

```
                methods
                match-value
                new-value
                element-rule
                        name                                    ChangeContact_er
                        parameter-name
                        type                                    uri-user
                        action                                  add
                        match-val-type                          any
                        comparison-type                         case-sensitive
                        match-value
                        new-value
$StoreFromnumber.$StoreFromnumber_er.$0
        last-modified-by                        admin@IP
        last-modified-date                      2014-11-17 12:50:13
sip-manipulation
        name                                    ChangeRecvOnlyToInactive
        description
        split-headers
        join-headers
        header-rule
                name                                    changeSDP
                header-name                             Content-Type
                action                                  manipulate
                comparison-type                         case-sensitive
                msg-type                                reply
                methods                                 INVITE
                match-value
                new-value
                element-rule
                        name                                    RecvOnlyToInactive
                        parameter-name                          application/sdp
                        type                                    mime
                        action                                  find-replace-all
                        match-val-type                          any
                        comparison-type                         pattern-rule
                        match-value                             a=recvonly
                        new-value                               a=inactive
        last-modified-by                        admin@IP
        last-modified-date                      2015-02-26 12:59:33
sip-manipulation
        name                                    Changeinactosendonly
        description                             Change inactive to sendonly for pstn tran
        split-headers
        join-headers
        header-rule
                name                                    changeSDP
                header-name                             Content-Type
                action                                  manipulate
                comparison-type                         case-sensitive
                msg-type                                request
                methods                                 INVITE
                match-value
                new-value
                element-rule
                        name                                    inacttosendonly
```

```
                        parameter-name                          application/sdp
                        type                                    mime
                        action                                  find-replace-all
                        match-val-type                          any
                        comparison-type                         pattern-rule
                        match-value                             a=inactive
                        new-value                               a=sendonly
        last-modified-by                        admin@IP
        last-modified-date                      2014-11-17 12:53:24
sip-manipulation
        name                                    Check183
        description
        split-headers
        join-headers
        header-rule
                name                                    check183
                header-name                             @status-line
                action                                  manipulate
                comparison-type                         pattern-rule
                msg-type                                any
                methods
                match-value
                new-value
                element-rule
                        name                                    is183
                        parameter-name
                        type                                    status-code
                        action                                  sip-manip
                        match-val-type                          any
                        comparison-type                         pattern-rule
                        match-value                             183
                        new-value                               Modcline
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-09 15:12:56
sip-manipulation
        name                                    ForEarlyMedia
        description
        split-headers
        join-headers
        header-rule
                name                                    delsupported
                header-name                             Supported
                action                                  delete
                comparison-type                         case-sensitive
                msg-type                                request
                methods                                 INVITE
                match-value
                new-value
        header-rule
                name                                    addrequireinINVITE
                header-name                             Require
                action                                  add
                comparison-type                         case-sensitive
                msg-type                                request
                methods                                 INVITE
                match-value
```

```
                new-value                               100rel
        header-rule
                name                                    Options
                header-name                             From
                action                                  sip-manip
                comparison-type                         case-sensitive
                msg-type                                any
                methods
                match-value
                new-value                               OptionsResponseLocally
        header-rule
                name                                    Change183
                header-name                             From
                action                                  sip-manip
                comparison-type                         case-sensitive
                msg-type                                any
                methods
                match-value
                new-value                               Check183
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-09 12:13:23
sip-manipulation
        name                                    Modcline
        description
        split-headers
        join-headers
        mime-sdp-rule
                name                                    test
                msg-type                                any
                methods
                action                                  manipulate
                comparison-type                         pattern-rule
                match-value
                new-value
                sdp-media-rule
                        name                                    checkcline
                        media-type                              audio
                        action                                  manipulate
                        comparison-type                         pattern-rule
                        match-value
                        new-value
                        sdp-line-rule
                                name                                    detectc
                                type                                    c
                                action                                  sip-manip
                                comparison-type                         pattern-rule
                                match-value
^(.(?!(172.16.29.44|172.16.29.45|10.64.3.163)))*$
                                new-value                               convert183to180
        header-rule
                name                                    checkcl
                header-name                             Content-Length
                action                                  sip-manip
                comparison-type                         case-sensitive
                msg-type                                any
                methods
```

```
                match-value                             0
                new-value                               convert183to180
        last-modified-by                        web_admin@IP
        last-modified-date                      2015-09-09 18:26:21
sip-manipulation
        name                                    NATandChangeContact
        description                             NAT plus Change Contact
        split-headers
        join-headers
        header-rule
                name                                    doNATfortrunk
                header-name                             From
                action                                  sip-manip
                comparison-type                         case-sensitive
                msg-type                                any
                methods
                match-value
                new-value                               NATting
        header-rule
                name                                    delsupported
                header-name                             Supported
                action                                  delete
                comparison-type                         case-sensitive
                msg-type                                request
                methods                                 INVITE
                match-value
                new-value
        header-rule
                name                                    addPAIonCallForwards
                header-name                             From
                action                                  sip-manip
                comparison-type                         case-sensitive
                msg-type                                request
                methods                                 INVITE
                match-value
                new-value                               addPAIonCallForwards
        header-rule
                name                                    addPAIRefers
                header-name                             From
                action                                  sip-manip
                comparison-type                         case-sensitive
                msg-type                                request
                methods                                 INVITE
                match-value
                new-value                               addPAIRefers
        header-rule
                name                                    ChangeContactHeader
                header-name                             From
                action                                  sip-manip
                comparison-type                         case-sensitive
                msg-type                                any
                methods
                match-value
                new-value                               ChangeContact
        header-rule
                name                                    modify183sdp
```

```
                header-name                             From
                action                                  sip-manip
                comparison-type                         case-sensitive
                msg-type                                any
                methods
                match-value
                new-value                               Addpcmato183
        last-modified-by                        web@
        last-modified-date                      2015-09-10 14:48:23
sip-manipulation
        name                                    NATting
        description
        split-headers
        join-headers
        header-rule
                name                                    From
                header-name                             From
                action                                  manipulate
                comparison-type                         case-sensitive
                msg-type                                request
                methods
                match-value
                new-value
                element-rule
                        name                                    From_header
                        parameter-name
                        type                                    uri-host
                        action                                  replace
                        match-val-type                          any
                        comparison-type                         case-sensitive
                        match-value
                        new-value                               $LOCAL_IP
        header-rule
                name                                    To
                header-name                             To
                action                                  manipulate
                comparison-type                         case-sensitive
                msg-type                                request
                methods
                match-value
                new-value
                element-rule
                        name                                    To
                        parameter-name
                        type                                    uri-host
                        action                                  replace
                        match-val-type                          any
                        comparison-type                         case-sensitive
                        match-value
                        new-value                               $REMOTE_IP
        last-modified-by                        web_admin@IP
        last-modified-date                      2015-09-10 16:38:21
sip-manipulation
        name                                    OptionsResponseLocally
        description
        split-headers
```

```
        join-headers
        header-rule
                name                                    rejectOptions
                header-name                             request-uri
                action                                  reject
                comparison-type                         case-sensitive
                msg-type                                request
                methods                                 OPTIONS
                match-value
                new-value                               200: OK
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-02 11:29:29
sip-manipulation
        name                                    addPAIRefers
        description
        split-headers
        join-headers
        header-rule
                name                                    checkReferredBy
                header-name                             REFERRED-BY
                action                                  store
                comparison-type                         case-sensitive
                msg-type                                request
                methods                                 INVITE
                match-value
                new-value
        header-rule
                name                                    addPAIifReferredBy
                header-name                             P-Asserted-Identity
                action                                  add
                comparison-type                         pattern-rule
                msg-type                                request
                methods                                 INVITE
                match-value                             $checkReferredBy
                new-value                               <sip:5712935325+@+$LOCAL_IP+>
        last-modified-by                        admin@IP
        last-modified-date                      2015-02-26 10:10:30
sip-manipulation
        name                                    addPAIonCallForwards
        description
        split-headers
        join-headers
        header-rule
                name                                    checkForHistoryInfo
                header-name                             History-Info
                action                                  store
                comparison-type                         case-sensitive
                msg-type                                request
                methods                                 INVITE
                match-value
                new-value
        header-rule
                name                                    addPAIifHistoryInfo
                header-name                             P-Asserted-Identity
                action                                  add
                comparison-type                         pattern-rule
```

```
                msg-type                                request
                methods                                 INVITE
                match-value                             $checkForHistoryInfo
                new-value                               <sip:5712935325+@+$LOCAL_IP+>
        last-modified-by                        admin@IP
        last-modified-date                      2015-02-20 12:06:39
sip-manipulation
        name                                    convert183to180
        description
        split-headers
        join-headers
        header-rule
                name                                    delSDP
                header-name                             Content-Type
                action                                  manipulate
                comparison-type                         case-insensitive
                msg-type                                any
                methods
                match-value
                new-value
                element-rule
                        name                                    del183SDP
                        parameter-name                          application/sdp
                        type                                    mime
                        action                                  delete-element
                        match-val-type                          any
                        comparison-type                         case-sensitive
                        match-value
                        new-value
        header-rule
                name                                    delContentType
                header-name                             Content-Type
                action                                  manipulate
                comparison-type                         case-sensitive
                msg-type                                any
                methods
                match-value
                new-value
                element-rule
                        name                                    delCT
                        parameter-name                          *
                        type                                    header-param
                        action                                  delete-header
                        match-val-type                          any
                        comparison-type                         case-sensitive
                        match-value
                        new-value
        header-rule
                name                                    change487to486
                header-name                             @status-line
                action                                  manipulate
                comparison-type                         case-sensitive
                msg-type                                any
                methods
                match-value
                new-value
```

```
                element-rule
                        name                                    modStatusCode
                        parameter-name
                        type                                    status-code
                        action                                  replace
                        match-val-type                          any
                        comparison-type                         case-sensitive
                        match-value                             183
                        new-value                               180
                element-rule
                        name                                    modReasonPhrase
                        parameter-name
                        type                                    reason-phrase
                        action                                  replace
                        match-val-type                          any
                        comparison-type                         case-insensitive
                        match-value                             Session Progress
                        new-value                               Ringing
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-09 11:59:41
sip-manipulation
        name                                    fix183sdp
        description                             To bypass the reinvite
        split-headers
        join-headers
        header-rule
                name                                    Checkforpcma
                header-name                             Content-type
                action                                  store
                comparison-type                         case-sensitive
                msg-type                                any
                methods
                match-value
                new-value
                element-rule
                        name                                    Checkpcmaexists
                        parameter-name                          application/sdp
                        type                                    mime
                        action                                  store
                        match-val-type                          any
                        comparison-type                         case-sensitive
                        match-value                             (a=rtpmap:8 PCMA/8000)
                        new-value
        header-rule
                name                                    Addpcma
                header-name                             Content-Type
                action                                  manipulate
                comparison-type                         boolean
                msg-type                                any
                methods
                match-value                             !$Checkforpcma.$Checkpcmaexists
                new-value
                element-rule
                        name                                    Addpcma
                        parameter-name                          application/sdp
                        type                                    mime
```

```
                        action                                  find-replace-all
                        match-val-type                          any
                        comparison-type                         pattern-rule
                        match-value                             a=rtpmap:0 PCMU/8000
                        new-value                               "a=rtpmap:0
PCMU/8000"+$CRLF+"a=rtpmap:8 PCMA/8000"
        mime-sdp-rule
                name                                    modmline
                msg-type                                any
                methods
                action                                  manipulate
                comparison-type                         case-sensitive
                match-value
                new-value
                sdp-media-rule
                        name                                    modmline_m
                        media-type                              audio
                        action                                  manipulate
                        comparison-type                         case-sensitive
                        match-value
                        new-value
                        sdp-line-rule
                                name                                            change_payload
                                type                                            m
                                action                                          find-replace-all
                                comparison-type                                 pattern-rule
                                match-value                                     ^(audio)( [0-
9]{4,5})( RTP/AVP 0 101)$
                                new-value                                       audio+$2+" RTP/AVP 0 8
101"
        last-modified-by                        web_admin@IP
        last-modified-date                      2015-09-10 13:02:42
sip-manipulation
        name                                    modcontact
        description
        split-headers
        join-headers
        header-rule
                name                                    modcontact_er
                header-name                             Contact
                action                                  manipulate
                comparison-type                         pattern-rule
                msg-type                                any
                methods
                match-value
                new-value
                element-rule
                        name                                    moder
                        parameter-name
                        type                                    uri-user
                        action                                  replace
                        match-val-type                          any
                        comparison-type                         pattern-rule
                        match-value                             ((\+1)(\+1\d+))
                        new-value                               $3
                element-rule
```

```
                        name                                    modanon
                        parameter-name
                        type                                    uri-user
                        action                                  replace
                        match-val-type                          any
                        comparison-type                         pattern-rule
                        match-value                             \+1anonymous
                        new-value                               anonymous
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-15 12:01:44
sip-manipulation
        name                                    outManipToSFB
        description
        split-headers
        join-headers
        header-rule
                name                                    From
                header-name                             From
                action                                  manipulate
                comparison-type                         case-sensitive
                msg-type                                request
                methods
                match-value
                new-value
                element-rule
                        name                                    From_header
                        parameter-name
                        type                                    uri-host
                        action                                  replace
                        match-val-type                          any
                        comparison-type                         case-sensitive
                        match-value
                        new-value                               oracle.sfblabdm.local
                element-rule
                        name                                    modanonfrom
                        parameter-name
                        type                                    uri-user
                        action                                  replace
                        match-val-type                          any
                        comparison-type                         pattern-rule
                        match-value                             \+1anonymous
                        new-value                               anonymous
        header-rule
                name                                    To
                header-name                             To
                action                                  manipulate
                comparison-type                         case-sensitive
                msg-type                                request
                methods
                match-value
                new-value
                element-rule
                        name                                    remplusone
                        parameter-name
                        type                                    uri-user
                        action                                  replace
```

```
                match-val-type                  any
                comparison-type                 pattern-rule
                match-value                     \+1$
                new-value
        element-rule
                name                            To
                parameter-name
                type                            uri-host
                action                          replace
                match-val-type                  any
                comparison-type                 case-sensitive
                match-value
                new-value                       medpool.sfblabdm.local
header-rule
        name                            fixcontact
        header-name                     Contact
        action                          manipulate
        comparison-type                 case-sensitive
        msg-type                        any
        methods
        match-value
        new-value
        element-rule
                name                            updatecontact
                parameter-name
                type                            uri-host
                action                          replace
                match-val-type                  any
                comparison-type                 case-sensitive
                match-value
                new-value                       oracle.sfblabdm.local
header-rule
        name                            fixcontactuser
        header-name                     Contact
        action                          manipulate
        comparison-type                 pattern-rule
        msg-type                        request
        methods                         INVITE
        match-value
        new-value
        element-rule
                name                            user
                parameter-name
                type                            uri-user
                action                          replace
                match-val-type                  any
                comparison-type                 pattern-rule
                match-value                     (.*)
                new-value                       "+1"+$ORIGINAL
        element-rule
                name                            moder
                parameter-name
                type                            uri-user
                action                          replace
                match-val-type                  any
                comparison-type                 pattern-rule
```

```
                match-value                     ((\+1)(\+1\d+))
                new-value                       $3
        element-rule
                name                            modanoncon
                parameter-name
                type                            uri-user
                action                          replace
                match-val-type                  any
                comparison-type                 pattern-rule
                match-value                     \+1anonymous
                new-value                       anonymous
header-rule
        name                                    Ruri
        header-name                             Request-URI
        action                                  manipulate
        comparison-type                         case-sensitive
        msg-type                                request
        methods
        match-value
        new-value
        element-rule
                name                                    remplusone
                parameter-name
                type                                    uri-user
                action                                  replace
                match-val-type                          any
                comparison-type                         pattern-rule
                match-value                             \+1$
                new-value
header-rule
        name                                    addReplaces
        header-name                             Supported
        action                                  manipulate
        comparison-type                         pattern-rule
        msg-type                                request
        methods                                 INVITE
        match-value
        new-value                               $ORIGINAL+,replaces
header-rule
        name                                    addUpdate
        header-name                             Allow
        action                                  manipulate
        comparison-type                         pattern-rule
        msg-type                                request
        methods                                 INVITE
        match-value
        new-value                               $ORIGINAL+,UPDATE
header-rule
        name                                    addSessionExpires
        header-name                             Session-Expires
        action                                  add
        comparison-type                         case-sensitive
        msg-type                                request
        methods                                 INVITE
        match-value
        new-value                               300
```

```
        header-rule
                name                                    addingptime
                header-name                             From
                action                                  sip-manip
                comparison-type                         case-sensitive
                msg-type                                request
                methods
                match-value
                new-value                               replacemptimewithptime
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-15 15:12:01
sip-manipulation
        name                                    replacemptimewithptime
        description
        split-headers
        join-headers
        mime-sdp-rule
                name                                    addptime
                msg-type                                request
                methods
                action                                  manipulate
                comparison-type                         case-sensitive
                match-value
                new-value
                sdp-media-rule
                        name                                    addSDPptime
                        media-type                              audio
                        action                                  manipulate
                        comparison-type                         case-sensitive
                        match-value
                        new-value
                        sdp-line-rule
                                name                                    addptimelr
                                type                                    a
                                action                                  find-replace-all
                                comparison-type                         case-sensitive
                                match-value                             maxptime:20
                                new-value                               ptime:20
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-15 15:09:56
sip-manipulation
        name                                    test183
        description
        split-headers
        join-headers
        header-rule
                name                                    manipulate183
                header-name                             content-type
                action                                  manipulate
                comparison-type                         pattern-rule
                msg-type                                reply
                methods                                 INVITE
                match-value
                new-value
                element-rule
                        name                                    check183_er
```

```
                        parameter-name                          application/sdp
                        type                                    mime
                        action                                  sip-manip
                        match-val-type                          any
                        comparison-type                         pattern-rule
                        match-value                             (.*)(?!c=IN IP4
172.16.29.44)(.*)
                        new-value                               convert183to180
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-09 14:55:43
sip-monitoring
        match-any-filter                        disabled
        state                                   enabled
        short-session-duration                  0
        monitoring-filters                      all
        trigger-window                          30
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-01 11:15:07
spl-config
        spl-options
        last-modified-by                        web_admin@IP
        last-modified-date                      2015-09-02 14:42:56
steering-pool
        ip-address                              10.64.3.163
        start-port                              49152
        end-port                                65535
        realm-id                                towards-sfb
        network-interface
        last-modified-by                        admin@IP
        last-modified-date                      2014-11-17 13:23:58
steering-pool
        ip-address                              192.65.79.126
        start-port                              49152
        end-port                                65535
        realm-id                                SIP-Trunk
        network-interface
        last-modified-by                        admin@IP
        last-modified-date                      2014-11-17 13:24:08
system-config
        hostname                                ACMESYSTEM
        description                             3820 Skype for Business IOT
        location
        mib-system-contact
        mib-system-name
        mib-system-location
        snmp-enabled                            enabled
        enable-snmp-auth-traps                  disabled
        enable-snmp-syslog-notify               disabled
        enable-snmp-monitor-traps               disabled
        enable-env-monitor-traps                disabled
        snmp-syslog-his-table-length            1
        snmp-syslog-level                       WARNING
        system-log-level                        WARNING
        process-log-level                       NOTICE
        process-log-ip-address                  0.0.0.0
        process-log-port                        0
```

```
        collect
                sample-interval                         5
                push-interval                           15
                boot-state                              disabled
                start-time                              now
                end-time                                never
                red-collect-state                       disabled
                red-max-trans                           1000
                red-sync-start-time                     5000
                red-sync-comp-time                      1000
                push-success-trap-state                 disabled
        comm-monitor
                state                                   disabled
                sbc-grp-id                              0
                tls-profile
                qos-enable                              enabled
                interim-qos-update                      disabled
        call-trace                              disabled
        internal-trace                          disabled
        log-filter                              all
        default-gateway                         192.65.79.33
        restart                                 enabled
        exceptions
        telnet-timeout                          0
        console-timeout                         0
        remote-control                          enabled
        cli-audit-trail                         enabled
        link-redundancy-state                   disabled
        source-routing                          enabled
        cli-more                                disabled
        terminal-height                         24
        debug-timeout                           0
        trap-event-lifetime                     0
        ids-syslog-facility                     -1
        options
        default-v6-gateway                      ::
        ipv6-signaling-mtu                      1500
        ipv4-signaling-mtu                      1500
        cleanup-time-of-day                     00:00
        snmp-engine-id-suffix
        snmp-agent-mode                         v1v2
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-21 12:56:25
tls-global
        session-caching                         enabled
        session-cache-timeout                   12
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-21 12:55:18
tls-profile
        name                                    sfb-tls-profile
        end-entity-certificate                  SBCcert1
        trusted-ca-certificates                 CAcert
        cipher-list                             ALL
        verify-depth                            10
        mutual-authenticate                     enabled
        tls-version                             tlsv12
```

```
        options
        cert-status-check                       disabled
        cert-status-profile-list
        ignore-dead-responder                   disabled
        allow-self-signed-cert                  disabled
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-18 16:51:10
translation-rules
        id                                      addplus1
        type                                    add
        add-string                              +1
        add-index                               0
        delete-string
        delete-index                            0
        last-modified-by                        admin@IP
        last-modified-date                      2015-03-05 12:07:49
translation-rules
        id                                      stripplus1
        type                                    delete
        add-string
        add-index                               0
        delete-string                           +1
        delete-index                            0
        last-modified-by                        admin@10.64.204.12
        last-modified-date                      2015-08-28 12:00:43
web-server-config
        state                                   enabled
        inactivity-timeout                      5
        http-state                              enabled
        http-port                               80
        https-state                             disabled
        https-port                              443
        tls-profile
        last-modified-by                        admin@IP
        last-modified-date                      2015-09-01 11:14:05
task done
ACMESYSTEM#
```

To configure TCP/RTP between SBC and Lync, two configuration elements need to be changed – the media-sec-policy should be removed from the realm-config elements and the ports of the Lync session agent needs to be modified.

```
realm-config
        identifier                              towards-sfb
        description
        addr-prefix                             0.0.0.0
        network-interfaces                      s1p0:0
        mm-in-realm                             enabled
        mm-in-network                           enabled
        mm-same-ip                              enabled
        mm-in-system                            enabled
        bw-cac-non-mm                           disabled
        msm-release                             disabled
        qos-enable                              disabled
        max-bandwidth                           0
        fallback-bandwidth                      0
        max-priority-bandwidth                  0
```

```
        max-latency                         0
        max-jitter                          0
        max-packet-loss                     0
        observ-window-size                  0
        parent-realm
        dns-realm
        media-policy
        media-sec-policy
        srtp-msm-passthrough                disabled
        class-profile
        in-translationid
        out-translationid
        in-manipulationid
        out-manipulationid
        average-rate-limit                  0
        access-control-trust-level          none
        invalid-signal-threshold            0
        maximum-signal-threshold            0
        untrusted-signal-threshold          0
        nat-trust-threshold                 0
        max-endpoints-per-nat               0
        nat-invalid-message-threshold       0
        wait-time-for-invalid-register      0
        deny-period                         30
        cac-failure-threshold               0
        untrust-cac-failure-threshold       0
        ext-policy-svr
        diam-e2-address-realm
        subscription-id-type                END_USER_NONE
        symmetric-latching                  disabled
        pai-strip                           disabled
        trunk-context
        device-id
        early-media-allow
        enforcement-profile
        additional-prefixes
        restricted-latching                 none
        restriction-mask                    32
        user-cac-mode                       none
        user-cac-bandwidth                  0
        user-cac-sessions                   0
        icmp-detect-multiplier              0
        icmp-advertisement-interval         0
        icmp-target-ip
        monthly-minutes                     0
        options
        spl-options
        accounting-enable                   enabled
        net-management-control              disabled
        delay-media-update                  disabled
        refer-call-transfer                 enabled
        refer-notify-provisional            none
        dyn-refer-term                      disabled
        codec-policy
        codec-manip-in-realm                disabled
        codec-manip-in-network              enabled
```

```
        rtcp-policy
        constraint-name
        call-recording-server-id
        session-recording-server
        session-recording-required              disabled
        manipulation-string
        manipulation-pattern
        stun-enable                             disabled
        stun-server-ip                          0.0.0.0
        stun-server-port                        3478
        stun-changed-ip                         0.0.0.0
        stun-changed-port                       3479
        sip-profile
        sip-isup-profile
        match-media-profiles
        qos-constraint
        block-rtcp                              disabled
        hide-egress-media-update                disabled
        tcp-media-profile
        monitoring-filters
        node-functionality
        default-location-string
        alt-family-realm
        pref-addr-type                          none
        last-modified-by                        admin@172.18.0.119
        last-modified-date                      2014-09-15 12:01:05
realm-config
        identifier                              SIP-Trunk
        description
        addr-prefix                             0.0.0.0
        network-interfaces                      s0p0:0
        mm-in-realm                             enabled
        mm-in-network                           enabled
        mm-same-ip                              enabled
        mm-in-system                            enabled
        bw-cac-non-mm                           disabled
        msm-release                             disabled
        qos-enable                              disabled
        max-bandwidth                           0
        fallback-bandwidth                      0
        max-priority-bandwidth                  0
        max-latency                             0
        max-jitter                              0
        max-packet-loss                         0
        observ-window-size                      0
        parent-realm
        dns-realm
        media-policy
        media-sec-policy
        srtp-msm-passthrough                    disabled
        class-profile
        in-translationid
        out-translationid
        in-manipulationid
        out-manipulationid
        average-rate-limit                      0
```

```
        access-control-trust-level              none
        invalid-signal-threshold                0
        maximum-signal-threshold                0
        untrusted-signal-threshold              0
        nat-trust-threshold                     0
        max-endpoints-per-nat                   0
        nat-invalid-message-threshold           0
        wait-time-for-invalid-register          0
        deny-period                             30
        cac-failure-threshold                   0
        untrust-cac-failure-threshold           0
        ext-policy-svr
        diam-e2-address-realm
        subscription-id-type                    END_USER_NONE
        symmetric-latching                      disabled
        pai-strip                               disabled
        trunk-context
        device-id
        early-media-allow
        enforcement-profile
        additional-prefixes
        restricted-latching                     none
        restriction-mask                        32
        user-cac-mode                           none
        user-cac-bandwidth                      0
        user-cac-sessions                       0
        icmp-detect-multiplier                  0
        icmp-advertisement-interval             0
        icmp-target-ip
        monthly-minutes                         0
        options
        spl-options
        accounting-enable                       enabled
        net-management-control                  disabled
        delay-media-update                      disabled
        refer-call-transfer                     enabled
        refer-notify-provisional                none
        dyn-refer-term                          disabled
        codec-policy
        codec-manip-in-realm                    disabled
        codec-manip-in-network                  enabled
        rtcp-policy
        constraint-name
        call-recording-server-id
        session-recording-server
        session-recording-required              disabled
        manipulation-string
        manipulation-pattern
        stun-enable                             disabled
        stun-server-ip                          0.0.0.0
        stun-server-port                        3478
        stun-changed-ip                         0.0.0.0
        stun-changed-port                       3479
        sip-profile
        sip-isup-profile
        match-media-profiles
```

```
        qos-constraint
        block-rtcp                              disabled
        hide-egress-media-update                disabled
        tcp-media-profile
        monitoring-filters
        node-functionality
        default-location-string
        alt-family-realm
        pref-addr-type                          none
        last-modified-by                        admin@172.18.0.119
        last-modified-date                      2014-09-15 12:01:14
session-agent
        hostname                                sfbmedpool.acmepacket.net
        ip-address
        port                                    5068
        state                                   enabled
        app-protocol                            SIP
        app-type
        transport-method                        StaticTCP
        realm-id                                towards-sfb
        egress-realm-id
        description
        carriers
        allow-next-hop-lp                       enabled
        constraints                             disabled
        max-sessions                            0
        max-inbound-sessions                    0
        max-outbound-sessions                   0
        max-burst-rate                          0
        max-inbound-burst-rate                  0
        max-outbound-burst-rate                 0
        max-sustain-rate                        0
        max-inbound-sustain-rate                0
        max-outbound-sustain-rate               0
        min-seizures                            5
        min-asr                                 0
        time-to-resume                          0
        ttr-no-response                         0
        in-service-period                       0
        burst-rate-window                       0
        sustain-rate-window                     0
        req-uri-carrier-mode                    None
        proxy-mode
        redirect-action
        loose-routing                           enabled
        send-media-session                      enabled
        response-map
        ping-method                             OPTIONS;hops=0
        ping-interval                           30
        ping-send-mode                          keep-alive
        ping-all-addresses                      disabled
        ping-in-service-response-codes
        out-service-response-codes
        load-balance-dns-query                  round-robin
        options
        spl-options
```

```
        media-profiles
        in-translationid
        out-translationid
        trust-me                                disabled
        request-uri-headers
        stop-recurse
        local-response-map
        ping-to-user-part
        ping-from-user-part
        in-manipulationid
        out-manipulationid
        manipulation-string
        manipulation-pattern
        p-asserted-id
        trunk-group
        max-register-sustain-rate               0
        early-media-allow
        invalidate-registrations                disabled
        rfc2833-mode                            none
        rfc2833-payload                         0
        codec-policy
        enforcement-profile
        refer-call-transfer                     enabled
        refer-notify-provisional                none
        reuse-connections                       NONE
        tcp-keepalive                           none
        tcp-reconn-interval                     0
        max-register-burst-rate                 0
        register-burst-window                   0
        sip-profile
        sip-isup-profile
        kpml-interworking                       inherit
        monitoring-filters
        session-recording-server
        session-recording-required              disabled
        last-modified-by                        admin@172.18.0.142
```

IPv4 with TCP/RTP

The following section provides information on configuration required on the SBC to route TCP/RTP based calls to and from the Skype for Business environment.

```
certificate-record
        name                                    CAcert
        organization                            Tekvizion
        common-name                             sfblabdm-DC-CA-1
        key-size                                2048
certificate-record
        name                                    SBCcert1
        organization                            Tekvizion
        common-name                             oracle.sfblabdm.local
        key-size                                2048
        alternate-name                          oraclepool.sfblabdm.local
codec-policy
        name                                    For488
```

```
        allow-codecs                          G729 PCMU:no telephone-event
PCMA:no
        order-codecs                          G729 telephone-event
codec-policy
        name                                  TC
        allow-codecs                          PCMA telephone-event PCMU:no
        add-codecs-on-egress                  PCMA telephone-event G729:no
        order-codecs                          PCMA telephone-event G729:no
codec-policy
        name                                  TCPCMU
        allow-codecs                          PCMU telephone-event PCMA:no
        order-codecs                          PCMU telephone-event
filter-config
        name                                  all
        user                                  *
local-policy
        from-address                          *
        to-address                            *
        source-realm                          SIP-Trunk
        policy-attribute
                next-hop                              Medpool.sfblabdm.local
                realm                                 towards-sfb
                action                                replace-uri
                app-protocol                          SIP
local-policy
        from-address                          *
        to-address                            med1.sfblabdm.local
        source-realm                          SIP-Trunk
        description                           For Referred-Party Header
        policy-attribute
                next-hop                              med1.sfblabdm.local
                realm                                 towards-sfb
                action                                replace-uri
                app-protocol                          SIP
local-policy
        from-address                          *
        to-address                            med2.sfblabdm.local
        source-realm                          SIP-Trunk
        policy-attribute
                next-hop                              med2.sfblabdm.local
                realm                                 towards-sfb
                action                                replace-uri
local-policy
        from-address                          *
        to-address                            *
        source-realm                          towards-sfb
        policy-attribute
                next-hop                              63.87.147.48
                realm                                 SIP-Trunk
                action                                replace-uri
                app-protocol                          SIP
media-manager
media-sec-policy
        name                                  rtp
media-sec-policy
        name                                  sfb-srtp
        inbound
```

```
                profile                                 sdes-profile
                mode                                    srtp
                protocol                                sdes
        outbound
                profile                                 sdes-profile
                mode                                    srtp
                protocol                                sdes
network-interface
        name                                    s0p0
        description                             For SIP-Trunk
        ip-address                              192.65.79.126
        netmask                                 255.255.255.224
        gateway                                 192.65.79.97
        hip-ip-list                             192.65.79.126
        icmp-address                            192.65.79.126
network-interface
        name                                    s1p0
        description                             Facing Skype for Business
        hostname                                oracle.sfblabdm.local
        ip-address                              10.64.3.163
        netmask                                 255.255.0.0
        gateway                                 10.64.1.1
        dns-ip-primary                          172.16.29.42
        dns-domain                              sfblabdm.local
        hip-ip-list                             10.64.3.163
        icmp-address                            10.64.3.163
        ssh-address                             10.64.3.163
network-interface
        name                                    wancom1
        pri-utility-addr                        169.254.1.1
        sec-utility-addr                        169.254.1.2
        netmask                                 255.255.255.252
network-interface
        name                                    wancom2
        pri-utility-addr                        169.254.2.1
        sec-utility-addr                        169.254.2.2
        netmask                                 255.255.255.252
phy-interface
        name                                    s0p0
        operation-type                          Media
        virtual-mac                             00:08:25:04:0d:1e
phy-interface
        name                                    s1p0
        operation-type                          Media
        slot                                    1
        virtual-mac                             00:08:25:04:0d:1f
phy-interface
        name                                    wancom1
        port                                    1
        duplex-mode
        speed
        wancom-health-score                     8
phy-interface
        name                                    wancom2
        port                                    2
        duplex-mode
        speed
```

```
        wancom-health-score                     9
playback-config
        name                                    transferrbt
        entry
                encoding                                PCMU
                filename                                US_ringbackPCMU.raw
realm-config
        identifier                              SIP-Trunk
        network-interfaces                      s0p0:0
        mm-in-realm                             enabled
        restricted-latching                     sdp
realm-config
        identifier                              towards-sfb
        network-interfaces                      s1p0:0
        mm-in-realm                             enabled
        refer-call-transfer                     enabled
redundancy-config
        peer
                name                                    acme_ap3820
                type                                    Primary
                destination
                        address                                 169.254.1.1:9090
                        network-interface                       wancom1:0
                destination
                        address                                 169.254.2.1:9090
                        network-interface                       wancom2:0
        peer
                name                                    acme_ap3820_b
                type                                    Secondary
                destination
                        address                                 169.254.1.2:9090
                        network-interface                       wancom1:0
                destination
                        address                                 169.254.2.2:9090
                        network-interface                       wancom2:0
response-map
        name                                    Changefor408324
        entries
                recv-code                               503
                xmit-code                               404
                reason                                  Not Found
response-map
        name                                    change183to180
        entries
                recv-code                               183
                xmit-code                               180
                reason                                  Ringing
sdes-profile
        name                                    sdes-profile
session-agent
        hostname                                63.87.147.48
        ip-address                              63.87.147.48
        port                                    5071
        realm-id                                SIP-Trunk
        ping-method                             OPTIONS
        ping-interval                           30
        out-translationid                       stripplus1
```

```
session-agent
        hostname                                Medpool.sfblabdm.local
        transport-method                        StaticTCP
        realm-id                                towards-sfb
        ping-method                             OPTIONS
        ping-interval                           60
        ping-all-addresses                      enabled
        out-translationid                       addplus1
        stop-recurse                            480
        refer-call-transfer                     enabled
        tcp-keepalive                           disabled
session-translation
        id                                      addplus1
        rules-calling                           addplus1
        rules-called                            addplus1
session-translation
        id                                      stripplus1
        rules-calling                           stripplus1
        rules-called                            stripplus1
sip-config
        home-realm-id                           towards-sfb
        registrar-domain                        *
        registrar-host                          *
        options                                 max-udp-length=0
sip-feature
        name                                    100rel
        realm                                   SIP-Trunk
        require-mode-inbound                    Pass
        require-mode-outbound                   Pass
sip-interface
        realm-id                                SIP-Trunk
        sip-port
                address                                 192.65.79.126
        out-manipulationid                      NATandChangeContact
sip-interface
        realm-id                                towards-sfb
        sip-port
                address                                 10.64.3.163
                transport-protocol                      TCP
        options                                 100rel-interworking
        in-manipulationid                       ForEarlyMedia
        out-manipulationid                      outManipToSFB
        response-map                            Changefor408324
sip-manipulation
        name                                    Addpcmato183
        header-rule
                name                                    check1for83
                header-name                             @status-line
                action                                  manipulate
                comparison-type                         pattern-rule
                element-rule
                        name                                    isit183
                        type                                    status-code
                        action                                  sip-manip
                        comparison-type                         pattern-rule
                        match-value                             183
                        new-value                               fix183sdp
```

```
sip-manipulation
        name                                    ChangeContact
        header-rule
                name                                    StoreFromnumber
                header-name                             From
                action                                  manipulate
                element-rule
                        name                                    StoreFromnumber_er
                        type                                    uri-user-only
                        action                                  store
        header-rule
                name                                    ChangeContact
                header-name                             Contact
                action                                  manipulate
                element-rule
                        name                                    ChangeContact_er
                        type                                    uri-user
                        action                                  add
                        new-value
$StoreFromnumber.$StoreFromnumber_er.$0
sip-manipulation
        name                                    ChangeRecvOnlyToInactive
        header-rule
                name                                    changeSDP
                header-name                             Content-Type
                action                                  manipulate
                msg-type                                reply
                methods                                 INVITE
                element-rule
                        name                                    RecvOnlyToInactive
                        parameter-name                          application/sdp
                        type                                    mime
                        action                                  find-replace-all
                        comparison-type                         pattern-rule
                        match-value                             a=recvonly
                        new-value                               a=inactive
sip-manipulation
        name                                    Changeinactosendonly
        description                             Change inactive to sendonly for
pstn tran
        header-rule
                name                                    changeSDP
                header-name                             Content-Type
                action                                  manipulate
                msg-type                                request
                methods                                 INVITE
                element-rule
                        name                                    inacttosendonly
                        parameter-name                          application/sdp
                        type                                    mime
                        action                                  find-replace-all
                        comparison-type                         pattern-rule
                        match-value                             a=inactive
                        new-value                               a=sendonly
sip-manipulation
        name                                    Check183
        header-rule
```

```
                name                                    check183
                header-name                             @status-line
                action                                  manipulate
                comparison-type                         pattern-rule
                element-rule
                        name                                    is183
                        type                                    status-code
                        action                                  sip-manip
                        comparison-type                         pattern-rule
                        match-value                             183
                        new-value                               Modcline
sip-manipulation
        name                                    ForEarlyMedia
        header-rule
                name                                    delsupported
                header-name                             Supported
                action                                  delete
                msg-type                                request
                methods                                 INVITE
        header-rule
                name                                    addrequireinINVITE
                header-name                             Require
                action                                  add
                msg-type                                request
                methods                                 INVITE
                new-value                               100rel
        header-rule
                name                                    Options
                header-name                             From
                action                                  sip-manip
                new-value                               OptionsResponseLocally
        header-rule
                name                                    Change183
                header-name                             From
                action                                  sip-manip
                new-value                               Check183
sip-manipulation
        name                                    Map183
        header-rule
                name                                    check183
                header-name                             @status-line
                action                                  store
                comparison-type                         pattern-rule
                element-rule
                        name                                    is183
                        type                                    status-code
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             183
                        new-value                               180
sip-manipulation
        name                                    Modcline
        mime-sdp-rule
                name                                    test
                action                                  manipulate
                comparison-type                         pattern-rule
                sdp-media-rule
```

```
                        name                                    checkcline
                        media-type                              audio
                        action                                  manipulate
                        comparison-type                         pattern-rule
                        sdp-line-rule
                                name                                    detectc
                                type                                    c
                                action                                  sip-manip
                                comparison-type                         pattern-
rule
                                match-value
^(.(?!(172.16.29.44|172.16.29.45|10.64.3.163)))*$
                                new-value
convert183to180
        header-rule
                name                                    checkcl
                header-name                             Content-Length
                action                                  sip-manip
                match-value                             0
                new-value                               convert183to180
sip-manipulation
        name                                    NATandChangeContact
        description                             NAT plus Change Contact
        header-rule
                name                                    doNATfortrunk
                header-name                             From
                action                                  sip-manip
                new-value                               NATting
        header-rule
                name                                    delsupported
                header-name                             Supported
                action                                  delete
                msg-type                                request
                methods                                 INVITE
        header-rule
                name                                    addPAIonCallForwards
                header-name                             From
                action                                  sip-manip
                msg-type                                request
                methods                                 INVITE
                new-value                               addPAIonCallForwards
        header-rule
                name                                    addPAIRefers
                header-name                             From
                action                                  sip-manip
                msg-type                                request
                methods                                 INVITE
                new-value                               addPAIRefers
        header-rule
                name                                    ChangeContactHeader
                header-name                             From
                action                                  sip-manip
                new-value                               ChangeContact
        header-rule
                name                                    modify183sdp
                header-name                             From
                action                                  sip-manip
```

```
                new-value                                       Addpcmato183
sip-manipulation
        name                                            NATting
        header-rule
                name                                            From
                header-name                                     From
                action                                          manipulate
                msg-type                                        request
                element-rule
                        name                                            From header
                        type                                            uri-host
                        action                                          replace
                        new-value                                       $LOCAL_IP
        header-rule
                name                                            To
                header-name                                     To
                action                                          manipulate
                msg-type                                        request
                element-rule
                        name                                            To
                        type                                            uri-host
                        action                                          replace
                        new-value                                       $REMOTE_IP
sip-manipulation
        name                                            OptionsResponseLocally
        header-rule
                name                                            rejectOptions
                header-name                                     request-uri
                action                                          reject
                msg-type                                        request
                methods                                         OPTIONS
                new-value                                       200: OK
sip-manipulation
        name                                            addPAIRefers
        header-rule
                name                                            checkReferredBy
                header-name                                     REFERRED-BY
                action                                          store
                msg-type                                        request
                methods                                         INVITE
        header-rule
                name                                            addPAIifReferredBy
                header-name                                     P-Asserted-Identity
                action                                          add
                comparison-type                                 pattern-rule
                msg-type                                        request
                methods                                         INVITE
                match-value                                     $checkReferredBy
                new-value
<sip:5712935325+@+$LOCAL_IP+>
sip-manipulation
        name                                            addPAIonCallForwards
        header-rule
                name                                            checkForHistoryInfo
                header-name                                     History-Info
                action                                          store
                msg-type                                        request
```

```
                methods                                 INVITE
        header-rule
                name                                    addPAIifHistoryInfo
                header-name                             P-Asserted-Identity
                action                                  add
                comparison-type                         pattern-rule
                msg-type                                request
                methods                                 INVITE
                match-value                             $checkForHistoryInfo
                new-value
<sip:5712935325+@+$LOCAL_IP+>
sip-manipulation
        name                                    convert183to180
        header-rule
                name                                    delSDP
                header-name                             Content-Type
                action                                  manipulate
                comparison-type                         case-insensitive
                element-rule
                        name                                    del183SDP
                        parameter-name                          application/sdp
                        type                                    mime
                        action                                  delete-element
        header-rule
                name                                    delContentType
                header-name                             Content-Type
                action                                  manipulate
                element-rule
                        name                                    delCT
                        parameter-name                          *
                        type                                    header-param
                        action                                  delete-header
        header-rule
                name                                    change487to486
                header-name                             @status-line
                action                                  manipulate
                element-rule
                        name                                    modStatusCode
                        type                                    status-code
                        action                                  replace
                        match-value                             183
                        new-value                               180
                element-rule
                        name                                    modReasonPhrase
                        type                                    reason-phrase
                        action                                  replace
                        comparison-type                         case-insensitive
                        match-value                             Session Progress
                        new-value                               Ringing
sip-manipulation
        name                                    fix183sdp
        description                             To bypass the reinvite
        header-rule
                name                                    Checkforpcma
                header-name                             Content-type
                action                                  store
                element-rule
```

```
                        name                                    Checkpcmaexists
                        parameter-name                          application/sdp
                        type                                    mime
                        action                                  store
                        match-value                             (a=rtpmap:8
PCMA/8000)
        header-rule
                name                                    Addpcma
                header-name                             Content-Type
                action                                  manipulate
                comparison-type                         boolean
                match-
value                           !$Checkforpcma.$Checkpcmaexists
                element-rule
                        name                                    Addpcma
                        parameter-name                          application/sdp
                        type                                    mime
                        action                                  find-replace-all
                        comparison-type                         pattern-rule
                        match-value                             a=rtpmap:0
PCMU/8000
                        new-value                               "a=rtpmap:0
PCMU/8000"+$CRLF+"a=rtpmap:8 PCMA/8000"
        mime-sdp-rule
                name                                    modmline
                action                                  manipulate
                sdp-media-rule
                        name                                    modmline_m
                        media-type                              audio
                        action                                  manipulate
                        sdp-line-rule
                                name
change_payload
                                type                                    m
                                action                                  find-
replace-all
                                comparison-type                         pattern-
rule
                                match-value
^(audio)( [0-9]{4,5})( RTP/AVP 0 101)$
                                new-value                               audio+$2+"
RTP/AVP 0 8 101"
sip-manipulation
        name                                    modcontact
        header-rule
                name                                    modcontact_er
                header-name                             Contact
                action                                  manipulate
                comparison-type                         pattern-rule
                element-rule
                        name                                    moder
                        type                                    uri-user
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             ((\+1)(\+1\d+))
                        new-value                               $3
                element-rule
```

```
                        name                                    modanon
                        type                                    uri-user
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             \+1anonymous
                        new-value                               anonymous
sip-manipulation
        name                                    outManipToSFB
        header-rule
                name                                    From
                header-name                             From
                action                                  manipulate
                msg-type                                request
                element-rule
                        name                                    From_header
                        type                                    uri-host
                        action                                  replace
                        new-value
oracle.sfblabdm.local
                element-rule
                        name                                    modanonfrom
                        type                                    uri-user
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             \+1anonymous
                        new-value                               anonymous
        header-rule
                name                                    To
                header-name                             To
                action                                  manipulate
                msg-type                                request
                element-rule
                        name                                    remplusone
                        type                                    uri-user
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             \+1$
                element-rule
                        name                                    To
                        type                                    uri-host
                        action                                  replace
                        new-value
medpool.sfblabdm.local
        header-rule
                name                                    fixcontact
                header-name                             Contact
                action                                  manipulate
                element-rule
                        name                                    updatecontact
                        type                                    uri-host
                        action                                  replace
                        new-value
oracle.sfblabdm.local
        header-rule
                name                                    fixcontactuser
                header-name                             Contact
                action                                  manipulate
```

```
                comparison-type                         pattern-rule
                msg-type                                request
                methods                                 INVITE
                element-rule
                        name                                    user
                        type                                    uri-user
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             (.*)
                        new-value                               "+1"+$ORIGINAL
                element-rule
                        name                                    moder
                        type                                    uri-user
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             ((\+1)(\+1\d+))
                        new-value                               $3
                element-rule
                        name                                    modanoncon
                        type                                    uri-user
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             \+1anonymous
                        new-value                               anonymous
        header-rule
                name                                    Ruri
                header-name                             Request-URI
                action                                  manipulate
                msg-type                                request
                element-rule
                        name                                    remplusone
                        type                                    uri-user
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             \+1$
        header-rule
                name                                    addReplaces
                header-name                             Supported
                action                                  manipulate
                comparison-type                         pattern-rule
                msg-type                                request
                methods                                 INVITE
                new-value                               $ORIGINAL+,replaces
        header-rule
                name                                    addUpdate
                header-name                             Allow
                action                                  manipulate
                comparison-type                         pattern-rule
                msg-type                                request
                methods                                 INVITE
                new-value                               $ORIGINAL+,UPDATE
        header-rule
                name                                    addSessionExpires
                header-name                             Session-Expires
                action                                  add
                msg-type                                request
                methods                                 INVITE
```

```
                new-value                                300
        header-rule
                name                                     addingptime
                header-name                              From
                action                                   sip-manip
                msg-type                                 request
                new-value                                replacemptimewithptime
sip-manipulation
        name                                     replacemptimewithptime
        mime-sdp-rule
                name                                     addptime
                msg-type                                 request
                action                                   manipulate
                sdp-media-rule
                        name                                     addSDPptime
                        media-type                               audio
                        action                                   manipulate
                        sdp-line-rule
                                name                                     addptimelr
                                type                                     a
                                action                                   find-
replace-all
                                match-value
maxptime:20
                                new-value                                ptime:20
sip-manipulation
        name                                     test183
        header-rule
                name                                     manipulate183
                header-name                              content-type
                action                                   manipulate
                comparison-type                          pattern-rule
                msg-type                                 reply
                methods                                  INVITE
                element-rule
                        name                                     check183_er
                        parameter-name                           application/sdp
                        type                                     mime
                        action                                   sip-manip
                        comparison-type                          pattern-rule
                        match-value                              (.*)(?!c=IN IP4
172.16.29.44)(.*)
                        new-value                                convert183to180
sip-monitoring
        monitoring-filters                       all
spl-config
steering-pool
        ip-address                               10.64.3.163
        start-port                               49152
        end-port                                 65535
        realm-id                                 towards-sfb
steering-pool
        ip-address                               192.65.79.126
        start-port                               49152
        end-port                                 65535
        realm-id                                 SIP-Trunk
system-config
```

```
        hostname                                ACMESYSTEM
        description                             3820 Skype for Business IOT
        process-log-level                       DEBUG
        default-gateway                         192.65.79.33
        source-routing                          enabled
tls-profile
        name                                    sfb-tls-profile
        end-entity-certificate                  SBCcert1
        trusted-ca-certificates                 CAcert
        mutual-authenticate                     enabled
        tls-version                             tlsv12
translation-rules
        id                                      addplus1
        type                                    add
        add-string                              +1
translation-rules
        id                                      stripplus1
        type                                    delete
        delete-string                           +1
```

IPv6 based signaling for communication between Skype for Business and Oracle ESBC

IPv6 with TLS/SRTP

****** Note: SBC requires IPv6-IPv4 interworking license in order for this to work***

```
certificate-record
        name                                    CAcert
        organization                            Tekvizion
        common-name                             sfblabdm-DC-CA-1
        key-size                                2048
certificate-record
        name                                    CAcert2
        organization                            Tekvizion
        common-name                             sfblabdm-DC-CA-1
        key-size                                2048
certificate-record
        name                                    CAcertpool
        organization                            Tekvizion
        common-name                             sfblabdm-DC-CA-1
        key-size                                2048
certificate-record
        name                                    SBCcert1
        organization                            Tekvizion
        common-name                             oracle.sfblabdm.local
        key-size                                2048
        alternate-name                          oraclepool.sfblabdm.local
certificate-record
        name                                    SBCcert2
        organization                            Tekvizion
        common-name                             oracle.sfblabdm.local
        key-size                                2048
        alternate-name                          DNS:oraclepool.sfblabdm.local
codec-policy
        name                                    For488
        allow-codecs                            G729 PCMU:no telephone-event PCMA:no
        order-codecs                            G729 telephone-event
codec-policy
        name                                    TC
        allow-codecs                            PCMA telephone-event PCMU:no
        add-codecs-on-egress                    PCMA telephone-event G729:no
        order-codecs                            PCMA telephone-event G729:no
codec-policy
        name                                    TCPCMU
        allow-codecs                            PCMU telephone-event PCMA:no
        order-codecs                            PCMU telephone-event
filter-config
        name                                    all
        user                                    *
filter-config
        name                                    ip6
        address                                 ::
        user                                    *
local-policy
        from-address                            *
        to-address                              *
        source-realm                            SIP-Trunk
        policy-attribute
                next-hop                                Medpool.sfblabdm.local
                realm                                   towards-sfb
                action                                  replace-uri
                app-protocol                            SIP
local-policy
```

```
        from-address                            *
        to-address                              med1.sfblabdm.local
        source-realm                            SIP-Trunk
        description                             For Referred-Party Header
        policy-attribute
                next-hop                                med1.sfblabdm.local
                realm                                   towards-sfb
                action                                  replace-uri
                app-protocol                            SIP
local-policy
        from-address                            *
        to-address                              med2.sfblabdm.local
        source-realm                            SIP-Trunk
        policy-attribute
                next-hop                                med2.sfblabdm.local
                realm                                   towards-sfb
                action                                  replace-uri
local-policy
        from-address                            *
        to-address                              *
        source-realm                            towards-sfb
        policy-attribute
                next-hop                                63.87.147.48
                realm                                   SIP-Trunk
                action                                  replace-uri
                app-protocol                            SIP
media-manager
media-sec-policy
        name                                    rtp
media-sec-policy
        name                                    sfb-srtp
        inbound
                profile                                 sdes-profile
                mode                                    srtp
                protocol                                sdes
        outbound
                profile                                 sdes-profile
                mode                                    srtp
                protocol                                sdes
network-interface
        name                                    s0p0
        description                             For SIP-Trunk
        ip-address                              192.65.79.126
        netmask                                 255.255.255.224
        gateway                                 192.65.79.97
        hip-ip-list                             192.65.79.126
        icmp-address                            192.65.79.126
network-interface
        name                                    s1p0
        description                             Facing Skype for Business
        hostname                                oracle.sfblabdm.local
        ip-address                              2620:96:c000:1::10/64
        netmask                                 ffff:ffff:ffff:ffff::
        gateway                                 2620:96:c000:1::1
        dns-ip-primary                          2620:96:c000:8:e840:68d3:2a77:3d2d
        dns-domain                              sfblabdm.local
        hip-ip-list                             2620:96:c000:1::10
        icmp-address                            2620:96:c000:1::10
        ssh-address                             10.64.3.163
network-interface
        name                                    wancom1
        pri-utility-addr                        169.254.1.1
        sec-utility-addr                        169.254.1.2
        netmask                                 255.255.255.252
```

```
network-interface
        name                                    wancom2
        pri-utility-addr                        169.254.2.1
        sec-utility-addr                        169.254.2.2
        netmask                                 255.255.255.252
phy-interface
        name                                    s0p0
        operation-type                          Media
        virtual-mac                             00:08:25:04:0d:1e
phy-interface
        name                                    s1p0
        operation-type                          Media
        slot                                    1
        virtual-mac                             00:08:25:04:0d:1f
phy-interface
        name                                    wancom1
        port                                    1
        duplex-mode
        speed
        wancom-health-score                     8
phy-interface
        name                                    wancom2
        port                                    2
        duplex-mode
        speed
        wancom-health-score                     9
playback-config
        name                                    transferrbt
        entry
                encoding                                PCMU
                filename                                US_ringbackPCMU.raw
realm-config
        identifier                              SIP-Trunk
        network-interfaces                      s0p0:0
        mm-in-realm                             enabled
        media-sec-policy                        rtp
realm-config
        identifier                              towards-sfb
        addr-prefix                             ::
        network-interfaces                      s1p0:0
        mm-in-realm                             enabled
        media-sec-policy                        sfb-srtp
        refer-call-transfer                     enabled
redundancy-config
        peer
                name                                    Acmesystem1
                type                                    Primary
                destination
                        address                                 169.254.1.1:9090
                        network-interface                       wancom1:0
                destination
                        address                                 169.254.2.1:9090
                        network-interface                       wancom2:0
        peer
                name                                    acmesystem3
                type                                    Secondary
                destination
                        address                                 169.254.1.2:9090
                        network-interface                       wancom1:0
                destination
                        address                                 169.254.2.2:9090
                        network-interface                       wancom2:0
response-map
        name                                    change183to180
```

```
        entries
                recv-code                               183
                xmit-code                               180
                reason                                  Ringing
sdes-profile
        name                                    sdes-profile
session-agent
        hostname                                63.87.147.48
        ip-address                              63.87.147.48
        port                                    5071
        realm-id                                SIP-Trunk
        ping-method                             OPTIONS
        ping-interval                           30
        out-translationid                       stripplus1
session-agent
        hostname                                Medpool.sfblabdm.local
        port                                    5067
        transport-method                        StaticTLS
        realm-id                                towards-sfb
        ping-method                             OPTIONS
        ping-interval                           60
        out-translationid                       addplus1
        stop-recurse                            480
        refer-call-transfer                     enabled
        tcp-keepalive                           disabled
session-timer-profile
        name                                    towardssfb
        session-expires                         900
        request-refresher                       none
session-translation
        id                                      addplus1
        rules-calling                           addplus1
        rules-called                            addplus1
session-translation
        id                                      stripplus1
        rules-calling                           stripplus1
        rules-called                            stripplus1
sip-config
        home-realm-id                           towards-sfb
        registrar-domain                        *
        registrar-host                          *
        options                                 max-udp-length=0
sip-feature
        name                                    100rel
        realm                                   SIP-Trunk
        require-mode-inbound                    Pass
        require-mode-outbound                   Pass
sip-interface
        realm-id                                SIP-Trunk
        sip-port
                address                                 192.65.79.126
        out-manipulationid                      NATandChangeContact
sip-interface
        realm-id                                towards-sfb
        sip-port
                address                                 2620:96:c000:1::10
                port                                    5067
                transport-protocol                      TLS
                tls-profile                             sfb-tls-profile
        options                                 100rel-interworking
        in-manipulationid                       ForEarlyMedia
        out-manipulationid                      outManipToSFB
        session-timer-profile                   towardssfb
sip-manipulation
```

```
        name                                    Addpcmato183
        header-rule
                name                                    check1for83
                header-name                             @status-line
                action                                  manipulate
                comparison-type                         pattern-rule
                element-rule
                        name                                    isit183
                        type                                    status-code
                        action                                  sip-manip
                        comparison-type                         pattern-rule
                        match-value                             183
                        new-value                               fix183sdp
sip-manipulation
        name                                    ChangeContact
        header-rule
                name                                    StoreFromnumber
                header-name                             From
                action                                  manipulate
                element-rule
                        name                                    StoreFromnumber_er
                        type                                    uri-user-only
                        action                                  store
        header-rule
                name                                    ChangeContact
                header-name                             Contact
                action                                  manipulate
                element-rule
                        name                                    ChangeContact_er
                        type                                    uri-user
                        action                                  add
                        new-value
$StoreFromnumber.$StoreFromnumber_er.$0
sip-manipulation
        name                                    ChangeRecvOnlyToInactive
        header-rule
                name                                    changeSDP
                header-name                             Content-Type
                action                                  manipulate
                msg-type                                reply
                methods                                 INVITE
                element-rule
                        name                                    RecvOnlyToInactive
                        parameter-name                          application/sdp
                        type                                    mime
                        action                                  find-replace-all
                        comparison-type                         pattern-rule
                        match-value                             a=recvonly
                        new-value                               a=inactive
sip-manipulation
        name                                    Changeinactosendonly
        description                             Change inactive to sendonly for pstn tran
        header-rule
                name                                    changeSDP
                header-name                             Content-Type
                action                                  manipulate
                msg-type                                request
                methods                                 INVITE
                element-rule
                        name                                    inacttosendonly
                        parameter-name                          application/sdp
                        type                                    mime
                        action                                  find-replace-all
                        comparison-type                         pattern-rule
```

```
                        match-value                             a=inactive
                        new-value                               a=sendonly
sip-manipulation
        name                                            Check183
        header-rule
                name                                            check183
                header-name                                     @status-line
                action                                          manipulate
                comparison-type                                 pattern-rule
                element-rule
                        name                                            is183
                        type                                            status-code
                        action                                          sip-manip
                        comparison-type                                 pattern-rule
                        match-value                                     183
                        new-value                                       Modcline
sip-manipulation
        name                                            ForEarlyMedia
        header-rule
                name                                            delsupported
                header-name                                     Supported
                action                                          delete
                msg-type                                        request
                methods                                         INVITE
        header-rule
                name                                            addrequireinINVITE
                header-name                                     Require
                action                                          add
                msg-type                                        request
                methods                                         INVITE
                new-value                                       100rel
        header-rule
                name                                            Options
                header-name                                     From
                action                                          sip-manip
                new-value                                       OptionsResponseLocally
        header-rule
                name                                            Change183
                header-name                                     From
                action                                          sip-manip
                new-value                                       Check183
sip-manipulation
        name                                            Map183
        header-rule
                name                                            check183
                header-name                                     @status-line
                action                                          store
                comparison-type                                 pattern-rule
                element-rule
                        name                                            is183
                        type                                            status-code
                        action                                          replace
                        comparison-type                                 pattern-rule
                        match-value                                     183
                        new-value                                       180
sip-manipulation
        name                                            Modcline
        mime-sdp-rule
                name                                            test
                action                                          manipulate
                comparison-type                                 pattern-rule
                sdp-media-rule
                        name                                            checkcline
                        media-type                                      audio
```

```
                        action                                  manipulate
                        comparison-type                         pattern-rule
                        sdp-line-rule
                                name                                    detectc
                                type                                    c
                                action                                  sip-manip
                                comparison-type                         pattern-rule
                                match-value
^(.(?!(2620:0096:c000:1::10|2620:96:c000:8:24b6:215d:7023:ec7d|2620:96:c000:8:55d6:58f5:b47
:fe82)))*$
                                new-value                               convert183to180
        header-rule
                name                                    checkcl
                header-name                             Content-Length
                action                                  sip-manip
                match-value                             0
                new-value                               convert183to180
sip-manipulation
        name                                    NATandChangeContact
        description                             NAT plus Change Contact
        header-rule
                name                                    doNATfortrunk
                header-name                             From
                action                                  sip-manip
                new-value                               NATting
        header-rule
                name                                    delsupported
                header-name                             Supported
                action                                  delete
                msg-type                                request
                methods                                 INVITE
        header-rule
                name                                    addPAIonCallForwards
                header-name                             From
                action                                  sip-manip
                msg-type                                request
                methods                                 INVITE
                new-value                               addPAIonCallForwards
        header-rule
                name                                    addPAIRefers
                header-name                             From
                action                                  sip-manip
                msg-type                                request
                methods                                 INVITE
                new-value                               addPAIRefers
        header-rule
                name                                    ChangeContactHeader
                header-name                             From
                action                                  sip-manip
                new-value                               ChangeContact
        header-rule
                name                                    modify183sdp
                header-name                             From
                action                                  sip-manip
                new-value                               Addpcmato183
sip-manipulation
        name                                    NATting
        header-rule
                name                                    From
                header-name                             From
                action                                  manipulate
                msg-type                                request
                element-rule
                        name                                    From_header
```

```
                        type                                    uri-host
                        action                                  replace
                        new-value                               $LOCAL_IP
        header-rule
                name                                    To
                header-name                             To
                action                                  manipulate
                msg-type                                request
                element-rule
                        name                                    To
                        type                                    uri-host
                        action                                  replace
                        new-value                               $REMOTE_IP
sip-manipulation
        name                                    OptionsResponseLocally
        header-rule
                name                                    rejectOptions
                header-name                             request-uri
                action                                  reject
                msg-type                                request
                methods                                 OPTIONS
                new-value                               200: OK
sip-manipulation
        name                                    addPAIRefers
        header-rule
                name                                    checkReferredBy
                header-name                             REFERRED-BY
                action                                  store
                msg-type                                request
                methods                                 INVITE
        header-rule
                name                                    addPAIifReferredBy
                header-name                             P-Asserted-Identity
                action                                  add
                comparison-type                         pattern-rule
                msg-type                                request
                methods                                 INVITE
                match-value                             $checkReferredBy
                new-value                               <sip:5712935325+@+$LOCAL_IP+>
sip-manipulation
        name                                    addPAIonCallForwards
        header-rule
                name                                    checkForHistoryInfo
                header-name                             History-Info
                action                                  store
                msg-type                                request
                methods                                 INVITE
        header-rule
                name                                    addPAIifHistoryInfo
                header-name                             P-Asserted-Identity
                action                                  add
                comparison-type                         pattern-rule
                msg-type                                request
                methods                                 INVITE
                match-value                             $checkForHistoryInfo
                new-value                               <sip:5712935325+@+$LOCAL_IP+>
sip-manipulation
        name                                    changecline
        mime-sdp-rule
                name                                    cline
                msg-type                                reply
                action                                  manipulate
                comparison-type                         pattern-rule
                sdp-session-rule
```

```
                        name                                    con
                        action                                  manipulate
                        comparison-type                         pattern-rule
                        sdp-line-rule
                                name                                    conl
                                type                                    c
                                action                                  find-replace-all
                                comparison-type                         pattern-rule
                                match-value                             (IN IP6
anonymous.invalid)
                                new-value                               "IN IP6 ::"
sip-manipulation
        name                                    convert183to180
        header-rule
                name                                    delSDP
                header-name                             Content-Type
                action                                  manipulate
                comparison-type                         case-insensitive
                element-rule
                        name                                    del183SDP
                        parameter-name                          application/sdp
                        type                                    mime
                        action                                  delete-element
        header-rule
                name                                    delContentType
                header-name                             Content-Type
                action                                  manipulate
                element-rule
                        name                                    delCT
                        parameter-name                          *
                        type                                    header-param
                        action                                  delete-header
        header-rule
                name                                    change487to486
                header-name                             @status-line
                action                                  manipulate
                element-rule
                        name                                    modStatusCode
                        type                                    status-code
                        action                                  replace
                        match-value                             183
                        new-value                               180
                element-rule
                        name                                    modReasonPhrase
                        type                                    reason-phrase
                        action                                  replace
                        comparison-type                         case-insensitive
                        match-value                             Session Progress
                        new-value                               Ringing
sip-manipulation
        name                                    fix183sdp
        description                             To bypass the reinvite
        header-rule
                name                                    Checkforpcma
                header-name                             Content-type
                action                                  store
                element-rule
                        name                                    Checkpcmaexists
                        parameter-name                          application/sdp
                        type                                    mime
                        action                                  store
                        match-value                             (a=rtpmap:8 PCMA/8000)
        header-rule
                name                                    Addpcma
```

```
                header-name                             Content-Type
                action                                  manipulate
                comparison-type                         boolean
                match-value                             !$Checkforpcma.$Checkpcmaexists
                element-rule
                        name                                    Addpcma
                        parameter-name                          application/sdp
                        type                                    mime
                        action                                  find-replace-all
                        comparison-type                         pattern-rule
                        match-value                             a=rtpmap:0 PCMU/8000
                        new-value                               "a=rtpmap:0
PCMU/8000"+$CRLF+"a=rtpmap:8 PCMA/8000"
        mime-sdp-rule
                name                                    modmline
                action                                  manipulate
                sdp-media-rule
                        name                                    modmline_m
                        media-type                              audio
                        action                                  manipulate
                        sdp-line-rule
                                name                                    change_payload
                                type                                    m
                                action                                  find-replace-all
                                comparison-type                         pattern-rule
                                match-value                             ^(audio)( [0-
9]{4,5})( RTP/AVP 0 101)$
                                new-value                               audio+$2+" RTP/AVP
0 8 101"
sip-manipulation
        name                                    modcontact
        header-rule
                name                                    modcontact_er
                header-name                             Contact
                action                                  manipulate
                comparison-type                         pattern-rule
                element-rule
                        name                                    moder
                        type                                    uri-user
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             ((\+1)(\+1\d+))
                        new-value                               $3
                element-rule
                        name                                    modanon
                        type                                    uri-user
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             \+1anonymous
                        new-value                               anonymous
sip-manipulation
        name                                    outManipToSFB
        header-rule
                name                                    From
                header-name                             From
                action                                  manipulate
                msg-type                                request
                element-rule
                        name                                    From_header
                        type                                    uri-host
                        action                                  replace
                        new-value                               oracle.sfblabdm.local
                element-rule
                        name                                    modanonfrom
```

```
                type                                    uri-user
                action                                  replace
                comparison-type                         pattern-rule
                match-value                             \+1anonymous
                new-value                               anonymous
        header-rule
                name                                    To
                header-name                             To
                action                                  manipulate
                msg-type                                request
                element-rule
                        name                                    remplusone
                        type                                    uri-user
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             \+1$
                element-rule
                        name                                    To
                        type                                    uri-host
                        action                                  replace
                        new-value                               medpool.sfblabdm.local
        header-rule
                name                                    fixcontact
                header-name                             Contact
                action                                  manipulate
                element-rule
                        name                                    updatecontact
                        type                                    uri-host
                        action                                  replace
                        new-value                               oracle.sfblabdm.local
        header-rule
                name                                    fixcontactuser
                header-name                             Contact
                action                                  manipulate
                comparison-type                         pattern-rule
                msg-type                                request
                methods                                 INVITE
                element-rule
                        name                                    user
                        type                                    uri-user
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             (.*)
                        new-value                               "+1"+$ORIGINAL
                element-rule
                        name                                    moder
                        type                                    uri-user
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             ((\+1)(\+1\d+))
                        new-value                               $3
                element-rule
                        name                                    modanoncon
                        type                                    uri-user
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             \+1anonymous
                        new-value                               anonymous
        header-rule
                name                                    Ruri
                header-name                             Request-URI
                action                                  manipulate
                msg-type                                request
                element-rule
```

```
                        name                                    remplusone
                        type                                    uri-user
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             \+1$
        header-rule
                name                                    addReplaces
                header-name                             Supported
                action                                  manipulate
                comparison-type                         pattern-rule
                msg-type                                request
                methods                                 INVITE
                new-value                               $ORIGINAL+,replaces
        header-rule
                name                                    addUpdate
                header-name                             Allow
                action                                  manipulate
                comparison-type                         pattern-rule
                msg-type                                request
                methods                                 INVITE
                new-value                               $ORIGINAL+,UPDATE
        header-rule
                name                                    addingptime
                header-name                             From
                action                                  sip-manip
                msg-type                                request
                new-value                               replaceptimewithptime
        header-rule
                name                                    forconsul
                header-name                             From
                action                                  sip-manip
                msg-type                                reply
                new-value                               changecline
sip-manipulation
        name                                    replaceptimewithptime
        mime-sdp-rule
                name                                    addptime
                msg-type                                request
                action                                  manipulate
                sdp-media-rule
                        name                                    addSDPptime
                        media-type                              audio
                        action                                  manipulate
                        sdp-line-rule
                                name                                    addptimelr
                                type                                    a
                                action                                  find-replace-all
                                match-value                             maxptime:20
                                new-value                               ptime:20
sip-manipulation
        name                                    test183
        header-rule
                name                                    manipulate183
                header-name                             content-type
                action                                  manipulate
                comparison-type                         pattern-rule
                msg-type                                reply
                methods                                 INVITE
                element-rule
                        name                                    check183_er
                        parameter-name                          application/sdp
                        type                                    mime
                        action                                  sip-manip
                        comparison-type                         pattern-rule
```

```
                        match-value                                 (.*)(?!c=IN IP4
172.16.29.44)(.*)
                        new-value                                   convert183to180
sip-monitoring
        monitoring-filters                      all,ip6
spl-config
steering-pool
        ip-address                              192.65.79.126
        start-port                              49152
        end-port                                65535
        realm-id                                SIP-Trunk
steering-pool
        ip-address                              2620:96:c000:1::10
        start-port                              49152
        end-port                                65535
        realm-id                                towards-sfb
system-config
        hostname                                ACMESYSTEM
        description                             3820 Skype for Business IOT
        default-gateway                         192.65.79.33
        source-routing                          enabled
        default-v6-gateway                      2620:96:c000:1::1
        ipv6-signaling-mtu                      1476
tls-global
        session-caching                         enabled
tls-profile
        name                                    sfb-tls-profile
        end-entity-certificate                  SBCcert1
        trusted-ca-certificates                 CAcert
        mutual-authenticate                     enabled
        tls-version                             tlsv12
translation-rules
        id                                      addplus1
        type                                    add
        add-string                              +1
translation-rules
        id                                      stripplus1
        type                                    delete
        delete-string                           +1
```

IPv6 with TCP/RTP

```
certificate-record
        name                                    CAcert
        organization                            Tekvizion
        common-name                             sfblabdm-DC-CA-1
        key-size                                2048
certificate-record
        name                                    CAcert2
        organization                            Tekvizion
        common-name                             sfblabdm-DC-CA-1
        key-size                                2048
certificate-record
        name                                    CAcertpool
        organization                            Tekvizion
        common-name                             sfblabdm-DC-CA-1
        key-size                                2048
certificate-record
        name                                    SBCcert1
        organization                            Tekvizion
        common-name                             oracle.sfblabdm.local
        key-size                                2048
        alternate-name                          oraclepool.sfblabdm.local
```

```
certificate-record
        name                                    SBCcert2
        organization                            Tekvizion
        common-name                             oracle.sfblabdm.local
        key-size                                2048
        alternate-name                          DNS:oraclepool.sfblabdm.local
codec-policy
        name                                    For488
        allow-codecs                            G729 PCMU:no telephone-event PCMA:no
        order-codecs                            G729 telephone-event
codec-policy
        name                                    TC
        allow-codecs                            PCMA telephone-event PCMU:no
        add-codecs-on-egress                    PCMA telephone-event G729:no
        order-codecs                            PCMA telephone-event G729:no
codec-policy
        name                                    TCPCMU
        allow-codecs                            PCMU telephone-event PCMA:no
        order-codecs                            PCMU telephone-event
filter-config
        name                                    all
        user                                    *
filter-config
        name                                    ip6
        address                                 ::
        user                                    *
local-policy
        from-address                            *
        to-address                              *
        source-realm                            SIP-Trunk
        policy-attribute
                next-hop                                Medpool.sfblabdm.local
                realm                                   towards-sfb
                action                                  replace-uri
                app-protocol                            SIP
local-policy
        from-address                            *
        to-address                              med1.sfblabdm.local
        source-realm                            SIP-Trunk
        description                             For Referred-Party Header
        policy-attribute
                next-hop                                med1.sfblabdm.local
                realm                                   towards-sfb
                action                                  replace-uri
                app-protocol                            SIP
local-policy
        from-address                            *
        to-address                              med2.sfblabdm.local
        source-realm                            SIP-Trunk
        policy-attribute
                next-hop                                med2.sfblabdm.local
                realm                                   towards-sfb
                action                                  replace-uri
local-policy
        from-address                            *
        to-address                              *
        source-realm                            towards-sfb
        policy-attribute
                next-hop                                63.87.147.48
                realm                                   SIP-Trunk
                action                                  replace-uri
                app-protocol                            SIP
media-manager
media-sec-policy
```

```
        name                                    rtp
media-sec-policy
        name                                    sfb-srtp
        inbound
                profile                                 sdes-profile
                mode                                    any
                protocol                                sdes
        outbound
                profile                                 sdes-profile
                mode                                    any
                protocol                                sdes
network-interface
        name                                    s0p0
        description                             For SIP-Trunk
        ip-address                              192.65.79.126
        netmask                                 255.255.255.224
        gateway                                 192.65.79.97
        hip-ip-list                             192.65.79.126
        icmp-address                            192.65.79.126
network-interface
        name                                    s1p0
        description                             Facing Skype for Business
        hostname                                oracle.sfblabdm.local
        ip-address                              2620:96:c000:1::10/64
        netmask                                 ffff:ffff:ffff:ffff::
        gateway                                 2620:96:c000:1::1
        dns-ip-primary                          2620:96:c000:8:e840:68d3:2a77:3d2d
        dns-domain                              sfblabdm.local
        hip-ip-list                             2620:96:c000:1::10
        icmp-address                            2620:96:c000:1::10
        ssh-address                             10.64.3.163
network-interface
        name                                    wancom1
        pri-utility-addr                        169.254.1.1
        sec-utility-addr                        169.254.1.2
        netmask                                 255.255.255.252
network-interface
        name                                    wancom2
        pri-utility-addr                        169.254.2.1
        sec-utility-addr                        169.254.2.2
        netmask                                 255.255.255.252
phy-interface
        name                                    s0p0
        operation-type                          Media
        virtual-mac                             00:08:25:04:0d:1e
phy-interface
        name                                    s1p0
        operation-type                          Media
        slot                                    1
        virtual-mac                             00:08:25:04:0d:1f
phy-interface
        name                                    wancom1
        port                                    1
        duplex-mode
        speed
        wancom-health-score                     8
phy-interface
        name                                    wancom2
        port                                    2
        duplex-mode
        speed
        wancom-health-score                     9
playback-config
        name                                    transferrbt
```

```
        entry
                encoding                                PCMU
                filename                                US_ringbackPCMU.raw
realm-config
        identifier                              SIP-Trunk
        network-interfaces                      s0p0:0
        mm-in-realm                             enabled
realm-config
        identifier                              towards-sfb
        addr-prefix                             ::
        network-interfaces                      s1p0:0
        mm-in-realm                             enabled
        refer-call-transfer                     enabled
redundancy-config
        peer
                name                                    Acmesystem1
                type                                    Primary
                destination
                        address                                 169.254.1.1:9090
                        network-interface                       wancom1:0
                destination
                        address                                 169.254.2.1:9090
                        network-interface                       wancom2:0
        peer
                name                                    acmesystem3
                type                                    Secondary
                destination
                        address                                 169.254.1.2:9090
                        network-interface                       wancom1:0
                destination
                        address                                 169.254.2.2:9090
                        network-interface                       wancom2:0
response-map
        name                                    change183to180
        entries
                recv-code                               183
                xmit-code                               180
                reason                                  Ringing
sdes-profile
        name                                    sdes-profile
        egress-offer-format                     simultaneous-best-effort
session-agent
        hostname                                63.87.147.48
        ip-address                              63.87.147.48
        port                                    5071
        realm-id                                SIP-Trunk
        ping-method                             OPTIONS
        ping-interval                           30
        out-translationid                       stripplus1
session-agent
        hostname                                Medpool.sfblabdm.local
        transport-method                        StaticTCP
        realm-id                                towards-sfb
        ping-method                             OPTIONS
        ping-interval                           60
        out-translationid                       addplus1
        stop-recurse                            480
        refer-call-transfer                     enabled
        tcp-keepalive                           disabled
session-agent
        hostname                                med1.sfblabdm.local
        ip-address                              172.16.29.44
        port                                    5067
        transport-method                        StaticTLS
```

```
        realm-id                                towards-sfb
        ping-method                             OPTIONS
        ping-interval                           60
        out-translationid                       addplus1
        refer-call-transfer                     enabled
session-agent
        hostname                                med2.sfblabdm.local
        ip-address                              172.16.29.45
        port                                    5067
        transport-method                        StaticTLS
        realm-id                                towards-sfb
        ping-method                             OPTIONS
        ping-interval                           60
        out-translationid                       addplus1
        refer-call-transfer                     enabled
session-timer-profile
        name                                    towardssfb
        session-expires                         900
        request-refresher                       none
session-translation
        id                                      addplus1
        rules-calling                           addplus1
        rules-called                            addplus1
session-translation
        id                                      stripplus1
        rules-calling                           stripplus1
        rules-called                            stripplus1
sip-config
        home-realm-id                           towards-sfb
        registrar-domain                        *
        registrar-host                          *
        options                                 max-udp-length=0
sip-feature
        name                                    100rel
        realm                                   SIP-Trunk
        require-mode-inbound                    Pass
        require-mode-outbound                   Pass
sip-interface
        realm-id                                SIP-Trunk
        sip-port
                address                                 192.65.79.126
        out-manipulationid                      NATandChangeContact
sip-interface
        realm-id                                towards-sfb
        sip-port
                address                                 2620:96:c000:1::10
                transport-protocol                      TCP
        options                                 100rel-interworking
        in-manipulationid                       ForEarlyMedia
        out-manipulationid                      outManipToSFB
        session-timer-profile                   towardssfb
sip-manipulation
        name                                    Addpcmato183
        header-rule
                name                                    check1for83
                header-name                             @status-line
                action                                  manipulate
                comparison-type                         pattern-rule
                element-rule
                        name                                    isit183
                        type                                    status-code
                        action                                  sip-manip
                        comparison-type                         pattern-rule
                        match-value                             183
```

```
                        new-value                                       fix183sdp
sip-manipulation
        name                                            ChangeContact
        header-rule
                name                                            StoreFromnumber
                header-name                                     From
                action                                          manipulate
                element-rule
                        name                                            StoreFromnumber_er
                        type                                            uri-user-only
                        action                                          store
        header-rule
                name                                            ChangeContact
                header-name                                     Contact
                action                                          manipulate
                element-rule
                        name                                            ChangeContact_er
                        type                                            uri-user
                        action                                          add
                        new-value
$StoreFromnumber.$StoreFromnumber_er.$0
sip-manipulation
        name                                            ChangeRecvOnlyToInactive
        header-rule
                name                                            changeSDP
                header-name                                     Content-Type
                action                                          manipulate
                msg-type                                        reply
                methods                                         INVITE
                element-rule
                        name                                            RecvOnlyToInactive
                        parameter-name                                  application/sdp
                        type                                            mime
                        action                                          find-replace-all
                        comparison-type                                 pattern-rule
                        match-value                                     a=recvonly
                        new-value                                       a=inactive
sip-manipulation
        name                                            Changeinactosendonly
        description                                     Change inactive to sendonly for pstn tran
        header-rule
                name                                            changeSDP
                header-name                                     Content-Type
                action                                          manipulate
                msg-type                                        request
                methods                                         INVITE
                element-rule
                        name                                            inacttosendonly
                        parameter-name                                  application/sdp
                        type                                            mime
                        action                                          find-replace-all
                        comparison-type                                 pattern-rule
                        match-value                                     a=inactive
                        new-value                                       a=sendonly
sip-manipulation
        name                                            Check183
        header-rule
                name                                            check183
                header-name                                     @status-line
                action                                          manipulate
                comparison-type                                 pattern-rule
                element-rule
                        name                                            is183
                        type                                            status-code
```

```
                        action                                  sip-manip
                        comparison-type                         pattern-rule
                        match-value                             183
                        new-value                               Modcline
sip-manipulation
        name                                    ForEarlyMedia
        header-rule
                name                                    delsupported
                header-name                             Supported
                action                                  delete
                msg-type                                request
                methods                                 INVITE
        header-rule
                name                                    addrequireinINVITE
                header-name                             Require
                action                                  add
                msg-type                                request
                methods                                 INVITE
                new-value                               100rel
        header-rule
                name                                    Options
                header-name                             From
                action                                  sip-manip
                new-value                               OptionsResponseLocally
        header-rule
                name                                    Change183
                header-name                             From
                action                                  sip-manip
                new-value                               Check183
sip-manipulation
        name                                    Map183
        header-rule
                name                                    check183
                header-name                             @status-line
                action                                  store
                comparison-type                         pattern-rule
                element-rule
                        name                                    is183
                        type                                    status-code
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             183
                        new-value                               180
sip-manipulation
        name                                    Modcline
        mime-sdp-rule
                name                                    test
                action                                  manipulate
                comparison-type                         pattern-rule
                sdp-media-rule
                        name                                    checkcline
                        media-type                              audio
                        action                                  manipulate
                        comparison-type                         pattern-rule
                        sdp-line-rule
                                name                                    detectc
                                type                                    c
                                action                                  sip-manip
                                comparison-type                         pattern-rule
                                match-value
^(.(?!(2620:0096:c000:1::10|2620:96:c000:8:24b6:215d:7023:ec7d|2620:96:c000:8:55d6:58f5:b47
:fe82)))*$
                                new-value                               convert183to180
        header-rule
```

```
                name                                    checkcl
                header-name                             Content-Length
                action                                  sip-manip
                match-value                             0
                new-value                               convert183to180
sip-manipulation
        name                                    NATandChangeContact
        description                             NAT plus Change Contact
        header-rule
                name                                    doNATfortrunk
                header-name                             From
                action                                  sip-manip
                new-value                               NATting
        header-rule
                name                                    delsupported
                header-name                             Supported
                action                                  delete
                msg-type                                request
                methods                                 INVITE
        header-rule
                name                                    addPAIonCallForwards
                header-name                             From
                action                                  sip-manip
                msg-type                                request
                methods                                 INVITE
                new-value                               addPAIonCallForwards
        header-rule
                name                                    addPAIRefers
                header-name                             From
                action                                  sip-manip
                msg-type                                request
                methods                                 INVITE
                new-value                               addPAIRefers
        header-rule
                name                                    ChangeContactHeader
                header-name                             From
                action                                  sip-manip
                new-value                               ChangeContact
        header-rule
                name                                    modify183sdp
                header-name                             From
                action                                  sip-manip
                new-value                               Addpcmato183
sip-manipulation
        name                                    NATting
        header-rule
                name                                    From
                header-name                             From
                action                                  manipulate
                msg-type                                request
                element-rule
                        name                                    From_header
                        type                                    uri-host
                        action                                  replace
                        new-value                               $LOCAL_IP
        header-rule
                name                                    To
                header-name                             To
                action                                  manipulate
                msg-type                                request
                element-rule
                        name                                    To
                        type                                    uri-host
                        action                                  replace
```

```
                        new-value                                   $REMOTE_IP
sip-manipulation
        name                                            OptionsResponseLocally
        header-rule
                name                                            rejectOptions
                header-name                                     request-uri
                action                                          reject
                msg-type                                        request
                methods                                         OPTIONS
                new-value                                       200: OK
sip-manipulation
        name                                            addPAIRefers
        header-rule
                name                                            checkReferredBy
                header-name                                     REFERRED-BY
                action                                          store
                msg-type                                        request
                methods                                         INVITE
        header-rule
                name                                            addPAIifReferredBy
                header-name                                     P-Asserted-Identity
                action                                          add
                comparison-type                                 pattern-rule
                msg-type                                        request
                methods                                         INVITE
                match-value                                     $checkReferredBy
                new-value                                       <sip:5712935325+@+$LOCAL_IP+>
sip-manipulation
        name                                            addPAIonCallForwards
        header-rule
                name                                            checkForHistoryInfo
                header-name                                     History-Info
                action                                          store
                msg-type                                        request
                methods                                         INVITE
        header-rule
                name                                            addPAIifHistoryInfo
                header-name                                     P-Asserted-Identity
                action                                          add
                comparison-type                                 pattern-rule
                msg-type                                        request
                methods                                         INVITE
                match-value                                     $checkForHistoryInfo
                new-value                                       <sip:5712935325+@+$LOCAL_IP+>
sip-manipulation
        name                                            convert183to180
        header-rule
                name                                            delSDP
                header-name                                     Content-Type
                action                                          manipulate
                comparison-type                                 case-insensitive
                element-rule
                        name                                            del183SDP
                        parameter-name                                  application/sdp
                        type                                            mime
                        action                                          delete-element
        header-rule
                name                                            delContentType
                header-name                                     Content-Type
                action                                          manipulate
                element-rule
                        name                                            delCT
                        parameter-name                                  *
                        type                                            header-param
```

```
                        action                                  delete-header
        header-rule
                name                                    change487to486
                header-name                             @status-line
                action                                  manipulate
                element-rule
                        name                                    modStatusCode
                        type                                    status-code
                        action                                  replace
                        match-value                             183
                        new-value                               180
                element-rule
                        name                                    modReasonPhrase
                        type                                    reason-phrase
                        action                                  replace
                        comparison-type                         case-insensitive
                        match-value                             Session Progress
                        new-value                               Ringing
sip-manipulation
        name                                    fix183sdp
        description                             To bypass the reinvite
        header-rule
                name                                    Checkforpcma
                header-name                             Content-type
                action                                  store
                element-rule
                        name                                    Checkpcmaexists
                        parameter-name                          application/sdp
                        type                                    mime
                        action                                  store
                        match-value                             (a=rtpmap:8 PCMA/8000)
        header-rule
                name                                    Addpcma
                header-name                             Content-Type
                action                                  manipulate
                comparison-type                         boolean
                match-value                             !$Checkforpcma.$Checkpcmaexists
                element-rule
                        name                                    Addpcma
                        parameter-name                          application/sdp
                        type                                    mime
                        action                                  find-replace-all
                        comparison-type                         pattern-rule
                        match-value                             a=rtpmap:0 PCMU/8000
                        new-value                               "a=rtpmap:0
PCMU/8000"+$CRLF+"a=rtpmap:8 PCMA/8000"
        mime-sdp-rule
                name                                    modmline
                action                                  manipulate
                sdp-media-rule
                        name                                    modmline_m
                        media-type                              audio
                        action                                  manipulate
                        sdp-line-rule
                                name                                    change_payload
                                type                                    m
                                action                                  find-replace-all
                                comparison-type                         pattern-rule
                                match-value                             ^(audio)( [0-
9]{4,5})( RTP/AVP 0 101)$
                                new-value                               audio+$2+" RTP/AVP
0 8 101"
sip-manipulation
        name                                    modcontact
```

```
        header-rule
                name                                    modcontact_er
                header-name                             Contact
                action                                  manipulate
                comparison-type                         pattern-rule
                element-rule
                        name                                    moder
                        type                                    uri-user
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             ((\+1)(\+1\d+))
                        new-value                               $3
                element-rule
                        name                                    modanon
                        type                                    uri-user
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             \+1anonymous
                        new-value                               anonymous
sip-manipulation
        name                                    outManipToSFB
        header-rule
                name                                    From
                header-name                             From
                action                                  manipulate
                msg-type                                request
                element-rule
                        name                                    From_header
                        type                                    uri-host
                        action                                  replace
                        new-value                               oracle.sfblabdm.local
                element-rule
                        name                                    modanonfrom
                        type                                    uri-user
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             \+1anonymous
                        new-value                               anonymous
        header-rule
                name                                    To
                header-name                             To
                action                                  manipulate
                msg-type                                request
                element-rule
                        name                                    remplusone
                        type                                    uri-user
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             \+1$
                element-rule
                        name                                    To
                        type                                    uri-host
                        action                                  replace
                        new-value                               medpool.sfblabdm.local
        header-rule
                name                                    fixcontact
                header-name                             Contact
                action                                  manipulate
                element-rule
                        name                                    updatecontact
                        type                                    uri-host
                        action                                  replace
                        new-value                               oracle.sfblabdm.local
        header-rule
```

```
                name                                    fixcontactuser
                header-name                             Contact
                action                                  manipulate
                comparison-type                         pattern-rule
                msg-type                                request
                methods                                 INVITE
                element-rule
                        name                                    user
                        type                                    uri-user
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             (.*)
                        new-value                               "+1"+$ORIGINAL
                element-rule
                        name                                    moder
                        type                                    uri-user
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             ((\+1)(\+1\d+))
                        new-value                               $3
                element-rule
                        name                                    modanoncon
                        type                                    uri-user
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             \+1anonymous
                        new-value                               anonymous
        header-rule
                name                                    Ruri
                header-name                             Request-URI
                action                                  manipulate
                msg-type                                request
                element-rule
                        name                                    remplusone
                        type                                    uri-user
                        action                                  replace
                        comparison-type                         pattern-rule
                        match-value                             \+1$
        header-rule
                name                                    addReplaces
                header-name                             Supported
                action                                  manipulate
                comparison-type                         pattern-rule
                msg-type                                request
                methods                                 INVITE
                new-value                               $ORIGINAL+,replaces
        header-rule
                name                                    addUpdate
                header-name                             Allow
                action                                  manipulate
                comparison-type                         pattern-rule
                msg-type                                request
                methods                                 INVITE
                new-value                               $ORIGINAL+,UPDATE
        header-rule
                name                                    addingptime
                header-name                             From
                action                                  sip-manip
                msg-type                                request
                new-value                               replacemptimewithptime
sip-manipulation
        name                                    replacemptimewithptime
        mime-sdp-rule
                name                                    addptime
```

```
                msg-type                                request
                action                                  manipulate
                sdp-media-rule
                        name                                    addSDPptime
                        media-type                              audio
                        action                                  manipulate
                        sdp-line-rule
                                name                                    addptimelr
                                type                                    a
                                action                                  find-replace-all
                                match-value                             maxptime:20
                                new-value                               ptime:20
sip-manipulation
        name                                    test183
        header-rule
                name                                    manipulate183
                header-name                             content-type
                action                                  manipulate
                comparison-type                         pattern-rule
                msg-type                                reply
                methods                                 INVITE
                element-rule
                        name                                    check183_er
                        parameter-name                          application/sdp
                        type                                    mime
                        action                                  sip-manip
                        comparison-type                         pattern-rule
                        match-value                             (.*)(?!c=IN IP4
172.16.29.44)(.*)
                        new-value                               convert183to180
sip-monitoring
        match-any-filter                        enabled
        monitoring-filters                      all,ip6
spl-config
steering-pool
        ip-address                              192.65.79.126
        start-port                              49152
        end-port                                65535
        realm-id                                SIP-Trunk
steering-pool
        ip-address                              2620:96:c000:1::10
        start-port                              49152
        end-port                                65535
        realm-id                                towards-sfb
system-config
        hostname                                ACMESYSTEM
        description                             3820 Skype for Business IOT
        default-gateway                         192.65.79.33
        source-routing                          enabled
        default-v6-gateway                      2620:96:c000:1::1
tls-global
        session-caching                         enabled
tls-profile
        name                                    sfb-tls-profile
        end-entity-certificate                  SBCcert1
        trusted-ca-certificates                 CAcert
        mutual-authenticate                     enabled
        tls-version                             tlsv12
translation-rules
        id                                      addplus1
        type                                    add
        add-string                              +1
translation-rules
        id                                      stripplus1
```

```
        type                                    delete
        delete-string                           +1
```

Test Plan Executed

Following is the test plan executed against this setup and results have been documented below.

Test case ID	TCP/TLS	Title	Result	Comments
408058	TCP	PstnEndPt calls LyncEndPt with Caller ID set to 'Anonymous' on DUT	Pass	
408282	TLS	DUT accepts MedSrv 'pool' certificate for a secure call	Pass	
428361	TLS	DUT offers DUT pool certificate for a secure call	Pass	
408064	TCP	LyncEndPt calls IVR number and navigates through the IVR menu before call Connection	Pass	
408106	TCP	LyncEndPt hears Early Media for a call to PstnEndPt	Pass	
408112	TCP	DUT sends PRACK for reliable Early Media for a call from PstnEndPt to LyncEndPt	Pass	
408079	TCP	PstnEndPt1 calls LyncEndPt that is set to simultaneous ring to LyncEndPt and PstnEndPt2 answers	Pass	
408109	TCP	DUT disconnects a forked call if PstnEndPt hangs up while phones are ringing	Pass	
408159	TCP	DUT disconnects a forked call if PstnEndPt hangs up while phones are ringing. (Media Bypass OFF) (IPv6)	Pass	
408062	TCP	LyncEndPt calls PstnEndPt with a call duration longer than 32 seconds	Pass	
408063	TCP	DUT generates 603 response for a call rejected by PstnEndPt	Pass	
408065	TCP	DUT correctly handles non-E.164 number in outbound Request URI	Pass	
408066	TCP	LyncEndPt calls PstnEndPt and hangs up before receiving 200 from DUT	Pass	
408067	TCP	PstnEndPt displays LyncEndPt Caller ID for Outbound Call	Pass	
408068	TCP	PstnEndPt disconnects established call to LyncEndPt	Pass	
408069	TCP	PstnEndPt disconnects established call from LyncEndPt	Pass	

408071	TCP	DUT processes phone-context in Request and To URI from LyncEndPt	Pass	
408072	TCP	LyncEndPt sends INVITE with E.164 number and extension in Request and To URI	Pass	
408073	TCP	DUT processes call from LyncEndPt with E.164 number in FROM Header URI	Pass	
408074	TCP	LyncEndPt response to PstnEndPt is delayed due to network delay	Pass	
408075	TCP	DUT is able to disconnect a call that is forked to LyncEndPts set to 'Do not disturb'	Pass	
408076	TCP	DUT sends single media description line for a call from PstnEndPt to LyncEndPt	Pass	
408077	TCP	LyncEndPt calls an IVR number and navigates through the IVR menu after call connection.	Pass	
408078	TCP	DUT handles call from MedSrv with an alias name in the FROM header	Pass	
408081	TCP	MedSrv renegotiates an existing voice session with a different IP address	Pass	
408082	TCP	PstnEndPt calls LyncEndPt1, LyncEndPt1 parks the call and retrieves it on LyncEndPt2	Pass	
408085	TCP	DUT establishes call to LyncEndpt with configured value of ptime	Pass	
408098	TLS	LyncEndPt makes a secure call to an IVR number and navigates through the IVR menu after receiving 200 from DUT	Pass	
408116	TLS	DUT that supports SRTP only rejects call from LyncEndPt that supports RTP Only	Pass	
433140	TLS	LyncEndPt makes a secure call to an IVR and pastes a string of conference ID digits which are recognized by the DUT and IVR	Pass	
408086	TCP	LyncEndPt makes a call to PstnEndPt with G.711 A-law and/or G.711 U-law codecs	Pass	
408090	TCP	PstnEndPt is able to establish a call with LyncEndPt using G.711 A-law	Pass	

		codec		
408092	TCP	LyncEndPt is able to establish a call with PstnEndPt using G.711 A-law codec	Pass	
408101	TCP	DUT offers DTMF payload type in the range of 96-127 to MedSrv	Pass	
408114	TCP	LyncEndPt makes a call to PstnEndPt with G.711 U-law codec	Pass	
408119	TCP	LyncEndPt receives a call from PstnEndPt with G.711 U-law codecs	Pass	
408093	TCP	DUT handles multiple RTP streams for a call to LyncEndPt	Pass	
408100	TCP	DUT does not change the SSRC of an established outbound RTP session	Pass	
408104	TCP	DUT does not change the SSRC of an established inbound RTP session	Pass	
408123	TLS	DUT does not change the SSRC of an established outbound SRTP session	Pass	
408126	TLS	DUT does not change the SSRC of an established inbound SRTP session	Pass	
408091	TLS	PstnEndPt is able to establish a secure call with LyncEndPt using G.711 A-law codec	Pass	
408094	TLS	DUT handles multiple SRTP streams for a secure call to LyncEndPt	Pass	
408107	TLS	LyncEndPt hears Early Media for a secure call to PstnEndPt	Pass	
408108	TLS	LyncEndPt hears Early Media for a secure call to PstnEndPt when Media Bypass OFF	Pass	
408110	TLS	DUT disconnects a forked secure call if PstnEndPt hangs up while phones are ringing	Pass	
408120	TLS	LyncEndPt receives a secure call with G.711 U-law codec with Media Bypass OFF	Pass	
408122	TLS	LyncEndPt makes a secure call to PstnEndPt and PstnEndPt later hangs up	Pass	
408129	TLS	LyncEndPt makes a secure call to PstnEndPt	Pass	
408160	TLS	DUT disconnects a forked secure call if PstnEndPt hangs up while phones	Pass	

		are ringing. (Media Bypass OFF) (IPv6)		
428537	TLS	LyncEndPt places a secure call to PstnEndPt and call is up for more than 30 minutes with session timer enabled on DUT	Pass	
439173	TLS	LyncEndPt places a secure call to PstnEndPt and call is up for more than 30 minutes with session timer enabled on DUT (Media Bypass OFF)	Pass	
408080	TCP	Inbound call to LyncEndPt from PstnEndPt with a very long Request-URI in the INVITE	Pass	
408083	TCP	LyncEndPt1 calls PstnEndPt, LyncEndPt1 parks the call and retrieves it on LyncEndPt2	Pass	
408084	TCP	PstnEndPt calls LyncEndPt that later parks the call but does not retrieve it	Pass	
408111	TCP	PstnEndPt1 calls LyncEndPt that is set to simultaneous ring to PstnIVR	Pass	
408115	TLS	MedSrv that requires SRTP rejects call from DUT that supports RTP only	Pass	
408117	TLS	DUT handles 488 response from the MedSrv operating in RTP only mode	Pass	
408118	TLS	DUT sends its own FQDN in contact header for TLS call from LyncEndPt to PstnEndPt	Pass	
408125	TLS	PstnEndPt calls LyncEndPt with security enabled and LyncEndPt later hangs up	Pass	
408127	TLS	DUT adds at least one "crypto" attribute for each media description line in the SDP	Pass	
408148	TCP	PstnEndPt1 calls LyncEndPt that is set to simultaneous ring to LyncEndPt and PstnEndPt2 answers. (Media Bypass OFF) (IPv6)	Pass	
408153	TCP	PstnEndPt calls LyncEndPt 1, LyncEndPt 1 parks the call and retrieves it on LyncEndPt 2. (Media Bypass OFF) (IPv6)	Pass	
408155	TCP	PstnEndPt calls LyncEndPt that later parks the call but does not retrieve it. (Media Bypass OFF) (IPv6)	Pass	
408162	TCP	DUT sends PRACK for reliable Early	Pass	

		Media for a call from PstnEndPt to LyncEndPt. (Media Bypass OFF) (IPv6)		
408205	TLS	PstnEndPt1 makes a secure call to LyncEndPt that has call forwarded to PstnEndPt2	Pass	
408206	TLS	PstnEndPt1 makes a secure call to LyncEndPt that forwards the call to PstnEndPt2 with Media Bypass OFF	Pass	
408207	TCP	PstnEndPt1 calls LyncEndPt that forwards all calls to PstnEndPt2 when Media Bypass OFF	Pass	
408213	TCP	LyncEndPt1 calls LyncEndPt2 and escalates the call to a conference, inviting PstnEndPt and later removing it	Pass	
408214	TCP	PstnEndPt establishes a call with the Conference Auto Attendant	Pass	
408216	TCP	LyncEndPt1 calls LyncEndPt2 and escalates the call to a conference, inviting PstnEndPt and later removing it. (Media Bypass OFF) (IPv6)	Pass	
408227	TCP	LyncEndPt resumes call to PstnEndPt after playing music on hold for 15 minutes	Pass	
408229	TCP	LyncEndPt places a call to PstnEndPt on hold and resumes after 12 minutes	Pass	
428506	TLS	LyncEndPt places secure call to PstnEndPt on hold after 30 minutes and then resumes	Pass	
408224	TLS	PstnEndPt places a secure call to LyncEndPt on hold and resumes after 15 minutes	Pass	
408235	TLS	PstnEndPt places a secure call from LyncEndPt on hold and then resumes	Pass	
408231	TCP	LyncEndPt plays music when it holds call from PstnEndPt to LyncEndPt	Pass	
408261	TCP	PstnEndPt1 calls LyncEndPt and LyncEndPt Consultative Transfers to PstnEndPt2	Pass	
408262	TLS	PstnEndPt1 makes a secure call to LyncEndPt and LyncEndPt Consultative Transfers to PstnEndPt2	Pass	
408263	TCP	DUT does not drop the call when	Pass	

		Consultative Transfer by LyncEndPt to second PstnEndPt fails		
408264	TCP	DUT supports Hairpin Elimination for Consultative Transfer with REFER	Pass	
408265	TLS	DUT supports Hairpin Elimination for secure Consultative Transfer with REFER	Pass	
408275	TLS	PstnEndPt1 makes a secure call to LyncEndPt and LyncEndPt Consultative Transfers to PstnEndPt2. (Media Bypass OFF) (IPv6)	Pass	
408254	TCP	DUT includes REFER in ALLOW header in INVITE sent to MedSrv	Pass	
408255	TCP	PstnEndPt1 calls LyncEndPt and LyncEndPt Blinds Transfers the call to PstnEndPt2	Pass	
408256	TLS	PstnEndPt1 makes a secure call to LyncEndPt and LyncEndPt Blinds Transfers the call to PstnEndPt2	Pass	
408259	TLS	DUT maintains the original session when rejecting a call transfer with REFER	Pass	
408268	TCP	PstnEndPt1 makes a secure call to LyncEndPt and LyncEndPt Blinds Transfers the call to PstnEndPt2. (Media Bypass OFF) (IPv6)	Pass	
408273	TCP	PstnEndPt calls LyncEndPt1 that performs Blind Transfer to LyncEndPt2 with REFER. (Media Bypass OFF) (IPv6)	Pass	
408285	TLS	DUT uses load balancing to distribute secure inbound calls among MedSrvs in a cluster	Pass	
408286	TCP	DUT responds to OPTIONS as keep alive to MedSrv over TCP	Pass	
408287	TCP	DUT sends periodic OPTIONS message as keep alive to MedSrv	Pass	
408288	TLS	DUT responds to OPTIONS as keep alive to MedSrv over TLS	Pass	
408289	TCP	DUT resumes sending calls to MedSrv when it starts receiving OPTIONS response from that MedSrv	Pass	
408291	TCP	PstnEndPt establishes a call with LyncEndPt when interface of MedSrv1 goes down	Pass	

408293	TCP	DUT fails over incoming call to a second MedSrv when the first MedSrv does not respond	Pass	
408306	TCP	DUT utilizes failover and does not offer new calls to a failed MedSrv	Pass	
408309	TCP	DUT distributes new calls among DNS configured MedSrvs	Pass	
408311	TCP	DUT honors TTL when distributing new calls among DNS configured MedSrvs	Pass	
408315	TCP	DUT sends 414 when unable to handle very long Request URI	Pass	
408317	TCP	DUT processes 488 response for unsupported codec from MedSrv	Pass	
408321	TCP	DUT disconnects call when MedSrv sends 408 for call from PstnEndPt	Pass	
408322	TLS	DUT processes 603 from LyncEndPt for a secure call	Pass	
408323	TCP	DUT processes 603 response from LyncEndPt	Pass	
408324	TCP	DUT handles call from LyncEndPt to a user that does not exist in the domain	Pass	
408325	TCP	DUT generates 486 response from a busy PstnEndPt	Pass	
408326	TCP	DUT processes 486 response from a busy LyncEndPt	Pass	
408327	TCP	DUT disconnects call when MedSrv sends 501 for call from PstnEndPt	Pass	
408328	TCP	DUT disconnects call when MedSrv sends 606 for call from PstnEndPt	Pass	
408329	TCP	DUT responds with 488 when MedSrv offers a codec unsupported on the device	Pass	
408347	TCP	LyncEndPt receives a call from PstnEndPt with G.711 A-law and/or G.711 U-law codecs	Pass	
408348	TCP	PstnEndPt1 calls LyncEndPt that forwards the call to PstnEndPt2	Pass	
408349	TCP	PstnEndPt1 calls LyncEndPt that escalates the call to a conference by inviting PstnEndPt2	Pass	
408350	TCP	DUT fails over incoming call to	Pass	

		MedSrv2 when MedSrv1 sends 503 response		

Troubleshooting Tools

If you find that you are not able to complete calls or have problems with the test cases, there are a few tools available for Windows Server, Lync Server, and the Oracle SBC like logging and tracing which may be of assistance. In this section we will provide a list of tools which you can use to aid in troubleshooting any issues you may encounter.

Since we are concerned with communication between the Lync Server mediation server and the SBC we will focus on the troubleshooting tools to use between those devices if calls are not working or tests are not passing.

Microsoft Network Monitor (NetMon)

NetMon is a network protocol analyzer which is freely downloadable from Microsoft. It can be found at www.microsoft.com/downloads. NetMon could be installed on the Lync Server mediation server, the Lync Server Standard Edition server, or Enterprise Edition front end server.

Wireshark

Wireshark is also a network protocol analyzer which is freely downloadable from www.wireshark.org. Wireshark could be installed on the Lync Server mediation server, the Lync Server Standard Edition server, or MCS Enterprise Edition front end server.

Eventviewer

There are several locations in the event viewer where you can find valuable information to aid in troubleshooting issues with your deployment.

With the requirement that there is a completely functioning Lync Server with Enterprise Voice deployment in place, there are only a few areas in which one would use the Event Viewer for troubleshooting:

- The Enterprise Voice client;
- The Lync Server Front End server;
- A Lync Server Standard Edition Server; and
- A Lync Server Mediation Server.

On the Oracle SBC 4600 Series

The Oracle SBC provides a rich set of statistical counters available from the ACLI, as well as log file output with configurable detail. The follow sections detail enabling, adjusting and accessing those interfaces.

Resetting the statistical counters, enabling logging and restarting the log files.

At the SBC Console:

```
oraclesbc1# reset sipd
oraclesbc1# notify sipd debug
oraclesbc1#
enabled SIP Debugging
oraclesbc1# notify all rotate-logs
```

Examining the log files

Note: You will FTP to the management interface of the SBC with the username user and user mode password (the default is "**acme**").

```
C:\Documents and Settings\user>ftp 192.168.5.24
Connected to 192.168.85.55.
220 oraclesbc1FTP server (VxWorks 6.4) ready.
User (192.168.85.55:(none)): user
331 Password required for user.
Password: acme
230 User user logged in.
ftp> cd /ramdrv/logs
250 CWD command successful.
ftp> get sipmsg.log
200 PORT command successful.
150 Opening ASCII mode data connection for '/ramdrv/logs/sipmsg.log' (3353
bytes).
226 Transfer complete.
ftp: 3447 bytes received in 0.00Seconds 3447000.00Kbytes/sec.
ftp> get log.sipd
200 PORT command successful.
150 Opening ASCII mode data connection for '/ramdrv/logs/log.sipd' (204681
bytes).
226 Transfer complete.
ftp: 206823 bytes received in 0.11Seconds 1897.46Kbytes/sec.
ftp> bye
221 Goodbye.
```

You may now examine the log files with the text editor of your choice.

Through the Web GUI

You can also check the display results of filtered SIP session data from the Oracle Enterprise Session Border Controller, and provides traces in a common log format for local viewing or for exporting to your PC. Please check the “Monitor and Trace” section (page 145) of the Web GUI User Guide available at http://docs.oracle.com/cd/E56581_01/index.htm

Telnet

Since we are working within an architecture which uses bound TCP listening ports for functionality, the simplest form of troubleshooting can be seeing if the devices are listening on a particular port, as well as confirming that the there is nothing blocking them such as firewalls. Ensure that you have a TELNET client available on a workstation as well as on the Lync Server mediation server.

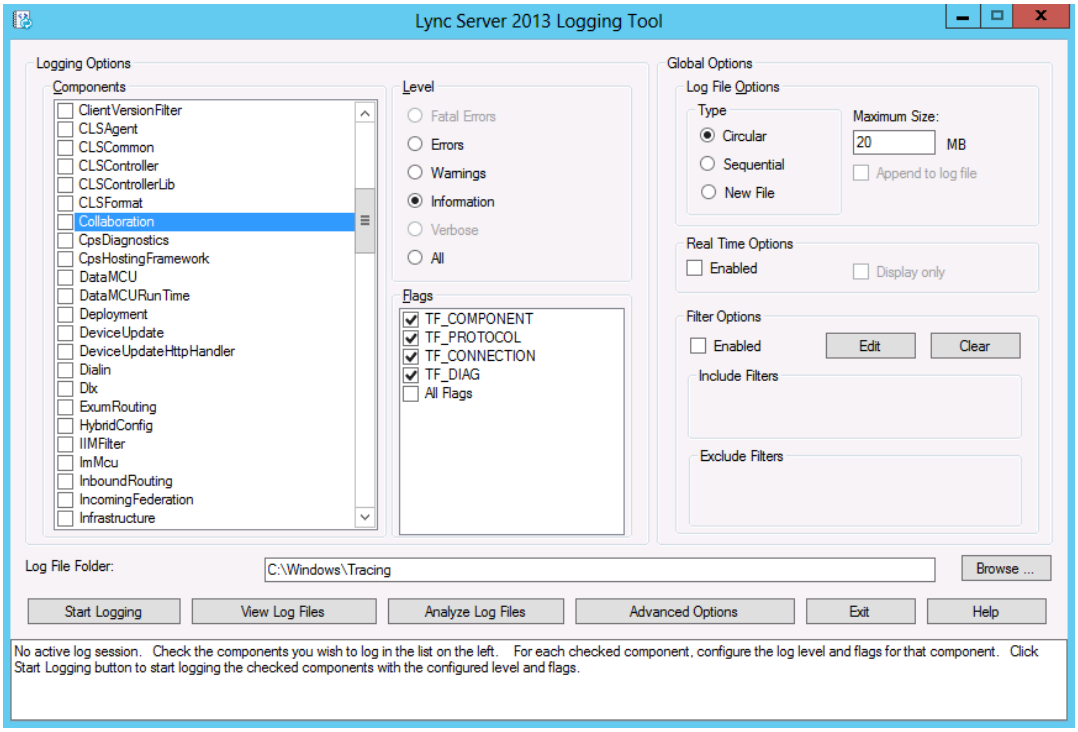
The Lync Server mediation server will listen on TCP port 5067 by default for SIP signaling. In our example we are listening on 5060 on the PSTN facing NIC. From the Standard Edition pool or Enterprise Edition pool the Mediation Server would be listening on port 5061. Tests may include:

- Client to pool server: **`telnet <servername> 5061`**
- Pool server to Mediation Server: **`telnet <servername> 5061`**

On the Lync Server

Lync Server Logging Tool

The Skype for Business Logging Tool provides internal traces and messaging between different Skype for Business elements like Front-end, Mediation server, Lync Clients, etc. File name is OCSReskit.msi. Once installed, it can be accessed from any one of the Lync Server servers by running Start/Microsoft Skype for Business/Lync Server Logging Tool.



Appendix A

Accessing the ACLI

Access to the ACLI is provided by:

- The serial console connection;
- TELNET, which is enabled by default but may be disabled; and
- SSH, this must be explicitly configured.

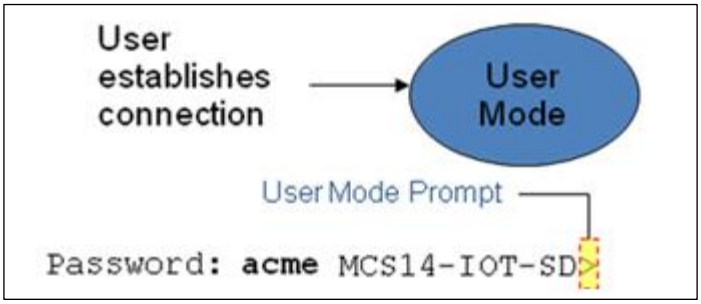
Initial connectivity will be through the serial console port. At a minimum, this is how to configure the management (eth0) interface on the SBC.

ACLI Basics

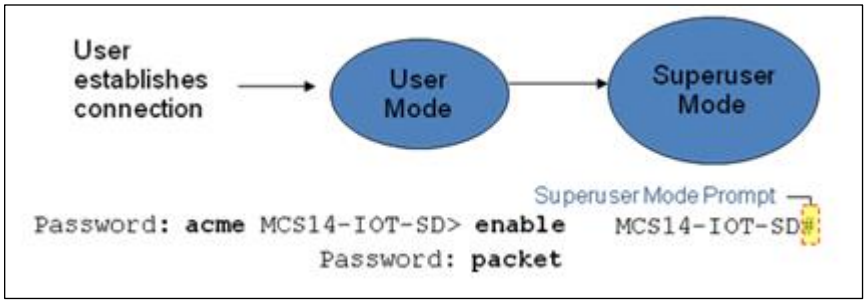
There are two password protected modes of operation within the ACLI, User mode and Superuser mode.

When you establish a connection to the SBC, the prompt for the User mode password appears. The default password is acme.

User mode consists of a restricted set of basic monitoring commands and is identified by the greater than sign (>) in the system prompt after the target name. You cannot perform configuration and maintenance from this mode.



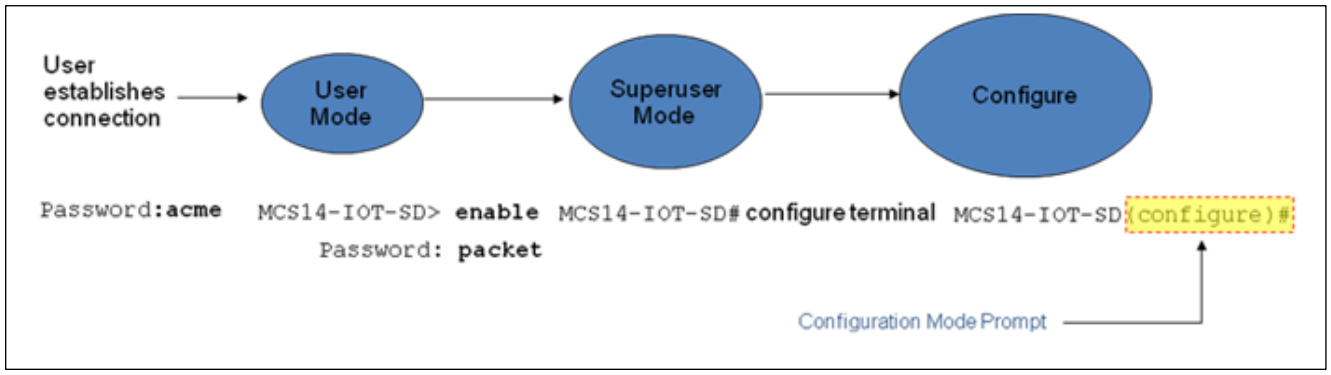
The Superuser mode allows for access to all system commands for operation, maintenance, and administration. This mode is identified by the pound sign (#) in the prompt after the target name. To enter the Superuser mode, issue the enable command in the User mode.



From the Superuser mode, you can perform monitoring and administrative tasks; however you cannot configure any elements. To return to User mode, issue the exit command.

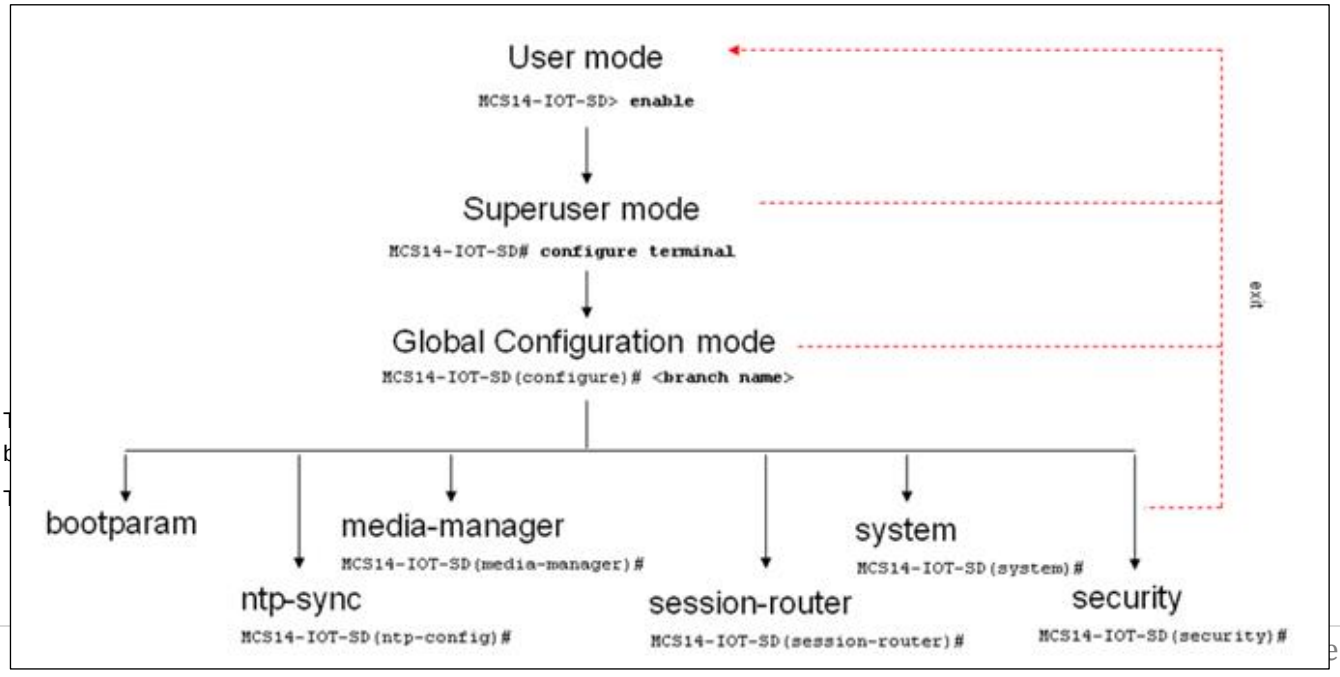
You must enter the Configuration mode to configure elements. For example, you can access the configuration branches and configuration elements for signaling and media configurations. To enter the Configuration mode, issue the **`configure terminal`** command in the Superuser mode.

Configuration mode is identified by the word configure in parenthesis followed by the pound sign (#) in the prompt after the target name, for example, **oraclesbc1(configure)#**. To return to the Superuser mode, issue the **`exit`** command.



In the configuration mode, there are six configuration branches:

- bootparam;
- ntp-sync;
- media-manager;
- session-router;
- system; and
- security.



- boot device – The global management port, usually eth0
- file name – The boot path and the image file.
- inet on ethernet – The IP address and subnet mask (in hex) of the management port of the SD.
- host inet –The IP address of external server where image file resides.
- user and ftp password – Used to boot from the external FTP server.
- gateway inet – The gateway IP address for reaching the external server, if the server is located in a different network.

```
'.' = clear field;  '-' = go to previous field;  q = quit
boot device             : eth0
processor number        : 0
host name               :
file name               : /tffs0/nnSCX620.gz
inet on ethernet (e)    : 10.0.3.11:ffff0000
inet on backplane (b)   :
host inet (h)           : 10.0.3.100
gateway inet (g)        : 10.0.0.1
user (u)                : anonymous
ftp password (pw) (blank = rsh)       : anonymous
flags (f)               : 0x8
target name (tn)        : MCS14-IOT-SD
startup script (s)      :
other (o)
```

The ntp-sync branch provides access to ntp server configuration commands for synchronizing the SBC time and date.

The security branch provides access to security configuration.

The system branch provides access to basic configuration elements as system-config, snmp-community, redundancy, physical interfaces, network interfaces, etc.

The session-router branch provides access to signaling and routing related elements, including H323-config, sip-config, iwf-config, local-policy, sip-manipulation, session-agent, etc.

The media-manager branch provides access to media-related elements, including realms, steering pools, dns-config, media-manager, and so forth.

You will use media-manager, session-router, and system branches for most of your working configuration.

Configuration Elements

The configuration branches contain the configuration elements. Each configurable object is referred to as an element. Each element consists of a number of configurable parameters.

Some elements are single-instance elements, meaning that there is only one of that type of the element - for example, the global system configuration and redundancy configuration.

Some elements are multiple-instance elements. There may be one or more of the elements of any given type. For example, physical and network interfaces.

Some elements (both single and multiple instance) have sub-elements. For example:

- SIP-ports - are children of the sip-interface element
- peers – are children of the redundancy element
- destinations – are children of the peer element

Creating an Element

1. To create a single-instance element, you go to the appropriate level in the ACLI path and enter its parameters. There is no need to specify a unique identifier property because a single-instance element is a global element and there is only one instance of this element.
2. When creating a multiple-instance element, you must specify a unique identifier for each instance of the element.
3. It is important to check the parameters of the element you are configuring before committing the changes. You do this by issuing the **show** command before issuing the **done** command. The parameters that you did not configure are filled with either default values or left empty.
4. On completion, you must issue the **done** command. The done command causes the configuration to be echoed to the screen and commits the changes to the volatile memory. It is a good idea to review this output to ensure that your configurations are correct.
5. Issue the **exit** command to exit the selected element.

Note that the configurations at this point are not permanently saved yet. If the SBC reboots, your configurations will be lost.

Editing an Element

The procedure of editing an element is similar to creating an element, except that you must select the element that you will edit before editing it.

1. Enter the element that you will edit at the correct level of the ACLI path.
2. Select the element that you will edit, and view it before editing it.
   The **select** command loads the element to the volatile memory for editing. The **show** command allows you to view the element to ensure that it is the right one that you want to edit.
3. Once you are sure that the element you selected is the right one for editing, edit the parameter one by one. The new value you provide will overwrite the old value.
4. It is important to check the properties of the element you are configuring before committing it to the volatile memory. You do this by issuing the **show** command before issuing the **done** command.
5. On completion, you must issue the **done** command.
6. Issue the **exit** command to exit the selected element.

Note that the configurations at this point are not permanently saved yet. If the SBC reboots, your configurations will be lost.

Deleting an Element

The **no** command deletes an element from the configuration in editing.

To delete a single-instance element,

1. Enter the **no** command from within the path for that specific element
2. Issue the **exit** command.

To delete a multiple-instance element,

1. Enter the **no** command from within the path for that particular element.
   The key field prompt, such as <name>:<sub-port-id>, appears.
2. Use the <Enter> key to display a list of the existing configured elements.
3. Enter the number corresponding to the element you wish to delete.
4. Issue the **select** command to view the list of elements to confirm that the element was removed.

Note that the configuration changes at this point are not permanently saved yet. If the SBC reboots, your configurations will be lost.

Configuration Versions

At any time, three versions of the configuration can exist on the SBC: the edited configuration, the saved configuration, and the running configuration.

- The **edited configuration** – this is the version that you are making changes to. This version of the configuration is stored in the SBC's volatile memory and will be lost on a reboot.
  To view the editing configuration, issue the **`show configuration`** command.
- The **saved configuration –** on issuing the **`save-config`** command, the edited configuration is copied into the non-volatile memory on the SBC and becomes the saved configuration. Because the saved configuration has not been activated yet, the changes in the configuration will not take effect. On reboot, the last activated configuration (i.e., the last running configuration) will be loaded, not the saved configuration.
- The **running configuration** is the saved then activated configuration. On issuing the **`activate-config`** command, the saved configuration is copied from the non-volatile memory to the volatile memory. The saved configuration is activated and becomes the running configuration. Although most of the configurations can take effect once being activated without reboot, some configurations require a reboot for the changes to take effect.
  To view the running configuration, issue command show **`running-config`**.

Saving the Configuration

The **`save-config`** command stores the edited configuration persistently.

Because the saved configuration has not been activated yet, changes in configuration will not take effect. On reboot, the last activated configuration (i.e., the last running configuration) will be loaded. At this stage, the saved configuration is different from the running configuration.

Because the saved configuration is stored in non-volatile memory, it can be accessed and activated at later time.

Upon issuing the **`save-config`** command, the SBC displays a reminder on screen stating that you must use the **`activate-config`** command if you want the configurations to be updated.

```
oraclesbc1 # save-config
Save-Config received, processing.
waiting 1200 for request to finish
Request to 'SAVE-CONFIG' has Finished,
Save complete
Currently active and saved configurations do not match!
To sync & activate, run 'activate-config' or 'reboot activate'.
oraclesbc1 #
```

Activating the Configuration

On issuing the **`activate-config`** command, the saved configuration is copied from the non-volatile memory to the volatile memory. The saved configuration is activated and becomes the running configuration.

Some configuration changes are service affecting when activated. For these configurations, the SBC warns that the change could have an impact on service with the configuration elements that will potentially be service affecting. You may decide whether or not to continue with applying these changes immediately or to apply them at a later time.

```
oraclesbc1# activate-config
Activate-Config received, processing.
waiting 120000 for request to finish
Request to 'ACTIVATE-CONFIG' has Finished,
Activate Complete
oraclesbc1#
```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