AudioCodes® Mediant™ Series

Session Border Controller (SBC)

Interoperability Laboratory

# Configuration Note

## Microsoft® Lync™ Server 2013 & ITSP SIP Trunk using AudioCodes Mediant SBC


Microsoft Partner
Gold Communications

Lync

AudioCodes

Version 6.8

May 2015

Document #: LTRT-54010

# Table of Contents

# List of Figures

**This page is intentionally left blank.**

## Notice

This Configuration Note shows how to connect Microsoft Lync Server 2013 and a SIP Trunk using AudioCodes Mediant SBC product series.

Information contained in this document is believed to be accurate and reliable at the time of printing. However, due to ongoing product improvements and revisions, AudioCodes cannot guarantee accuracy of printed material after the Date Published, nor can it accept responsibility for errors or omissions. Updates to this document and other documents as well as software files can be viewed by registered customers at http://www.audiocodes.com/downloads.



Date Published: May-17-2015

## Trademarks

AudioCodes, AC, AudioCoded, Ardito, CTI2, CTI², CTI Squared, HD VoIP, HD VoIP Sounds Better, InTouch, IPmedia, Mediant, MediaPack, NetCoder, Netrake, Nuera, Open Solutions Network, OSN, Stretto, TrunkPack, VMAS, VoicePacketizer, VoIPerfect, VoIPerfectHD, What's Inside Matters, Your Gateway To VoIP and 3GX are trademarks or registered trademarks of AudioCodes Limited. All other products or trademarks are property of their respective owners. Product specifications are subject to change without notice.

## WEEE EU Directive

Pursuant to the WEEE EU Directive, electronic and electrical waste must not be disposed of with unsorted waste. Please contact your local recycling authority for disposal of this product.

## Customer Support

Customer technical support and services are provided by AudioCodes or by an authorized AudioCodes Service Partner. For more information on how to buy technical support for AudioCodes products and for contact information, please visit our Web site at www.audiocodes.com/support.

## Abbreviations and Conventions

Each abbreviation, unless widely used, is spelled out in full when first used.

**Note:** Throughout this manual, unless otherwise specified, the term *SBC* refers to AudioCodes Mediant SBC product.

# Documentation Feedback

AudioCodes continually strives to produce high quality documentation. If you have any comments (suggestions or errors) regarding this document, please fill out the Documentation Feedback form on our Web site at http://www.audiocodes.com/downloads.

# Document Revision Record

| LTRT | Description |
|---|---|
| 54010 | Added 'Encryption Support Level'. |

# 1 Introduction

This Configuration Note shows how to configure AudioCodes' Session Border Controller (SBC) for interworking between an ITSP (Internet Telephony Service Provider's) SIP (Session Initiation Protocol) Trunking service and Microsoft's Lync communication platform (Lync Server 2013).

This document describes how to connect Microsoft Lync Server 2013 and a SIP Trunk using AudioCodes Mediant SBC product series (see Section 2.1 on page 11).

**Note:** Throughout this manual, unless otherwise specified, the term *SBC* refers to AudioCodes Mediant SBC product.

## 1.1 Intended Audience

The Configuration Note is intended for engineers or AudioCodes and Partners who are responsible for installing and configuring SIP Trunking and Microsoft's Lync communication platform for enabling VoIP calls using AudioCodes' SBC.

## 1.2 About AudioCodes SBC Product Series

AudioCodes' family of SBC devices enables reliable connectivity and security between an enterprise's VoIP network and the ITSP's VoIP network.

The SBC provides perimeter defense as a way of protecting enterprises from malicious VoIP attacks; mediation for allowing the connection of any PBX and/or IP-PBX to any Service Provider; and Service Assurance for service quality and manageability.

Designed as a cost-effective appliance, the SBC is based on field-proven VoIP and network services with a native host processor, allowing the creation of purpose-built multiservice appliances, providing smooth connectivity to cloud services, with integrated quality of service, SLA monitoring, security and manageability.

The native implementation of SBC provides a host of additional capabilities that are not possible with standalone SBC appliances such as VoIP mediation, PSTN access survivability, and third-party value-added services applications. This enables enterprises to utilize the advantages of converged networks and eliminate the need for standalone appliances.

AudioCodes' SBC is available as an integrated solution running on top of its field-proven Mediant Media Gateway and Multi-Service Business Router platforms, or as a software-only solution for deployment with third-party hardware.

**This page is intentionally left blank.**

# 2 Component Information

## 2.1 AudioCodes SBC Version

| | |
|---|---|
| **SBC Vendor** | AudioCodes |
| **Models** | ▪ Mediant 500 E-SBC<br>▪ Mediant 800 Gateway & E-SBC<br>▪ Mediant 1000B Gateway & E-SBC<br>▪ Mediant 2600 E-SBC<br>▪ Mediant 3000 Gateway & E-SBC<br>▪ Mediant 4000 SBC<br>▪ Mediant 9000 SBC |
| **Software Version** | SIP_6.80A or later |
| **Protocol** | ▪ SIP/UDP (to the ITSP's SIP Trunk)<br>▪ SIP/TCP or TLS (to the Lync Front End Server) |
| **Additional Notes** | None |

## 2.2 Microsoft Lync Server 2013 Version

| | |
|---|---|
| **Vendor** | Microsoft |
| **Model** | Microsoft Lync |
| **Software Version** | Release 2013 5.0.8308.0 |
| **Protocol** | SIP |
| **Additional Notes** | None |

## 2.3 Deploying the SBC

### 2.3.1 Example Environment

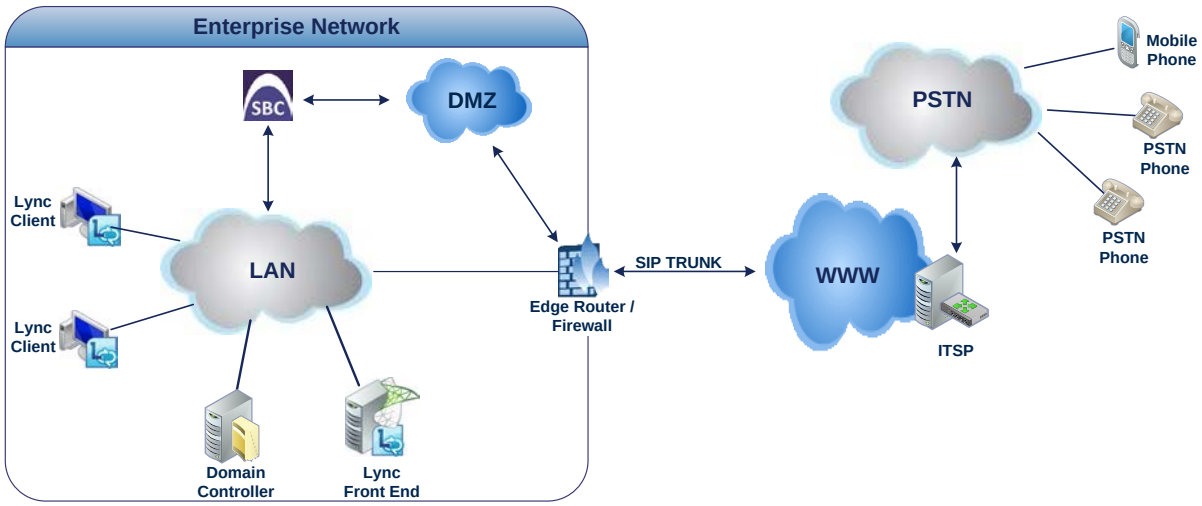
The example scenario below is referred to throughout this document in order to show how to deploy the SBC.

In the example environment:

- Microsoft Lync Server 2013 is deployed in an enterprise's private network for enhanced communication within the enterprise.
- The enterprise wants to offer its employees enterprise-voice capabilities and to connect the enterprise to the PSTN network using a SIP Trunking service provided by the enterprise's ITSP.
- AudioCodes' SBC is implemented to interconnect between the enterprise's LAN and the SIP Trunk.
  - Session: Real-time voice session using IP-based SIP
  - Border: IP-to-IP network border between Lync Server 2013 network in the enterprise LAN and the SIP Trunk located in the public network.

The figure below illustrates AudioCodes' SBC interworking between Microsoft Lync Server 2013 and an ITSP's SIP Trunking site.

**Figure 2-1: SBC Interworking Lync 2013 and a SIP Trunk in an Example Environment**



### 2.3.2 Environment Setup

The example scenario includes the following environment setup:

| Area | Setup |
|---|---|
| Network | ▪ Microsoft Lync Server 2013 environment is located in the enterprise's LAN<br>▪ The SIP Trunk is located in the WAN |
| Signaling Transcoding | ▪ Microsoft Lync Server 2013 functions with SIP-over-TLS transport type<br>▪ The SIP Trunk operates with SIP-over-UDP transport type |
| Codecs Transcoding | ▪ Microsoft Lync Server 2013 supports G.711A-law and G.711U-law coders<br>▪ The SIP Trunk supports G.711A-law, G.711U-law and G.729 coders |
| Media Transcoding | ▪ Microsoft Lync Server 2013 operates with SRTP media type<br>▪ The SIP trunk operates with RTP media type |

**This page is intentionally left blank.**

# 3 Configuring Microsoft Lync Server 2013

The procedure below describes how to configure Microsoft Lync Server 2013 to operate with AudioCodes' SBC.

**Note:** Dial plans, voice policies, and PSTN usages are also necessary for enterprise voice deployment but are beyond the scope of this document.

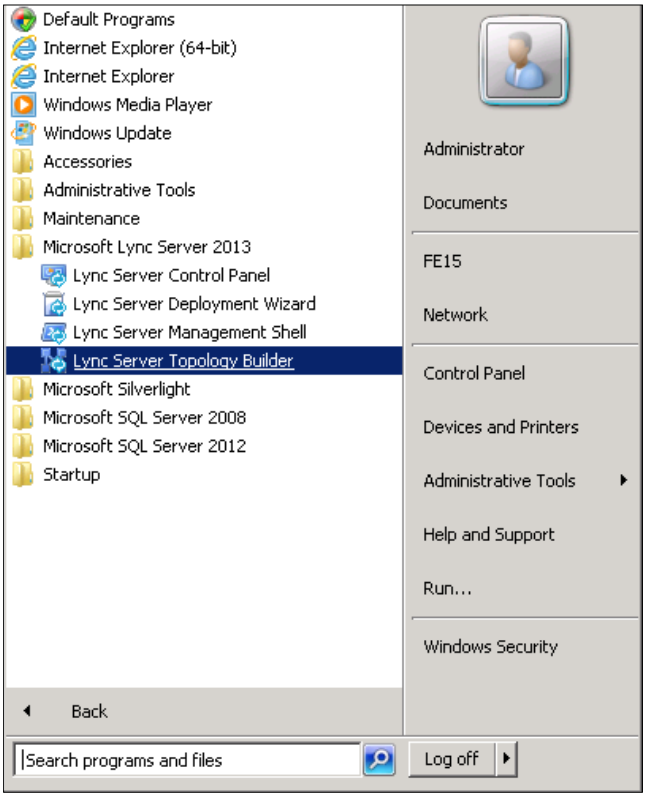
## 3.1 Configuring the SBC as an IP / PSTN Gateway

The procedure below describes how to configure the SBC as an IP / PSTN Gateway.

➢ **To configure the SBC as an IP/PSTN Gateway and associate it with a Mediation Server:**

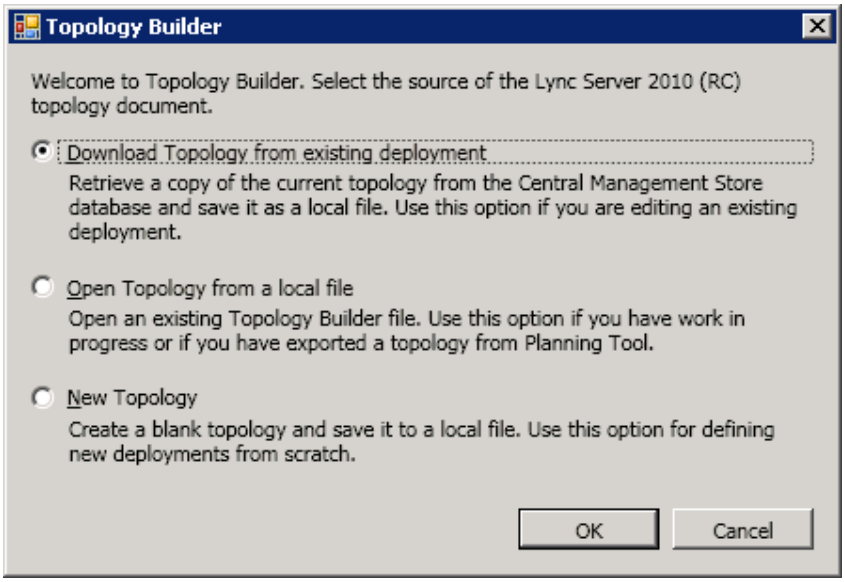
1. On the server where the Topology Builder is installed, start the Lync Server 2013 Topology Builder: Click the Windows **Start** menu > **All Programs** > **Lync Server Topology Builder**.

**Figure 3-1: Starting the Lync Server Topology Builder**



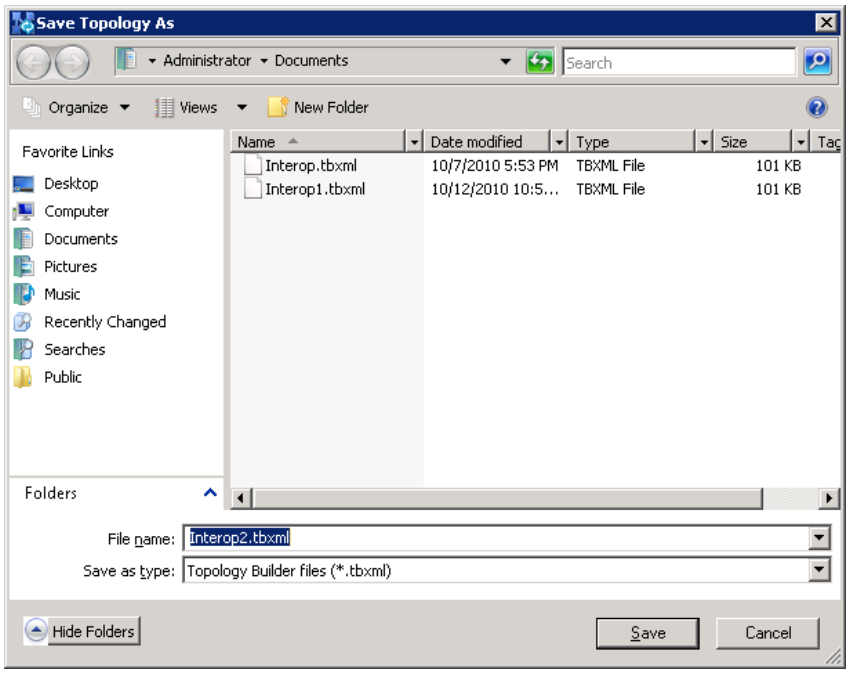
This screen is displayed:

**Figure 3-2: Topology Builder Options**




2. Select the **Download Topology from existing deployment** option and click **OK**; you're prompted to save the downloaded Topology:

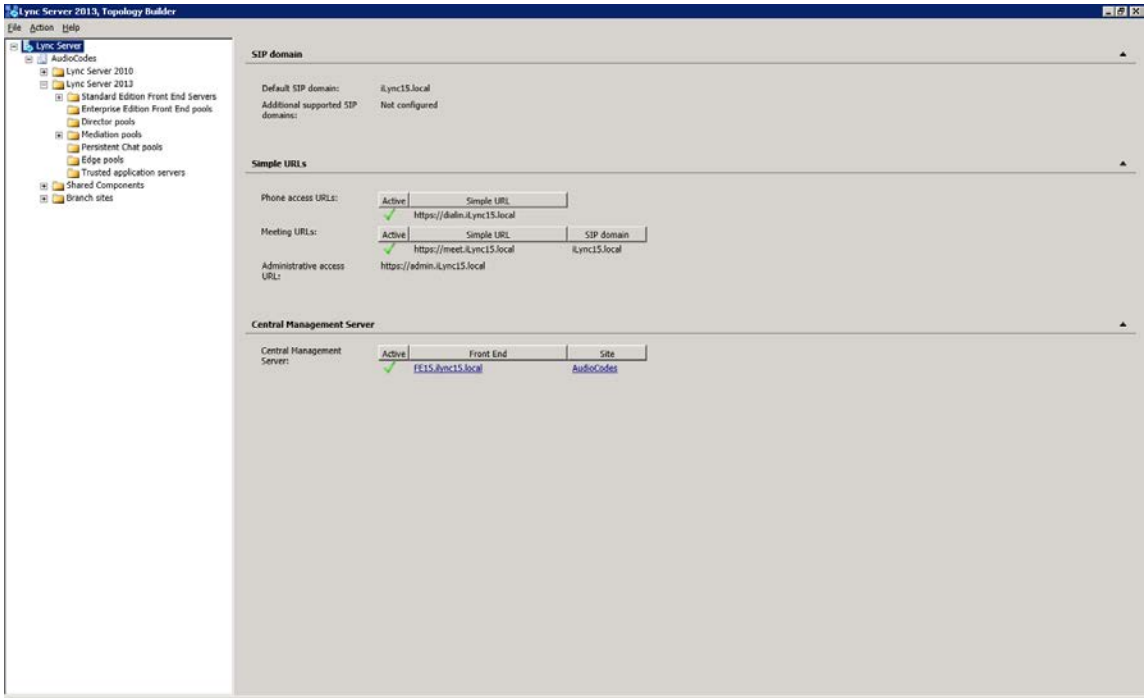
**Figure 3-3: Save Topology**



3. Enter a name for the Topology file and click **Save**. This step enables you to roll back from any changes you make during the installation.

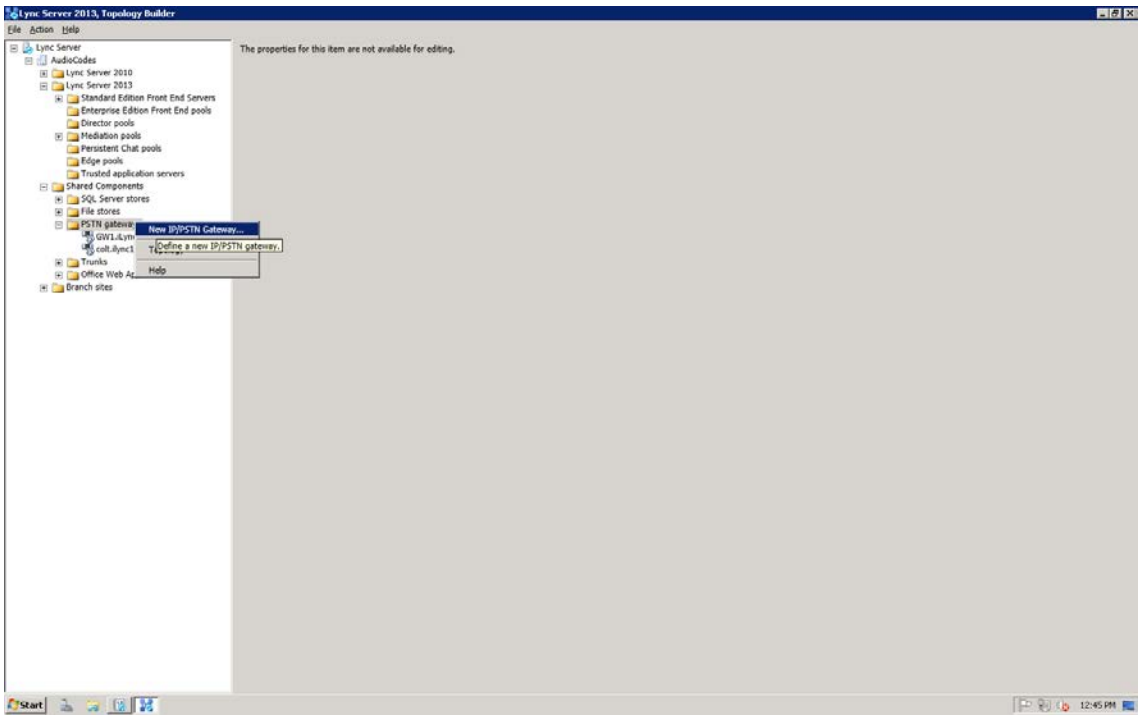
   The Topology Builder screen with the downloaded Topology is displayed:

**Figure 3-4: Topology Builder Displaying Downloaded Topology**



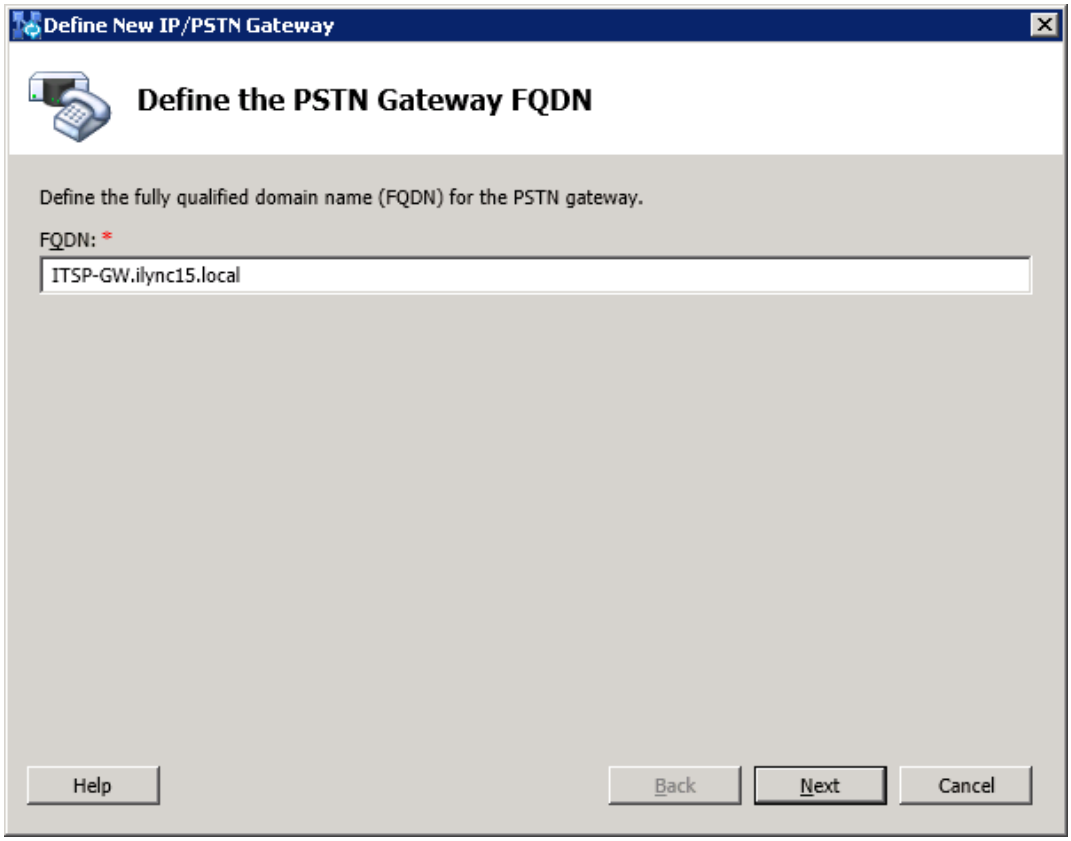

4. In the tree, expand Lync Server 2013 > your site name > Shared Components.
5. Right-click the **PSTN Gateways** folder and select **New IP/PSTN Gateway** from the popup menu:

**Figure 3-5: Selecting New IP/PSTN Gateway**



The following dialog opens:

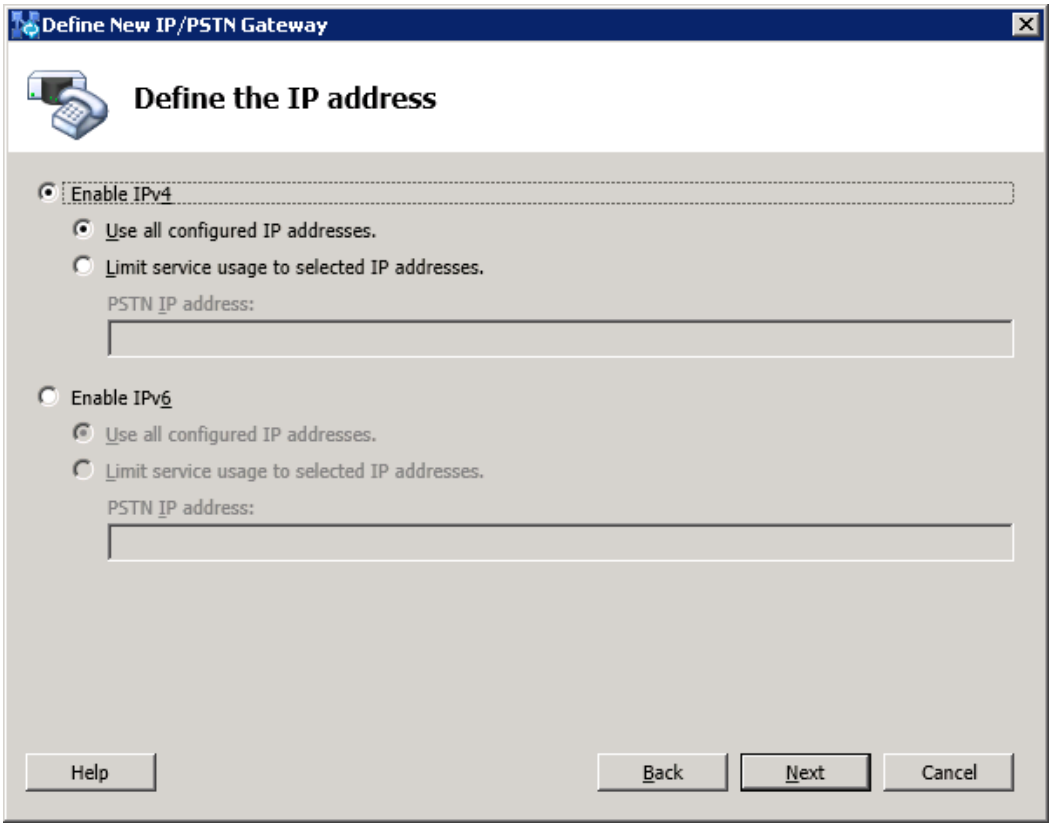
**Figure 3-6: Define New IP/PSTN Gateway**




6. Enter the Fully Qualified Domain Name (FQDN) of the SBC (e.g., ITSP-GW.ilync15.local). This FQDN should be updated in the relevant DNS record and then, click **Next**.

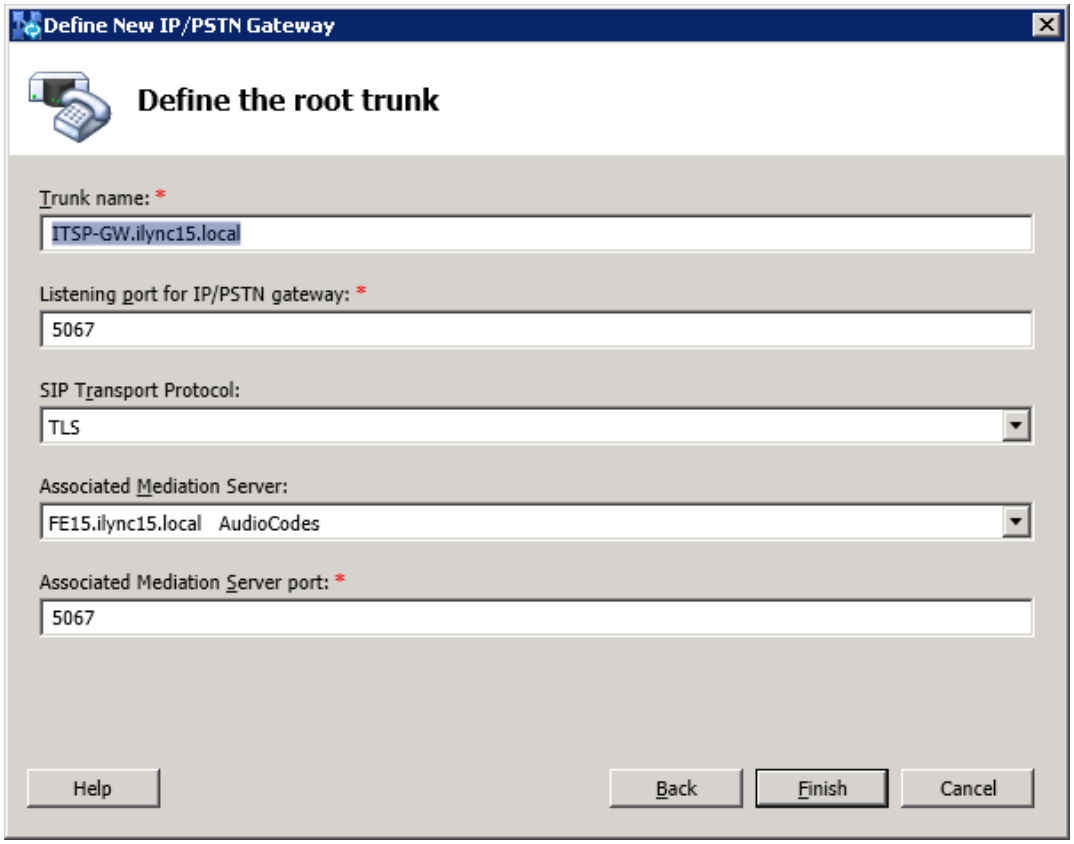
7. Define the listening mode (IPv4 or IPv6) of the IP address of your new PSTN gateway and click **Next**.

**Figure 3-7: Define the IP Address**




8. Click **Next**.
9. Define a **root trunk** for the PSTN gateway. A trunk is a logical connection between a Mediation Server and a gateway, uniquely identified by the combination {Mediation Server FQDN, Mediation Server listening port (TLS or TCP): gateway IP and FQDN, gateway listening port}
   a. When defining a PSTN gateway in Topology Builder, you must define a root trunk to successfully add the PSTN gateway to your topology.
   b. The root trunk cannot be removed until the associated PSTN gateway is removed.

**Figure 3-8: Define the Root Trunk**




c. In the 'Listening Port for IP/PSTN Gateway' field, type the listening port that the SBC will use for SIP messages from the Mediation Server that will be associated with the root trunk of the PSTN gateway (i.e., 5067).

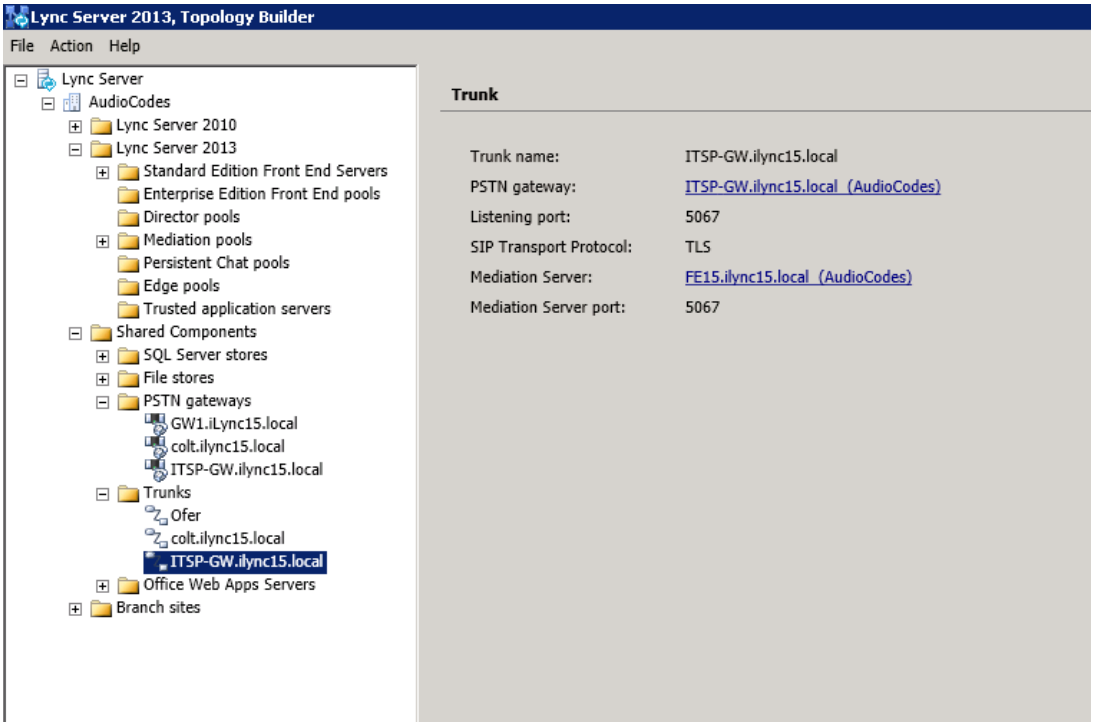
d. In the 'SIP Transport Protocol' field, click the transport type (i.e., TLS) that the trunk uses.

e. In the 'Associated Mediation Server' field, select the Mediation Server pool to associate with the root trunk of this PSTN Gateway.

f. In the 'Associated Mediation Server port' field, enter the listening port that the Mediation Server will use for SIP messages from the SBC (i.e., 5067).

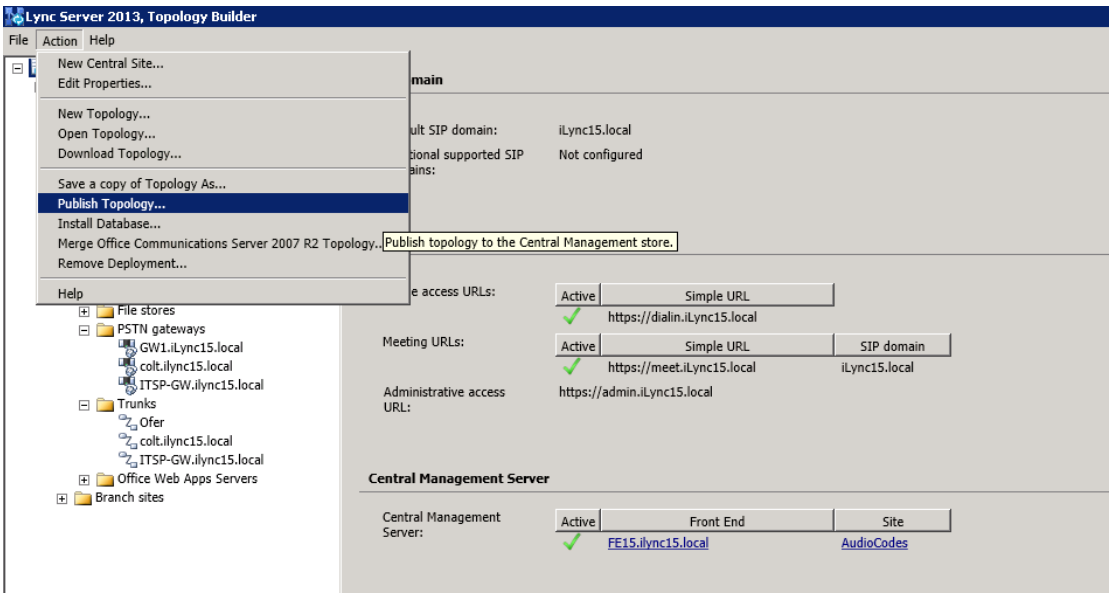
g. Click **Finish**; the SBC is added as a PSTN Gateway and a trunk is created:

**Figure 3-9: SBC Added as an IP/PSTN Gateway and Trunk Created**



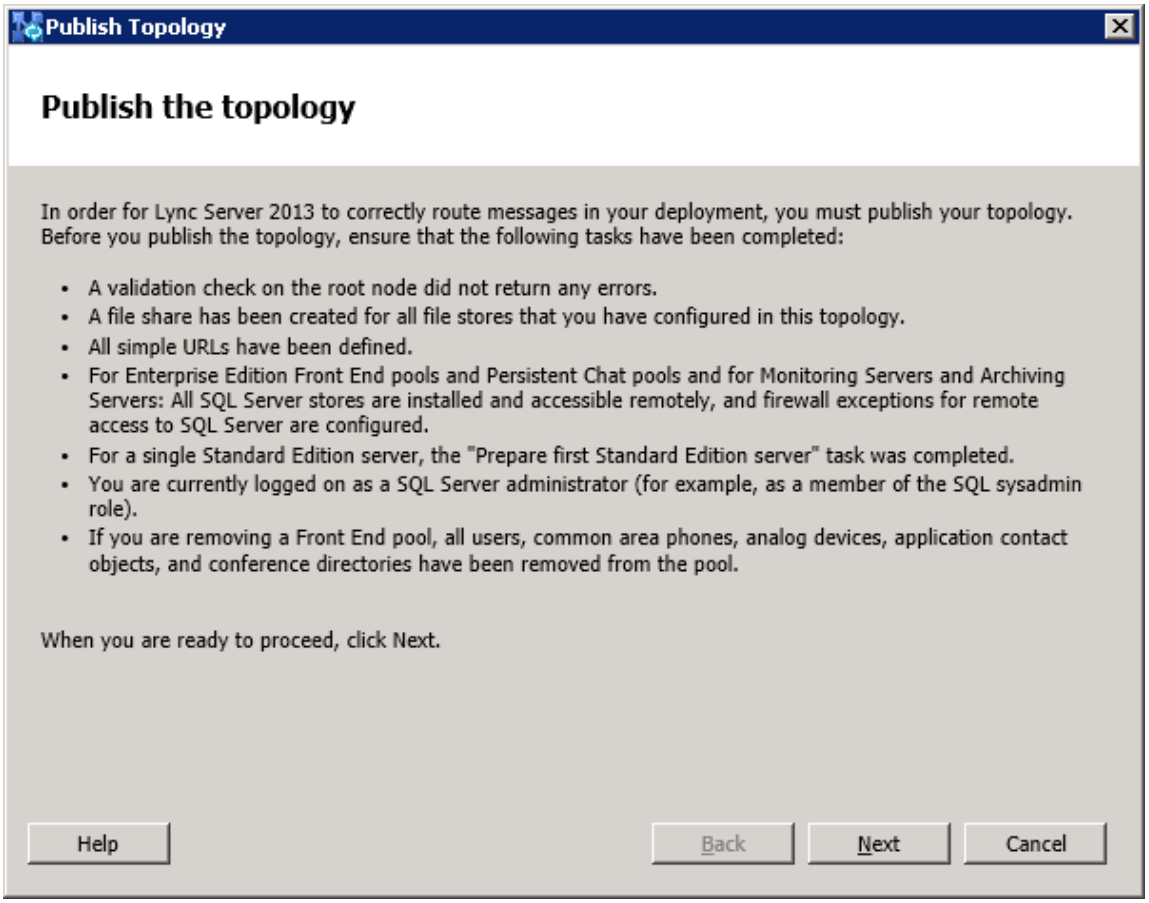

**10.** Publish the Topology; in the main tree, select the root item **Lync Server** and from the **Action** menu, select **Publish Topology**:

**Figure 3-10: Selecting 'Publish Topology' from the 'Action' Menu**



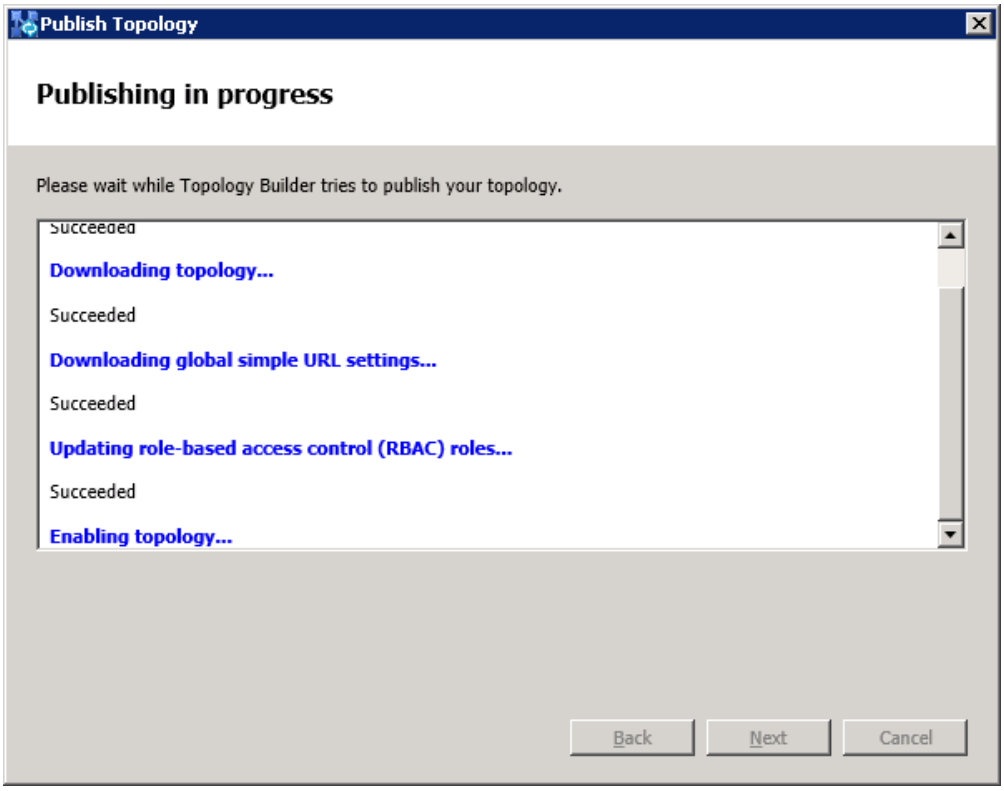
The Publish Topology screen is displayed:

**Figure 3-11: Publish Topology**



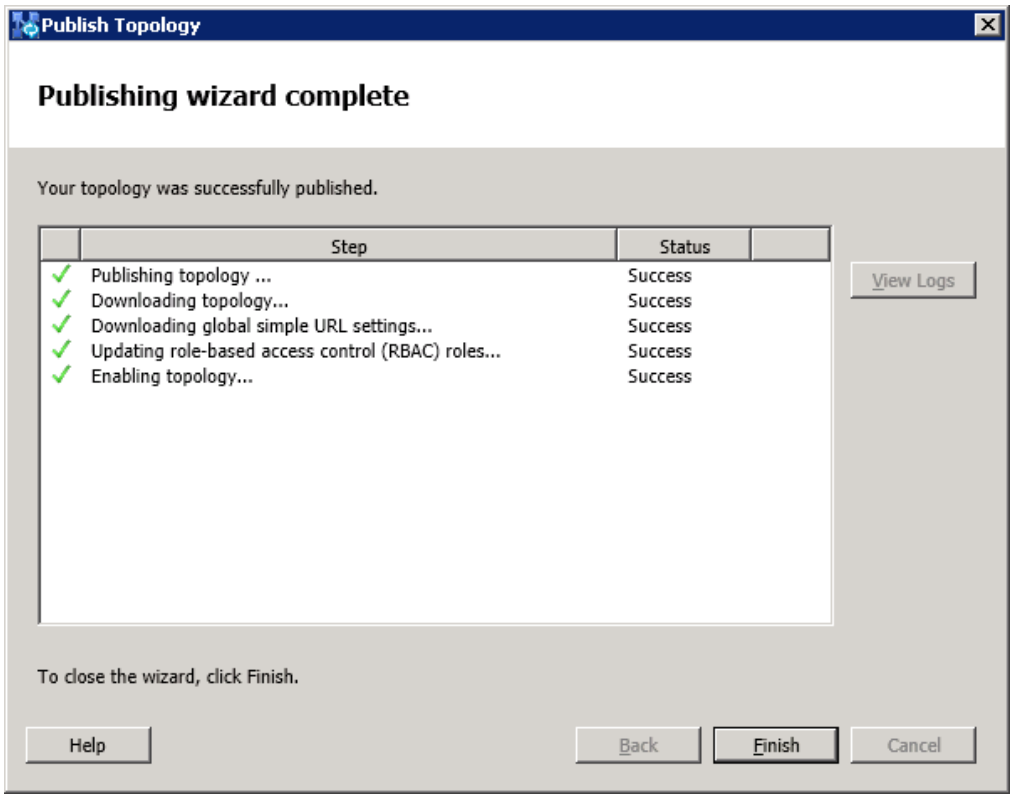
**11.** Click **Next**; the Topology Builder starts publishing your topology:

**Figure 3-12: Publish Topology Progress Screen**




**12.** Wait for the publishing topology process to successfully complete:

**Figure 3-13: Publish Topology Successfully Completed**




**13.** Click **Finish**.

## 3.2 Configuring 'Route' on Lync Server 2013

The procedure below describes how to configure a 'Route' on the Lync Server 2013 and to associate it with the SBC PSTN gateway.

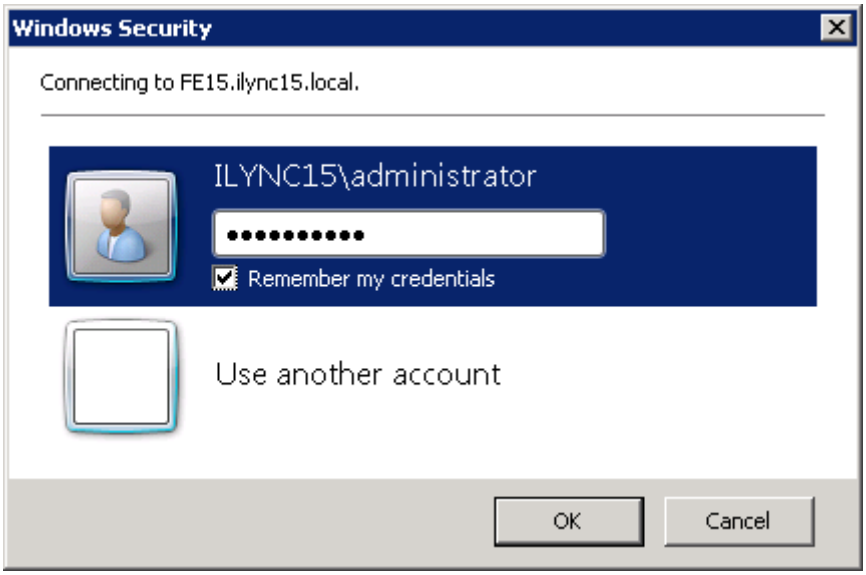
➢ **To configure a 'route' on Lync Server 2013:**

1. Start the Microsoft Lync Server 2013 Control Panel: Click **Start** > **All Programs** > **Microsoft Lync Server 2013** and then click **Lync Server Control Panel**:

**Figure 3-14: Opening the Lync Server Control Panel**

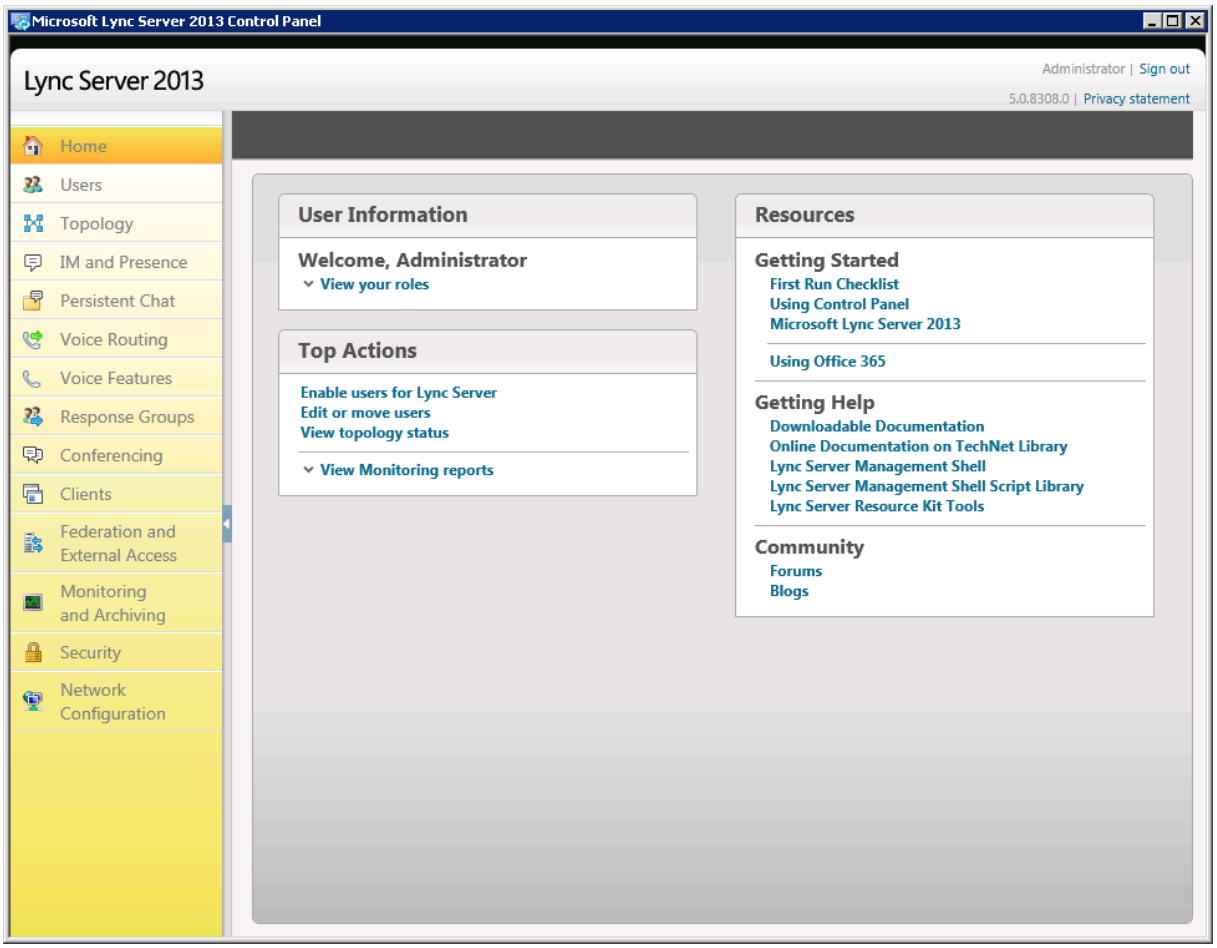
2. You are prompted to enter your login credentials:

**Figure 3-15: Lync Server Credentials**



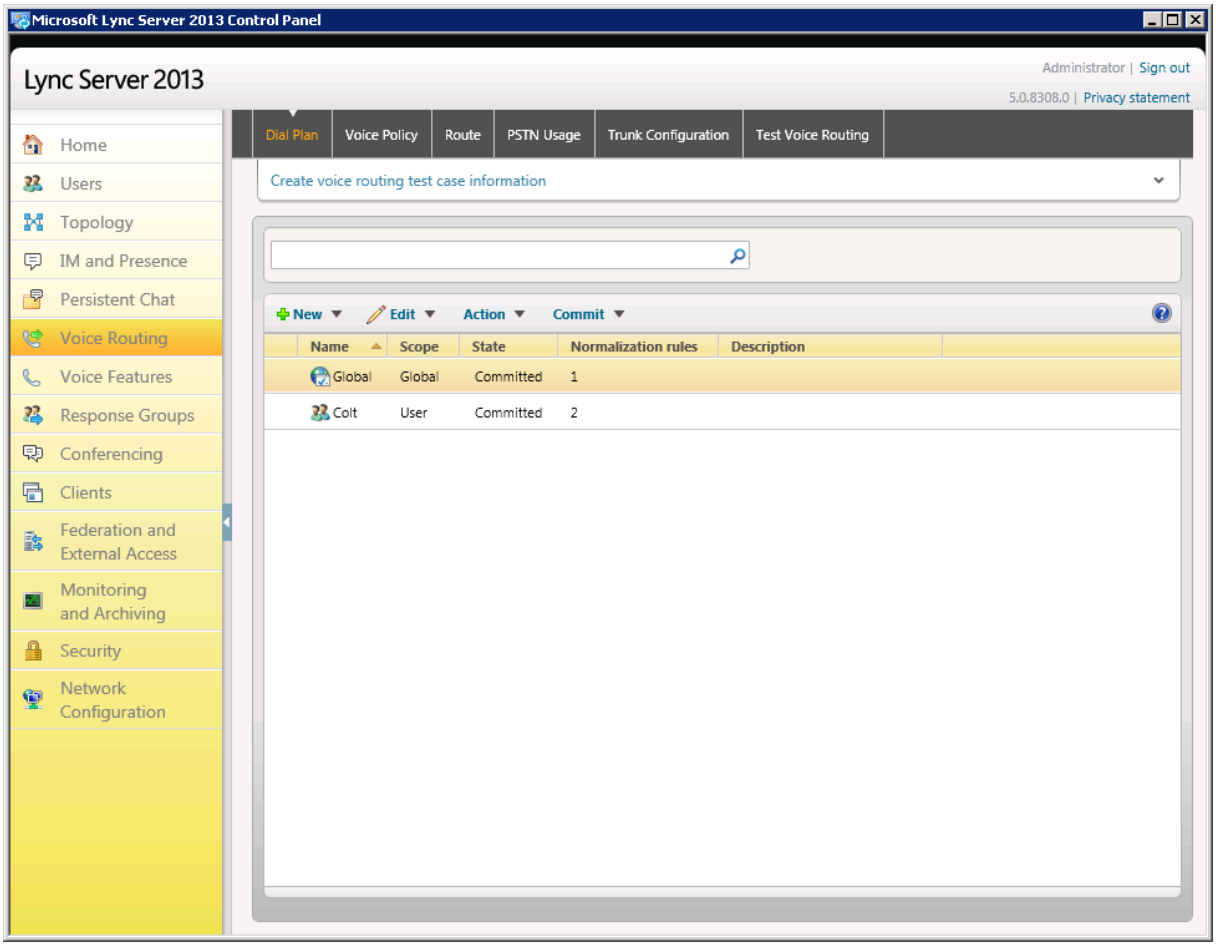

3. Enter your domain 'User name' and 'Password' and click **OK**; the Microsoft Lync Server 2013 Control Panel is displayed:

**Figure 3-16: Microsoft Lync Server 2013 Control Panel**



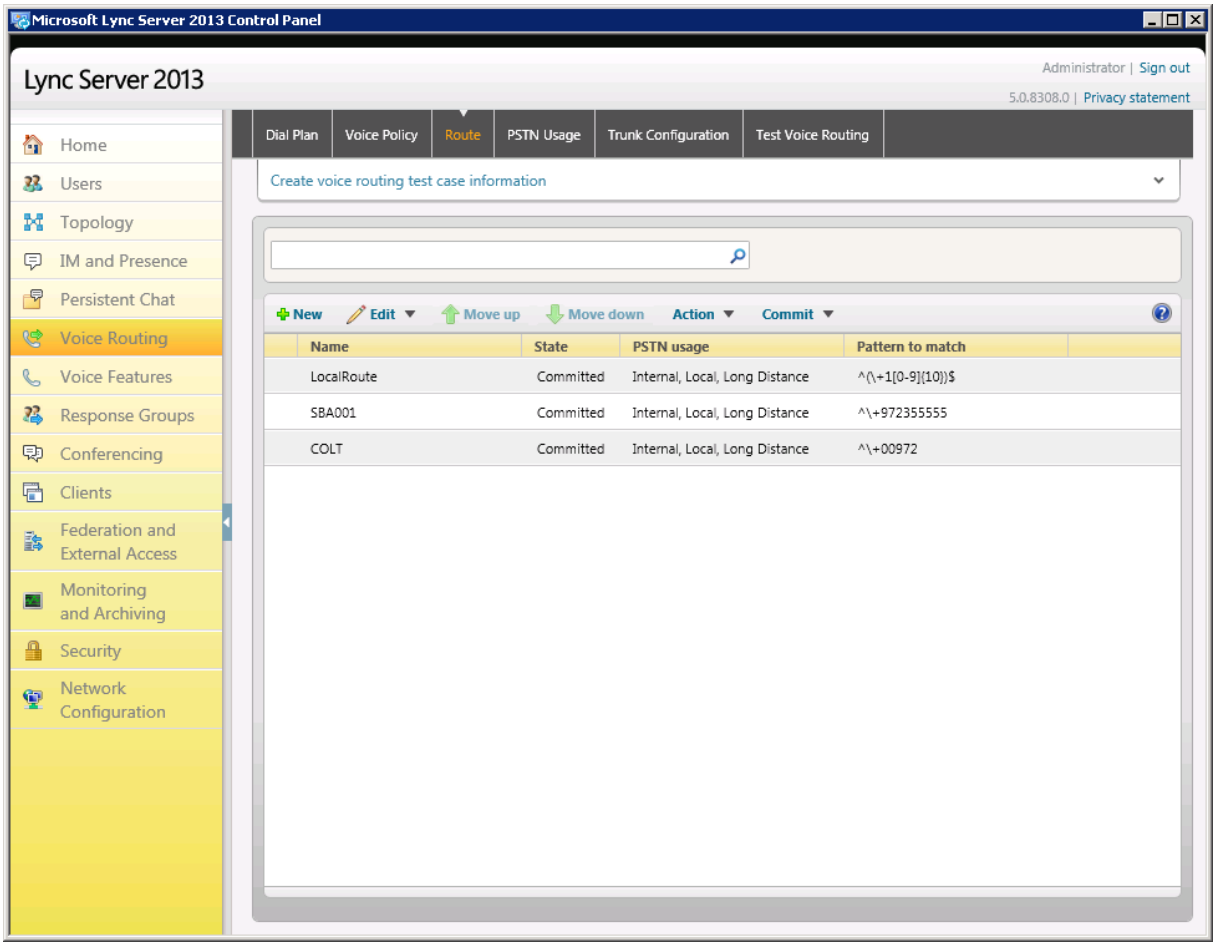
4. In the left navigation pane, select **Voice Routing**:

**Figure 3-17: Voice Routing**



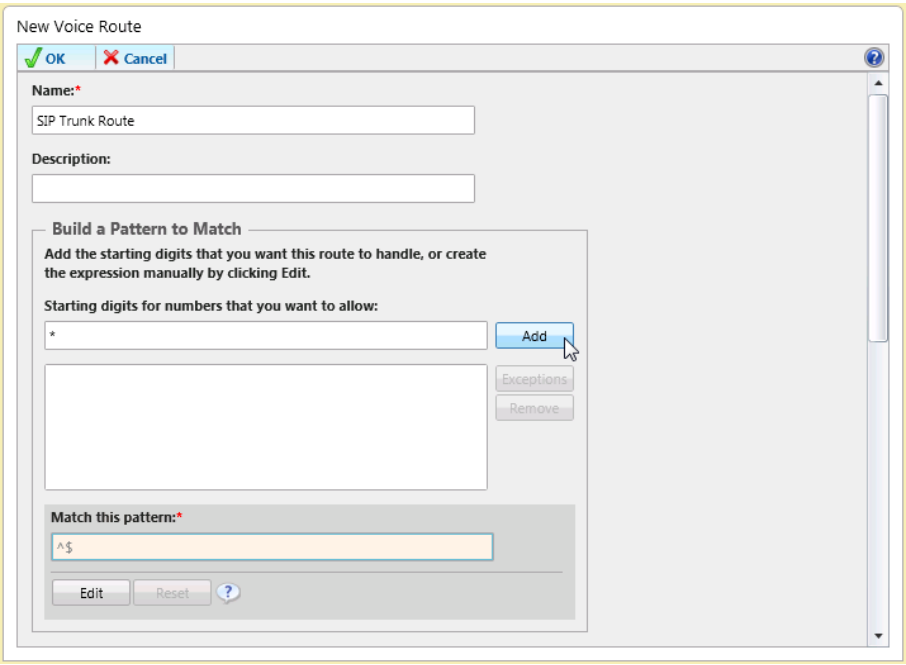
**5.** In the Voice Routing page, click the **Route** tab:

**Figure 3-18: Route Option**



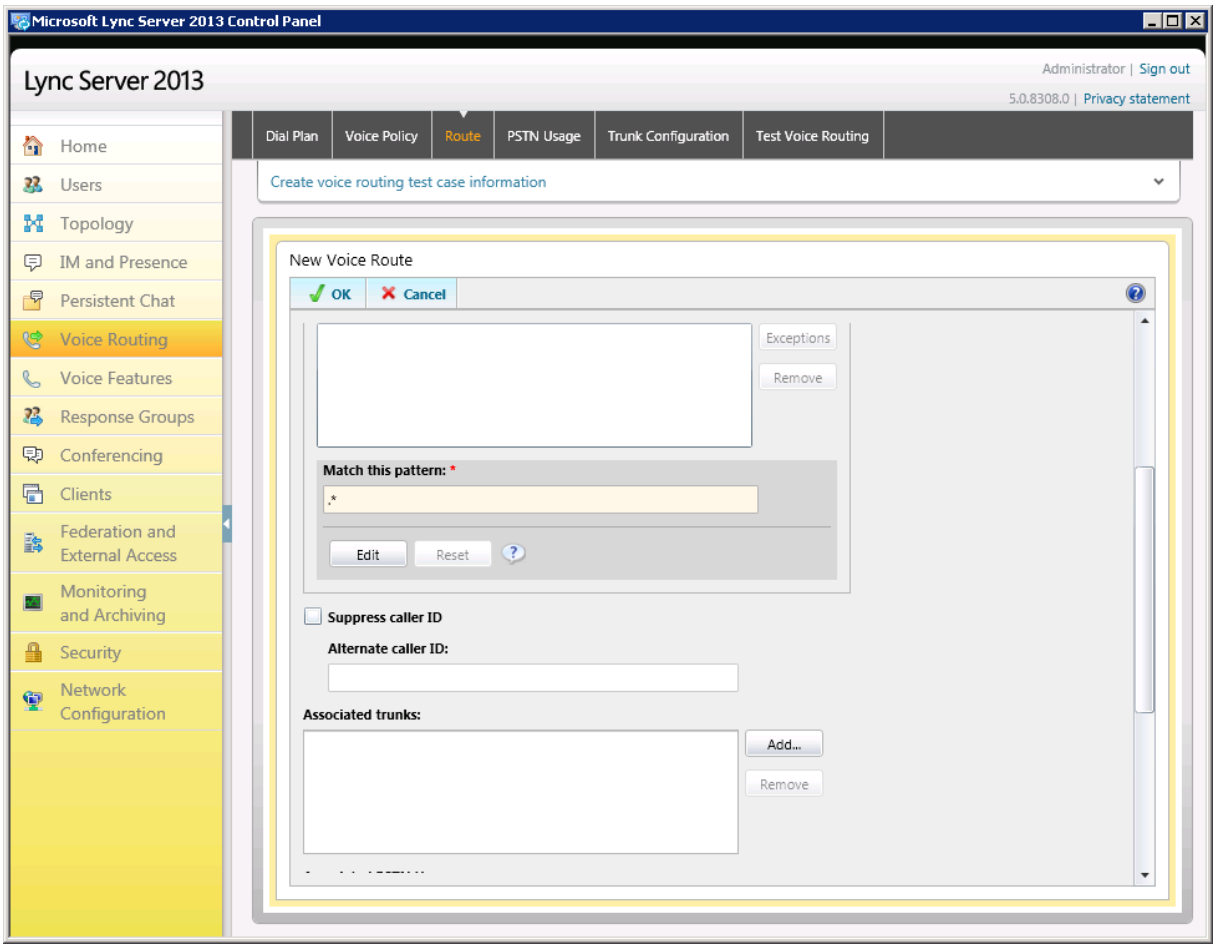

**6.** Click **New**; the New Voice Route dialog opens:

**Figure 3-19: Adding New Voice Route**



7. In the 'Name' field, enter a name for this route (e.g., SIP Trunk Route).
8. In the 'Build a Pattern to Match' field, enter the starting digits you want this route to handle (e.g., *, i.e., to match all numbers).
9. Click **Add**.

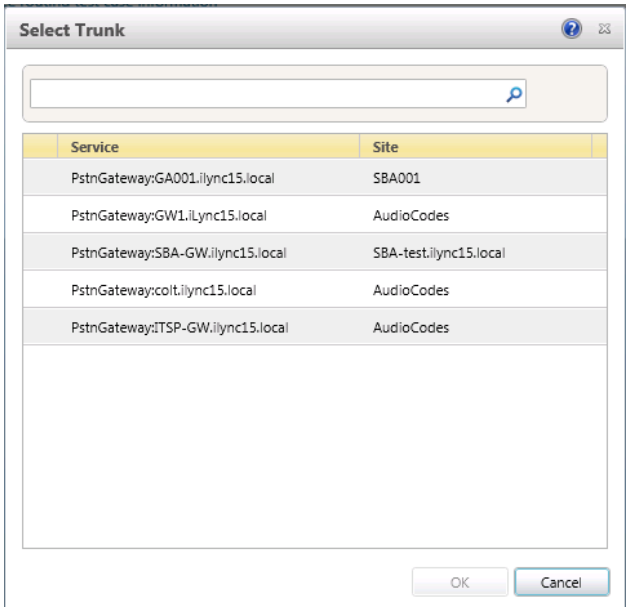
**Figure 3-20: Adding New Trunk**



**10.** Associate the route with the SBC Trunk that you created:

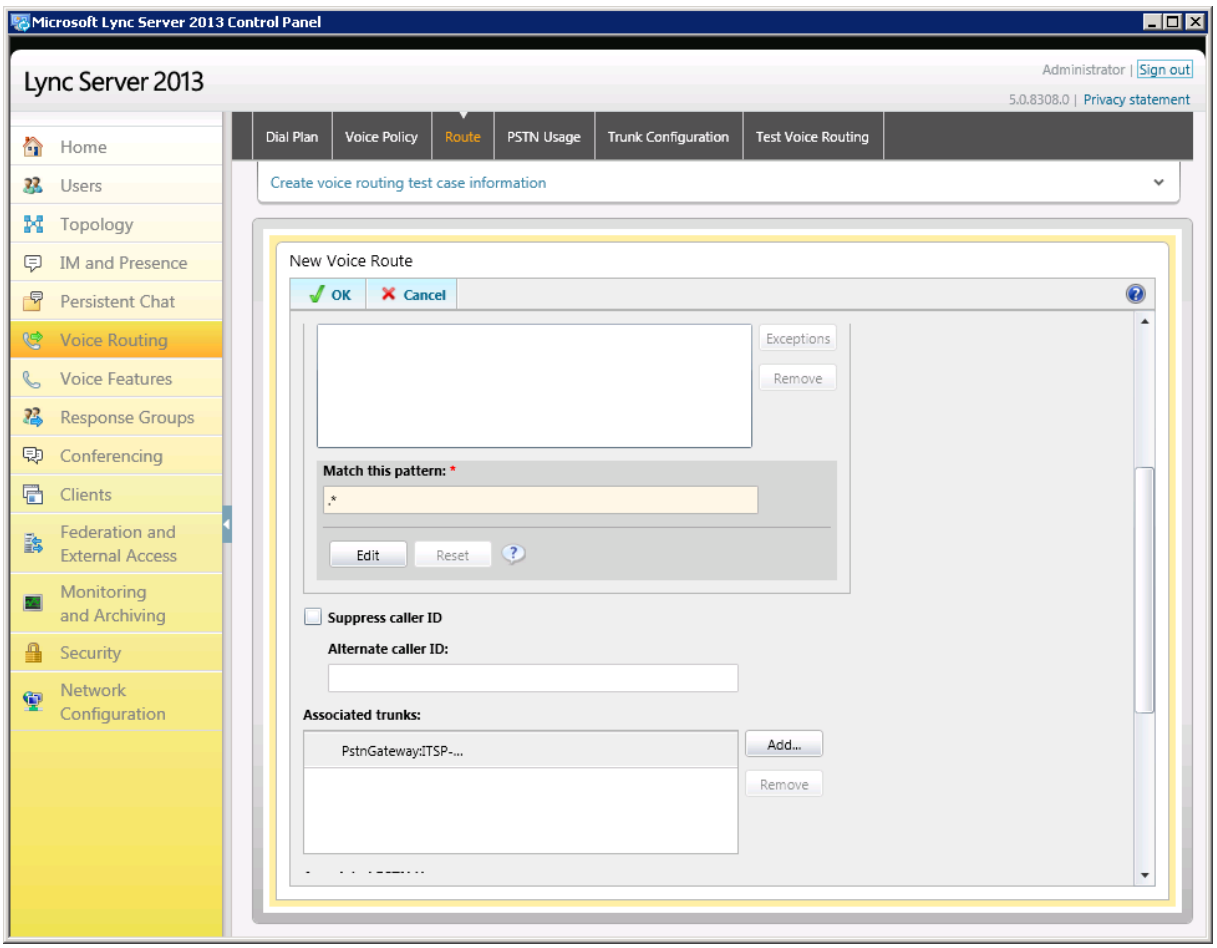
**a.** In the Associated Trunks pane, click **Add**; a list of all the deployed gateways is displayed:

**Figure 3-21: List of Deployed Trunks**



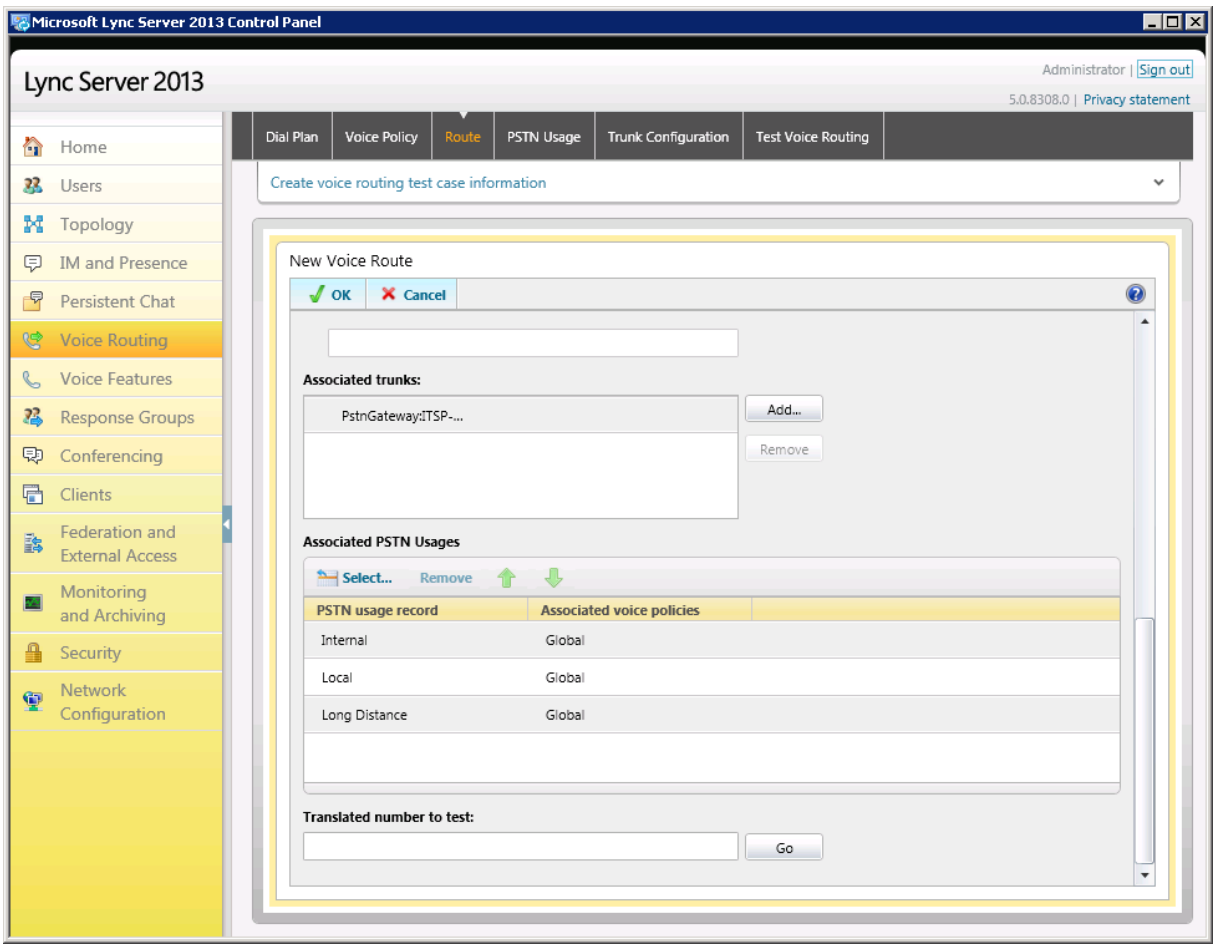

**b.** Select the SBC Trunk you created and click **OK**:

**Figure 3-22: Selected SBC Trunk**



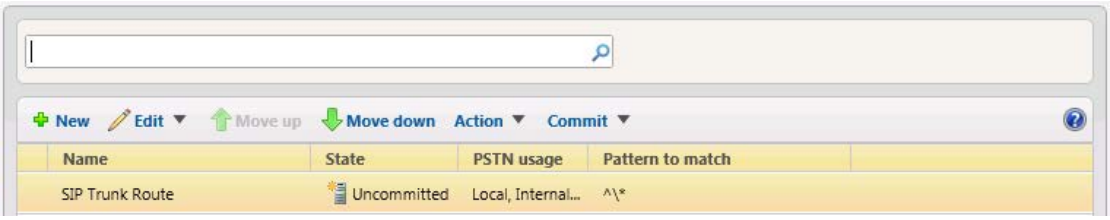
**11.** Associate a PSTN Usage with this route: In the Associated PSTN Usages group, click **Select** and then add the associated PSTN Usage.

**Figure 3-23: Associating PSTN Usage with the Route**



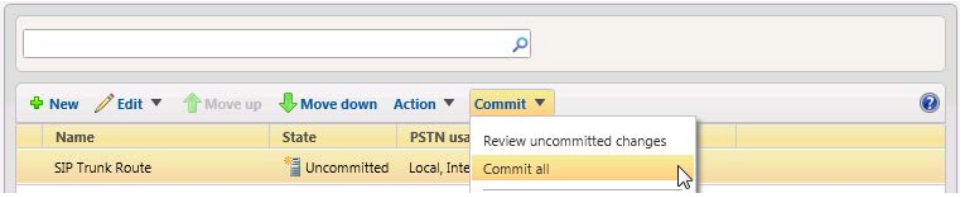

**12.** Click **OK** (located under the New Voice Route section); the New Voice Route (Uncommitted) is displayed:

**Figure 3-24: Confirmation of New Voice Route**



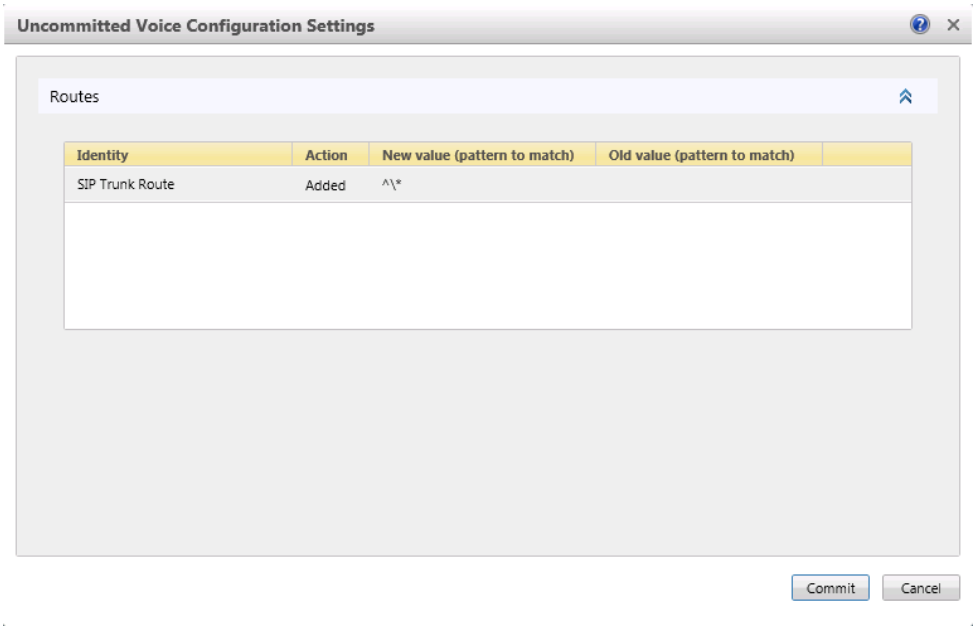
**13.** From the **Commit** drop-down list, choose **Commit all**:

**Figure 3-25: Committing Voice Routes**



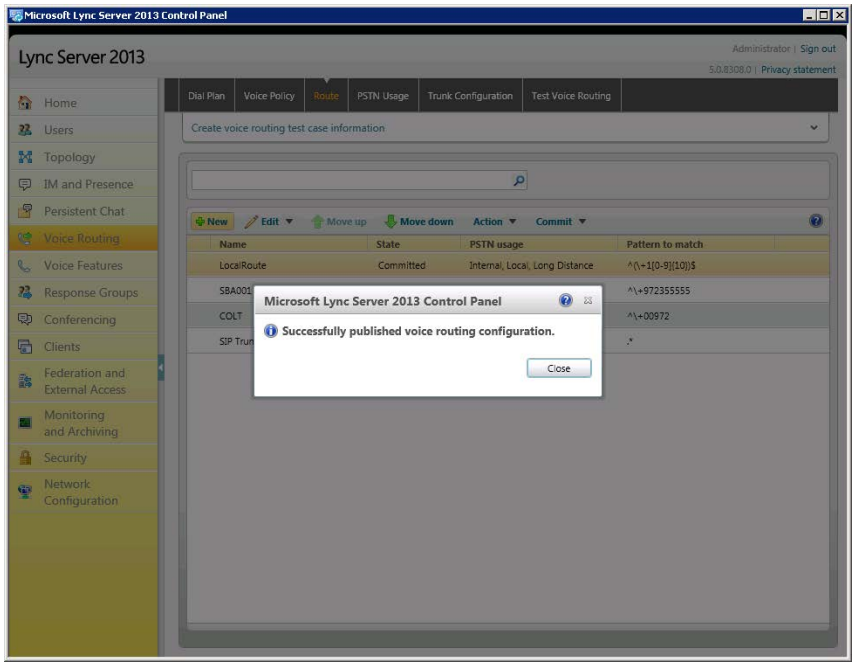

The Uncommitted Voice Configuration Settings dialog opens:

**Figure 3-26: Uncommitted Voice Configuration Settings**



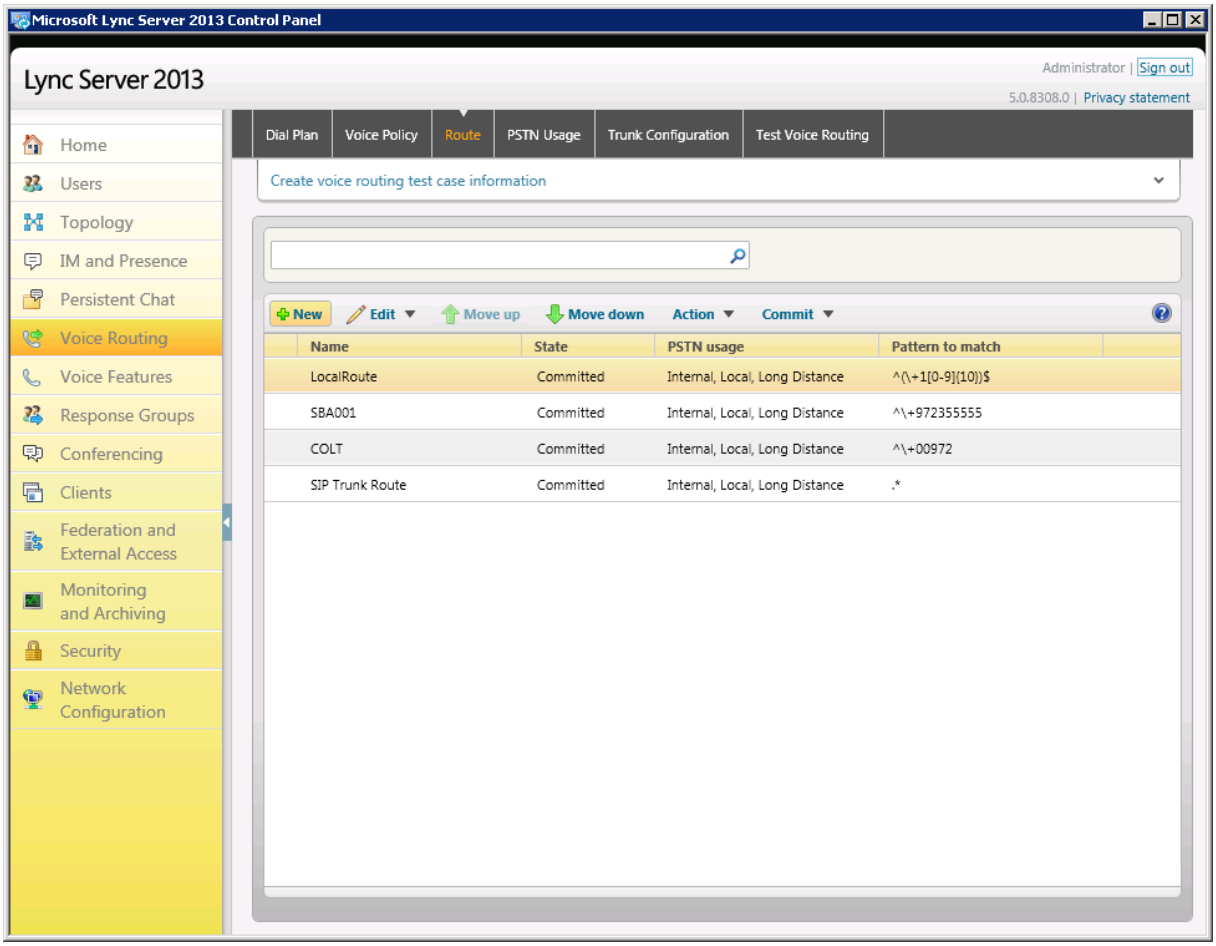

**14.** Click **Commit**; a message is displayed confirming a successful voice routing configuration:

**Figure 3-27: Confirmation of a Successful Voice Routing Configuration**



**15.** Click **Close**; the newly committed Route is displayed in the Voice Routing screen:

**Figure 3-28: Voice Routing Screen Displaying Committed Routes**

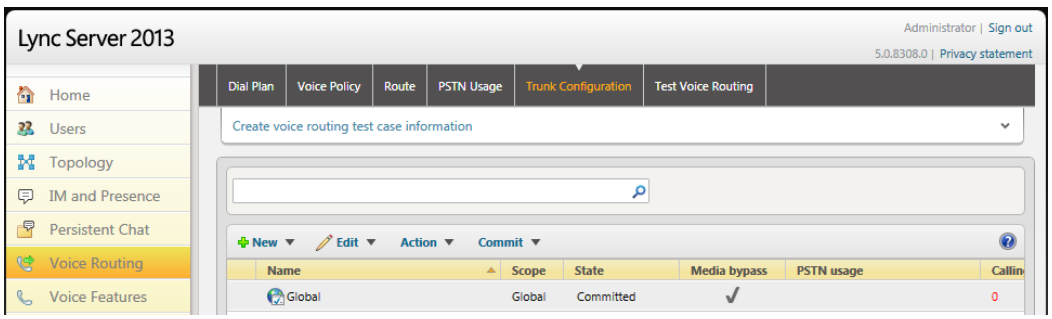



**16.** For ITSPs that implement a call identifier, continue with the following steps:

**Note:** The SIP History-Info header provides a method to verify the identity (ID) of the call forwarder (i.e., the Lync user number). This ID is required by ITSP SIP Trunk in the P-Asserted-Identity header. Using a Message Manipulation rule (see Section 4.12 on page 74), the device adds this ID to the P-Asserted-Identity header in the sent INVITE message.

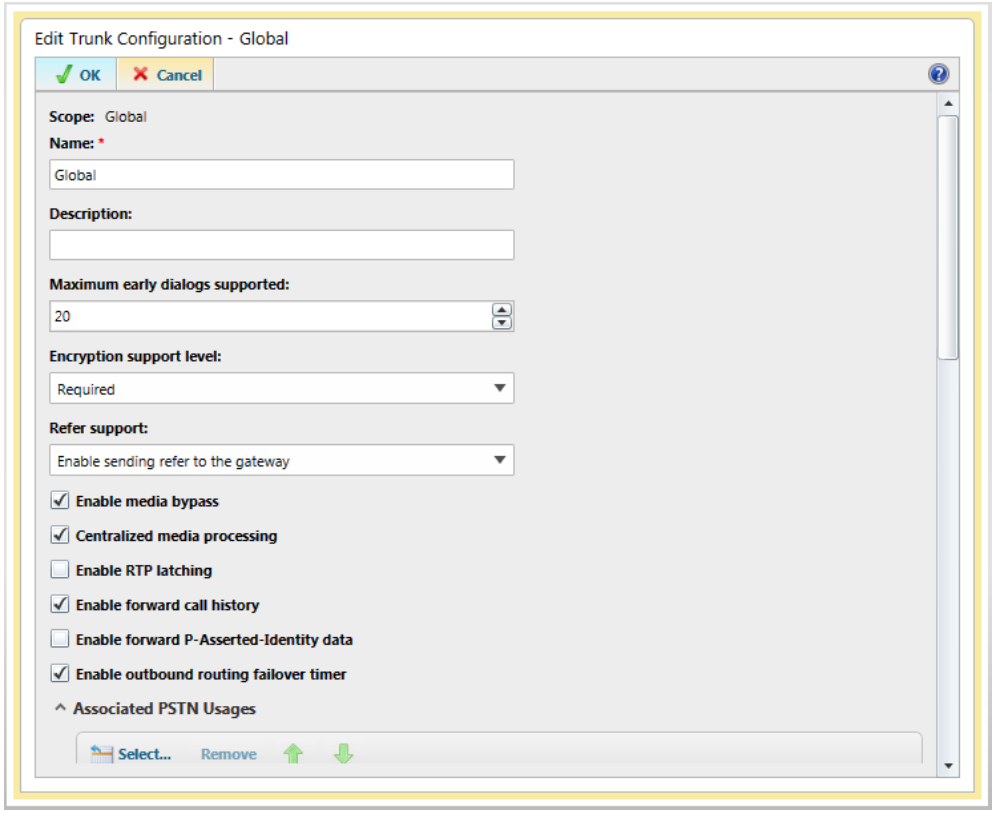
**a.** In the Voice Routing page, select the **Trunk Configuration** tab. Note that you can add and modify trunk configuration by site or by pool.

**Figure 3-29: Voice Routing Screen – Trunk Configuration Tab**



**b.** Click **Edit**; the Edit Trunk Configuration page appears:

**Figure 3-30: Edit Trunk Configuration - Global**




**c.** Select the **Enable media bypass** option.

**d.** Select one of the following options from the the 'Encryption Support Level' dropdown:

- Required - SRTP encryption will be used to help protect traffic between the Mediation Server and the gateway or private branch exchange (PBX).
- Optional - SRTP encryption will be used if the service provider or equipment manufacturer supports it.
- Not Supported **-** SRTP encryption is not supported by the service provider or equipment manufacturer and will therefore not be used.

The option selected depends on customer configuration / requirements.

- If you set 'Encryption Support Level' to **Optional**, make sure the encryption is enabled in PowerShell (https://support.microsoft.com/en-us/kb/2761579):

```
Get-CsMediaConfiguration |Set-CsMediaConfiguration -EncryptionLevel
SupportEncryption
Identity             : Global
EnableQoS            : False
EncryptionLevel      : SupportEncryption
EnableSiren          : False
MaxVideoRateAllowed  : VGA600K
```

**e.** Select the **Enable forward call history** check box, and then click **OK**.

**f.** Repeat Steps 13 through 15 to commit your settings.

**This page is intentionally left blank.**

# 4 Configuring AudioCodes SBC

The procedure below describes how to configure AudioCodes' SBC for interworking between Microsoft Lync Server 2013 and an ITSP's SIP Trunk:

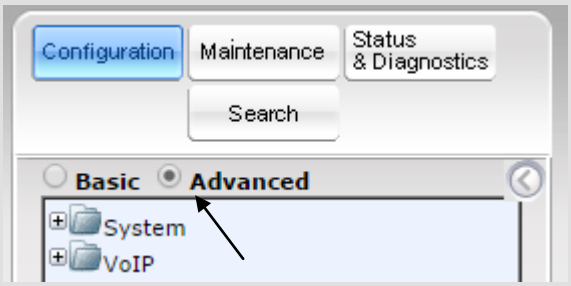
- SBC WAN interface: SIP Trunking environment
- SBC LAN interface: Lync Server 2013 environment

Configure the SBC using the Web-based management interface (embedded Web server).

**Notes:**

- The SBC must be installed with a Software Feature Key that includes the following items:
  - √ **Microsoft**
  - √ **SBC**
  - √ **Security**
  - √ **DSP**
  - √ **RTP**
  - √ **SIP**

  For more information about the Key, contact your AudioCodes representative.
- The scope of this document does *not* cover security aspects of connecting a SIP Trunk to the Microsoft Lync environment. Security measures should be implemented in accordance with your organization's security policies. For basic security guidelines, see the *Recommended Security Guidelines Technical Note*.
- The SBC must be installed with SIP firmware version 6.8 or later.
- Before beginning to configure the SBC, select the **Advanced** option in the Web interface to display the full Navigation tree:




When the SBC is reset, the Web interface reverts to **Basic** display.

- This document applies to Microsoft Lync 2013 *and* to Microsoft Lync 2010.

## 4.1 Step 1: Configuring the SBC's Network Interfaces

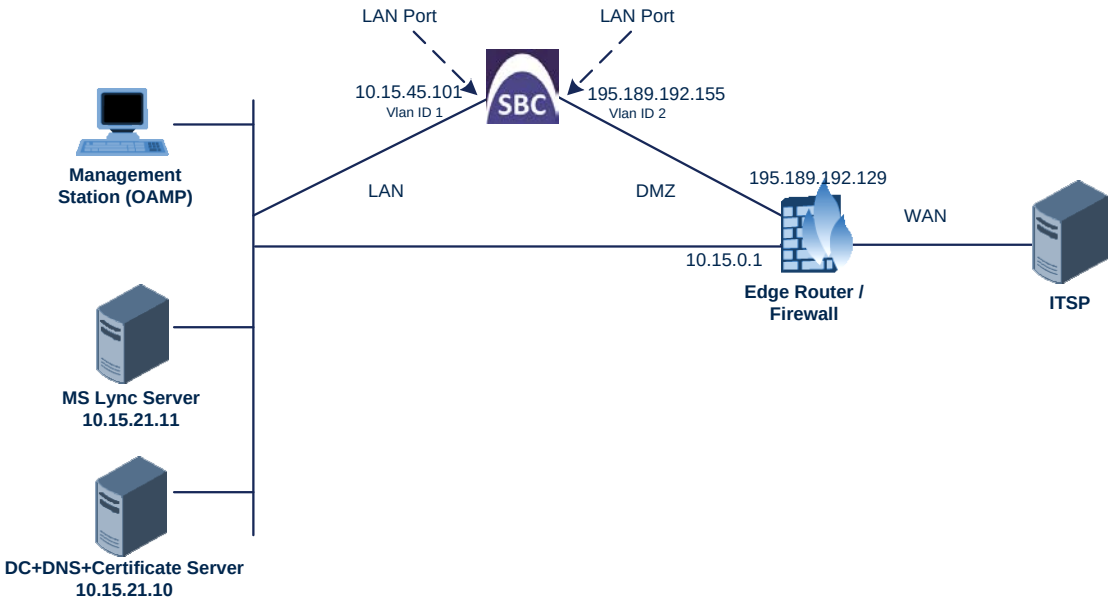
The procedure below describes how to configure the SBC's network interfaces. Several methods can be used. The scenario exemplified in this document uses this method:

- The SBC interfaces are between the Lync servers located on the LAN and the SIP Trunk located on the WAN.
- The SBC connects to the WAN through a DMZ network.

The type of physical LAN connection depends on the method used to connect to the enterprise's network. In this example, the SBC connects to the LAN and WAN using dedicated LAN ports (i.e., two ports and network cables).

In addition, the SBC uses two logical network interfaces; one to the LAN (VLAN ID 1) and one to the WAN (VLAN ID 2).

**Figure 4-1: Network Interfaces**



### 4.1.1 Step 1a: Create Ethernet Port Groups for Port Redundancy

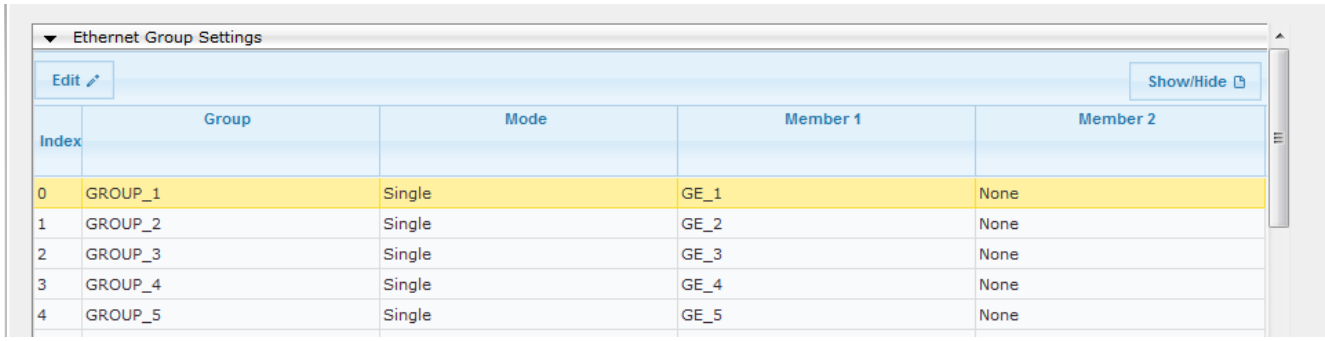
The procedure below describes how to create Ethernet Groups for port redundancy. In our example, two Ethernet Groups need to be configured as follows:

- GROUP_1 with ports 1 (GE_1) and 2 (GE_2)
- GROUP_2 with ports 3 (GE_3) and 4 (GE_4)

➢ **To create Ethernet Groups for port redundancy:**

1. Open the Ethernet Group Settings page (**Configuration** tab > **VoIP** menu > **Network** > **Ethernet Groups Table**).

**Figure 4-2: Configured Ethernet Groups Table Example**




| Index | Group | Mode | Member 1 | Member 2 |
|---|---|---|---|---|
| 0 | GROUP_1 | Single | GE_1 | None |
| 1 | GROUP_2 | Single | GE_2 | None |
| 2 | GROUP_3 | Single | GE_3 | None |
| 3 | GROUP_4 | Single | GE_4 | None |
| 4 | GROUP_5 | Single | GE_5 | None |

2. For GROUP_1 do the following:
   a. Select the index row of GROUP_2 and then click **Edit**.
   b. Remove port GE_2 from this group by setting the 'Member 1' field to **None**.
   c. Select the index row of GROUP_1 and then click **Edit**.
   d. Add port GE_2 to this group by setting the 'Member 2' field to **GE_2**.
3. For GROUP_2 do the following:
   a. Remove ports GE_3 and GE_4 from GROUP_3 and GROUP_4 respectively.
   b. Assign these ports to GROUP_2.

### 4.1.2 Step 1b: Configure the Native VLAN ID

The procedure below describes how to configure the Native VLAN ID for the two network interfaces (LAN and WAN). In the example, the following Native VLAN IDs are used:

- LAN (GROUP_1 ports): Native VLAN ID 1
- WAN (GROUP_2 ports): Native VLAN ID 2

➢ **To configure the Native VLAN ID for LAN and WAN interfaces:**

1. Open the Physical Ports Settings page (**Configuration** tab > **VoIP** menu > **Network** > **Physical Ports Table**).
2. For each of the ports belonging to GROUP_1, do the following:
   a. Select the port and then click **Edit**.
   b. Set the native VLAN field to **1**.
3. For each of the ports belonging to GROUP_2, do the following:
   a. Select the port and then click **Edit**.
   b. Set the native VLAN field to **2**.

**Figure 4-3: Configured Port Native VLAN**

Physical Ports Settings

Edit | Show/Hide

| Index | Port | Mode | Native Vlan | Speed&Duplex | Description | Group Member | Group Status |
|---|---|---|---|---|---|---|---|
| 0 | GE_1 | Enable | 1 | Auto Negotiation | User Port #0 | GROUP_1 | Active |
| 1 | GE_2 | Enable | 1 | Auto Negotiation | User Port #1 | GROUP_1 | Active |
| 2 | GE_3 | Enable | 1 | Auto Negotiation | User Port #2 | GROUP_2 | Active |
| 3 | GE_4 | Enable | 1 | Auto Negotiation | User Port #3 | GROUP_2 | Active |

### 4.1.3 Step 1c: Configure VLANs

The procedure below describes how to define VLANs for the two network interfaces (LAN and WAN). In the example, the following VLAN IDs are used:

- LAN (GROUP_1 ports): VLAN ID 1
- WAN (GROUP_2 ports): VLAN ID 2

➢ **To configure the VLANs:**

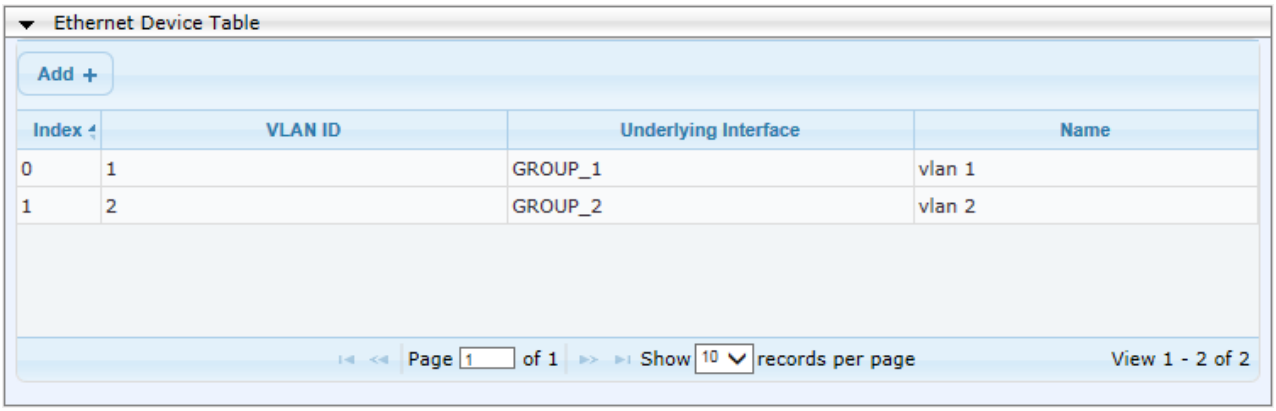
1. Open the Ethernet Device Table page (**Configuration** tab > **VoIP** menu > **Network** > **Ethernet Device Table**).
2. Configure the VLAN for GROUP_1:
   a. Click **Add**.
   b. Configure the Ethernet Device as shown below:

| Parameter | Value |
|---|---|
| VLAN ID | **1** |
| Underlying Interface | **GROUP_1**<br>(Ethernet Group) |
| Name | **vlan 1** |

3. Configure the VLAN for GROUP_2:
   a. Click **Add**.
   b. Configure the Ethernet Device as shown below:

| Parameter | Value |
|---|---|
| VLAN ID | **2** |
| Underlying Interface | **GROUP_2**<br>(Ethernet Group) |
| Name | **vlan 2** |

**Figure 4-4: Configured VLAN IDs in Ethernet Device Table**



### 4.1.4 Step 1d: Configure IP Network Interfaces for LAN and WAN

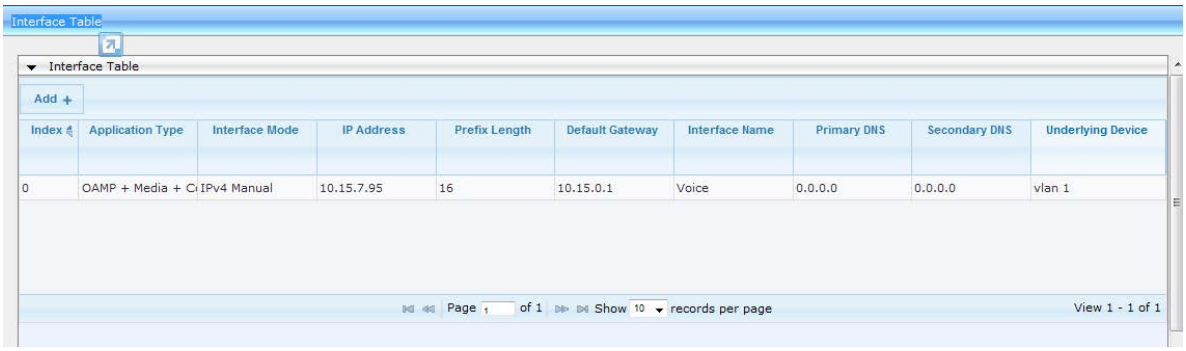
The procedure below describes how to configure the IP network interfaces. In the example, the following IP network interfaces are required:

- LAN VoIP (assigned the identification string "Voice"). This interface is assigned to the Ethernet Device that is configured with Ethernet Group 1 and VLAN 1.
- WAN VoIP (assigned the identification string "WANSP"). This interface is assigned to the Ethernet Device that is configured with Ethernet Group 2 and VLAN 2.

➢ **To configure the interfaces:**

1. Open the Interface Table page (**Configuration** tab > **VoIP** menu > **Network** > **IP Interfaces Table**).

**Figure 4-5: Interface Table**




2. Modify the existing LAN network interface:
   a. Select the row index of the **OAMP + Media + Control** Application Type, and then click **Edit**.
   b. Configure the interface as shown below:

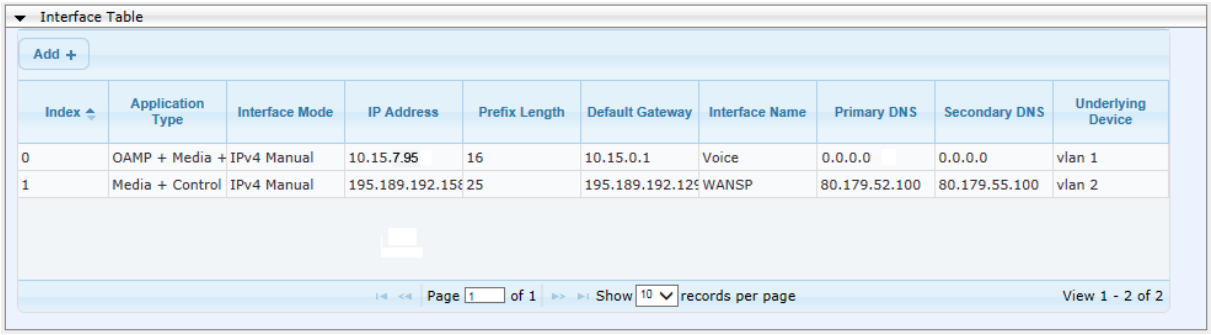
| Parameter | Example Setting for IPv4 | Example Setting for IPv6 |
|---|---|---|
| Application Type | **OAMP + Media + Control** | **Media + Control**<br>(**Note:** The OAMP application can be configured only with IPv4.) |
| Interface Mode | See IPv4 in the SBC documentation. | See IPv6 in the SBC documentation. |
| IP Address | **10.15.7.95** | **2001::101**<br>(only a global address can be entered) |
| Prefix Length | **16** for 255.255.0.0 (subnet mask, in bits) | **64** (only 64 is supported) |
| Default Gateway | **10.15.0.1** | **2001::1** |
| Interface Name | **Voice**<br>(arbitrary descriptive name) | **IP6Voice** |
| Primary DNS Server IP Address | **0.0.0.0** | **2001::10** |
| Secondary DNS Server IP Address | **0.0.0.0** | **2001::10** |
| Underlying Device | **vlan 1** | **vlan 1** |

3. Add a network interface for the WAN:
   a. Click **Add**.
   b. Configure the interface as shown below:

| Parameter | Example Setting for IPv4 | Example Setting for IPv6 |
|---|---|---|
| Application Type | **Media + Control** | **Media + Control** |
| Interface Mode | See IPv4 in the SBC documentation. | See IPv6 in the SBC documentation. |
| IP Address | **195.189.192.155** | **2002::155** |
| Prefix Length | **16** | **64** |
| Default Gateway | **195.189.192.129** | **2002::129** |
| Interface Name | **WANSP** | **IP6WANSP** |
| Primary DNS Server IP Address | **80.179.52.100** | **2001:4860:4860::8888** |
| Secondary DNS Server IP Address | **80.179.55.100** | **2001:4860:4860::8844** |
| Underlying Device | **vlan 2** | **vlan 2** |

4. Click **Submit**.
   The configured IP network interfaces are shown below:

**Figure 4-6: Configured Network Interface in IP Interfaces Table**



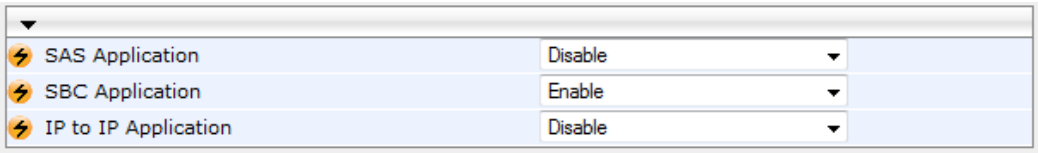
## 4.2 Step 2: Enable the SBC Application

The procedure below describes how to enable the SBC application.

➢ **To enable the SBC application:**

1. Open the Applications Enabling page (**Configuration** tab > **VoIP** menu > **Applications Enabling** > **Applications Enabling**).

**Figure 4-7: Applications Enabling**




2. From the 'SBC Application' drop-down list, select **Enable**.
3. Reset the SBC with a **burn to flash** for this setting to take effect (see Section 4.16 on page 81).

# 4.3 Step 3: Configuring SRDs

The procedure below describes how to configure Signaling Routing Domains (SRDs). An SRD is a set of definitions comprising IP interfaces, SBC resources, SIP behaviors, and Media Realms.

## 4.3.1 Step 3a: Configure Media Realms

The procedure below describes how to configure Media Realms. A Media Realm represents a set of ports, associated with an IP interface, used by the SBC to transmit or receive media (RTP or SRTP). Media Realms are associated with SRDs or IP Groups.

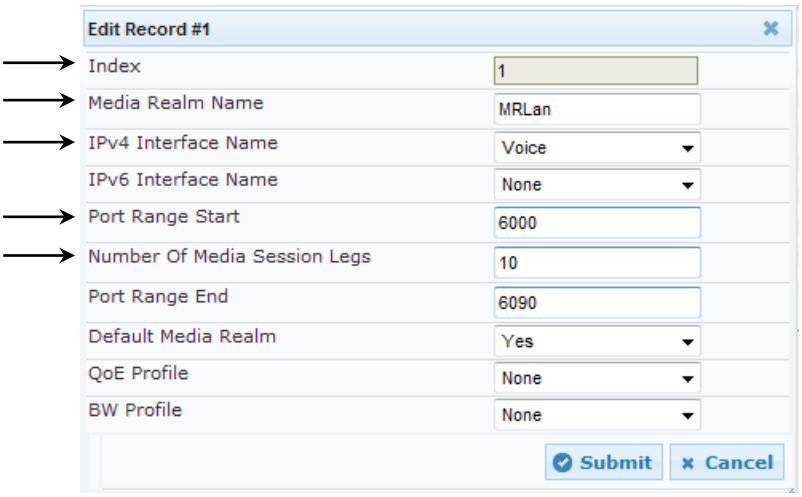
Configure one Media Realm for internal (LAN) traffic and another for external (WAN) traffic as shown below.

➢ **To configure Media Realms:**

1. Open the Media Realm Table page (**Configuration** tab > **VoIP** menu > **VoIP Network** > **Media Realm Table**).
2. Add a Media Realm for the LAN traffic:
   a. Click **Add**.
   b. Configure like this:

| Parameter | Example Setting |
|---|---|
| Index | **1** |
| Media Realm Name | **MRLan** (an arbitrary name) |
| IPv4 Interface Name | **Voice** |
| IPv6 Interface Name | **None**<br>**Note:** Only applicable if using IPv6. |
| Port Range Start | **6000** (represents the lowest UDP port number to be used for media on the LAN) |
| Number of Media Session Legs | **10** (media sessions assigned with the port range) |

**Figure 4-8: Configuring a LAN Media Realm**

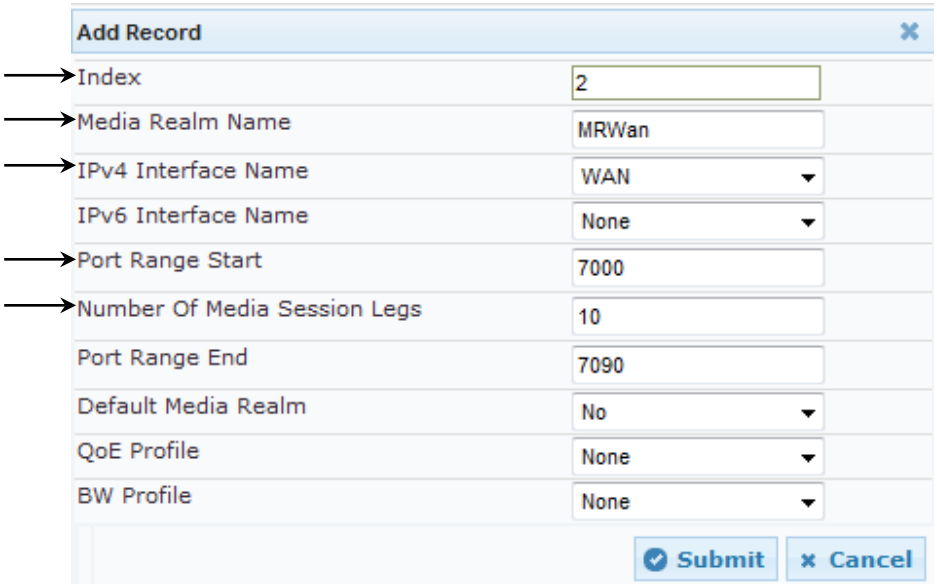



   c. Click **Submit**.

3. Add a Media Realm for the external traffic (WAN):
   a. Click **Add**.
   b. Configure like this:

| Parameter | Example Setting |
|---|---|
| Index | **2** |
| Media Realm Name | **MRWan** (an arbitrary name) |
| IPv4 Interface Name | **WAN** |
| IPv6 Interface Name | **IP6WANSP**<br>**Note:** Only applicable if using IPv6. |
| Port Range Start | **7000** (represents the lowest UDP port number to be used for media on the WAN) |
| Number of Media Session Legs | **10** (media sessions assigned with the port range) |

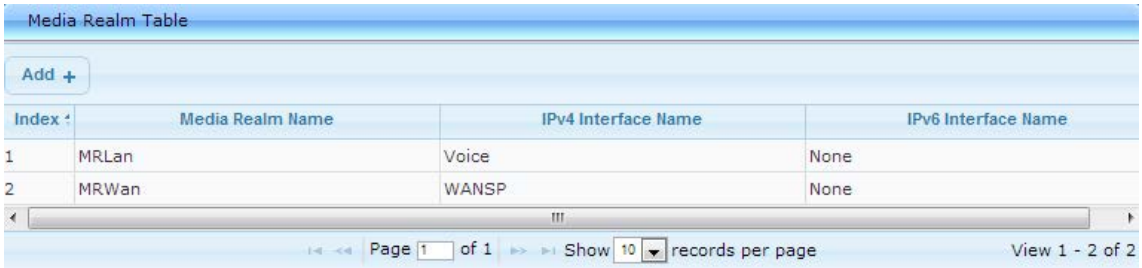
**Figure 4-9: Configuring a WAN Media Realm**




   c. Click **Submit**.

The configured Media Realm table is shown below:

**Figure 4-10: Required Media Realm Table**



### 4.3.2 Step 3b: Configure SRDs

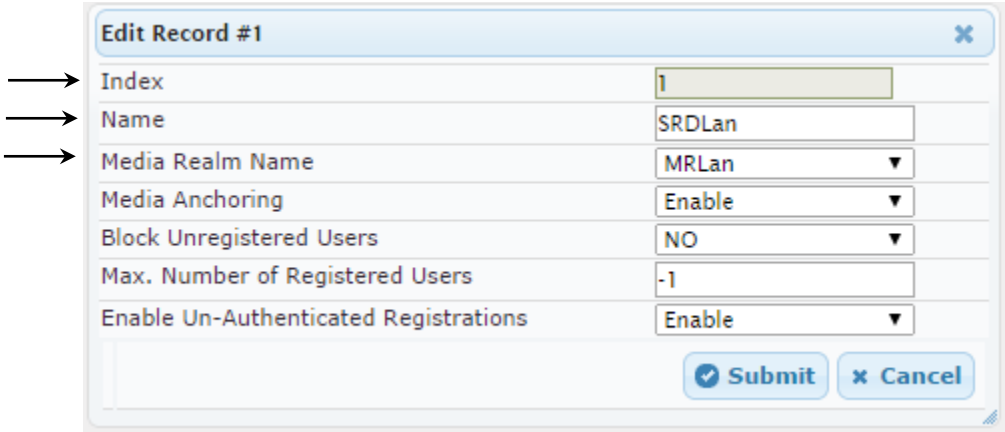
The procedure below describes how to configure SRDs.

➢ **To configure SRDs:**

1. Open the SRD Table page (**Configuration** tab > **VoIP** menu > **VoIP Network** > **SRD Table**).
2. Add an SRD for the SBC's internal interface (toward Lync Server 2013):
   a. Configure these parameters:

| Parameter | Example Setting |
|---|---|
| Index | **1** |
| Name | **SRDLan** (descriptive name for the SRD) |
| Media Realm Name | **MRLan** (associates the SRD with a Media Realm) |

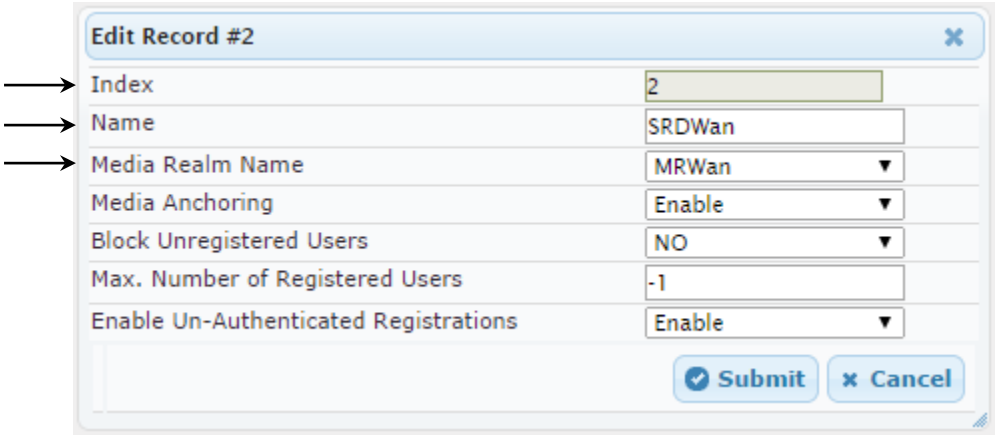
**Figure 4-11: Configuring the LAN SRD Example**




   b. Click **Submit**.
3. Add an SRD for the SBC's external interface (toward the SIP Trunk):
   a. Configure these parameters:

| Parameter | Example Setting |
|---|---|
| SRD Index | **2** |
| SRD Name | **SRDWan** |
| Media Realm Name | **MRWan** |

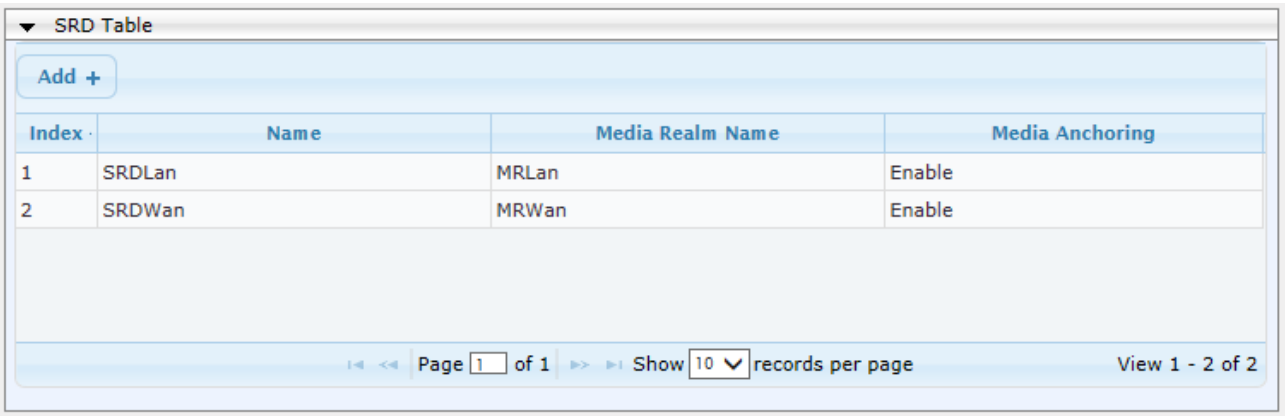
**Figure 4-12: Configuring the WAN SRD**




**b.** Click **Submit**.

The configured SRDs are shown in the figure below:

**Figure 4-13: Configured SRDs in SRD Table**



### 4.3.3 Step 3c: Configure SIP Signaling Interfaces

The procedure below describes how to add SIP interfaces. In the example scenario, an internal and external SIP interface must be added for the SBC.

A SIP Interface consists of a combination of ports (UDP, TCP, and TLS) associated with a specific IP network interface. The SIP Interface is associated with an SRD.

➢ **To add SIP interfaces:**

1. Open the SIP Interface Table page (**Configuration** tab > **VoIP** menu > **VoIP Network** > **SIP Interface Table**).
2. Add a SIP interface for the LAN:
   a. Click **Add**.
   b. Configure these parameters:

| Parameter | Example Setting |
|---|---|
| Index | **1** |
| Network Interface | **Voice** (for IPv4) / **IP6Voice** (for IPv6) |
| Application Type | **SBC** |
| TLS Port | **5067** |
| TCP and UDP | **0** |
| SRD | **1** |

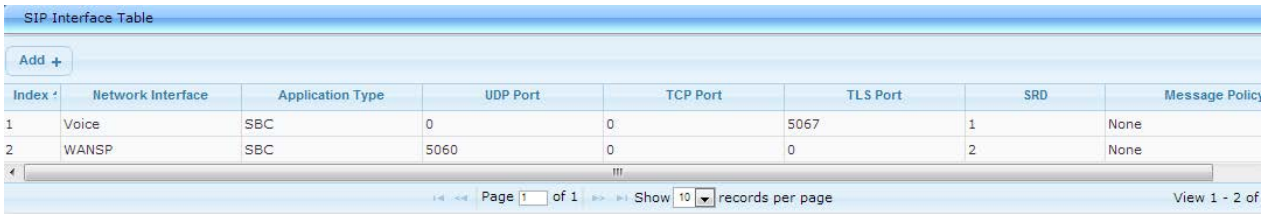
   c. Click **Submit**.
3. Add a SIP interface for the WAN:
   a. Click **Add**.
   b. Configure these parameters:

| Parameter | Example Setting |
|---|---|
| Index | **2** |
| Network Interface | **WANSP** (for IPv4) / **IP6WANSP** (for IPv6) |
| Application Type | **SBC** |
| UDP Port | **5060** |
| TCP and TLS | **0** |
| SRD | **2** |

   c. Click **Submit**.

The configured SIP Interface table is shown below:

**Figure 4-14: Required SIP Interface Table**



## 4.4 Step 4: Configure Proxy Sets

The procedure below describes how to configure the Proxy Sets. A Proxy Set is a group of Proxy servers defined by IP address or fully qualified domain name (FQDN). In the example scenario, two Proxy Sets must be configured for:

- Microsoft Lync Server 2013
- SIP Trunk

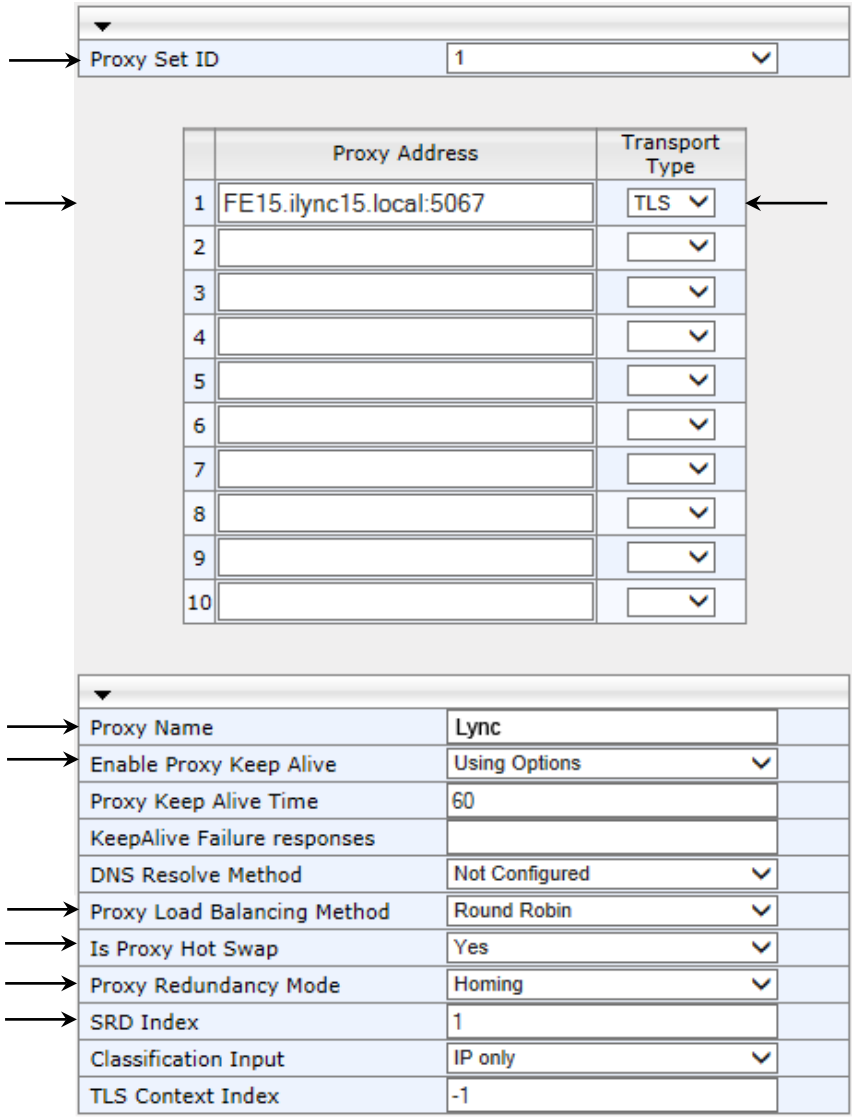
These Proxy Sets will later be associated with IP Groups.

➢ **To add Proxy Sets:**

1. Open the Proxy Sets Table page (**Configuration** tab > **VoIP** menu > **VoIP Network** > **Proxy Sets Table**).
2. Add a Proxy Set for Lync Server 2013:
   a. Configure these parameters:

| Parameter | Example Setting |
|---|---|
| Proxy Set ID | **1** |
| Proxy Address | **FE15.ilync15.local:5067**<br>(the Lync Server 2013 SIP Trunking IP address or FQDN and destination port) |
| Transport Type | **TLS** |
| Proxy Name | **Lync** |
| Enable Proxy Keep Alive | **Using Options** |
| Proxy Load Balancing Method | **Round Robin** |
| Is Proxy Hot Swap | **Yes** |
| Proxy Redundancy Mode | **Homing** |
| SRD Index | **1** |

**Figure 4-15: Proxy Set for Microsoft Lync Server 2013**




**b.** Click **Submit**.

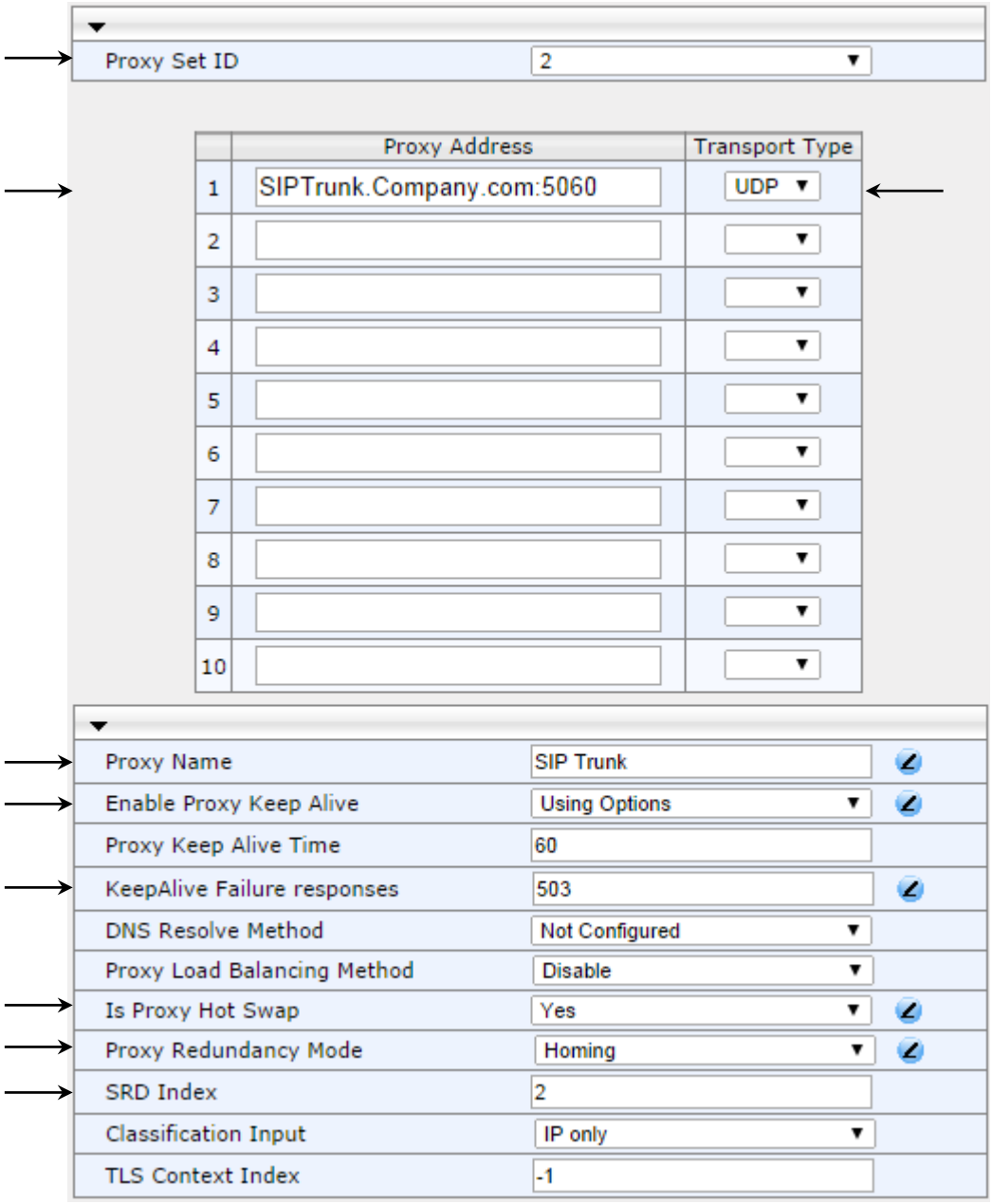
**3.** Add a Proxy Set for the SIP Trunk:

**a.** Configure these parameters:

| Parameter | Example Setting |
|---|---|
| Proxy Set ID | **2** |
| Proxy Address | **SIPTrunk.Company.com:5060**<br>(SIP Trunk IP address or FQDN and destination port) |
| Transport Type | **UDP** |
| Proxy Name | **SIP Trunk** |
| Enable Proxy Keep Alive | **Using Options** |
| KeepAlive Failure responses | **503** (If this is received in response to a keep-alive message using SIP OPTIONS, the SBC considers the proxy as down and tries the next proxy.) |
| Is Proxy Hot Swap | **Yes** |

| | |
|---|---|
| Proxy Redundancy Mode | **Homing** |
| SRD Index | **2** (enables classification by Proxy Set for this SRD in the IP Group belonging to the SIP Trunk) |

**Figure 4-16: Configuring a Proxy Set for the ITSP SIP Trunk**




**b.** Click **Submit**.

## 4.5 Step 5: Configure IP Groups

The procedure below describes how to create IP Groups. An IP Group represents a SIP entity behavior in the SBC's network. In the example scenario, IP Groups are created for:

- Lync Server 2013 (Mediation Server) on the LAN
- SIP Trunk on the WAN

These IP Groups are later used by the SBC application for routing calls.

➢ **To configure IP Groups:**

1. Open the IP Group Table page (**Configuration** tab > **VoIP** menu > **VoIP Network** > **IP Group Table**).
2. Add an IP Group for the Lync Server 2013 Mediation Server:
   a. Click **Add**.
   b. Configure the parameters like this:

| Parameter | Example Setting |
|---|---|
| Index | **1** |
| Type | **Server** |
| Description | **Lync** (a descriptive name) |
| Proxy Set ID | **1** |
| SRD | **1** |
| Media Realm Name | **MRLan** |
| IP Profile ID | **1** |

   c. Click **Submit**.
3. Add an IP Group for the SIP Trunk:
   a. Click **Add**.
   b. Configure the parameters like this:

| Parameter | Example Setting |
|---|---|
| Index | **2** |
| Type | **Server** |
| Description | **SIP Trunk** (a descriptive name) |
| Proxy Set ID | **2** |
| SRD | **2** |
| Media Realm Name | **MRWan** |
| IP Profile ID | **2** |

   c. Click **Submit**.

The figure below shows the configured IP Group table:

**Figure 4-17: Configured IP Group Table**

IP Group Table

Add +

| Index | Type | Description | Proxy Set ID | SIP Group Name | Contact User | SIP Re-Routing Mode | Always Use Route Table | SRD |
|---|---|---|---|---|---|---|---|---|
| 1 | Server | Lync | 1 | | | | No | 1 |
| 2 | Server | SIP Trunk | 2 | | | | No | 2 |

Page 1 of 1 Show 10 records per page View 1 - 2 of 2

## 4.6 Step 6: Configure IP Profiles

The procedure below describes how to configure IP Profiles. In the example scenario, the IP Profiles are used to configure the SRTP / TLS modes and other parameters that differ between the two entities - Lync Server 2013 and SIP Trunk.

Note that the IP Profiles were assigned to the relevant IP Group in the previous step (see Section 4.5 on page 51).

In the example, an IP Profile is added for each entity:

- Microsoft Lync Server 2013 - to operate in secure mode using SRTP and TLS
- SIP Trunk - to operate in non-secure mode using RTP and UDP

➢ **To add IP Profiles:**

1. Open the IP Profile Settings page (**Configuration** tab > **VoIP** menu > **Coders and Profiles** > **IP Profile Settings**).
2. Add an IP Profile for Lync Server 2013:
   a. Configure the parameters like this:

| Parameter | Example Setting |
|---|---|
| Profile ID | **1** |
| Media IP Version Preference | **Only IPv4 / Only IPv6** |
| Reset SRTP State Upon Re-key | **Enable** |
| Extension Coders Group ID | **Coders Group 1** |
| SBC Media Security Behavior | **SRTP** |
| Remote Early Media RTP Behavior | **Delayed** (This field is mandatory because the Lync Server 2013 does not immediately send an RTP to the remote side if it sends a SIP 18x response.) |
| RFC 2833 Behavior | **Extend** (In case the SIP Trunk does not send RFC 2833 in SDP.) |
| Remote Update Support | **Supported Only After Connect** |
| Remote Re-INVITE | **Supported Only With SDP** |
| Remote REFER Behavior | **Handle Locally** (This field is mandatory because Lync Server 2013 does not support receive REFER.) |
| Remote 3xx Behavior | **Handle Locally** (This field is mandatory because Lync Server 2013 does not support receive 3xx.) |
| Remote Hold Format | **Inactive** |

**Figure 4-18: Configured IP Profile for Lync Server 2013 – Common**

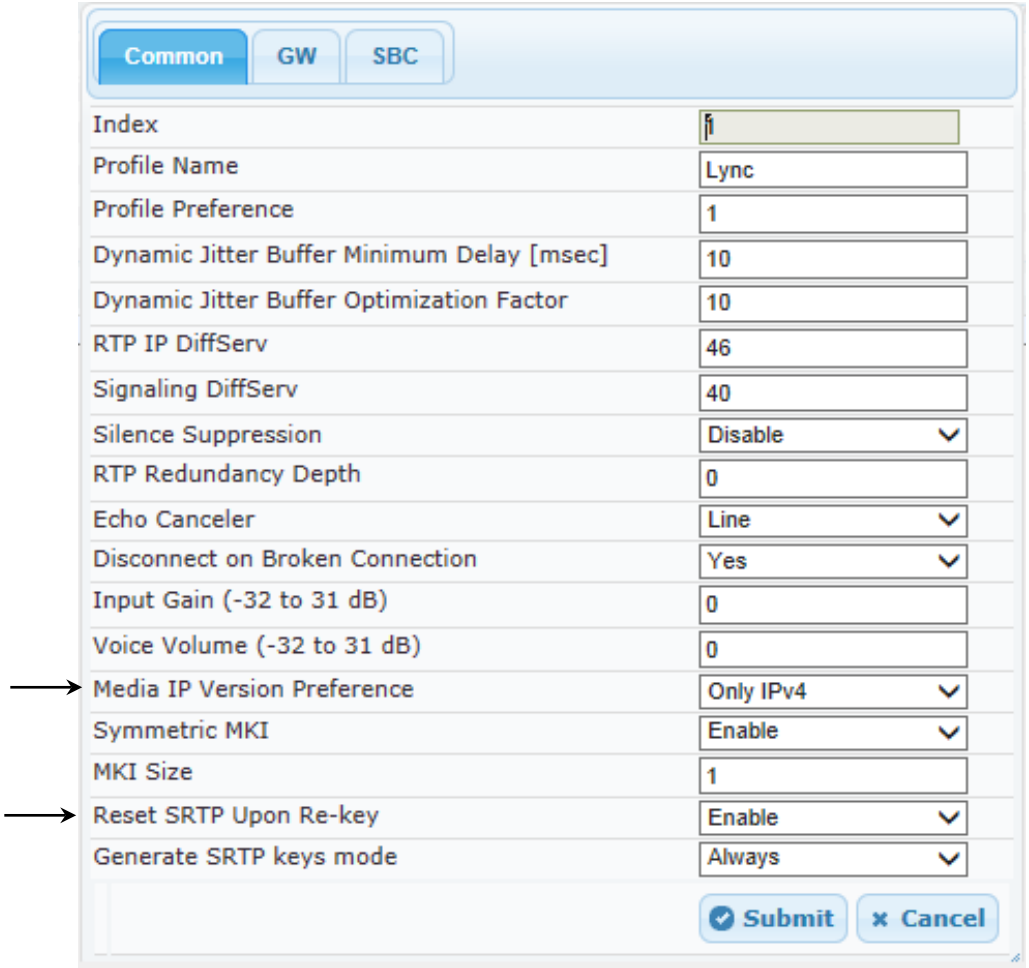
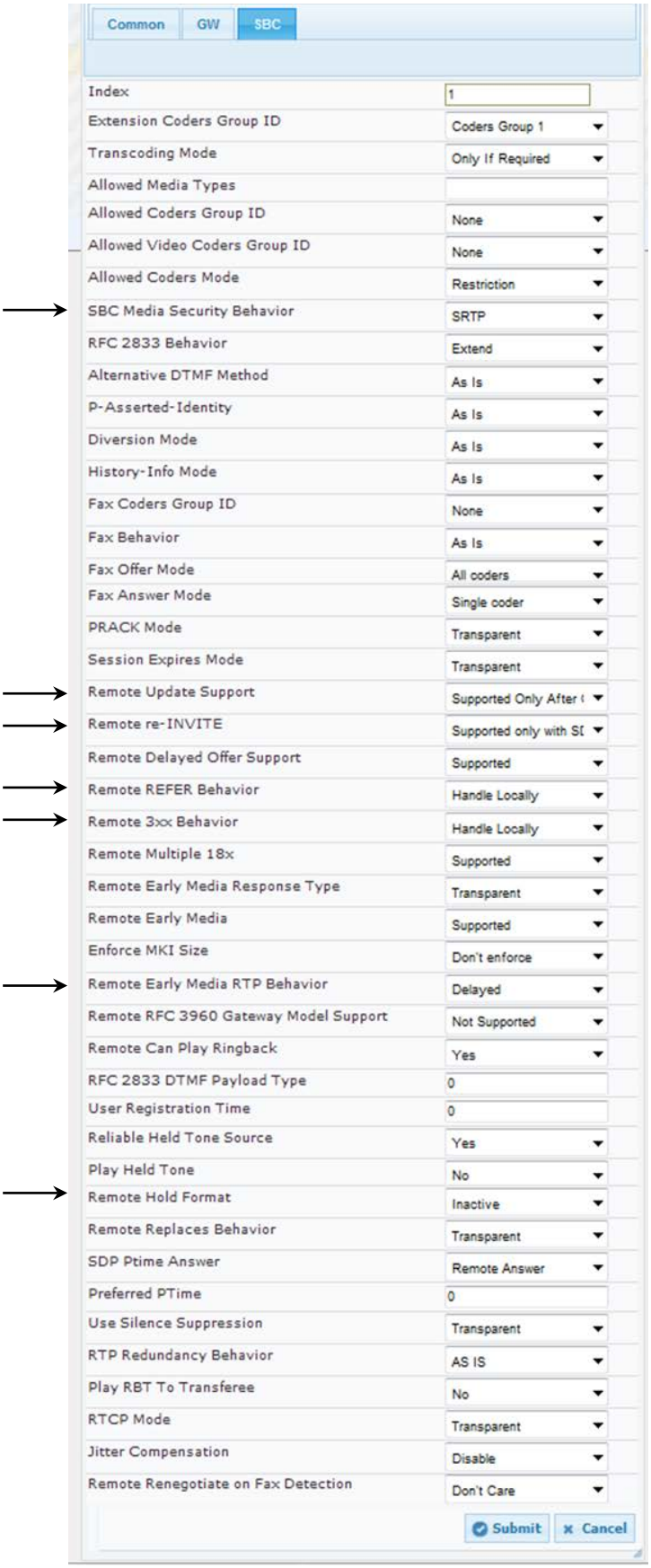


**Figure 4-19: Configured IP Profile for Lync Server 2013 – SBC**



**b.** Click **Submit**.

**3.** Add an IP Profile for the SIP Trunk:

**a.** Configure the parameters like this:

| Parameter | Example Setting |
|---|---|
| Profile ID | **2** |
| Media IP Version Preference | **Only IPv4 / Only IPv6** |
| Extension Coders Group ID | **Coders Group 2** |
| Allowed Coders Group ID | **Coders Group 2** |
| Allowed Coders Mode | **Preference** (enables the received SDP offer to list Allowed coders first and then the original coders received in the SDP). |
| SBC Media Security Behavior | **RTP** |
| Remote REFER Behavior | **Handle Locally** (the SBC handles the incoming REFER request itself, without forwarding the REFER towards the SIP Trunk) |

**Note:** The SIP Trunk's IP Profile depends on the SIP Trunk behavior. Refer to the explanations of the IP Profile parameters in the *SBC User's Manual* in order to configure the profile according to SIP Trunk behavior.

**Figure 4-20: Configured IP Profile for SIP Trunk**

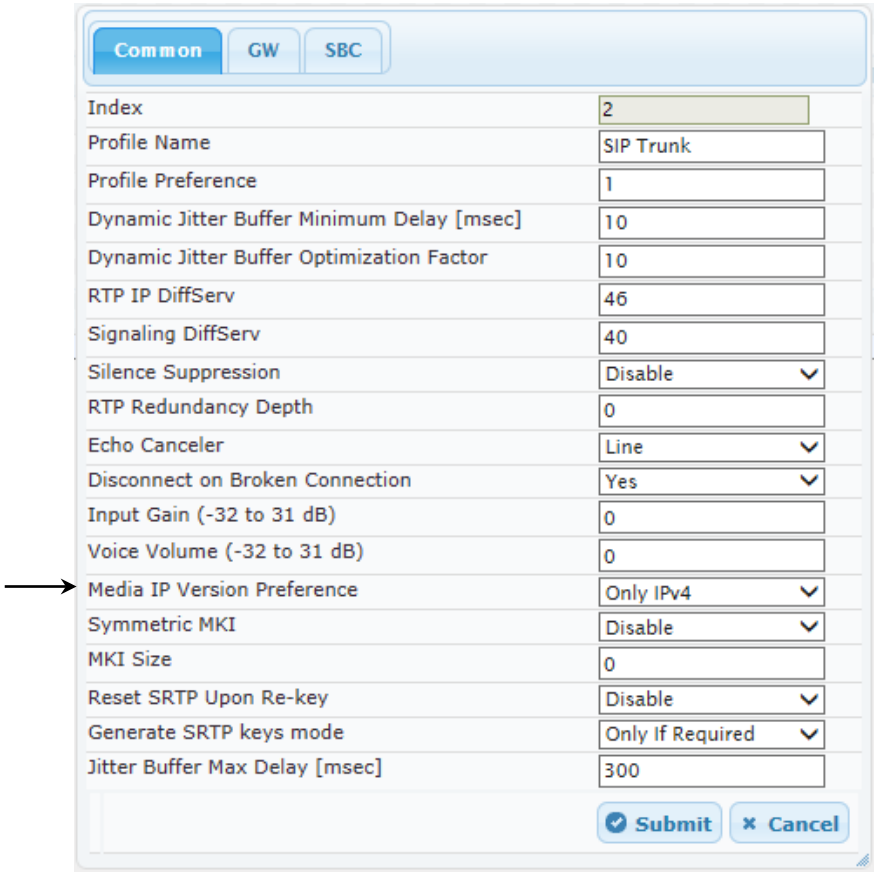
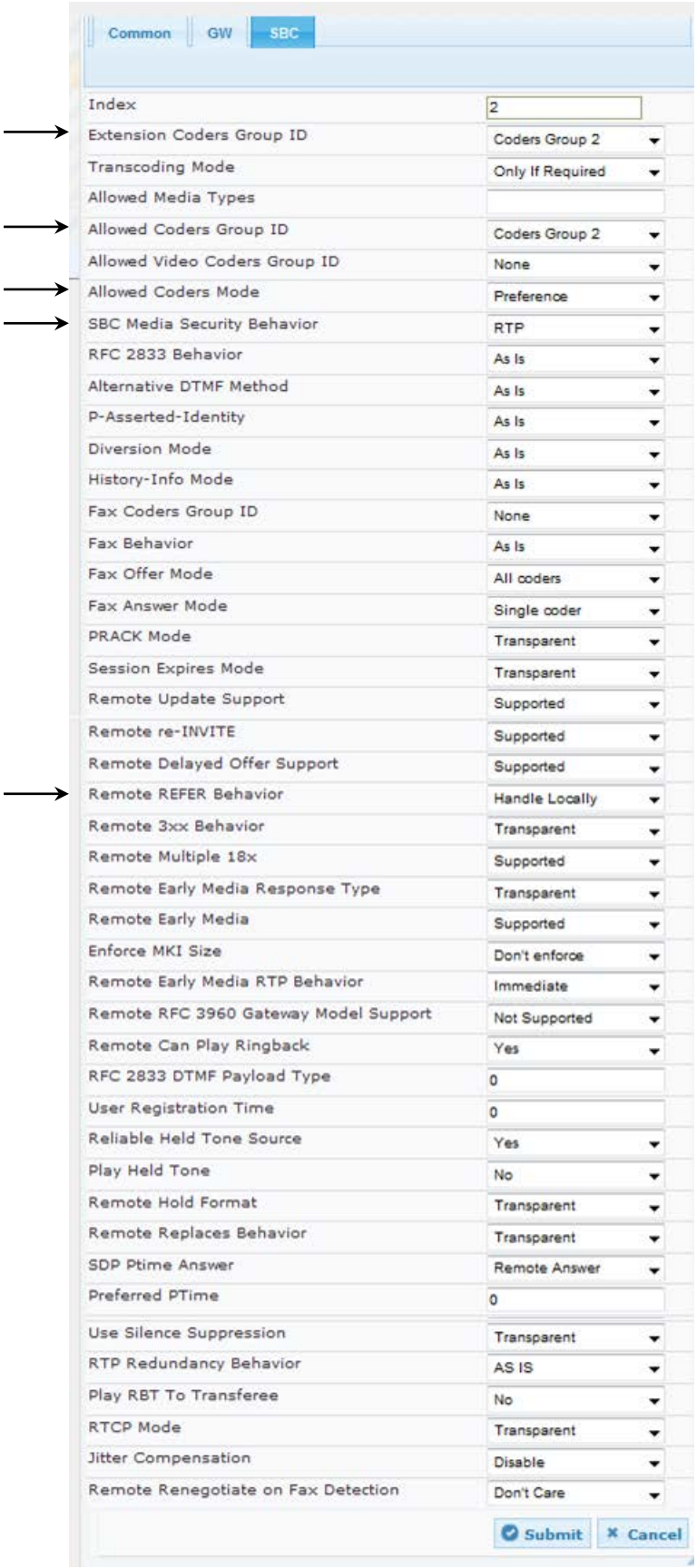


**Figure 4-21: Configured IP Profile for SIP – SBC**




**b.** Click **Submit**.

## 4.7 Step 7: Configure Coders

The procedure below describes how to configure coders (termed *Coder Groups*). You can configure up to four different Coder Groups. As Lync Server 2013 supports the G.711 coder while the network connection to SIP Trunk may restrict you to operate with a lower bandwidth coder such as G.729, you need to add a Coder Group with the G.711 coders for Lync Server 2013, and Coder Group with the G.729 coder for the SIP Trunk.

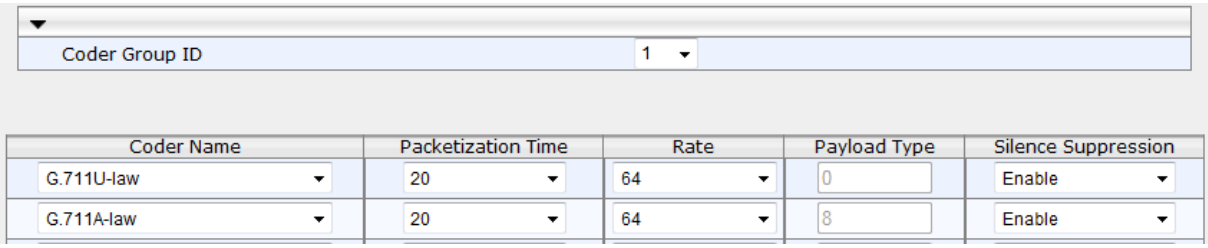
Note that the Coder Group ID for this entity was assigned to its corresponding IP Profile in the previous step (see Section 4.6 on page 53).

➢ **To configure coders:**

1. Open the Coder Group Settings page (**Configuration** tab > **VoIP** menu > **Coders and Profiles** > **Coders Group Settings**).
2. Add a Coder Group for Lync Server 2013.
   a. Configure the parameters like this:

| Parameter | Example Setting |
|---|---|
| Coder Group ID | **1** |
| Coder Name | **G.711 U-law** |
| Coder Name | **G.711 A-law** |
| Silence Suppression | **Enable** |

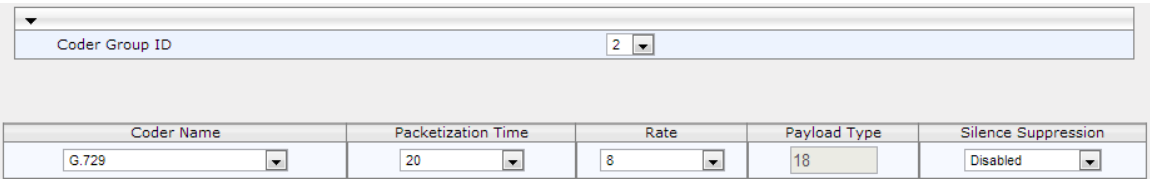
**Figure 4-22: Configured Coder Group for Lync Server 2013**




   b. Click **Submit**.
3. Add a Coder Group for SIP Trunk:
   a. Configure the parameters like this:

| Parameter | Example Setting |
|---|---|
| Coder Group ID | **2** |
| Coder Name | **G.729** |

**Figure 4-23: Configured Coder Group for the SIP Trunk**




   b. Click **Submit**.

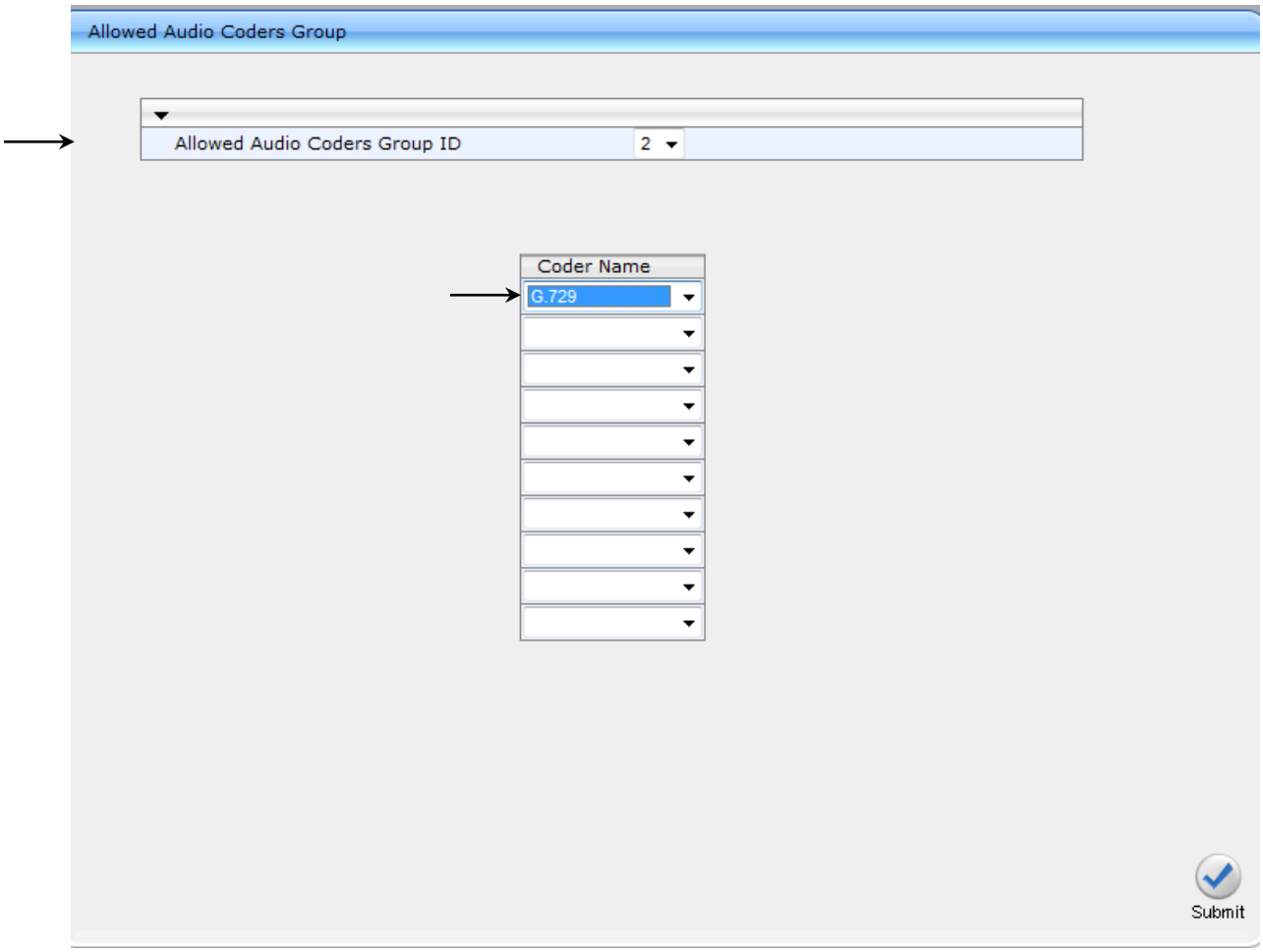
The step below adds an Allowed Coders Group to ensure that voice sent to the SIP Trunk uses the G.729 coder whenever possible.

**Note:** This Allowed Coders Group ID (and its preference) was assigned to the IP Profile belonging to the SIP Trunk in the previous step (see Section 4.6 on page 53).

➢ **To set a preferred coder for the SIP Trunk:**

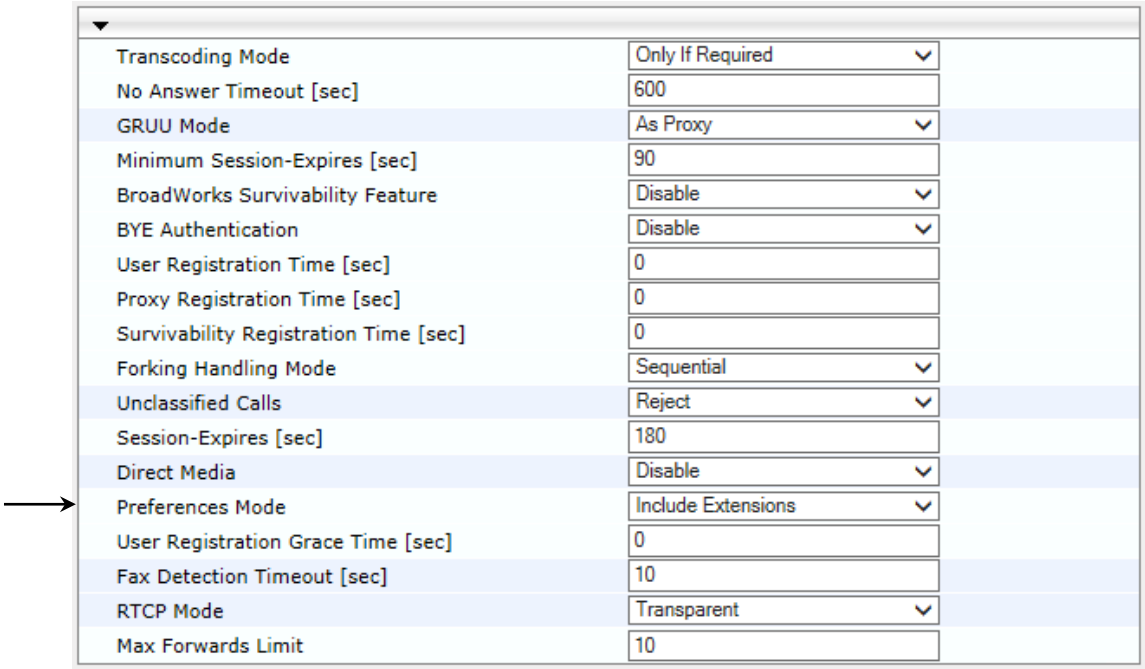
1. Open the Allowed Coders Group page (**Configuration** tab > **VoIP** menu > **SBC** > **Allowed Audio Coders Group**).
2. From the 'Allowed Coders Group ID' drop-down list, select **2**.
3. From the 'Coder Name' drop-down list, select **G.729**.

**Figure 4-24: Allowed Audio Coders Group for SIP Trunk**



4. Open the General Settings page (**Configuration** tab > **VoIP** menu > **SBC** > **General Settings**).

**Figure 4-25: SBC Preferences Mode**



| | |
|---|---|
| Transcoding Mode | Only If Required |
| No Answer Timeout [sec] | 600 |
| GRUU Mode | As Proxy |
| Minimum Session-Expires [sec] | 90 |
| BroadWorks Survivability Feature | Disable |
| BYE Authentication | Disable |
| User Registration Time [sec] | 0 |
| Proxy Registration Time [sec] | 0 |
| Survivability Registration Time [sec] | 0 |
| Forking Handling Mode | Sequential |
| Unclassified Calls | Reject |
| Session-Expires [sec] | 180 |
| Direct Media | Disable |
| Preferences Mode | Include Extensions |
| User Registration Grace Time [sec] | 0 |
| Fax Detection Timeout [sec] | 10 |
| RTCP Mode | Transparent |
| Max Forwards Limit | 10 |

5. From the '**Preferences Mode**' drop-down list, select **Include Extensions**.
6. Click **Submit**.

# 4.8 Step 8: Configure SIP TLS Connection

The procedure below describes how to configure the SBC to use a TLS connection with the Lync Server 2013 Mediation Server. This step is mandatory for a secure SIP TLS connection.

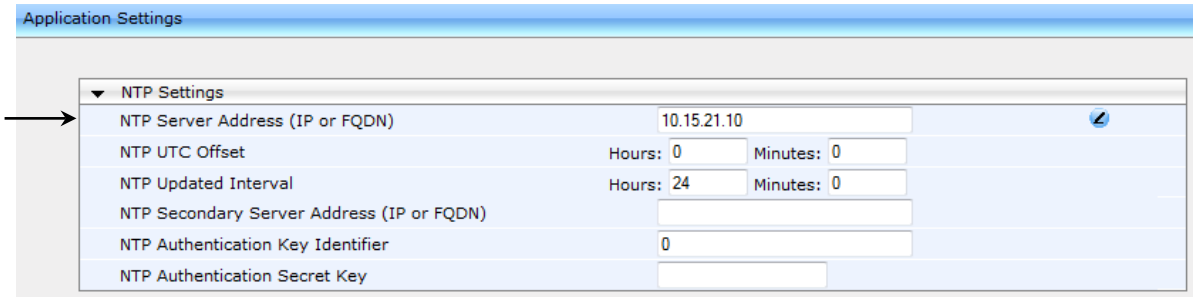
## 4.8.1 Step 8a: Configure the NTP Server Address

The procedure below describes how to configure the NTP server's IP address. It's recommended to implement an NTP server (Microsoft NTP server or third-party server) to ensure that the SBC receives accurate and current date and time. This is necessary for validating certificates of remote parties.

➢ **To configure the NTP server address:**

1. Open the Application Settings page (**Configuration** tab > **System** menu > **Application Settings**).
2. In the 'NTP Server IP Address' field, enter the IP address of the NTP server (e.g., 10.15.21.10).

**Figure 4-26: Configuring the NTP Server IP Address**




3. Click **Submit**.

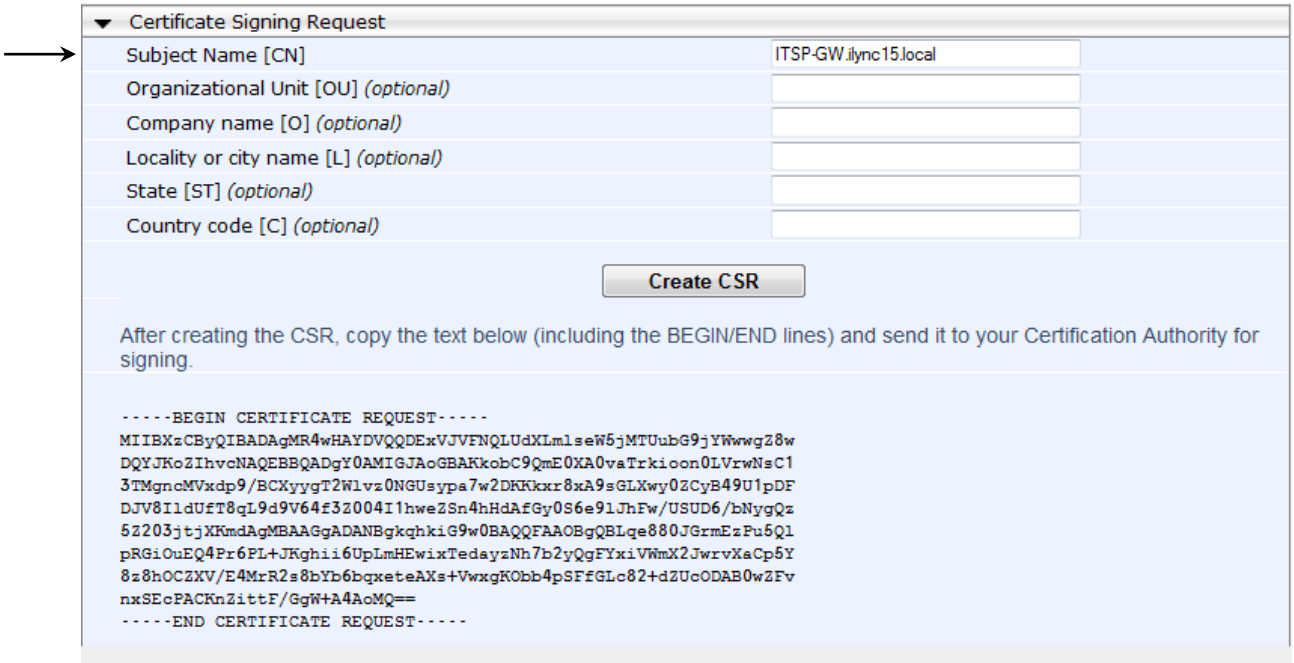
### 4.8.2 Step 8b: Configure a Certificate

The procedure below describes how to exchange a certificate with the Microsoft Certificate Authority (CA). The certificate is used by the SBC to authenticate the connection with the management station (i.e., the computer used to manage the SBC through its embedded Web server).

➢ **To configure a certificate:**

1. Open the Certificates page (**Configuration** tab > **System** menu > **TLS Contexts**).

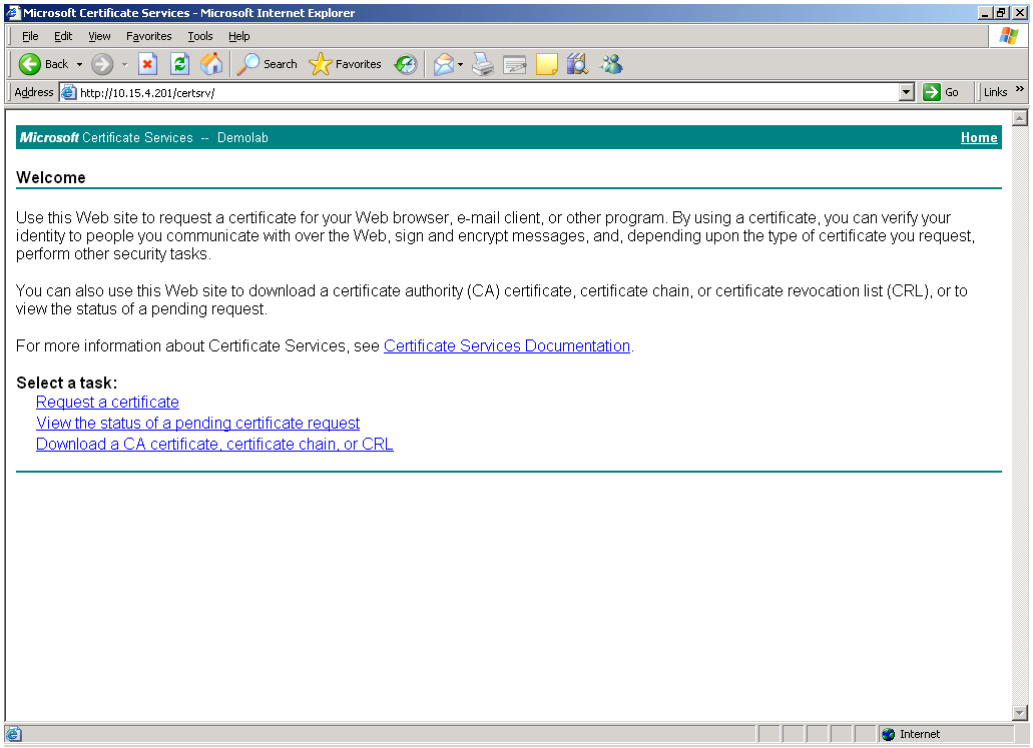
**Figure 4-27: Certificates Page - Creating CSR**




2. In the 'Subject Name' field, enter the media gateway name (e.g., ITSP-GW.ilync15.local). This name must be identical to the gateway name configured in the Topology Builder for Lync Server 2013 (see Section 3.1 on page 15).
3. Click **Create CSR**; a certificate request is generated.
4. Copy the CSR (from the line ----BEGIN CERTIFICATE to the line END CERTIFICATE REQUEST----) to a text file (such as Notepad) and save it to a folder on your computer with the file name *certreq.txt*.

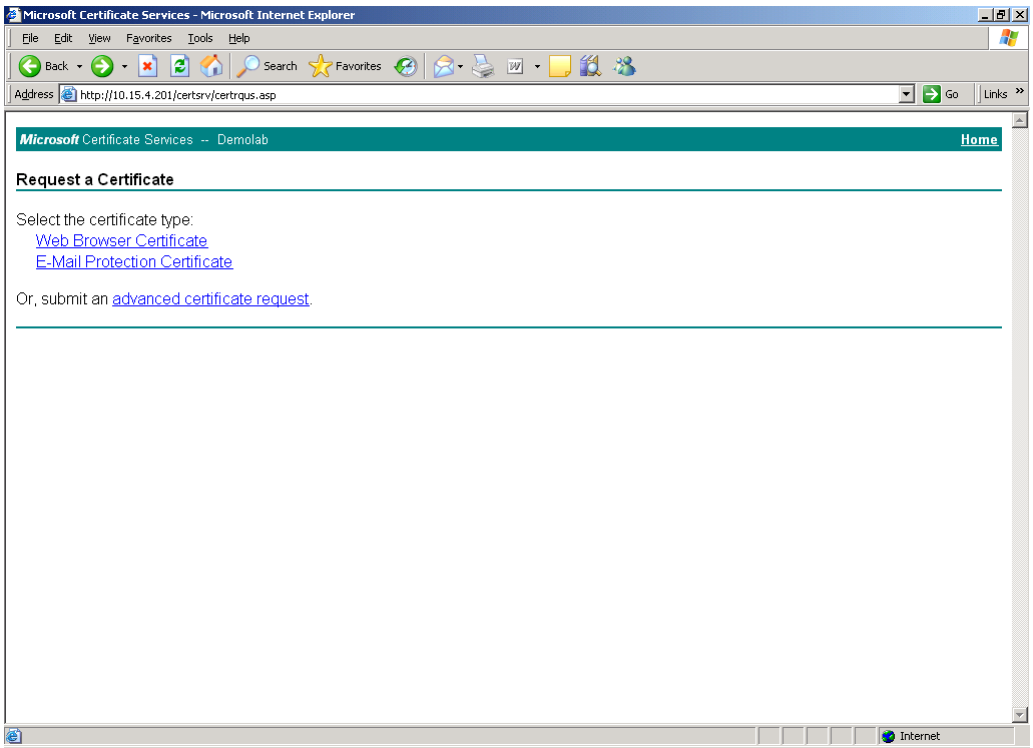
5. Open a Web browser and navigate to the Microsoft Certificates Services Web site at http://<certificate server>/CertSrv.

**Figure 4-28: Microsoft Certificate Services Web Page**



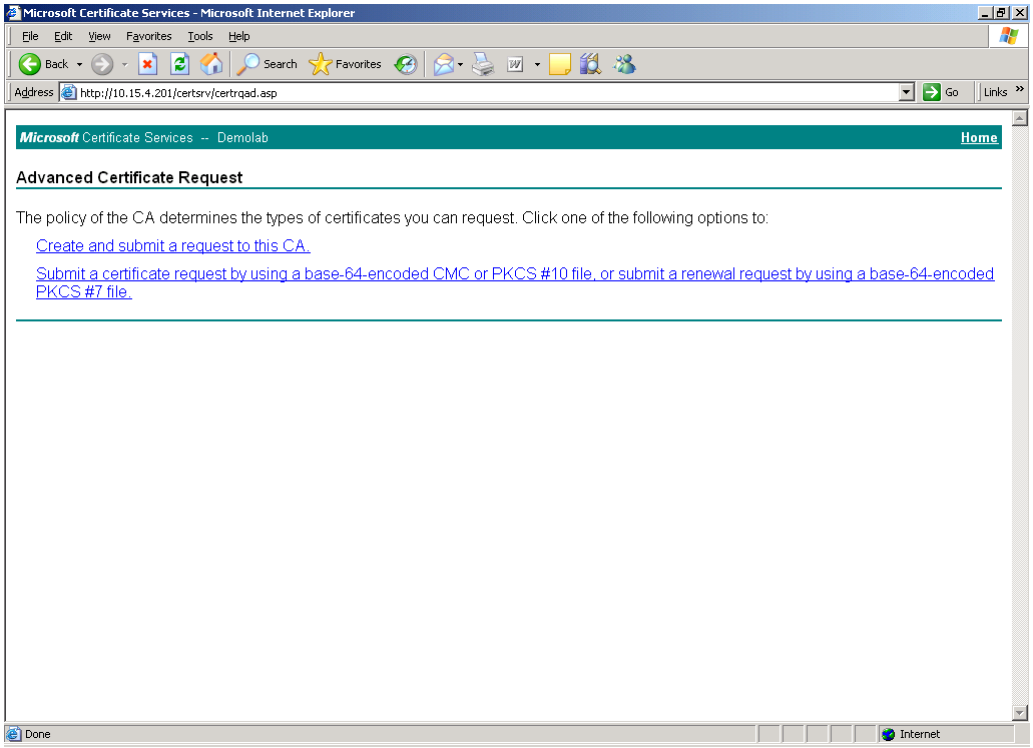

6. Click **Request a certificate**.

**Figure 4-29: Request a Certificate Page**



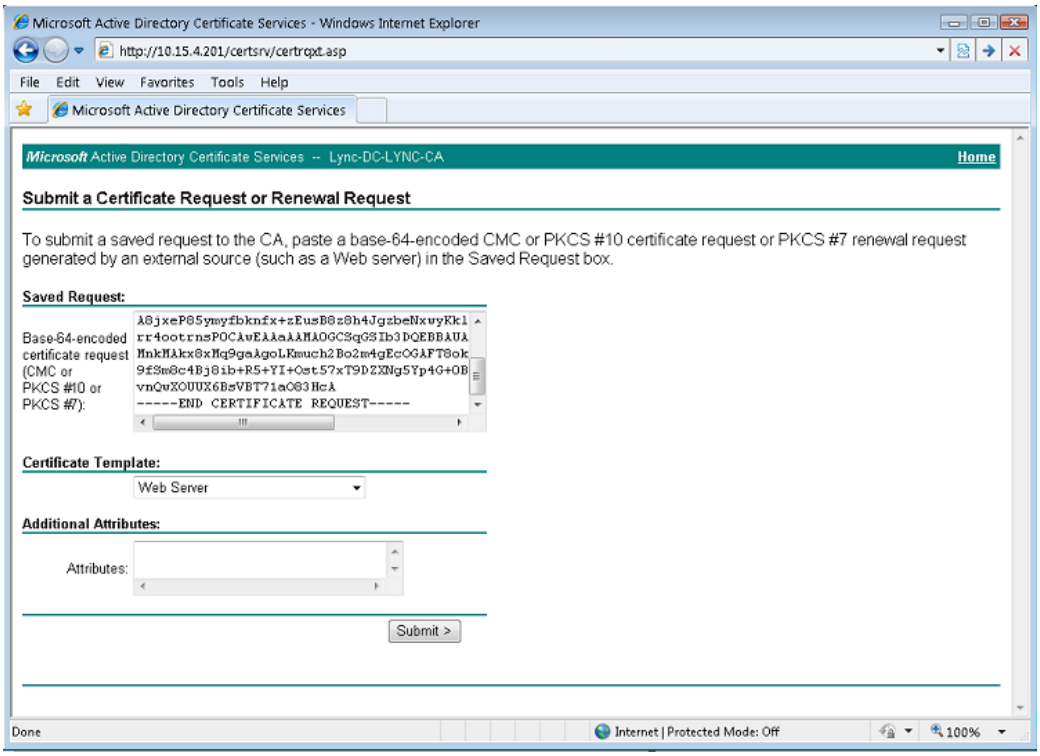
7. Click **advanced certificate request** and click **Next**.

**Figure 4-30: Advanced Certificate Request Page**




8. Click **Submit a certificate request...** and click **Next**.

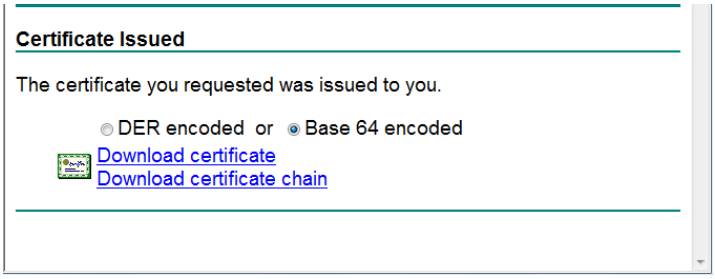
**Figure 4-31: Submit a Certificate Request or Renewal Request Page**




9. Open the *certreq.txt* file that you created and saved in Step 4 and copy its contents to the 'Base-64-Encoded Certificate Request' field.
10. From the 'Certificate Template' drop-down list, select **Web Server**.

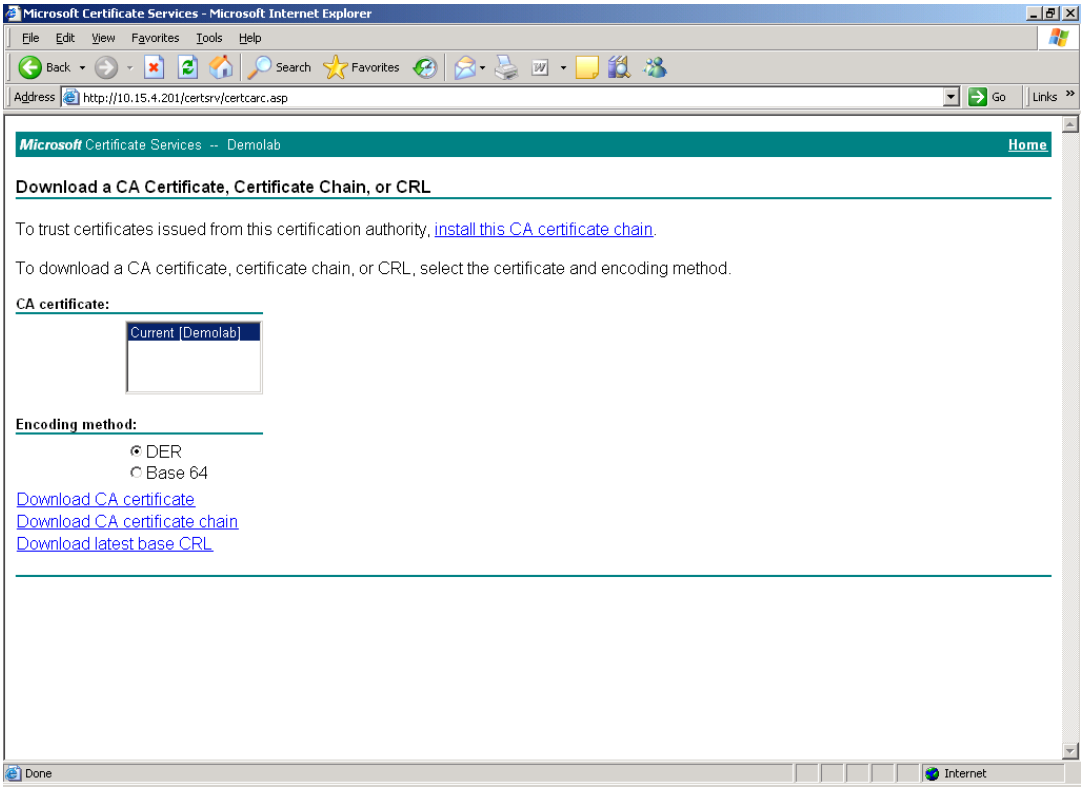
11. Click **Submit**.

**Figure 4-32: Certificate Issued Page**



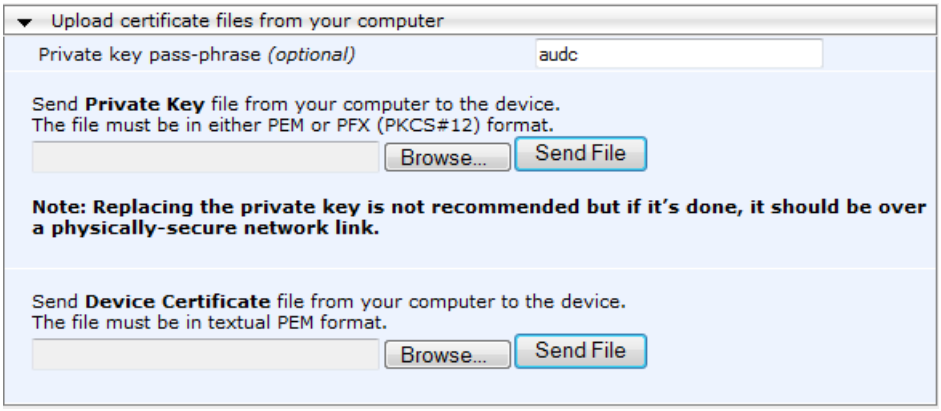

12. Select the **Base 64 encoded** option for encoding and click **Download certificate**.
13. Save the file with the name *gateway.cer* to a folder on your computer.
14. Click the **Home** button (or navigate to the certificate server at http://<Certificate Server>/CertSrv).

**Figure 4-33: Download a CA Certificate, Certificate Chain, or CRL**




15. Under the 'Encoding method' group, select the **Base 64** option for encoding.
16. Click **Download CA certificate**.
17. In the SBC's Web interface, return to the **TLS Contexts** page and do the following:
    a. Scroll down to the **Upload certificates files from your computer** group, click the **Browse** button corresponding to the 'Send Device Certificate...' field, navigate to the *gateway.cer* certificate file that you saved on your computer in Step 13, and then click **Send File** to upload the certificate to the SBC.

**Figure 4-34: Upload Device Certificate Files from your Computer Group**

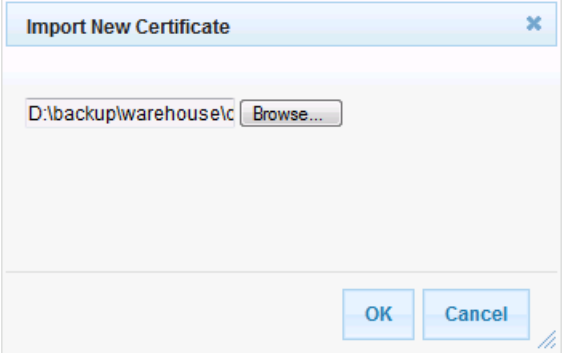



**b.** In the SBC's Web interface, return to the **TLS Contexts** page.

**c.** In the TLS Contexts table, select the required TLS Context index row, and then click the **TLS Context Trusted-Roots Certificates** button, located at the bottom of the TLS Contexts page; the Trusted Certificates page appears.

**d.** Click the **Import** button, and then select the certificate file to load.

**Figure 4-35: Importing Root Certificate into Trusted Certificates Store**




**18.** Click **OK**; the certificate is loaded to the device and listed in the Trusted Certificates store.

**19.** Reset the SBC with a burn to flash for your settings to take effect (see Section 4.16 on page 81).

## 4.9 Step 9: Configure SRTP

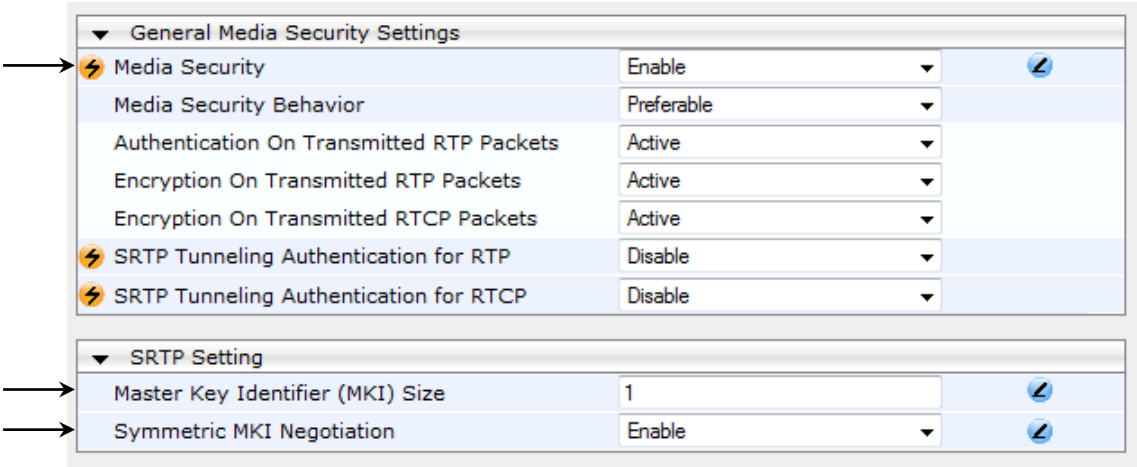
The procedure below describes how to configure media security. If you configure the Microsoft Mediation Server to use Secure Real-Time Transport Protocol (SRTP), configure the SBC to do so as well.

Note that SRTP was enabled for Lync Server 2013 when you added an IP Profile for Lync Server 2013 (see Section 4.6 on page 53).

➢ **To configure media security:**

1. Open the Media Security page (**Configuration** tab > **VoIP** menu > **Media** > **Media Security**).

**Figure 4-36: Media Security Page**




2. Configure the parameters like this:

| Parameter | Example Setting |
|---|---|
| Media Security | **Enable** |
| Master Key Identifier (MKI) Size | "1" |
| Symmetric MKI Negotiation | **Enable** |

3. Click **Submit**.
4. Reset the SBC with a burn to flash for your settings to take effect (see Section 4.16 on page 81).

**Note:** If you are implementing SRTP, make sure that you also configure the Lync server for SRTP 'Encryption Support Level'). For more information, see here.

## 4.10 Step 10: Configure IP Media

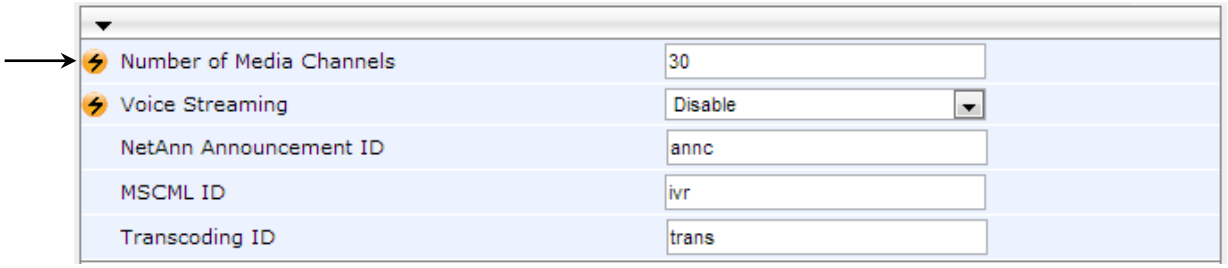
The procedure below describes how to configure the number of media channels for IP-based media. To perform coder transcoding, define digital signaling processors (DSP) channels. The number of media channels represents the number of DSP channels that the SBC allocates to sessions.

**Note:** This step is required *only* if transcoding is required.

➢ **To configure IP media:**

1. Open the IP Media Settings page (**Configuration** tab > **VoIP** menu > **IP Media** > **IP Media Settings**).

**Figure 4-37: IP Media Settings**




2. In the 'Number of Media Channels' field, enter the number of media channels according to your environment's transcoding calls (e.g., 30).
3. Click **Submit**.

## 4.11 Step 11: Configure IP-to-IP Call Routing Rules

This step describes how to configure IP-to-IP call routing rules. These rules define the routes for forwarding SIP messages (e.g., INVITE) received from one IP entity to another. The SBC selects the rule whose configured input characteristics (e.g., IP Group) match those of the incoming SIP message. If the input characteristics do not match the first rule in the table, they are compared to the second rule, and so on, until a matching rule is located. If no rule is matched, the message is rejected. The routing rules use the configured IP Groups to denote the source and destination of the call. As configured in Section 4.5 on page 51, IP Group 1 represents Lync Server 2013, and IP Group 2 represents ITSP SIP Trunk.

For the interoperability test topology, the following IP-to-IP routing rules need to be configured to route calls between Lync Server 2013 (LAN) and ITSP SIP Trunk (WAN):

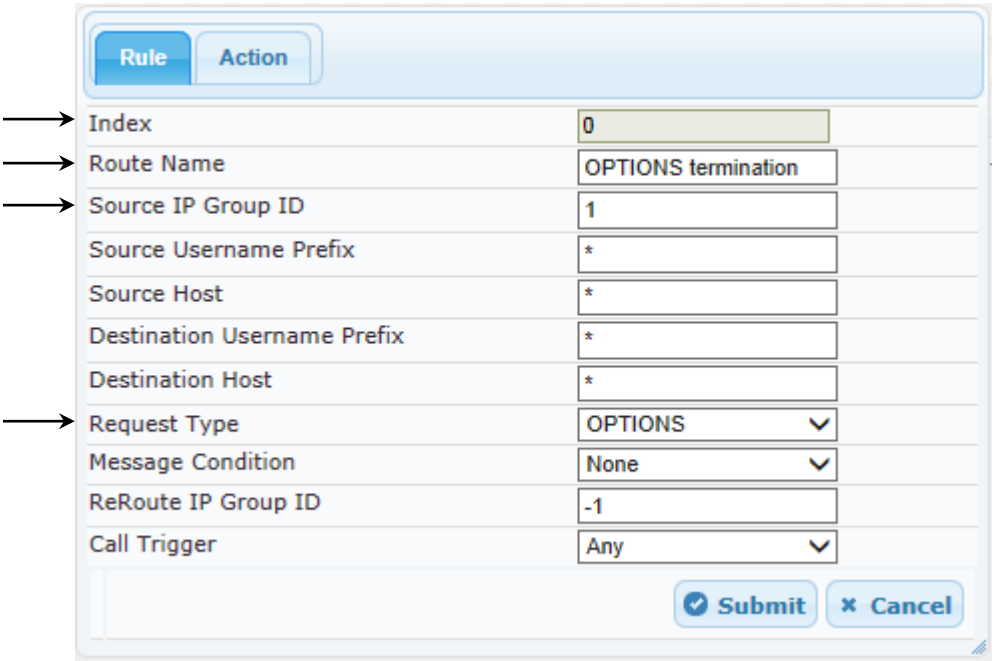
- Terminate SIP OPTIONS messages on the SBC that are received from the LAN
- Calls from Lync Server 2013 to ITSP SIP Trunk
- Calls from ITSP SIP Trunk to Lync Server 2013

➢ **To configure IP-to-IP routing rules:**

1. Open the IP-to-IP Routing Table page (**Configuration** tab > **VoIP** menu > **SBC** > **Routing SBC** > **IP-to-IP Routing Table**).
2. Configure a rule to terminate SIP OPTIONS messages received from the LAN:
3. Click **Add**.
4. Click the **Rule** tab, and then configure the parameters as follows:

| Parameter | Value |
|---|---|
| Index | **0** |
| Route Name | **OPTIONS termination** (arbitrary descriptive name) |
| Source IP Group ID | **1** |
| Request Type | **OPTIONS** |
| Destination Type | **Dest Address** |
| Destination Address | **internal** |

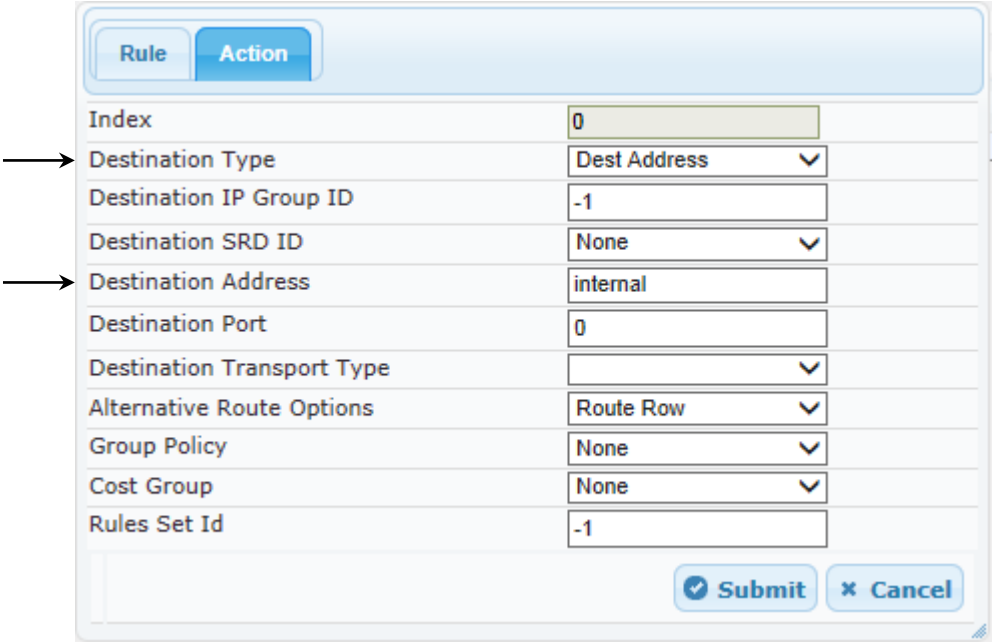
**Figure 4-38: Configuring IP-to-IP Routing Rule for Terminating SIP OPTIONS from LAN – Rule Tab**




5. Click the **Action** tab, and then configure the parameters as follows:

| Parameter | Value |
|---|---|
| Destination Type | **Dest Address** |
| Destination Address | **internal** |

**Figure 4-39: Configuring IP-to-IP Routing Rule for Terminating SIP OPTIONS from LAN – Action Tab**

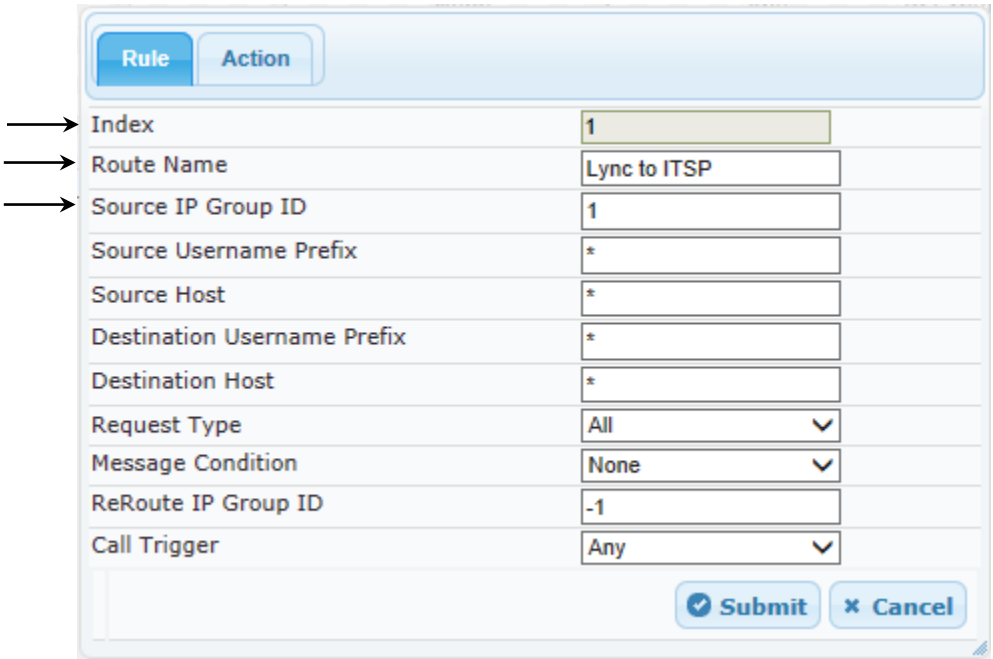



6. Configure a rule to route calls from Lync Server 2013 to ITSP SIP Trunk:
7. Click **Add**.

8. Click the **Rule** tab, and then configure the parameters as follows:

| Parameter | Value |
|---|---|
| Index | **1** |
| Route Name | **Lync to ITSP** (arbitrary descriptive name) |
| Source IP Group ID | **1** |

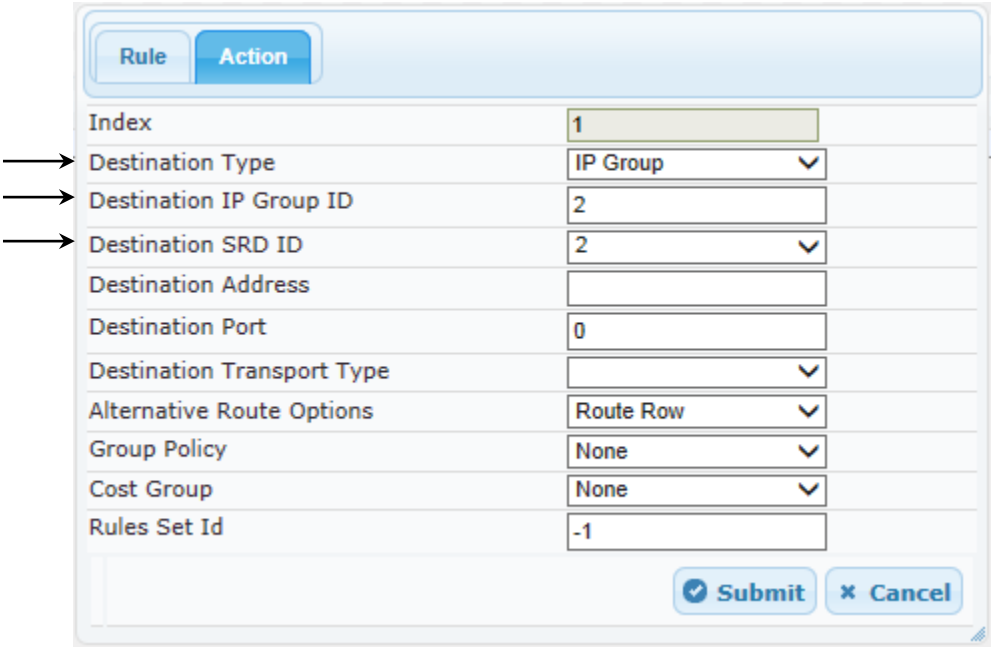
**Figure 4-40: Configuring IP-to-IP Routing Rule for Lync to ITSP – Rule tab**




9. Click the **Action** tab, and then configure the parameters as follows:

| Parameter | Value |
|---|---|
| Destination Type | **IP Group** |
| Destination IP Group ID | **2** |
| Destination SRD ID | **2** |

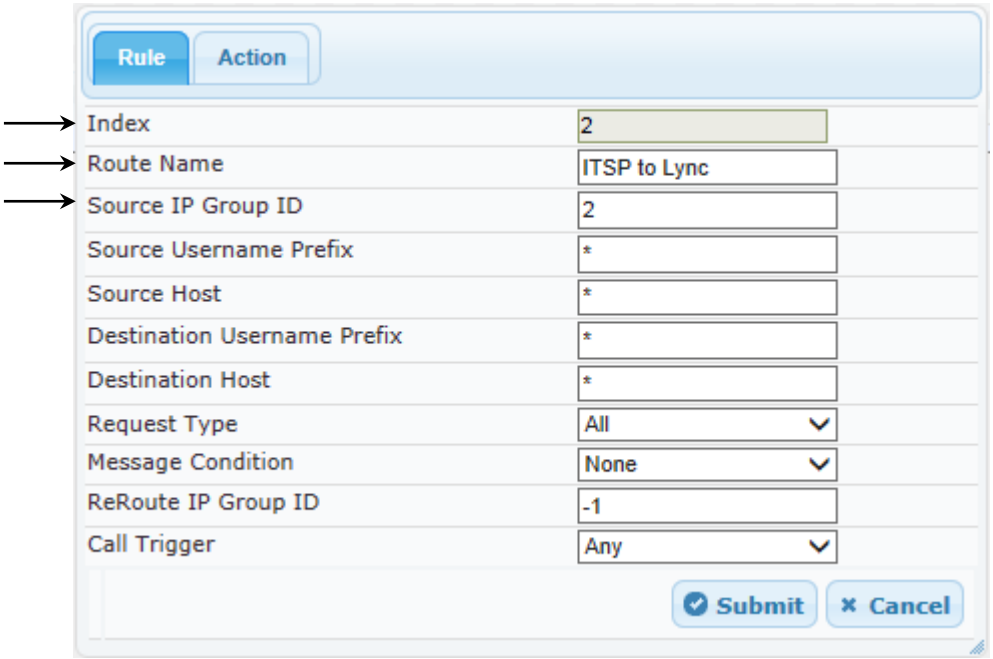
**Figure 4-41: Configuring IP-to-IP Routing Rule for Lync to ITSP – Action tab**




10. Configure a rule to route calls from ITSP SIP Trunk to Lync Server 2013:
11. Click **Add**.
12. Click the **Rule** tab, and then configure the parameters as follows:

| Parameter | Value |
|---|---|
| Index | **2** |
| Route Name | **ITSP to Lync** (arbitrary descriptive name) |
| Source IP Group ID | **2** |

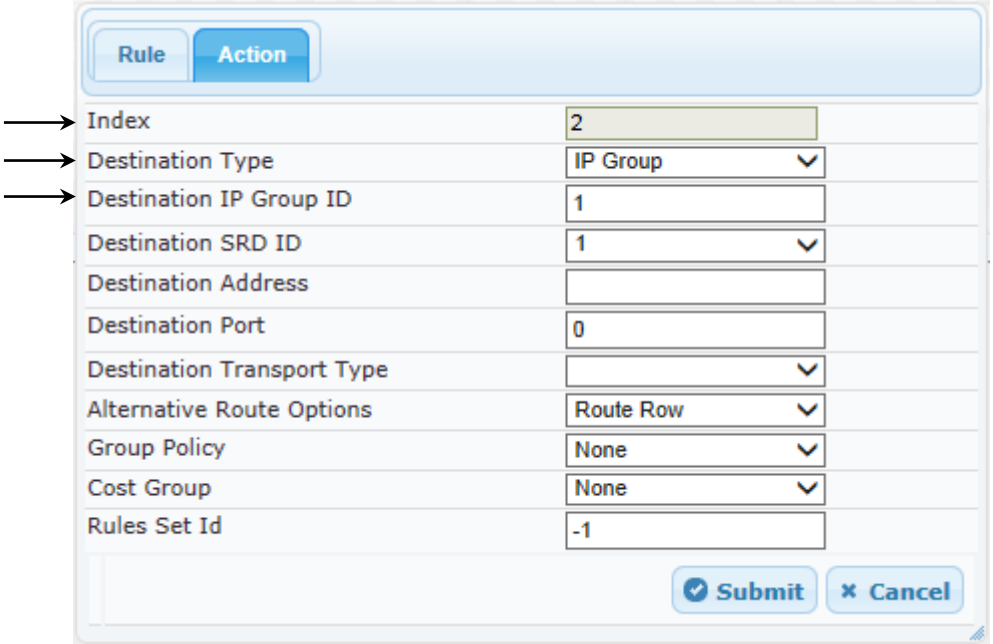
**Figure 4-42: Configuring IP-to-IP Routing Rule for ITSP to Lync – Rule tab**



**13.** Click the **Action** tab, and then configure the parameters as follows:

| Parameter | Value |
|---|---|
| Destination Type | **IP Group** |
| Destination IP Group ID | **1** |
| Destination SRD ID | **1** |

**Figure 4-43: Configuring IP-to-IP Routing Rule for ITSP to Lync – Action tab**




The configured routing rules are shown in the figure below:

**Figure 4-44: Configured IP-to-IP Routing Rules in IP-to-IP Routing Table**

IP-to-IP Routing Table

Add + Insert +

| Index | Route Name | Source Host | Destination Username Prefix | Destination Host | Message Condition | ReRoute IP Group ID | Call Trigger | Destination Type | Destination IP Group ID | Destination Address |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | OPTIONS terminatio | * | * | * | None | -1 | Any | Dest Address | -1 | internal |
| 1 | Lync to ITSP | * | * | * | None | -1 | Any | IP Group | 2 | |
| 2 | ITSP to Lync | * | * | * | None | -1 | Any | IP Group | 1 | |

Page 1 of 1 Show 10 records per page View 1 - 3 of 3

**Note:** The routing configuration may change according to your specific deployment topology.

## 4.12 Step 12: Configure IP-to-IP Manipulation Rules

This step describes how to configure IP-to-IP manipulation rules. These rules manipulate the source and / or destination number. The manipulation rules use the configured IP Groups to denote the source and destination of the call. As configured in Section 4.5 on page 51, IP Group 1 represents Lync Server 2013, and IP Group 2 represents ITSP SIP Trunk.

**Note:** Adapt the manipulation table according to you environment dial plan.

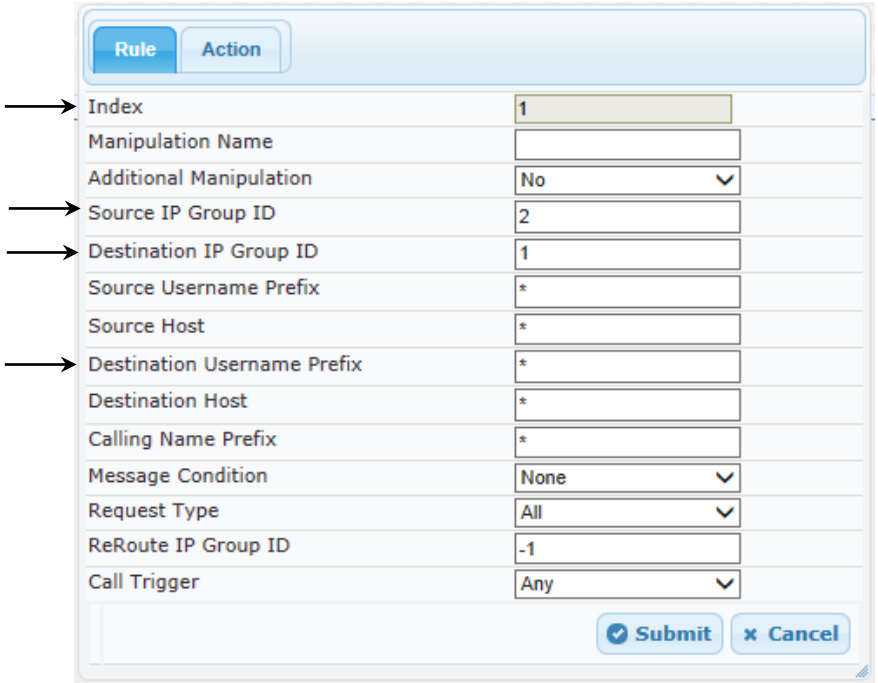
For this interoperability test topology, a manipulation is configured to add the "+" (plus sign) to the destination number for calls from IP Group 2 (ITSP SIP Trunk) to IP Group 1 (i.e., Lync Server 2013) for any destination username prefix.

➢ **To configure a number manipulation rule:**

1. Open the IP-to-IP Outbound Manipulation page (**Configuration** tab > **VoIP** menu > **SBC** > **Manipulations SBC** > **IP-to-IP Outbound**).
2. Click **Add**.
3. Click the **Rule** tab, and then configure the parameters as follows:

| Parameter | Value |
|---|---|
| Index | **1** |
| Source IP Group | **2** |
| Destination IP Group | **1** |
| Destination Username Prefix | ***** (asterisk sign) |

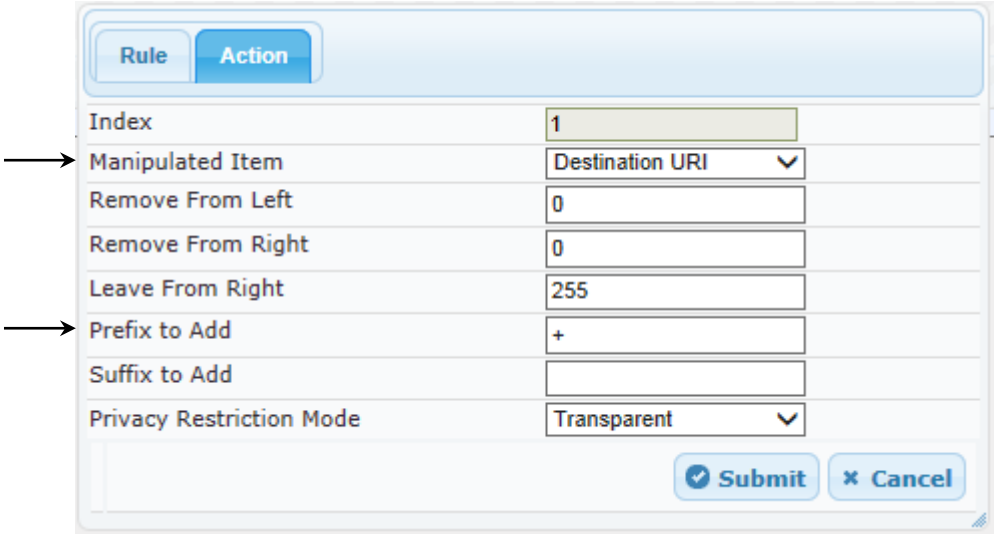
**Figure 4-45: Configuring IP-to-IP Outbound Manipulation Rule – Rule Tab**



4. Click the **Action** tab, and then configure the parameters as follows:

| Parameter | Value |
|---|---|
| Manipulated Item | **Destination URI** |
| Prefix to Add | **+** (plus sign) |

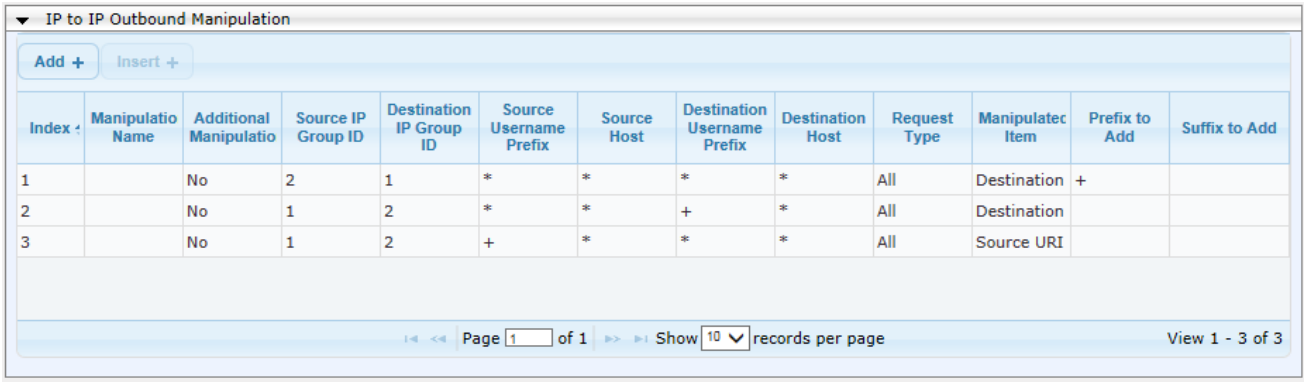
**Figure 4-46: Configuring IP-to-IP Outbound Manipulation Rule - Action Tab**




5. Click **Submit**.

The figure below shows an example of configured IP-to-IP outbound manipulation rules for calls between IP Group 1 (i.e., Lync Server 2013) and IP Group 2 (i.e., ITSP SIP Trunk):

**Figure 4-47: Example of Configured IP-to-IP Outbound Manipulation Rules**




| Index | Manipulation Name | Additional Manipulation | Source IP Group ID | Destination IP Group ID | Source Username Prefix | Source Host | Destination Username Prefix | Destination Host | Request Type | Manipulated Item | Prefix to Add | Suffix to Add |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | No | 2 | 1 | * | * | * | * | All | Destination | + | |
| 2 | | No | 1 | 2 | * | * | + | * | All | Destination | | |
| 3 | | No | 1 | 2 | + | * | * | * | All | Source URI | | |

| Rule Index | Description |
|---|---|
| **1** | Calls from IP Group 2 to IP Group 1 with any destination number (*), add "+" to the prefix of the destination number. |
| **2** | Calls from IP Group 1 to IP Group 2 with the prefix destination number "+", remove "+" from this prefix. |
| **3** | Calls from IP Group 1 to IP Group 2 with source number prefix "+", remove the "+" from this prefix. |

## 4.13 Step 13: Configure SIP Message Manipulation Rules

The procedure below describes how to configure SIP message manipulation rules (configured in the Message Manipulations table).

SIP message manipulation rules can include insertion, removal and/or modification of SIP headers. Multiple manipulation rules can be configured for the same SIP message. After configuring the SIP message manipulation rules assign them to the relevant IP Group (in the IP Group table) and determine whether they must be applied to inbound or outbound messages.

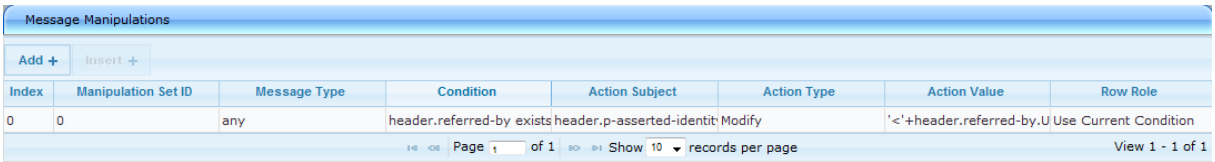
See an example below of a message manipulation rule configuration; use the *SBC User's Manual* for detailed instructions on how to configure message manipulation rules according to your requirements.

In the example scenario, the configured manipulation rule manipulates the P-Asserted-Identity user part of the header, and replaces it with the user part that appears on the Referred-By header.

➢ **To configure SIP message manipulation rules:**

1. Open the Message Manipulations page (**Configuration** tab > **VoIP** menu > **SIP Definitions** > **Msg Policy & Manipulation** > **Message Manipulations**).

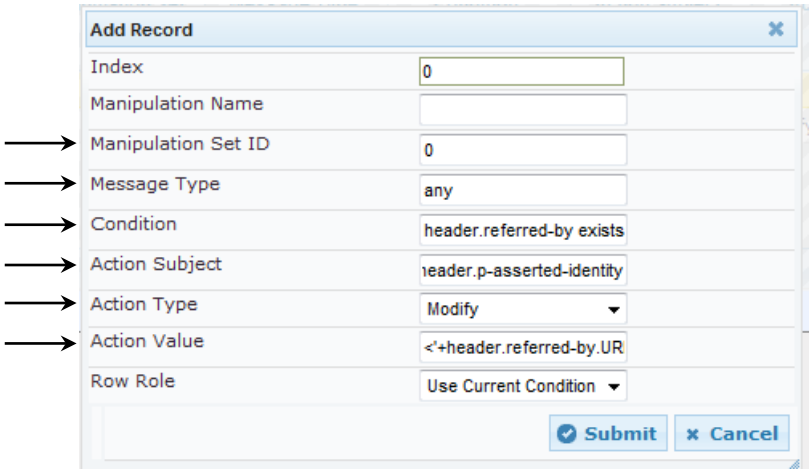
**Figure 4-48: Message Manipulations Page**




2. Add the following manipulation rules for Manipulation Set ID 0:

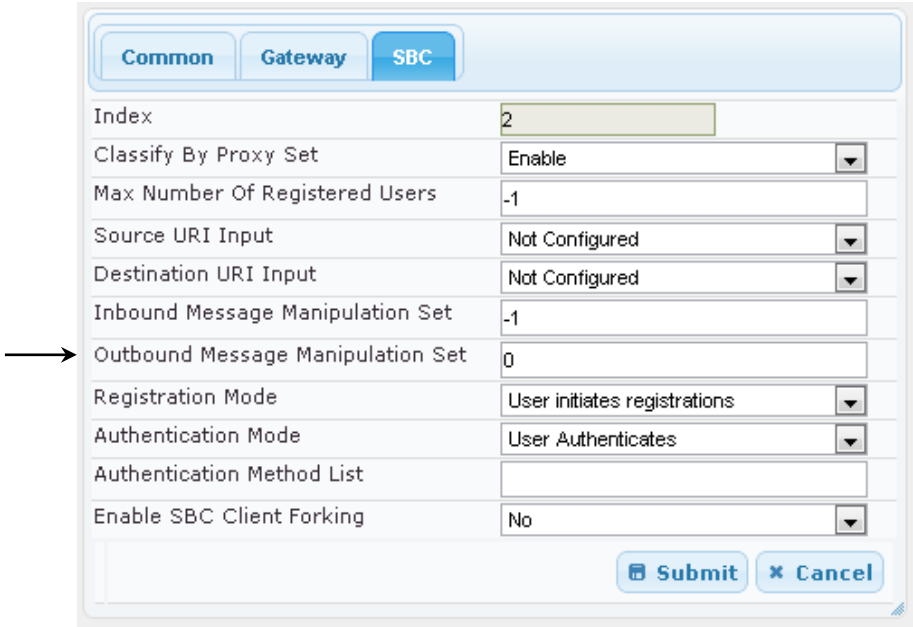
| Parameter | Example Setting |
|---|---|
| Index | "0" |
| Manipulation Set ID | "0" |
| Message Type | any<br>**Note:** Enter the value as is. |
| Condition | header.referred-by exists<br>**Note:** Enter the value as is. |
| Action Subject | header.p-asserted-identity<br>**Note:** Enter the value as is. |
| Action Type | **Modify** |
| Action Value | '<'+header.referred-by.URL+'>'<br>**Note:** Enter the value as is. |

**Figure 4-49: Configured SIP Message Manipulation Rule**




3. Click **Submit**.
4. Assign the Manipulation Set ID 0 to IP Group 2:
   a. Open the IP Group Table page (**Configuration** tab > **VoIP** menu > **VoIP Network** > **IP Group Table**).
   b. Select the row of IP Group 2 and click **Edit**.
   c. Click the **SBC** tab.
   d. Set the 'Outbound Message Manipulation Set' field to "0".

**Figure 4-50: Assigning a Manipulation Rule to IP Group 2**




   e. Click **Submit**.

## 4.14 Step 14: Configure Registration Account

The procedure below describes how to configure SIP registration accounts (in the Account Table page) so that the SBC can register with the SIP Trunk on behalf of Lync Server 2013.

**Note:** Not *all* SIP Trunks require registration (and authentication) to provide service. If your SIP Trunk doesn't require registration, skip this step.

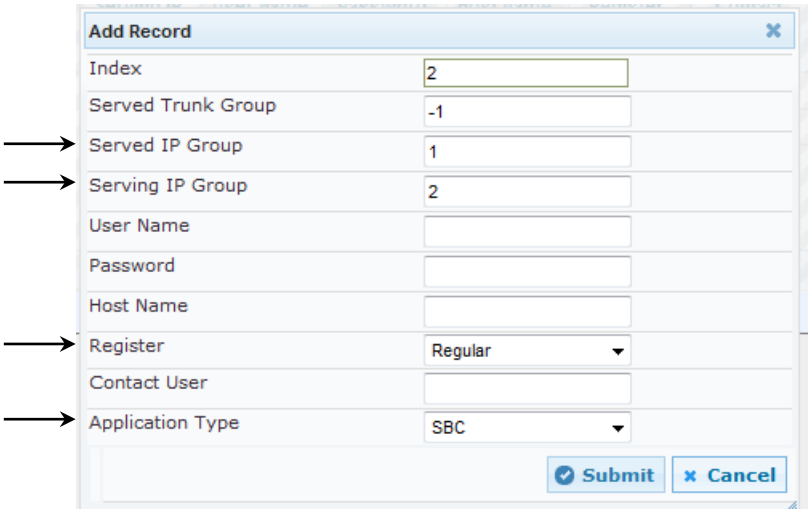
In this example, the Served IP Group is Lync Server 2013 (IP Group 1) and the Serving IP Group is SIP Trunk (IP Group 2).

➢ **To configure a registration account:**

1. Open the Account Table page (**Configuration** tab > **VoIP** menu > **SIP Definitions** > **Account Table**).
2. Click **Add**.
3. Configure the account according to the information provided by the SIP Trunk provider, for example:

| Parameter | Example Setting |
|---|---|
| Served IP Group | "1" (i.e., Lync Server 2013) |
| Serving IP Group | "2" (i.e., SIP Trunk) |
| Username | (Provided by the SIP Trunk provider) |
| Password | (Provided by the SIP Trunk provider) |
| Register | **Regular** |
| Application Type | **SBC** |

**Figure 4-51: Configuring a SIP Registration Account**




4. Click **Submit**.

# 4.15 Step 15: Configure Miscellaneous SBC Functions

The procedures below describe miscellaneous SBC configuration functions.

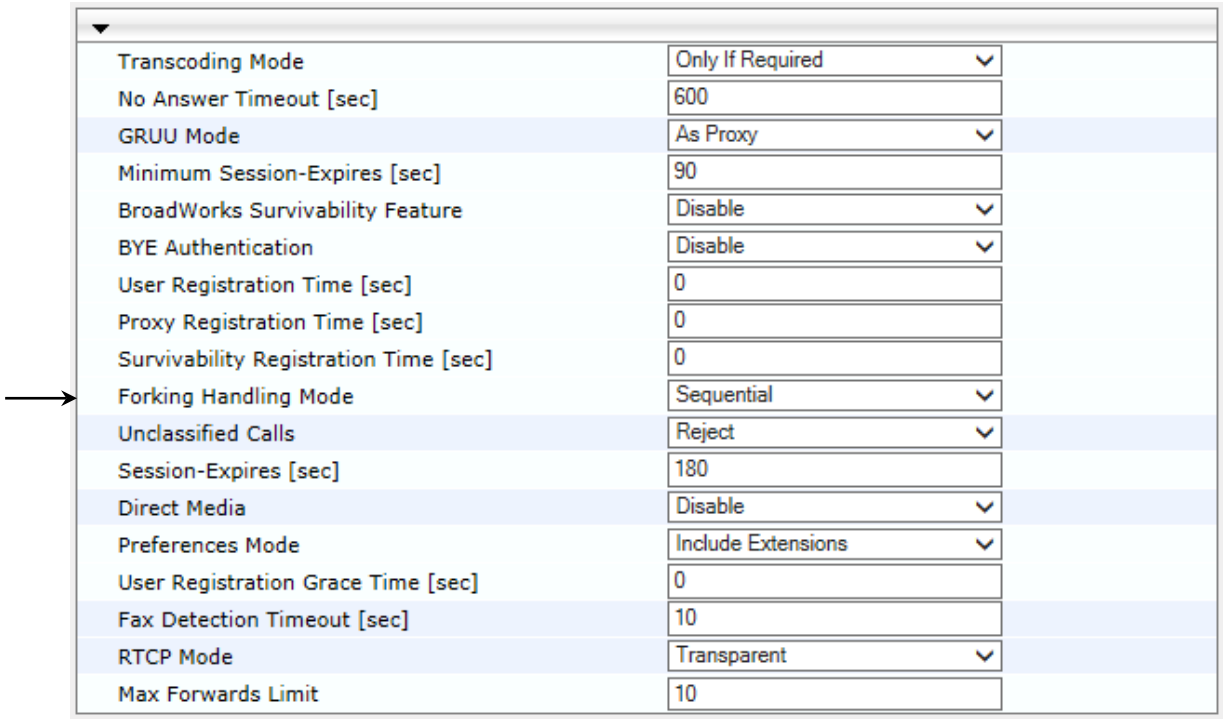
## 4.15.1 Step 15a: Configure Call Forking Mode

This step describes how to configure the SBC's handling of SIP 18x responses received for call forking of INVITE messages. For the interoperability test topology, if a SIP 18x response with SDP is received, the SBC opens a voice stream according to the received SDP. The SBC re-opens the stream according to subsequently received SIP 18x responses with SDP or plays a ringback tone if a SIP 180 response without SDP is received. It is mandatory to set this field for the Lync Server 2013 environment.

➢ **To configure call forking:**

1. Open the General Settings page (**Configuration** tab > **VoIP** menu > **SBC** > **General Settings**).
2. From the 'Forking Handling Mode' drop-down list, select **Sequential**.

**Figure 4-52: Configuring Forking Mode**




3. Click **Submit**.

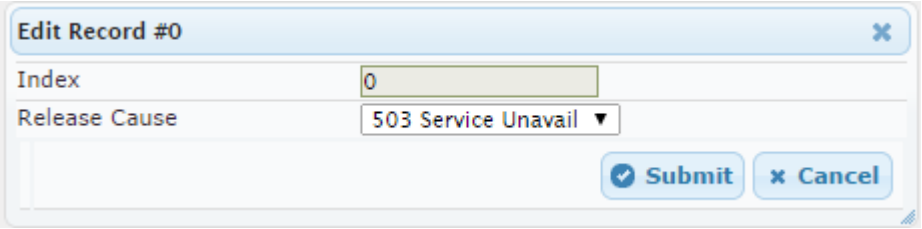
### 4.15.2 Step 15b: Configure SBC Alternative Routing Reasons

This step describes how to configure the SBC's handling of SIP 503 responses received for outgoing SIP dialog-initiating methods, e.g., INVITE, OPTIONS, and SUBSCRIBE messages. In this case, the SBC attempts to locate an alternative route for the call.

➢ **To configure SIP reason codes for alternative IP routing:**

1. Open the SBC Alternative Routing Reasons page (**Configuration** tab > **VoIP** menu > **SBC** > **Routing SBC** > **Alternative Routing Reasons**).
2. Click **Add**; the following dialog box appears:

**Figure 4-53: Alternative Routing Reasons Table - Add Record**




3. Click **Submit**.

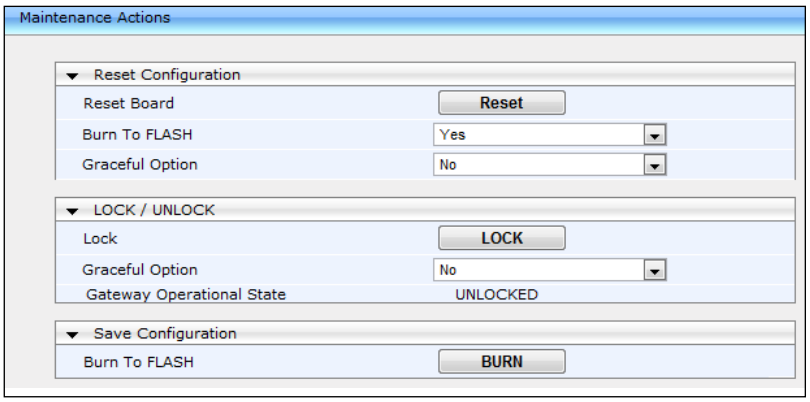
## 4.16 Step 16: Reset the SBC

The procedure below describes how reset the SBC. After completing the configuration of the SBC as described in the preceding steps, save (burn) the configuration to the SBC's flash memory with a reset; the settings will now take effect.

➢ **To save the configuration to flash memory with a reset:**

1. Open the Maintenance Actions page (**Maintenance** tab > **Maintenance** menu > **Maintenance Actions**).

**Figure 4-54: Resetting the SBC**




2. Ensure that the 'Burn to FLASH' field is set to **Yes** (default).
3. Click the **Reset** button.

**This page is intentionally left blank.**

# A Configuring SBC to Send 414 Request-URI Too Long

The procedure below describes how to configure the SBC to send a 414 Request-URI Too Long response, when it encounters a Request URI it cannot handle due to excessive length.

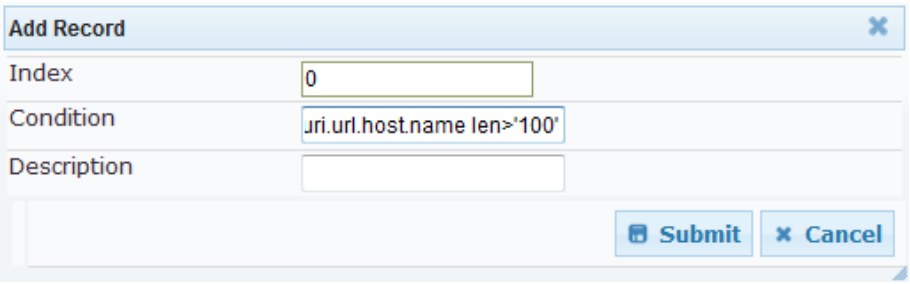
When the SBC receives an INVITE with a long Request URI (a condition rule), it routes it to an unknown destination IP address (i.e., 1.1.1.1). It sets a variable for this call to **1**. After a timeout, the SBC generates an internal 408 Request Timeout response. Using message manipulation, the SBC converts this response to a 414 Request-URI Too Long response (only if the variable value is **1**).

➢ **To configure a condition for this route:**

1. Open the Condition Table page (**Configuration** tab **> VoIP** menu > **SBC** > **Routing SBC** > **Message Condition Table**).
2. Click the **Add** tab and configure the parameters like this:

| Parameter | Example Setting |
|---|---|
| Index | **0** |
| Condition | **header.request-uri.url.host.name len>'100'**<br>**Note:** You can choose the length of the Request-URI to process. |

**Figure A-1: Configuring a Condition for the Route**




3. Click **Submit**.

➢ **To configure the route:**

1. Open the IP-to-IP Routing Table page (**Configuration** tab **> VoIP** menu > **SBC** > **Routing SBC** > **IP-to-IP Routing Table**).
2. Add a rule to route long-URI calls to unknown IP address:
   a. Click **Add**.
   b. Configure the parameters like this:

| Parameter | Example Setting |
|---|---|
| Index | **0** (This rule should be the first rule in the table.) |
| Message Condition | **0** (This number is the index of the condition configured above.) |
| Destination Type | **Dest address** |
| Destination Address | **1.1.1.1** (unreachable IP address) |

**Figure A-2: IP-to-IP Routing Rule for Long-URI Calls**

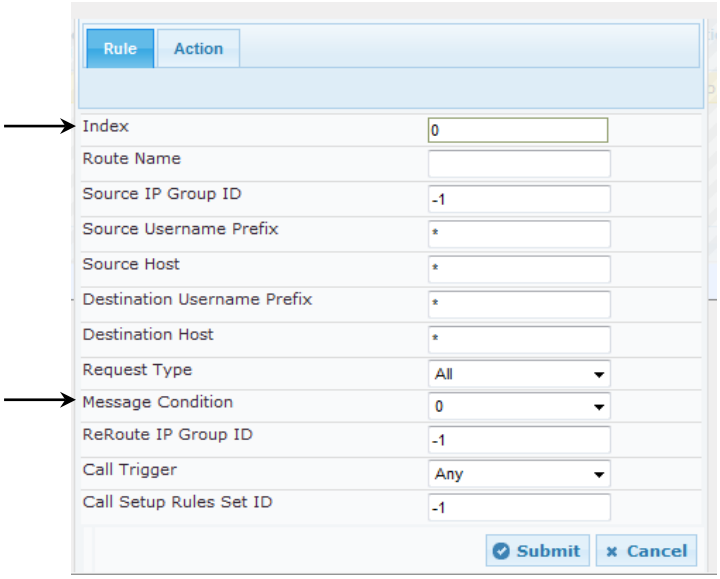
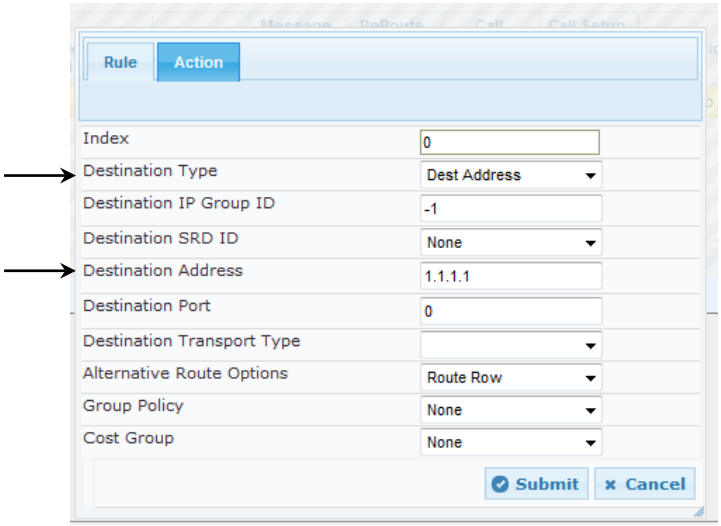



**Figure A-3: IP-to-IP Routing Action for Long-URI Calls**

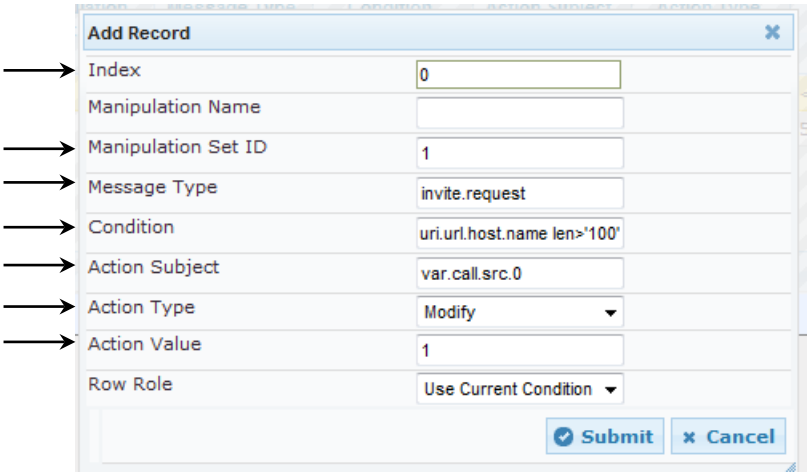


➢ **To configure a message manipulation rule:**

1. Open the Message Manipulations page (**Configuration** tab > **VoIP** menu > **SIP Definitions** > **Msg Policy & Manipulation** > **Message Manipulations**).
2. Add a rule to set a variable to **1** in the case of a long-URI call:
   a. Click **Add**.
   b. Configure the parameters like this:

| Parameter | Example Setting |
|---|---|
| Index | **0** |
| Manipulation Set ID | **1** |
| Message Type | **invite.request** |
| Condition | **header.request-uri.url.host.name len>'100'** |
| Action Subject | **var.call.src.0** |
| Action Type | **Modify** |
| Action Value | **1** |

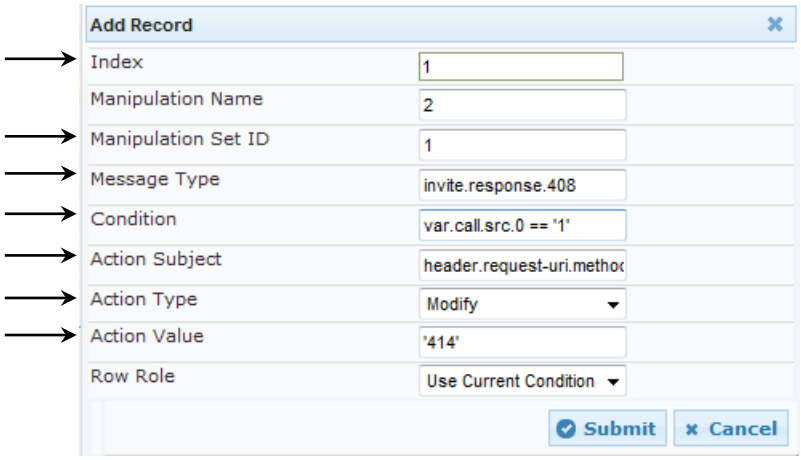
**Figure A-4: Manipulation Rule to Set a Variable to '1' in Case of Long-URI Call**




   c. Click **Submit**.
3. Add a rule to convert 408 to '414':
   a. Click **Add**.
   b. Configure the parameters like this:

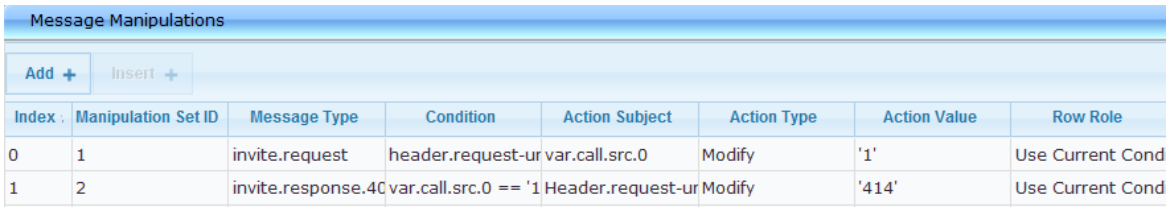
| Parameter | Example Setting |
|---|---|
| Index | **1** |
| Manipulation Set ID | **2** |
| Message Type | **invite.response.408** |
| Condition | **var.call.src.0 == '1'** |
| Action Subject | **header.request-uri.methodtype** |
| Action Type | **Modify** |
| Action Value | **'414'** |

**Figure A-5: Manipulation Rule to Convert 408 to '414'**



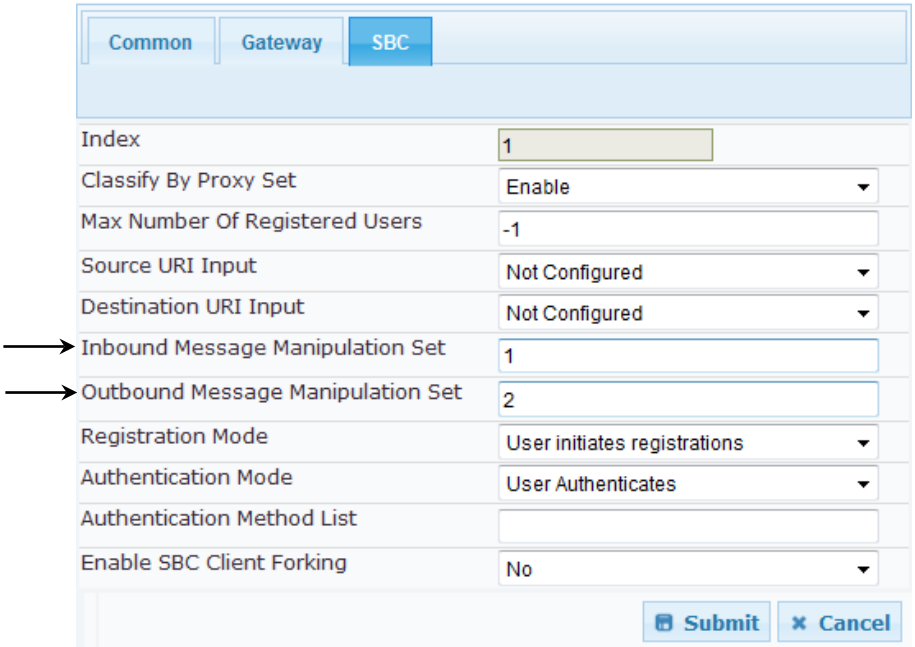

c. Click **Submit**.

**Figure A-6: Message Manipulations Page**




4. Assign the Manipulation Set to IP Group 1 :
   a. Open the IP Group Table page (**Configuration** tab > **VoIP** menu > **VoIP Network** > **IP Group Table**).
   b. Select the row of IP Group 1 and click **Edit**.
   c. Click the **SBC** tab.
   d. Set the 'Inbound Message Manipulation Set' field to **1**.
   e. Set the 'Outbound Message Manipulation Set' field to **2**.

**Figure A-7: Assigning Manipulation Rule to IP Group 1**




f. Click **Submit**.

**This page is intentionally left blank.**

AudioCodes

# Configuration Note

www.audiocodes.com