Configuration Note

AudioCodes Professional Services - Interoperability Lab

# Microsoft® Lync™ Server 2013 and Twilio SIP Trunk using AudioCodes Mediant™ E-SBC

Version 7.0

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## Notice

This document describes how to connect the Microsoft Lync Server 2013 and 8BTwilio SIP Trunk using AudioCodes Mediant E-SBC product series.

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| LTRT | Description |
|---|---|
| xxxxx | Initial document release for Version 7.0. |

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# 1 Introduction

This Configuration Note describes how to set up AudioCodes Enterprise Session Border Controller (hereafter, referred to as *E-SBC*) for interworking between 8BTwilio's SIP Trunk and Microsoft's Lync Server 2013 environment.

## 1.1 Intended Audience

The document is intended for engineers, or AudioCodes and 8BTwilio Partners who are responsible for installing and configuring 8BTwilio's SIP Trunk and Microsoft's Lync Server 2013 for enabling VoIP calls using AudioCodes E-SBC.

## 1.2 About AudioCodes E-SBC Product Series

AudioCodes' family of E-SBC devices enables reliable connectivity and security between the Enterprise's and the service provider's VoIP networks.

The E-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 E-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 E-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.

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# 2 Component Information

## 2.1 AudioCodes E-SBC Version

**Table 2-1: AudioCodes E-SBC Version**

| | |
|---|---|
| **SBC Vendor** | AudioCodes |
| **Models** | ▪ Mediant 500 E-SBC<br>▪ Mediant 800 Gateway & E-SBC<br>▪ Mediant 1000B Gateway & E-SBC<br>▪ Mediant 3000 Gateway & E-SBC<br>▪ Mediant 2600 E-SBC<br>▪ Mediant 4000 E-SBC |
| **Software Version** | SIP_F7.00A.013.015 |
| **Protocol** | ▪ SIP/UDP (to the 8BTwilio SIP Trunk)<br>▪ SIP/TCP or TLS (to the Lync FE Server) |
| **Additional Notes** | None |

## 2.2 Twilio SIP Trunking Version

**Table 2-2: 8BTwilio Version**

| | |
|---|---|
| **Vendor/Service Provider** | 8BTwilio |
| **SSW Model/Service** | Twilio |
| **Software Version** | |
| **Protocol** | SIP |
| **Additional Notes** | None |

## 2.3 Microsoft Lync Server 2013 Version

**Table 2-3: Microsoft Lync Server 2013 Version**

| | |
|---|---|
| **Vendor** | Microsoft |
| **Model** | Microsoft Lync |
| **Software Version** | Release 2013 5.0.8308.556 |
| **Protocol** | SIP |
| **Additional Notes** | None |

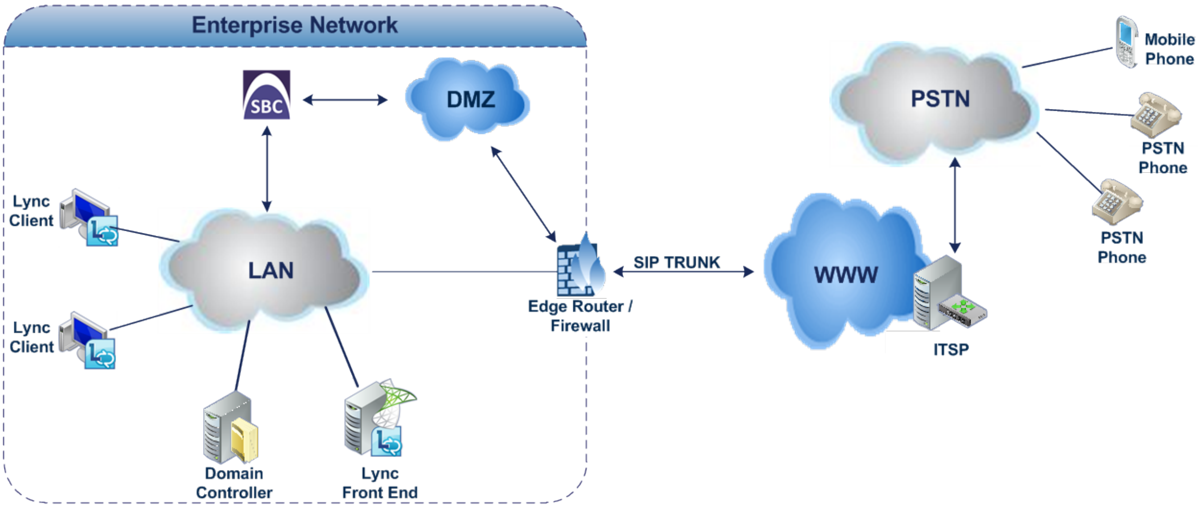
## 2.4 Interoperability Test Topology

The interoperability testing between AudioCodes E-SBC and 8BTwilio SIP Trunk with Lync 2013 was done using the following topology setup:

- Enterprise deployed with Microsoft Lync Server 2013 in its private network for enhanced communication within the Enterprise.
- Enterprise wishes to offer its employees enterprise-voice capabilities and to connect the Enterprise to the PSTN network using 8BTwilio's SIP Trunking service.
- AudioCodes E-SBC is implemented to interconnect between the Enterprise LAN and the SIP Trunk.
  - **Session:** Real-time voice session using the IP-based Session Initiation Protocol (SIP).
  - **Border:** IP-to-IP network border between Lync Server 2013 network in the Enterprise LAN and 8BTwilio's SIP Trunk located in the public network.

The figure below illustrates this interoperability test topology:

**Figure 2-1: Interoperability Test Topology between E-SBC and Microsoft Lync with 8BTwilio SIP Trunk**



### 2.4.1 Environment Setup

The interoperability test topology includes the following environment setup:

**Table 2-4: Environment Setup**

| Area | Setup |
|---|---|
| **Network** | ▪ Microsoft Lync Server 2013 environment is located on the Enterprise's LAN<br>▪ 8BTwilio SIP Trunk is located on the WAN |
| **Signaling Transcoding** | ▪ Microsoft Lync Server 2013 operates with SIP-over-TLS transport type<br>▪ 8BTwilio SIP Trunk operates with SIP-over-UDP transport type |
| **Codecs Transcoding** | ▪ Microsoft Lync Server 2013 supports a wide range of coders<br>▪ 8BTwilio SIP Trunk supports G.711U-law coder only |
| **Media Transcoding** | ▪ Microsoft Lync Server 2013 operates with SRTP media type<br>▪ 8BTwilio SIP Trunk operates with RTP media type |

### 2.4.2 Known Limitations

The following limitation was observed in the Interoperability tests done for the AudioCodes E-SBC interworking between Microsoft Lync Server 2013 and 8BTwilio's SIP Trunk:

- There is a 120 seconds broken connection timeout defined on the 8BTwilio SIP Trunk. Consequently, the SIP trunk always expects to receive RTP packets. When a call is muted or placed on Hold, no packets are sent from the Microsoft Lync Server 2013 side. To resolve this issue, Force Transcoding should be enabled in the E-SBC IP Profile (see Section 4.6 on page 45).

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# 3 Configuring Lync Server 2013

This chapter describes how to configure Microsoft Lync Server 2013 to operate with AudioCodes E-SBC.

**Note:** Dial plans, voice policies, and PSTN usages are also necessary for Enterprise voice deployment; however, they are beyond the scope of this document.

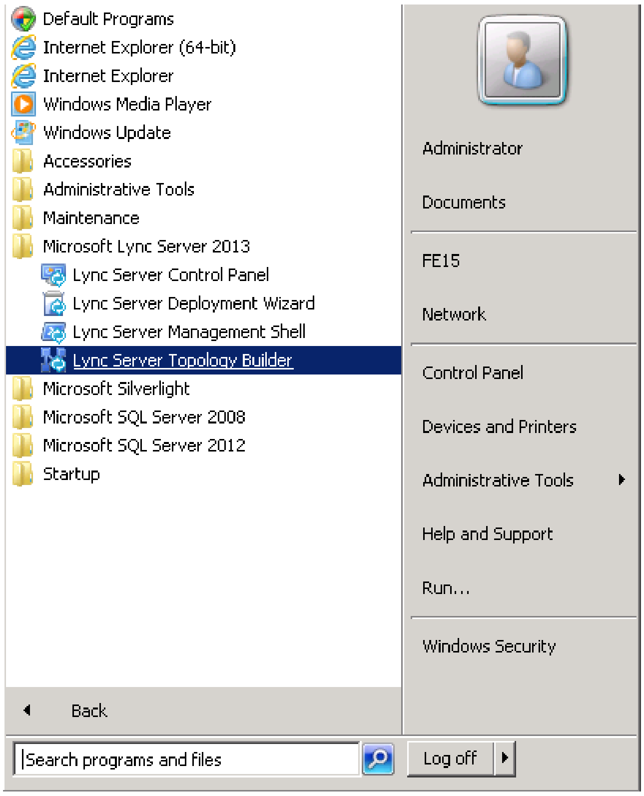
## 3.1 Configuring the E-SBC as an IP / PSTN Gateway

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

➢ **To configure E-SBC as IP/PSTN Gateway and associate it with Mediation Server:**

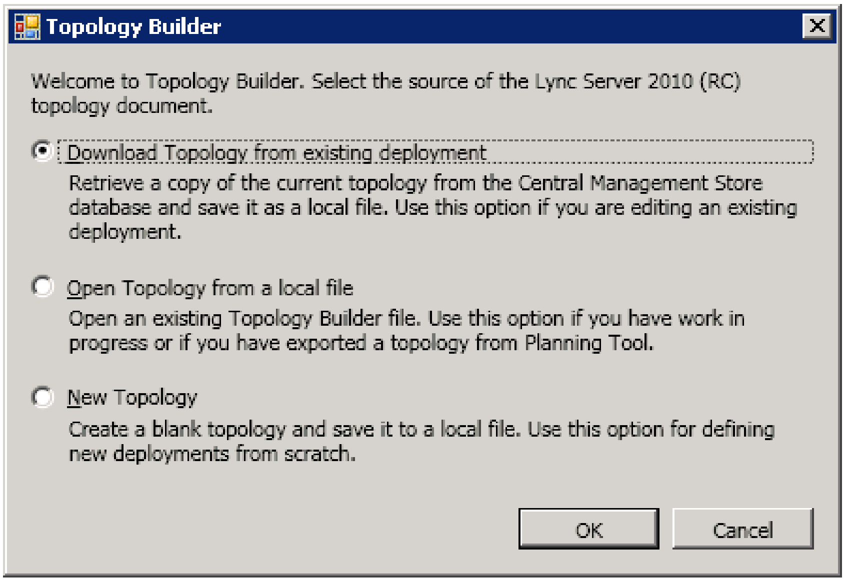
1. On the server where the Topology Builder is installed, start the Lync Server 2013 Topology Builder (Windows **Start** menu > **All Programs** > **Lync Server Topology Builder**), as shown below:

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



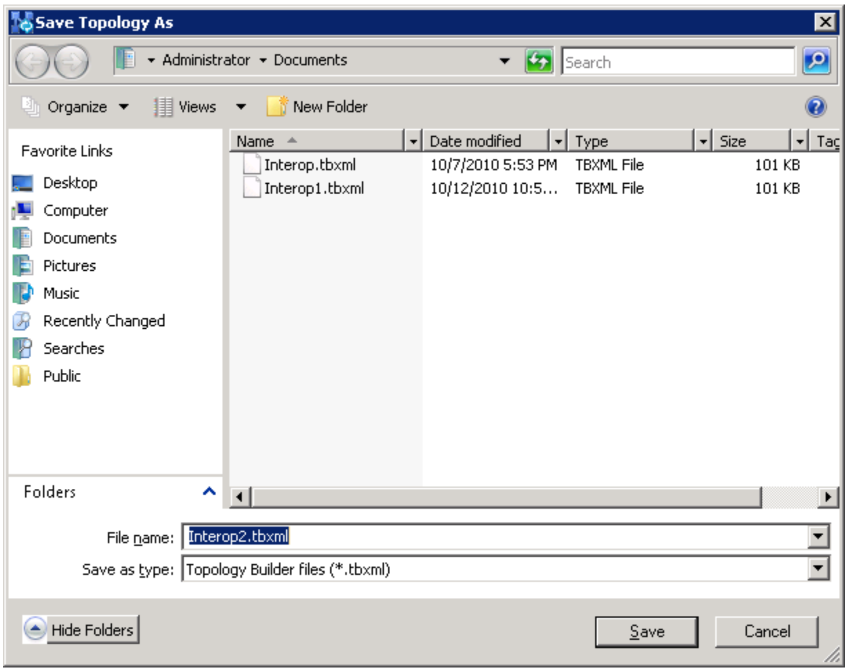
The following is displayed:

**Figure 3-2: Topology Builder Dialog Box**




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

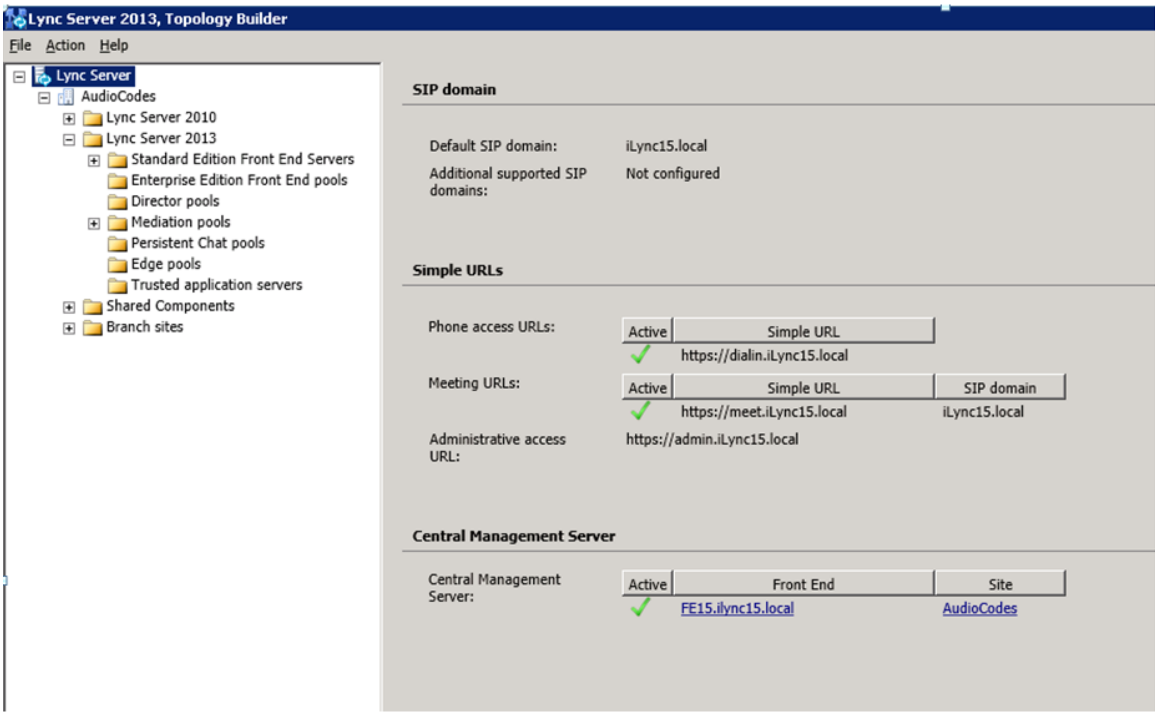
**Figure 3-3: Save Topology Dialog Box**




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

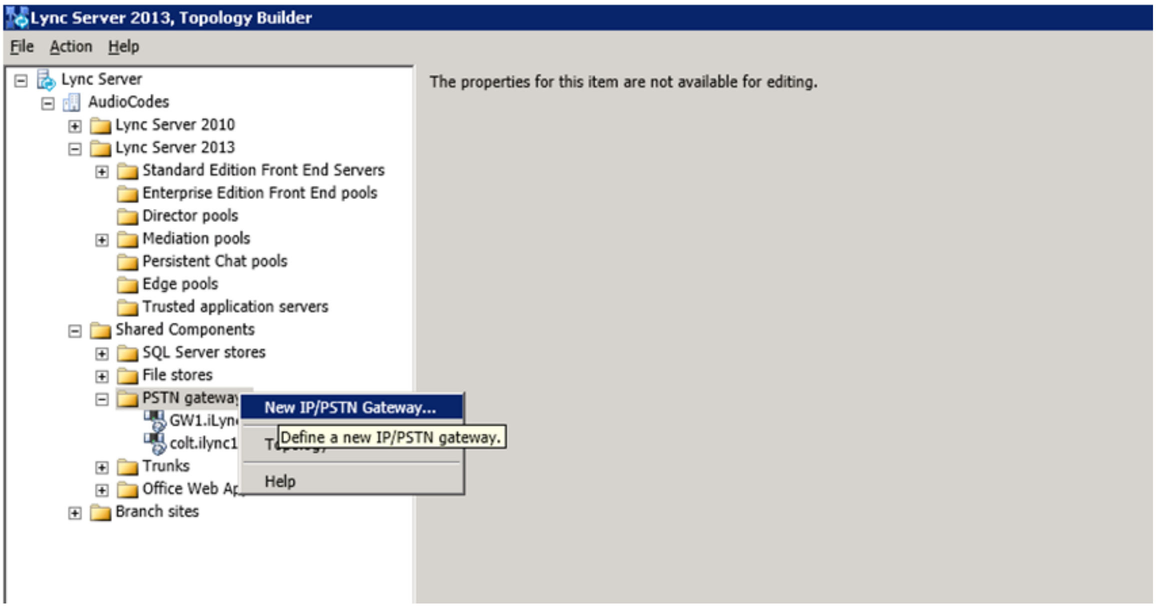
The Topology Builder screen with the downloaded Topology is displayed:

**Figure 3-4: Downloaded Topology**



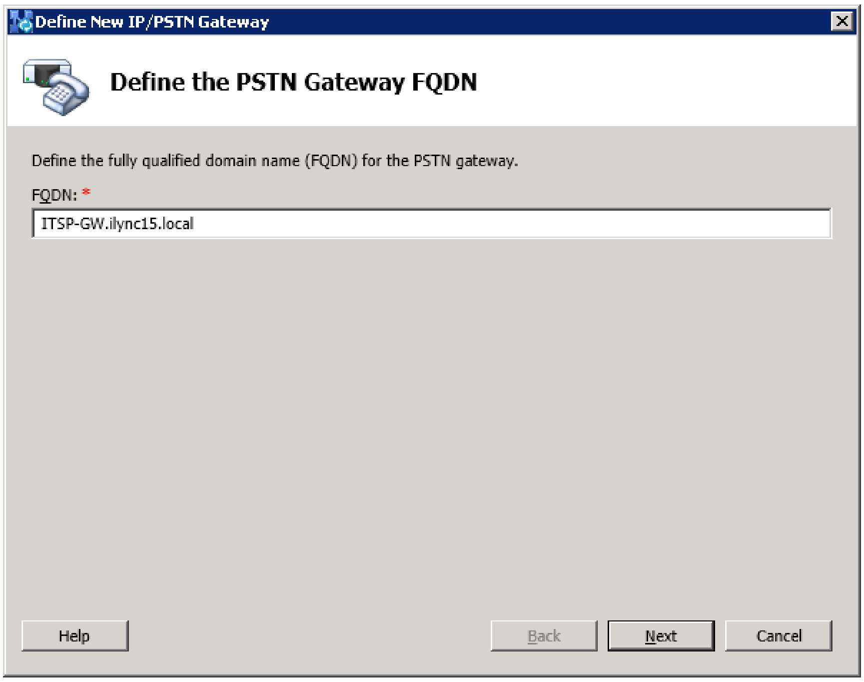
4. Under the **Shared Components** node, right-click the **PSTN gateways** node, and then from the shortcut menu, choose **New IP/PSTN Gateway**, as shown below:

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



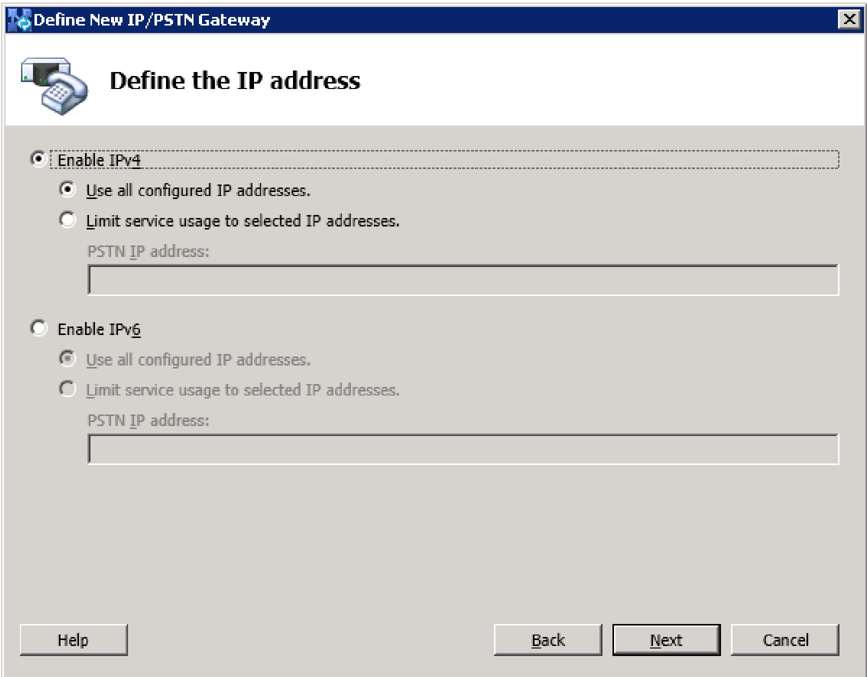
The following is displayed:

**Figure 3-6: Define the PSTN Gateway FQDN**




5. Enter the Fully Qualified Domain Name (FQDN) of the E-SBC (e.g., **ITSP-GW.ilync15.local**). Update this FQDN in the relevant DNS record, and then click **Next**; the following is displayed:

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



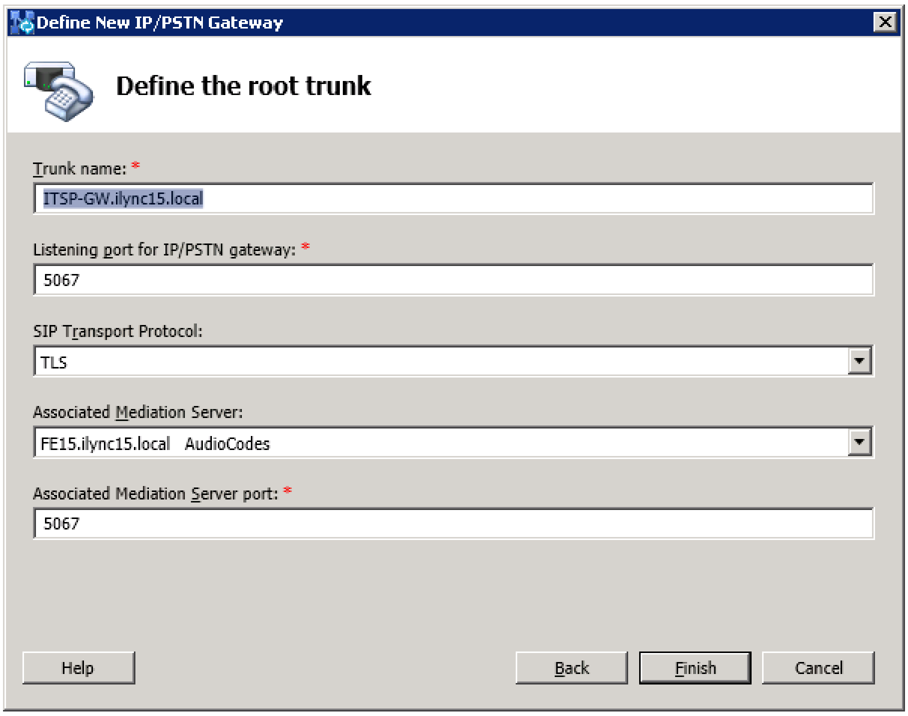

6. Define the listening mode (IPv4 or IPv6) of the IP address of your new PSTN gateway, and then click **Next**.

7. Define a *root trunk* for the PSTN gateway. A trunk is a logical connection between the Mediation Server and a gateway uniquely identified by the following combination: Mediation Server FQDN, Mediation Server listening port (TLS or TCP), gateway IP and FQDN, and gateway listening port.

**Notes:**

- When defining a PSTN gateway in Topology Builder, you must define a root trunk to successfully add the PSTN gateway to your topology.
- The root trunk cannot be removed until the associated PSTN gateway is removed.

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




a. In the 'Listening Port for IP/PSTN Gateway' field, enter the listening port that the E-SBC will use for SIP messages from the Mediation Server that will be associated with the root trunk of the PSTN gateway (e.g., **5067**).

b. In the 'SIP Transport Protocol' field, select the transport type (e.g., **TLS**) that the trunk uses.

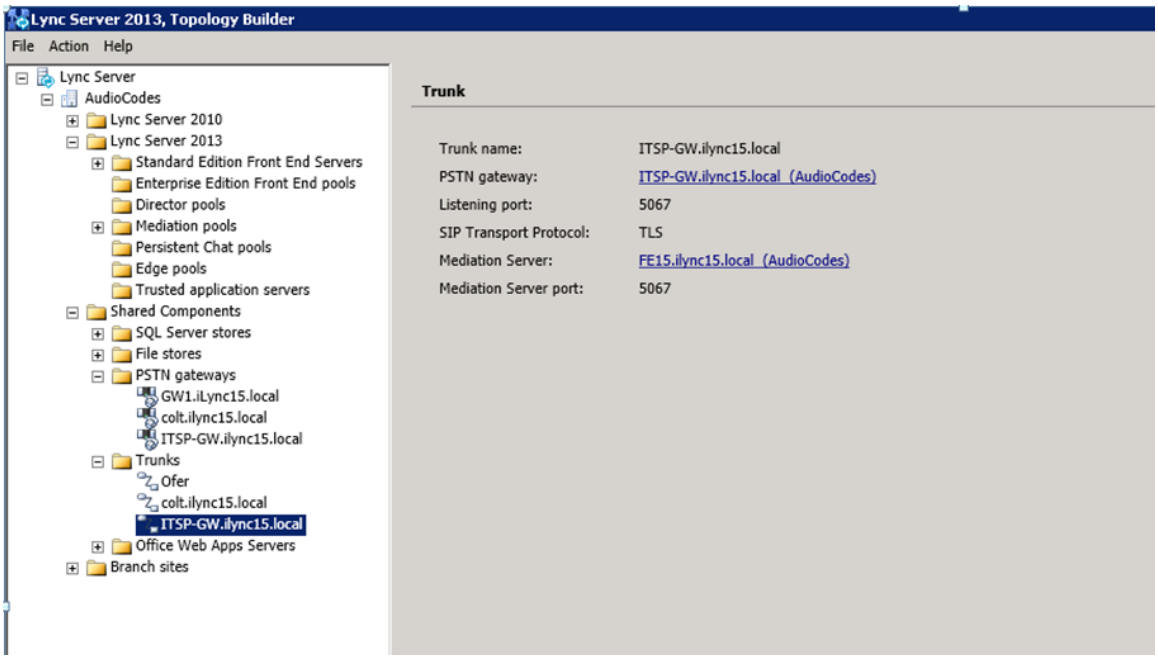
c. In the 'Associated Mediation Server' field, select the Mediation Server pool to associate with the root trunk of this PSTN gateway.

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

e. Click **Finish**.

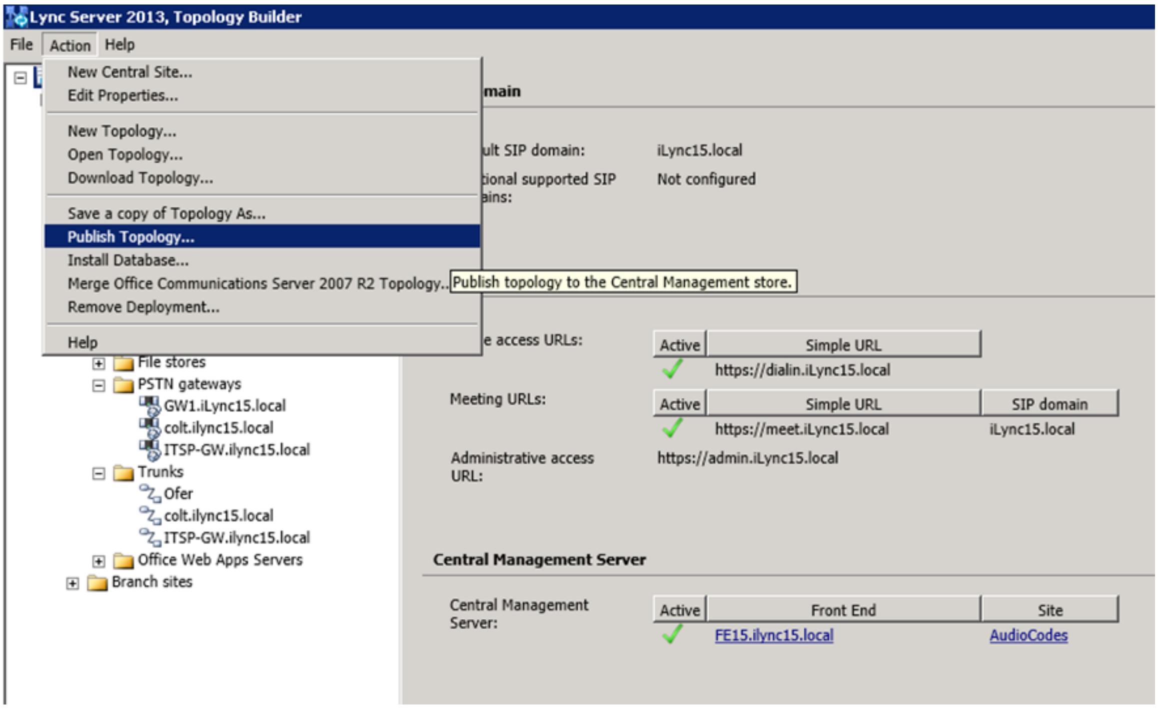
The E-SBC is added as a PSTN gateway, and a trunk is created as shown below:

**Figure 3-9: E-SBC added as IP/PSTN Gateway and Trunk Created**



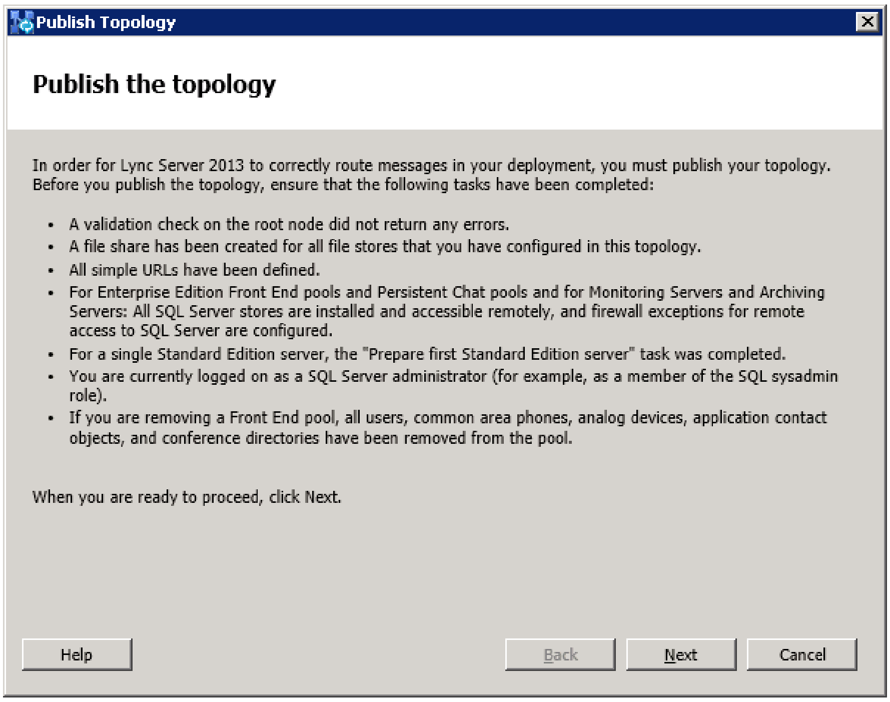

8. Publish the Topology: In the main tree, select the root node **Lync Server**, and then from the **Action** menu, choose **Publish Topology**, as shown below:

**Figure 3-10: Choosing Publish Topology**



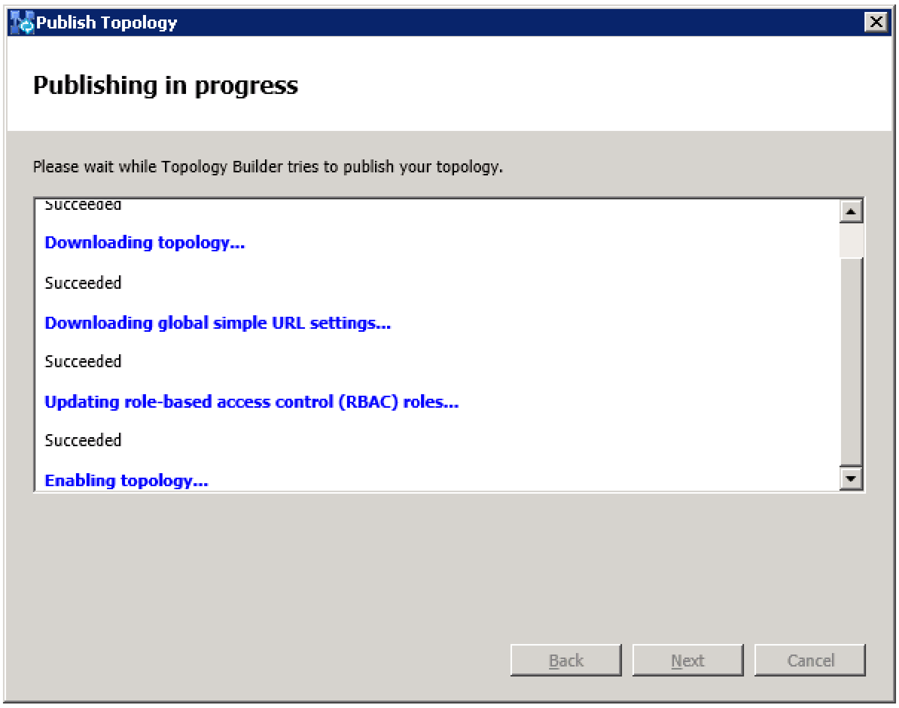
The following is displayed:

**Figure 3-11: Publish the Topology**



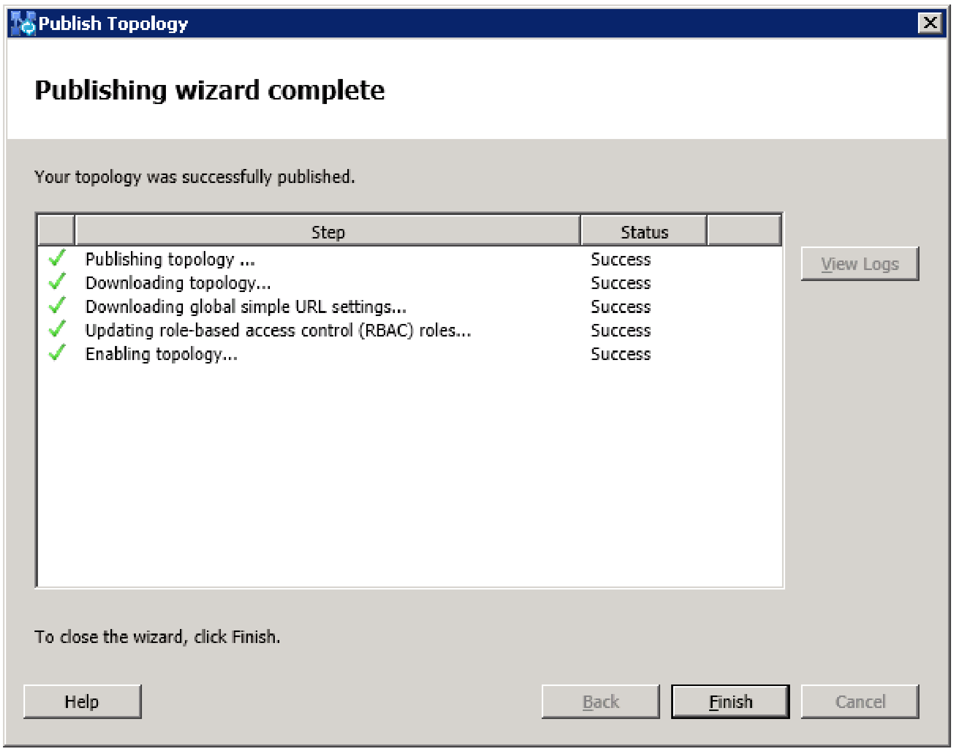

9. Click **Next**; the Topology Builder starts to publish your topology, as shown below:

**Figure 3-12: Publishing in Progress**



10. Wait until the publishing topology process completes successfully, as shown below:

**Figure 3-13: Publishing Wizard Complete**




11. Click **Finish**.

## 3.2 Configuring the "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 E-SBC PSTN gateway.

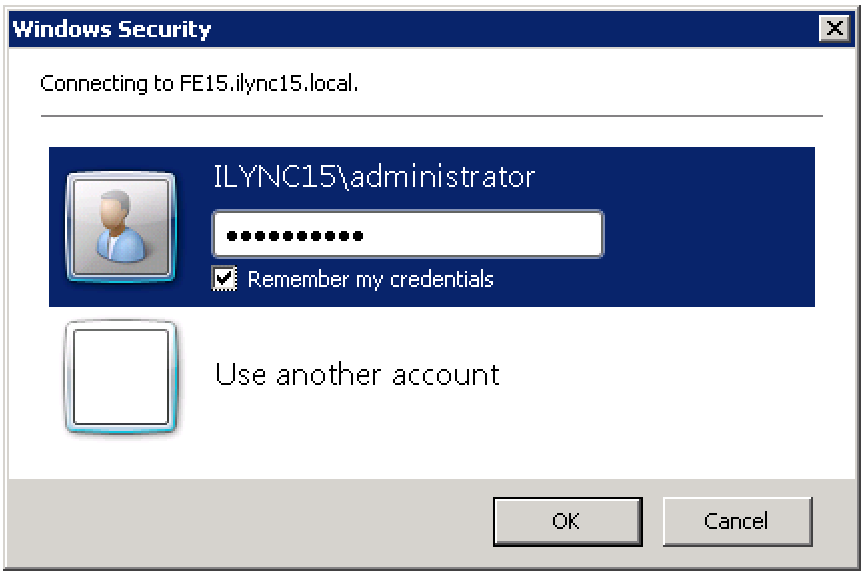
➢ **To configure the "route" on Lync Server 2013:**

1. Start the Microsoft Lync Server 2013 Control Panel (**Start** > **All Programs** > **Microsoft Lync Server 2013** > **Lync Server Control Panel**), as shown below:

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

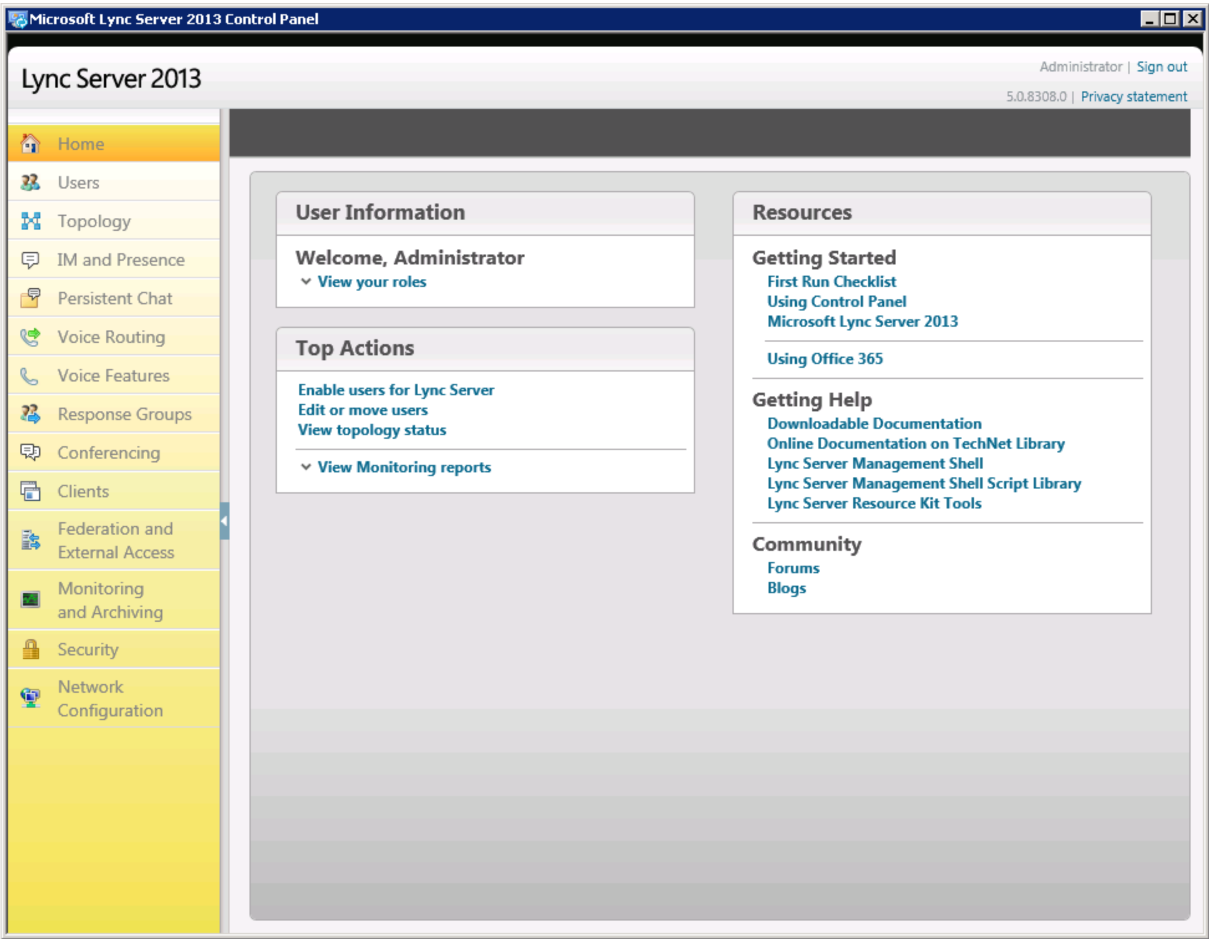
2. You are prompted to enter your login credentials:

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



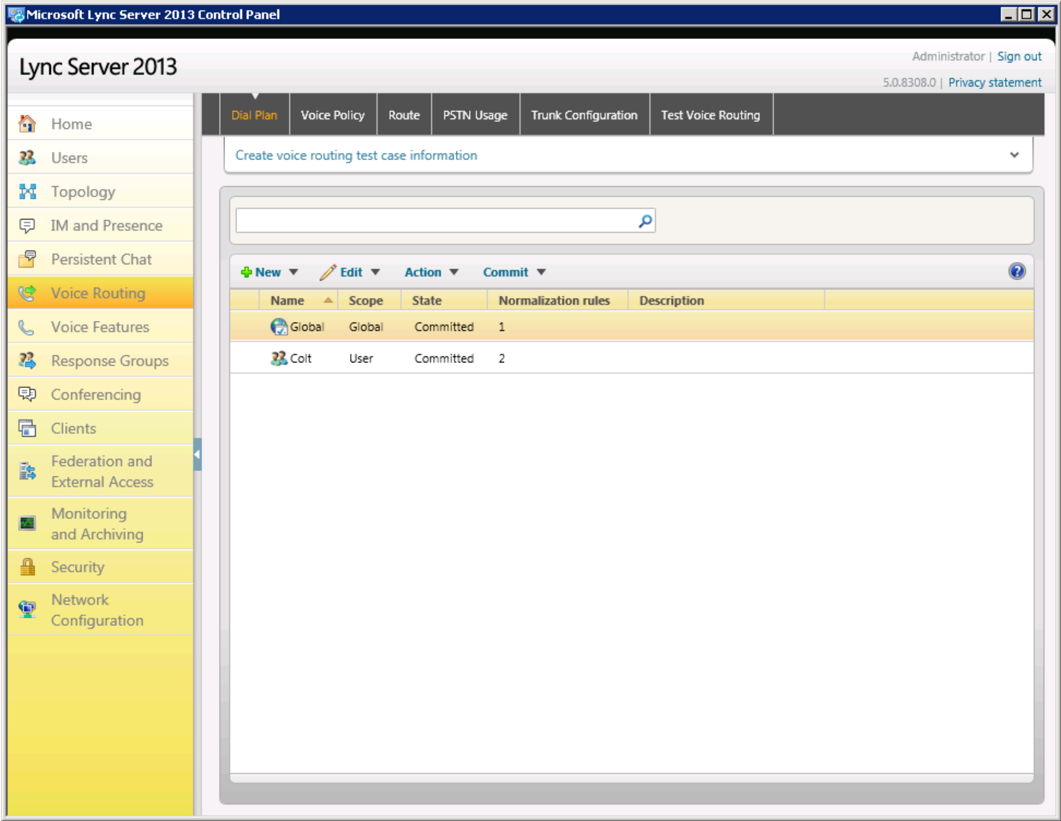

3. Enter your domain username and password, and then click **OK**; the Microsoft Lync Server 2013 Control Panel is displayed:

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



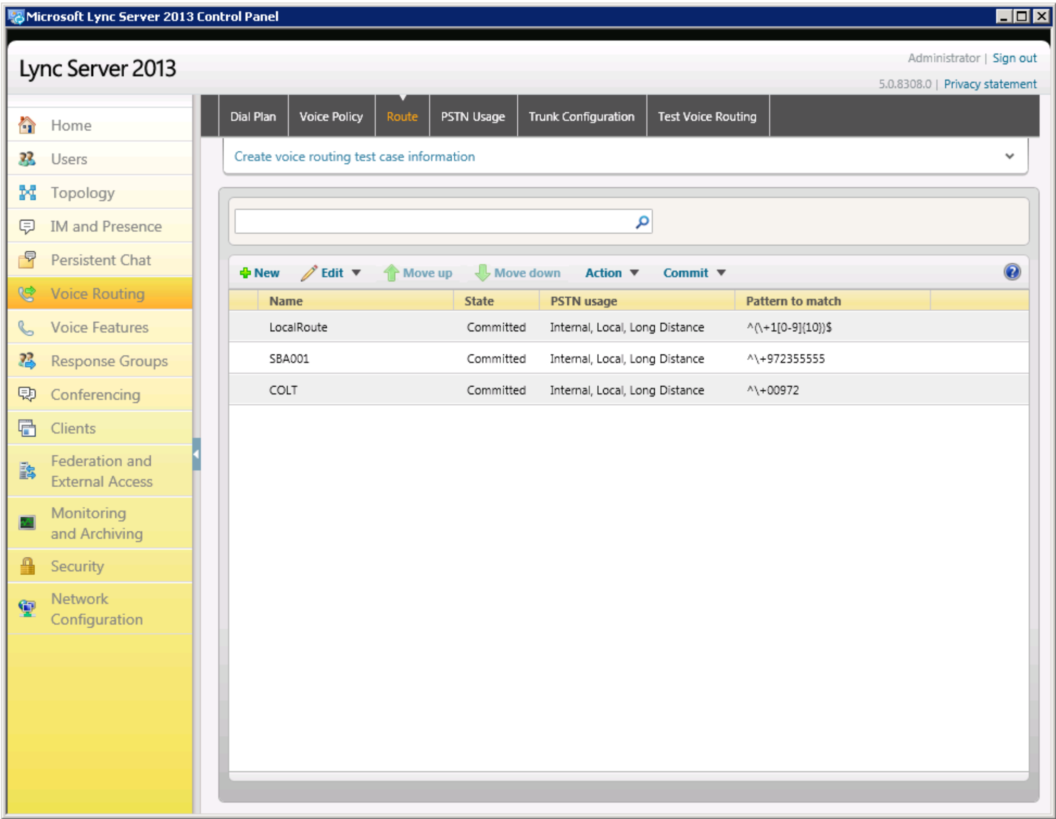
4. In the left navigation pane, select **Voice Routing**.

**Figure 3-17: Voice Routing Page**



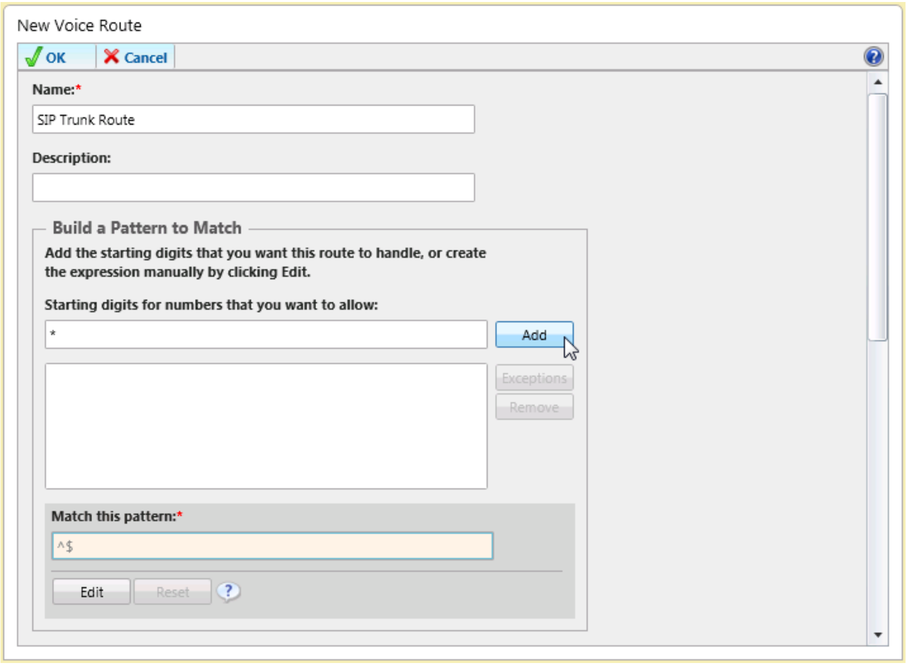

5. In the Voice Routing page, select the **Route** tab.

**Figure 3-18: Route Tab**



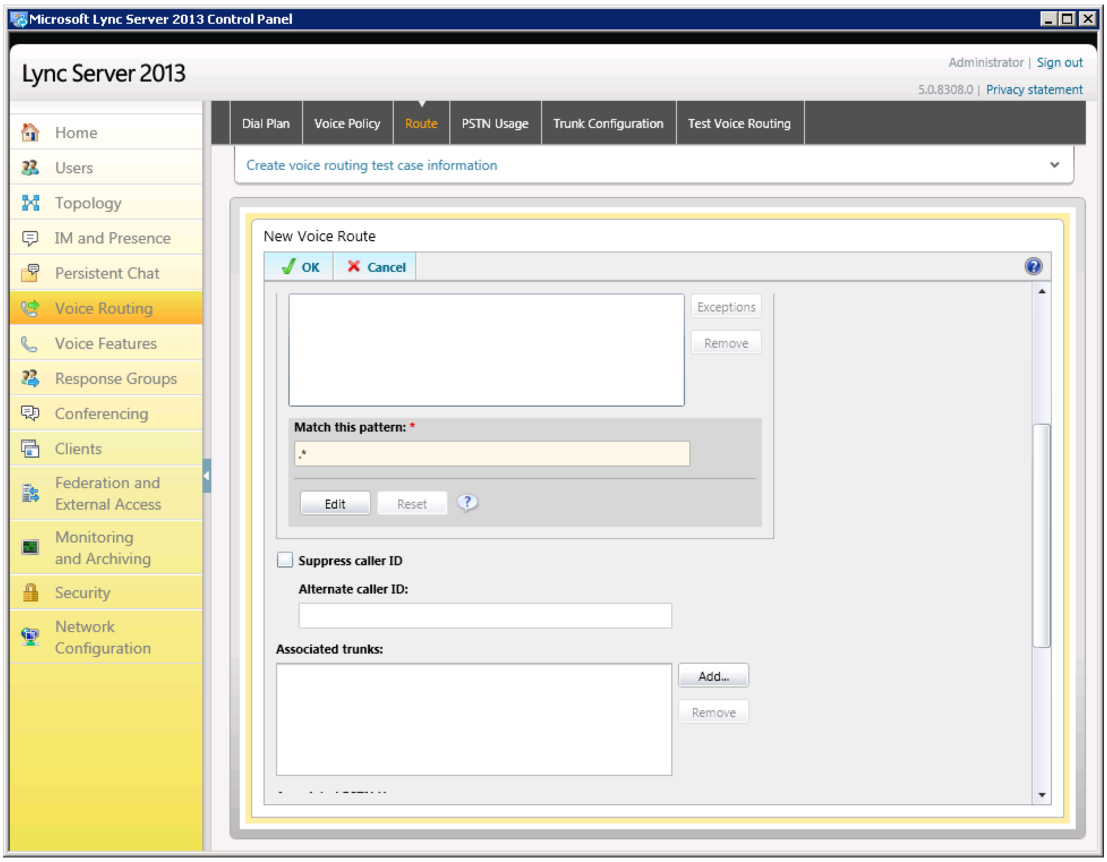
6. Click **New**; the New Voice Route page appears:

**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 'Starting digits for numbers that you want to allow' field, enter the starting digits you want this route to handle (e.g., * to match all numbers), and then click **Add**.

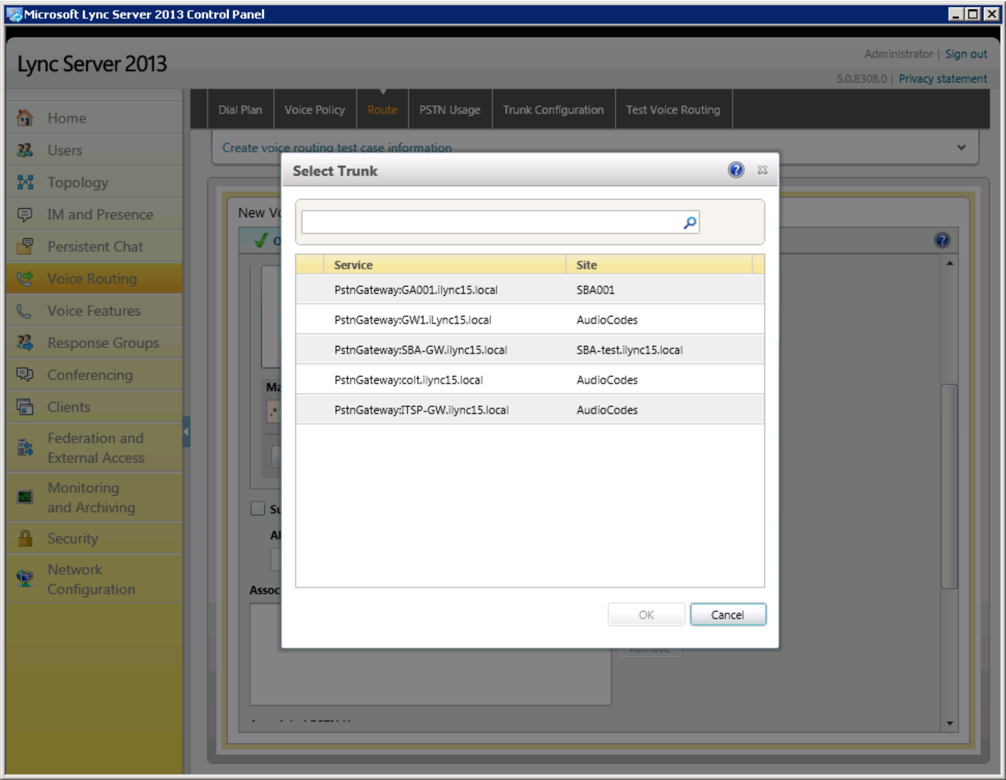
**Figure 3-20: Adding New Trunk**



**9.** Associate the route with the E-SBC Trunk that you created:

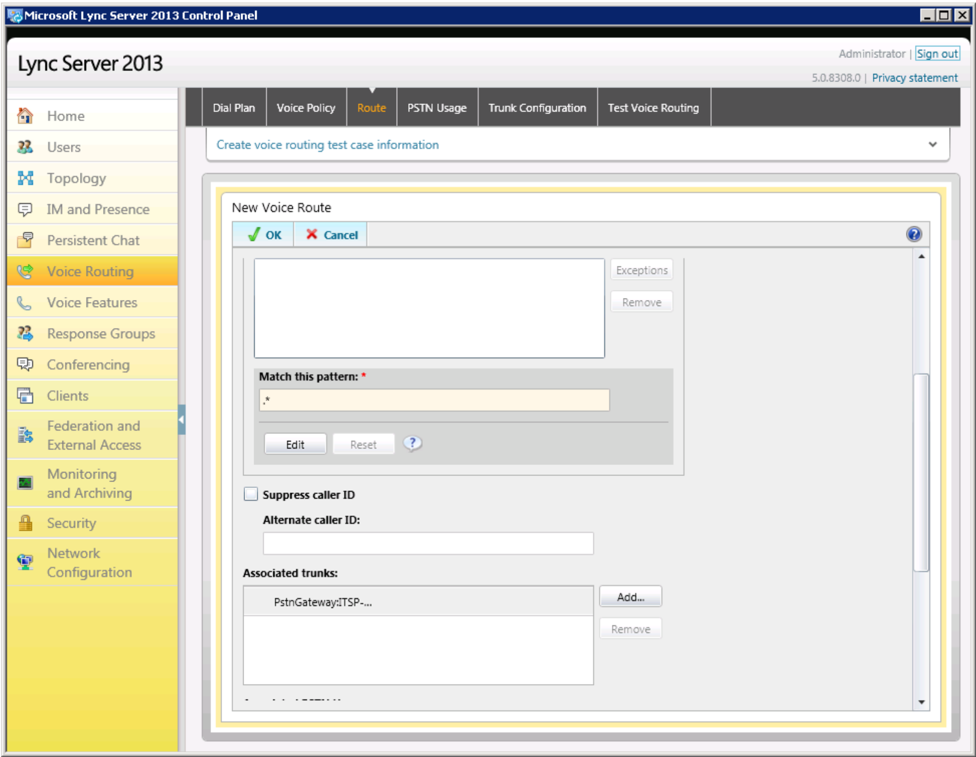
**a.** Under the 'Associated Trunks' group, click **Add**; a list of all the deployed gateways is displayed:

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



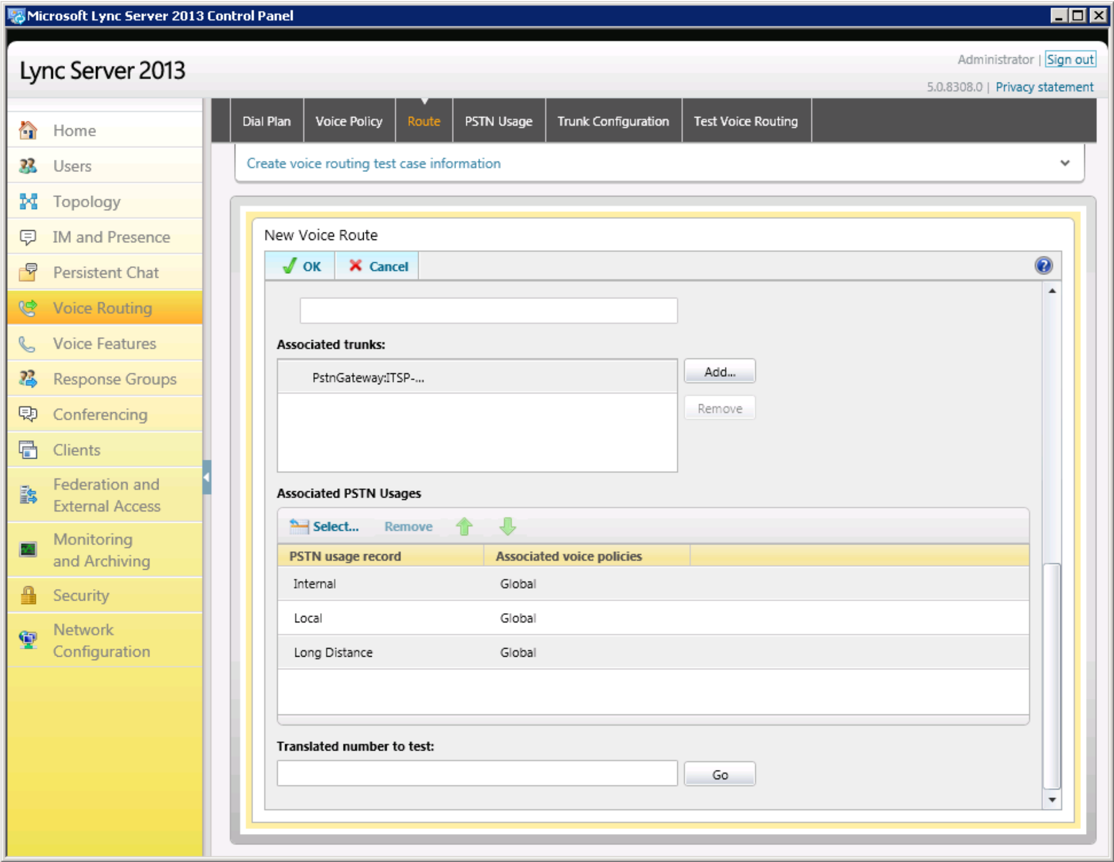

**b.** Select the E-SBC Trunk you created, and then click **OK**; the trunk is added to the 'Associated Trunks' group list:

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



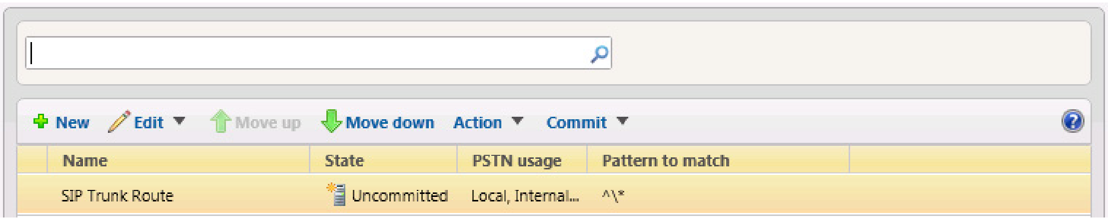
10. Associate a PSTN Usage to this route:
    a. Under the 'Associated PSTN Usages' group, click **Select** and then add the associated PSTN Usage.

**Figure 3-23: Associating PSTN Usage to Route**



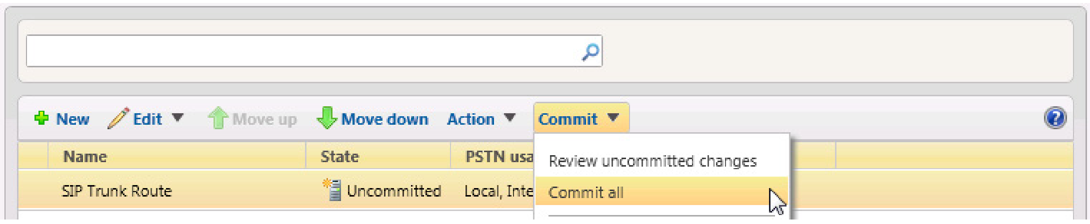

11. Click **OK** (located on the top of the New Voice Route page); the New Voice Route (Uncommitted) is displayed:

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



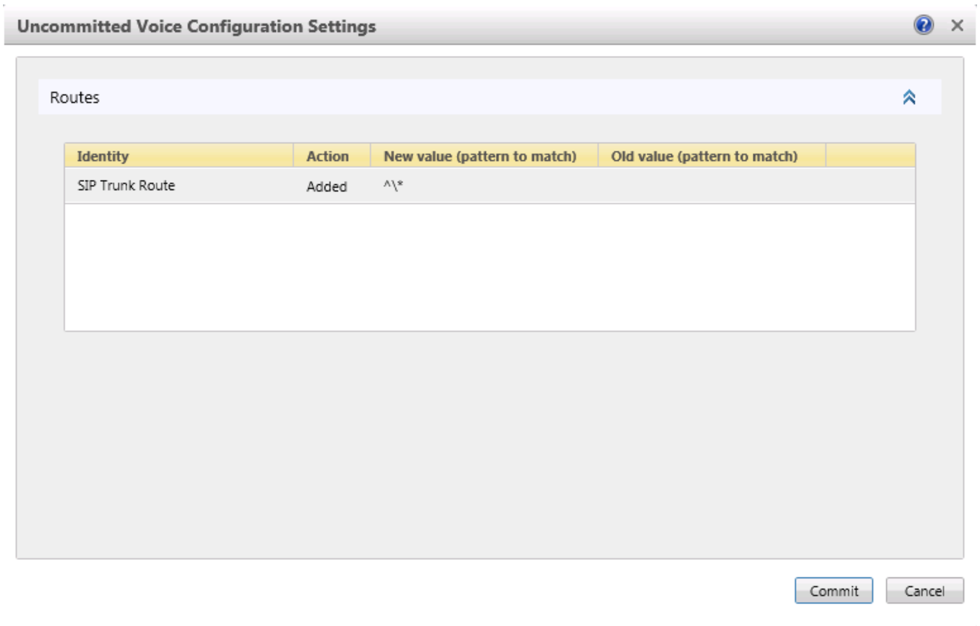

12. From the **Commit** drop-down list, choose **Commit all**, as shown below:

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



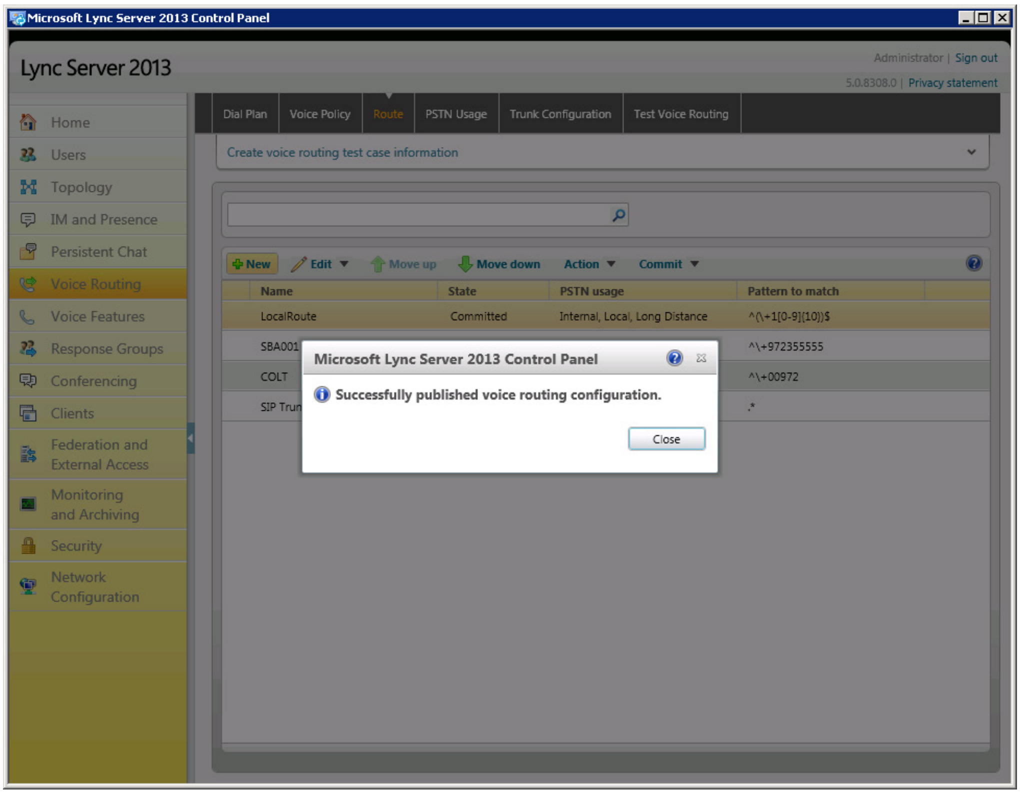
The Uncommitted Voice Configuration Settings page appears:

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



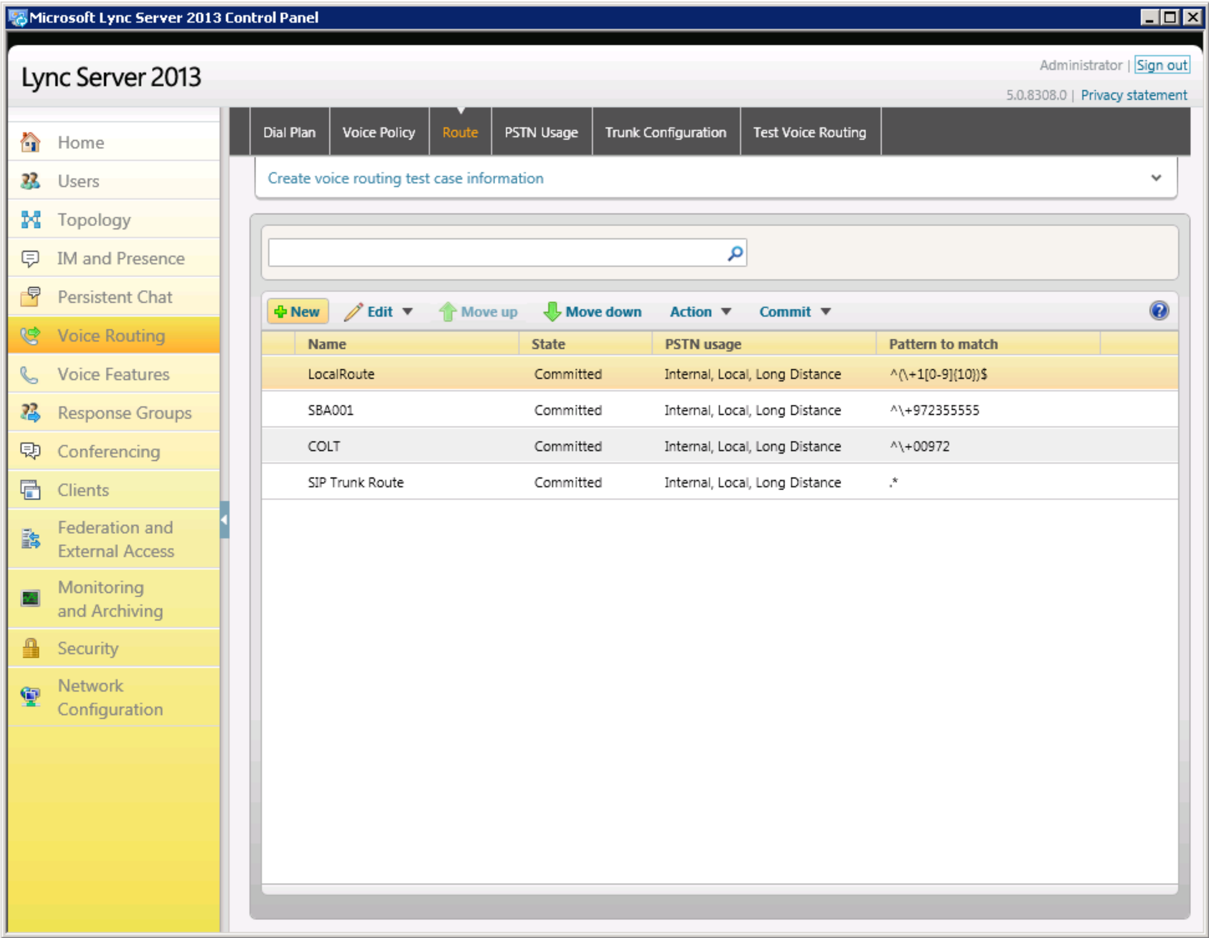

**13.** Click **Commit**; a message is displayed confirming a successful voice routing configuration, as shown below:

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



14. Click **Close**; the new committed Route is displayed in the Voice Routing page, as shown below:

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

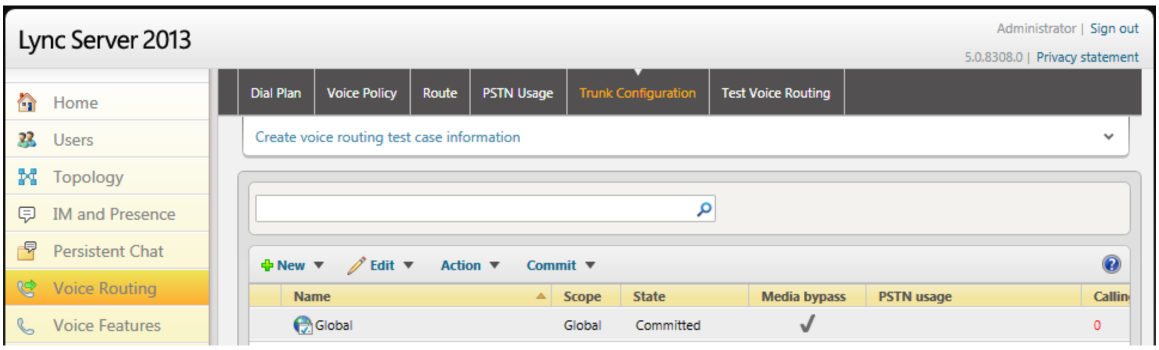



15. For ITSPs that implement a call identifier, continue with the following steps:

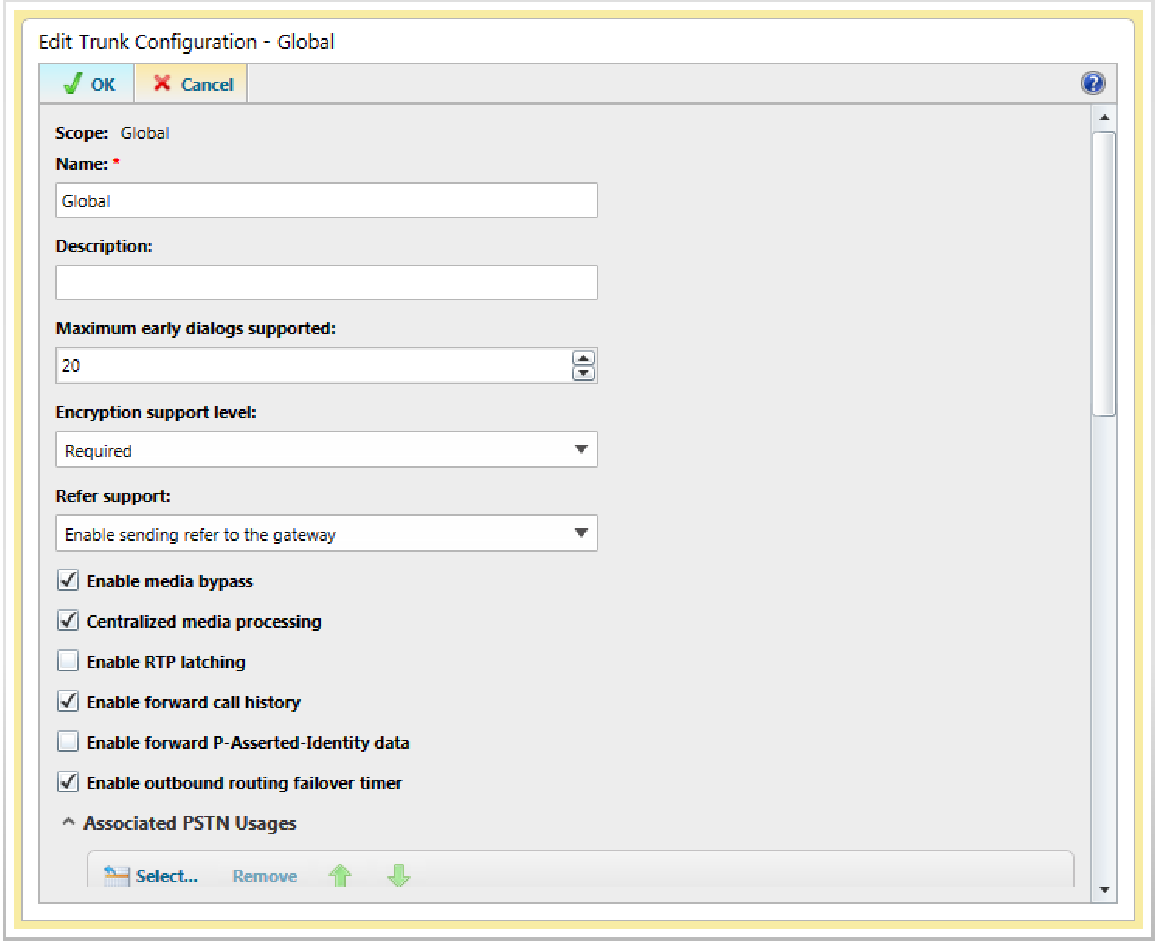
**Note:** The SIP History-Info header provides a method to verify the identity (ID) of the call forwarder (i.e., the Lync user number). This ID is required by the 8BTwilio SIP Trunk in the P-Asserted-Identity header. The device adds this ID to the P-Asserted-Identity header in the sent INVITE message using the IP Profile (see Section 4.6 on page 45).

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:




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

**d.** Repeat Steps 11 through 13 to commit your settings.

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# 4 Configuring AudioCodes E-SBC

This chapter provides step-by-step procedures on how to configure AudioCodes E-SBC for interworking between Microsoft Lync Server 2013 and the 8BTwilio SIP Trunk. These configuration procedures are based on the interoperability test topology described in Section 2.4 on page 10, and includes the following main areas:

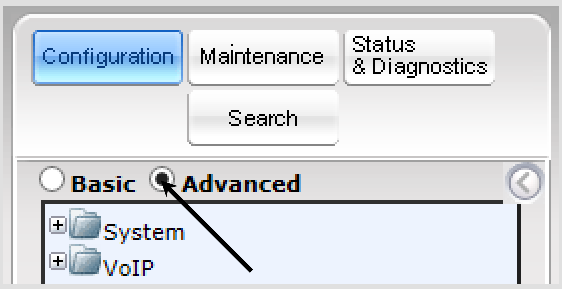
- E-SBC WAN interface - 8BTwilio SIP Trunking environment
- E-SBC LAN interface - Lync Server 2013 environment

This configuration is done using the E-SBC's embedded Web server (hereafter, referred to as *Web interface*).

**Notes:**

- For implementing Microsoft Lync and 8BTwilio SIP Trunk based on the configuration described in this section, AudioCodes E-SBC must be installed with a Software License Key that includes the following software features:
  - √ **Microsoft**
  - √ **SBC**
  - √ **Security**
  - √ **DSP**
  - √ **RTP**
  - √ **SIP**

  For more information about the Software License Key, contact your AudioCodes sales representative.
- The scope of this interoperability test and document does **not** cover all security aspects for connecting the SIP Trunk to the Microsoft Lync environment. Comprehensive security measures should be implemented per your organization's security policies. For security recommendations on AudioCodes' products, refer to the *Recommended Security Guidelines* document.
- Before you begin configuring the E-SBC, ensure that the E-SBC's Web interface Navigation tree is in Advanced-menu display mode. To do this, select the **Advanced** option, as shown below:



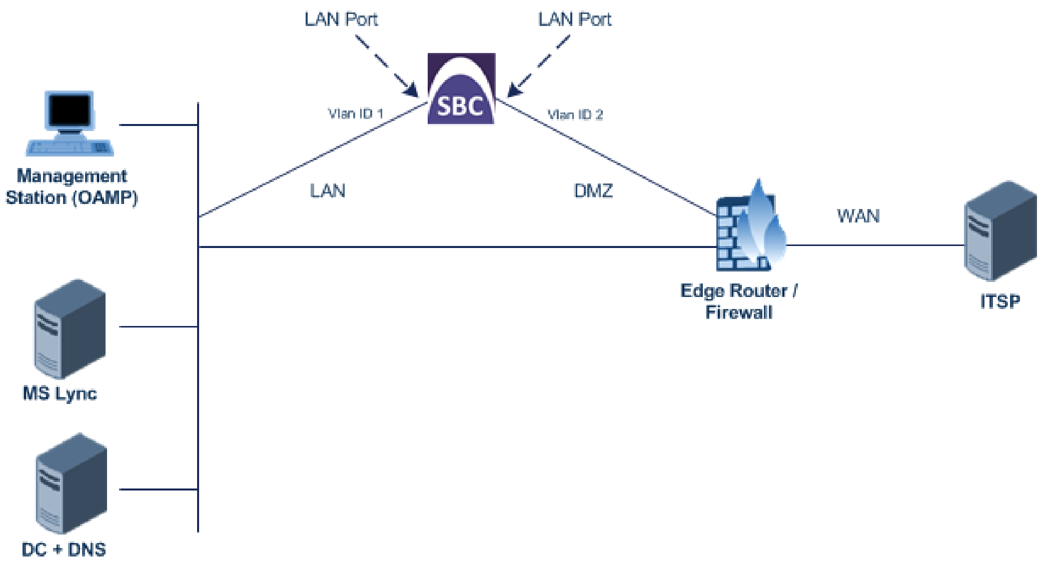

  Note that when the E-SBC is reset, the Navigation tree reverts to Basic-menu display.

## 4.1 Step 1: IP Network Interfaces Configuration

This step describes how to configure the E-SBC's IP network interfaces. There are several ways to deploy the E-SBC; however, this interoperability test topology employs the following deployment method:

- E-SBC interfaces with the following IP entities:
  - Lync servers, located on the LAN
  - 8BTwilio SIP Trunk, located on the WAN
- E-SBC connects to the WAN through a DMZ network
- Physical connection: The type of physical connection to the LAN depends on the method used to connect to the Enterprise's network. In the interoperability test topology, E-SBC connects to the LAN and WAN using dedicated LAN ports (i.e., two ports and two network cables are used).
- E-SBC also uses two logical network interfaces:
  - LAN (VLAN ID 1)
  - WAN (VLAN ID 2)

**Figure 4-1: Network Interfaces in Interoperability Test Topology**



### 4.1.1 Step 1a: Configure VLANs

This step describes how to define VLANs for each of the following interfaces:

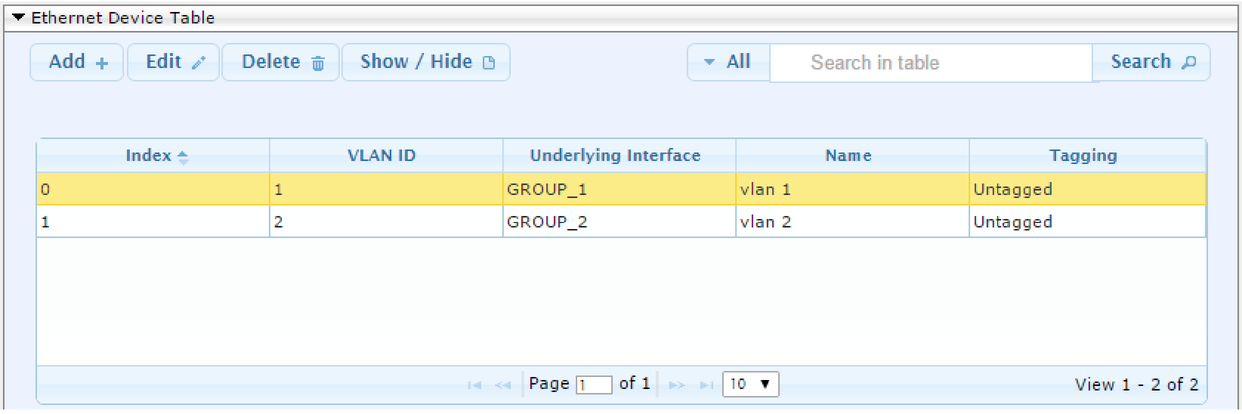
- LAN VoIP (assigned the name "Voice")
- WAN VoIP (assigned the name "WANSP")

➢ **To configure the VLANs:**

1. Open the Ethernet Device Table page (**Configuration** tab > **VoIP** menu > **Network** > **Ethernet Device Table**).
2. There will be one existing row for VLAN ID 1 and underlying interface GROUP_1.
3. Add another VLAN ID 2 for the WAN side as follows:

| Parameter | Value |
|---|---|
| Index | **1** |
| VLAN ID | **2** |
| Underlying Interface | **GROUP_2** (Ethernet port group) |
| Name | **vlan 2** |
| Tagging | **Untagged** |

**Figure 4-2: Configured VLAN IDs in Ethernet Device Table**



### 4.1.2 Step 1b: Configure Network Interfaces

This step describes how to configure the IP network interfaces for each of the following interfaces:

- LAN VoIP (assigned the name "Voice")
- WAN VoIP (assigned the name "WANSP")

➢ **To configure the IP network interfaces:**

1. Open the IP Interfaces Table page (**Configuration** tab > **VoIP** menu > **Network** > **IP Interfaces Table**).
2. Modify the existing LAN network interface:
   a. Select the 'Index' radio button of the **OAMP + Media + Control** table row, and then click **Edit**.
   b. Configure the interface as follows:

| Parameter | Value |
|---|---|
| IP Address | **10.15.17.77** (IP address of E-SBC) |
| Prefix Length | **16** (subnet mask in bits for 255.255.0.0) |
| Default Gateway | **10.15.0.1** |
| Interface Name | **Voice** (arbitrary descriptive name) |
| Primary DNS Server IP Address | **10.15.25.1** |
| Underlying Device | **vlan 1** |

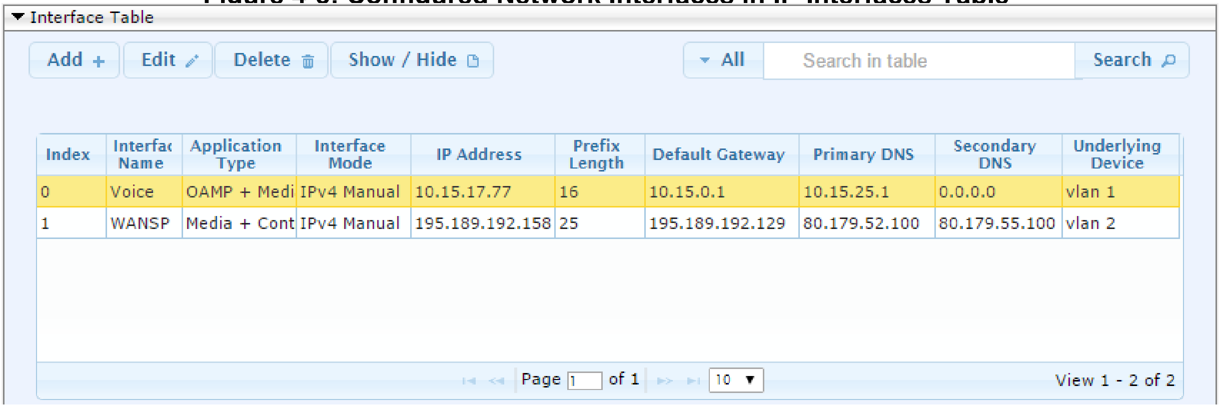
3. Add a network interface for the WAN side:
   a. Enter **1**, and then click **Add Index**.
   b. Configure the interface as follows:

| Parameter | Value |
|---|---|
| Application Type | **Media + Control** |
| IP Address | **195.189.192.158** (WAN IP address) |
| Prefix Length | **25** (for 255.255.255.128) |
| Default Gateway | **195.189.192.129** (router's IP address) |
| Interface Name | **WANSP** |
| Primary DNS Server IP Address | **80.179.52.100** |
| Secondary DNS Server IP Address | **80.179.55.100** |
| Underlying Device | **vlan 2** |

4. Click **Apply**, and then **Done**.

The configured IP network interfaces are shown below:

**Figure 4-3: Configured Network Interfaces in IP Interfaces Table**




| Index | Interfac Name | Application Type | Interface Mode | IP Address | Prefix Length | Default Gateway | Primary DNS | Secondary DNS | Underlying Device |
|---|---|---|---|---|---|---|---|---|---|
| 0 | Voice | OAMP + Medi | IPv4 Manual | 10.15.17.77 | 16 | 10.15.0.1 | 10.15.25.1 | 0.0.0.0 | vlan 1 |
| 1 | WANSP | Media + Cont | IPv4 Manual | 195.189.192.158 | 25 | 195.189.192.129 | 80.179.52.100 | 80.179.55.100 | vlan 2 |

## 4.2 Step 2: Enable the SBC Application

This step 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 4-4: Enabling SBC Application**


2. From the 'SBC Application' drop-down list, select **Enable**.
3. Click **Submit**.
4. Reset the E-SBC with a burn to flash for this setting to take effect (see Section 4.15 on page 77).

## 4.3 Step 3: Configure Media Realms

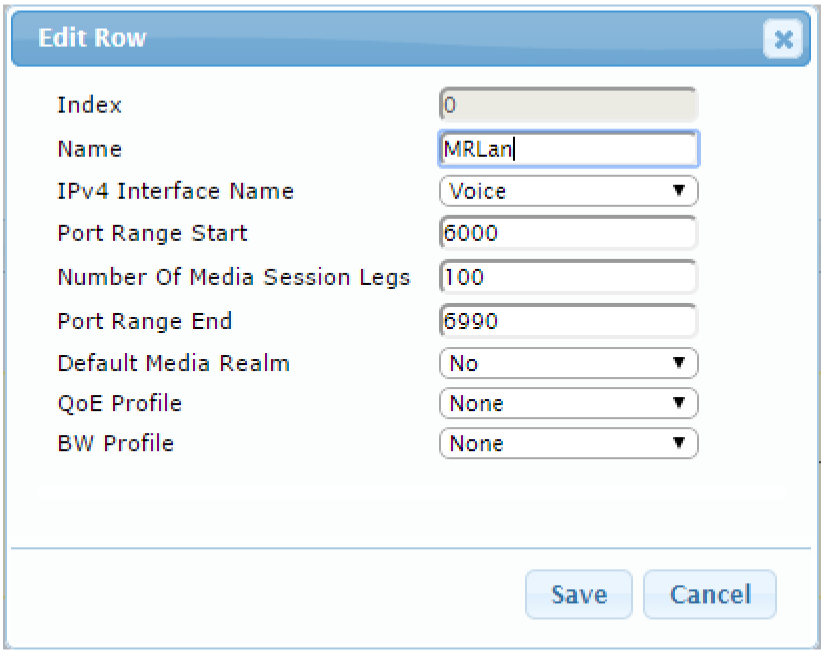
This step describes how to configure Media Realms. The simplest configuration is to create two Media Realms - one for internal (LAN) traffic and one for external (WAN) traffic.

➢ **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 interface. You can use the default Media Realm (Index 0), but modify it as shown below:

| Parameter | Value |
|---|---|
| Index | **0** |
| Media Realm Name | **MRLan** (descriptive name) |
| IPv4 Interface Name | **Voice** |
| Port Range Start | **6000** (represents lowest UDP port number used for media on LAN) |
| Number of Media Session Legs | **100** (media sessions assigned with port range) |

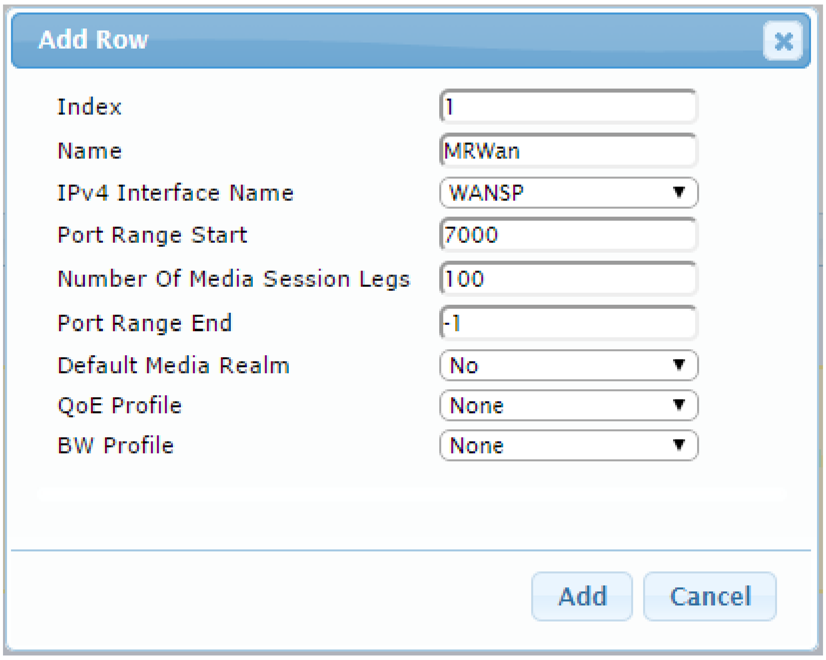
**Figure 4-5: Configuring Media Realm for LAN**



3. Configure a Media Realm for WAN traffic:

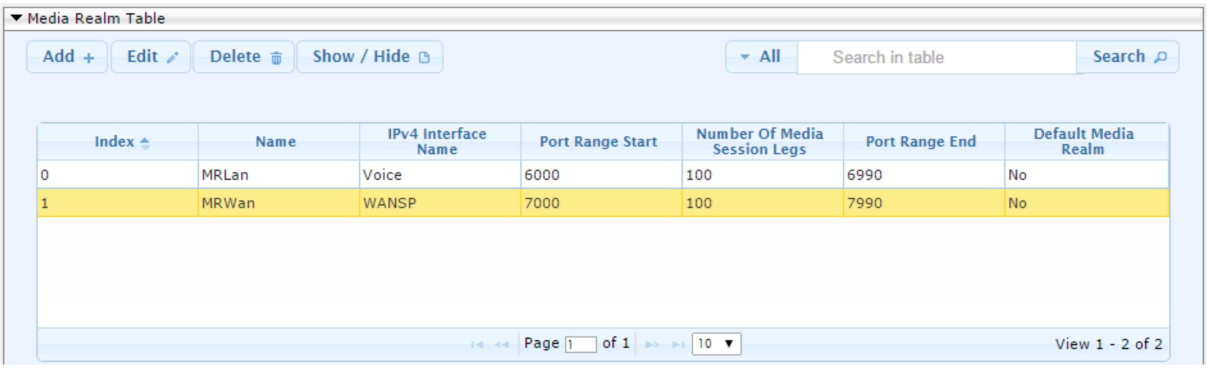
| Parameter | Value |
|---|---|
| Index | **1** |
| Media Realm Name | **MRWan** (arbitrary name) |
| IPv4 Interface Name | **WANSP** |
| Port Range Start | **7000** (represents lowest UDP port number used for media on WAN) |
| Number of Media Session Legs | **100** (media sessions assigned with port range) |

**Figure 4-6: Configuring Media Realm for WAN**




The configured Media Realms are shown in the figure below:

**Figure 4-7: Configured Media Realms in Media Realm Table**



## 4.4 Step 4: Configure SIP Signaling Interfaces

This step describes how to configure SIP Interfaces. For the interoperability test topology, an internal and external SIP Interface must be configured for the E-SBC.

### ➢ To configure 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 interface. You can use the default SIP Interface (Index 0), but modify it as shown below:

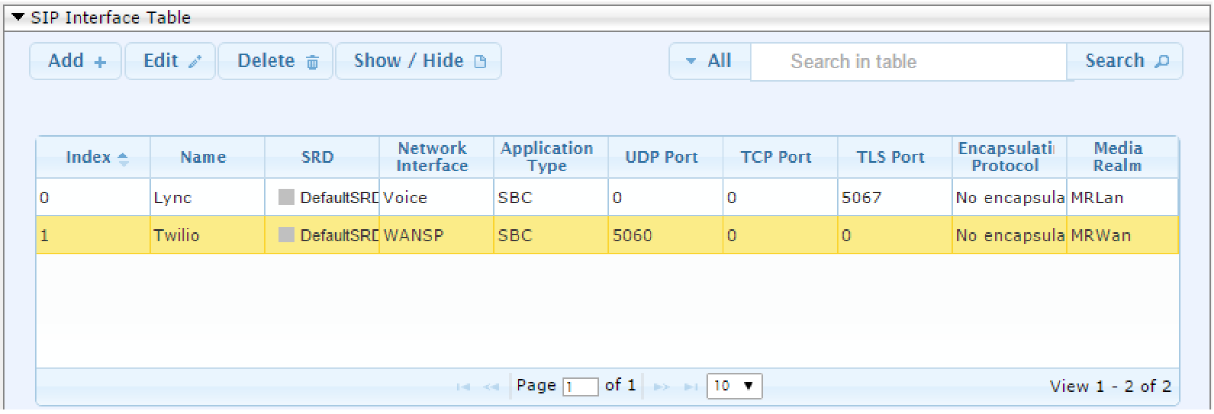
| Parameter | Value |
|---|---|
| Index | **0** |
| Interface Name | **Lync** (see Note below) |
| Network Interface | **Voice** |
| Application Type | **SBC** |
| TLS Port | **5067** |
| TCP and UDP | **0** |
| Media Realm | **MRLan** |

3. Configure a SIP Interface for the WAN:

| Parameter | Value |
|---|---|
| Index | **1** |
| Interface Name | **Twilio** (see Note below) |
| Network Interface | **WANSP** |
| Application Type | **SBC** |
| UDP Port | **5060** |
| TCP and TLS | **0** |
| Media Realm | **MRWan** |

The configured SIP Interfaces are shown in the figure below:

**Figure 4-8: Configured SIP Interfaces in SIP Interface Table**



SIP Interface Table

| Index | Name | SRD | Network Interface | Application Type | UDP Port | TCP Port | TLS Port | Encapsulati Protocol | Media Realm |
|---|---|---|---|---|---|---|---|---|---|
| 0 | Lync | DefaultSRD | Voice | SBC | 0 | 0 | 5067 | No encapsula | MRLan |
| 1 | Twilio | DefaultSRD | WANSP | SBC | 5060 | 0 | 0 | No encapsula | MRWan |



**Note:** Unlike in previous software releases where configuration entities (e.g., SIP Interface, Proxy Sets, and IP Groups) were associated with each other using table row indices, Version 7.0 uses the string **names** of the configuration entities. Therefore, it is recommended to configure each configuration entity with meaningful names for easy identification.

## 4.5 Step 5: Configure Proxy Sets

This step describes how to configure Proxy Sets. The Proxy Set defines the destination address (IP address or FQDN) of the IP entity server. Proxy Sets can also be used to configure load balancing between multiple servers.

For the interoperability test topology, two Proxy Sets need to be configured for the following IP entities:

- Microsoft Lync Server 2013
- 8BTwilio SIP Trunk

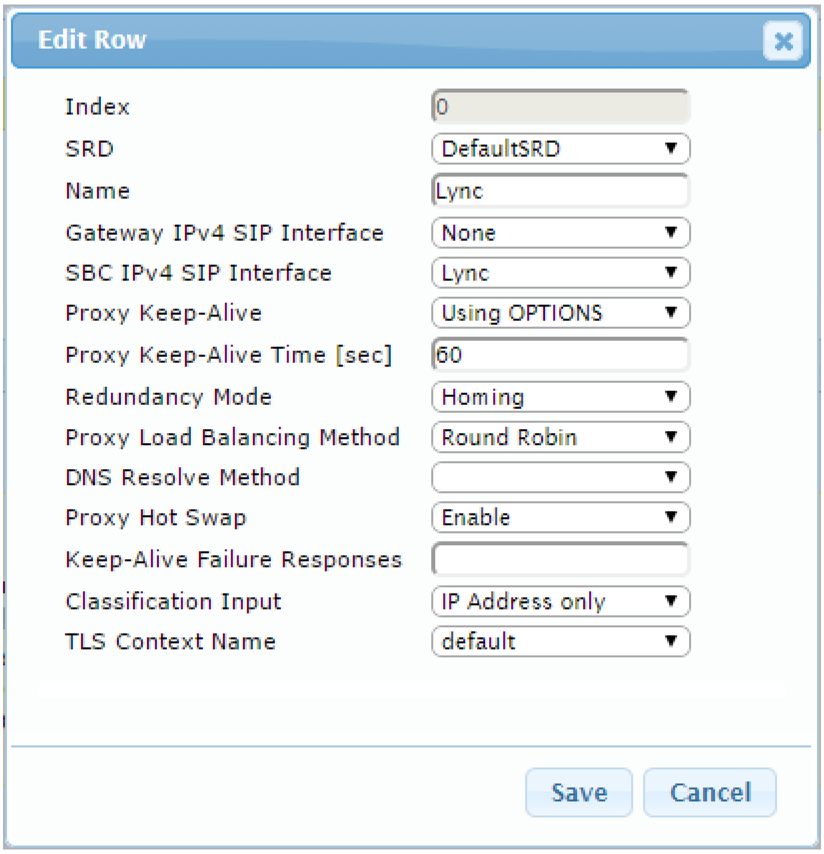
The Proxy Sets will be later applying to the VoIP network by assigning them to IP Groups.

➢ **To configure Proxy Sets:**

1. Open the Proxy Sets Table page (**Configuration** tab > **VoIP** menu > **VoIP Network** > **Proxy Sets Table**).
2. Add a Proxy Set for the Lync Server 2013. You can use the default Proxy Set (Index 0), but modify it as shown below:

| Parameter | Value |
|---|---|
| Proxy Set ID | **0** |
| Proxy Name | **Lync** (see note in Section 4.4) |
| SBC IPv4 SIP Interface | **Lync** |
| Proxy Keep Alive | **Using Options** |
| Redundancy Mode | **Homing** |
| Load Balancing Method | **Round Robin** |
| Proxy Hot Swap | **Enable** |
| TLS Context Name | **default** |

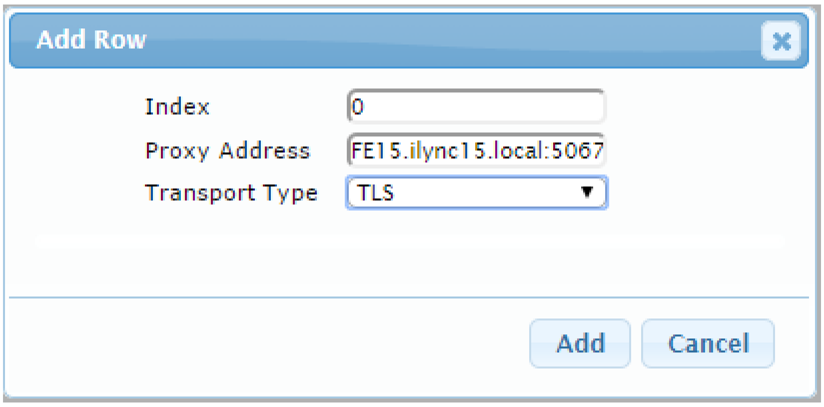
**Figure 4-9: Configuring Proxy Set for Microsoft Lync Server 2013**




3. Configure a Proxy Address Table for Proxy Set for Lync Server 2013:
   a. Go to **Configuration** tab > **VoIP** menu > **VoIP Network** > **Proxy Sets Table** > **Proxy Address Table**.

| Parameter | Value |
|---|---|
| Index | **0** |
| Proxy Address | **FE15.ilync15.local:5067**<br>(Lync Server 2013 IP address / FQDN and destination port) |
| Transport Type | **TLS** |

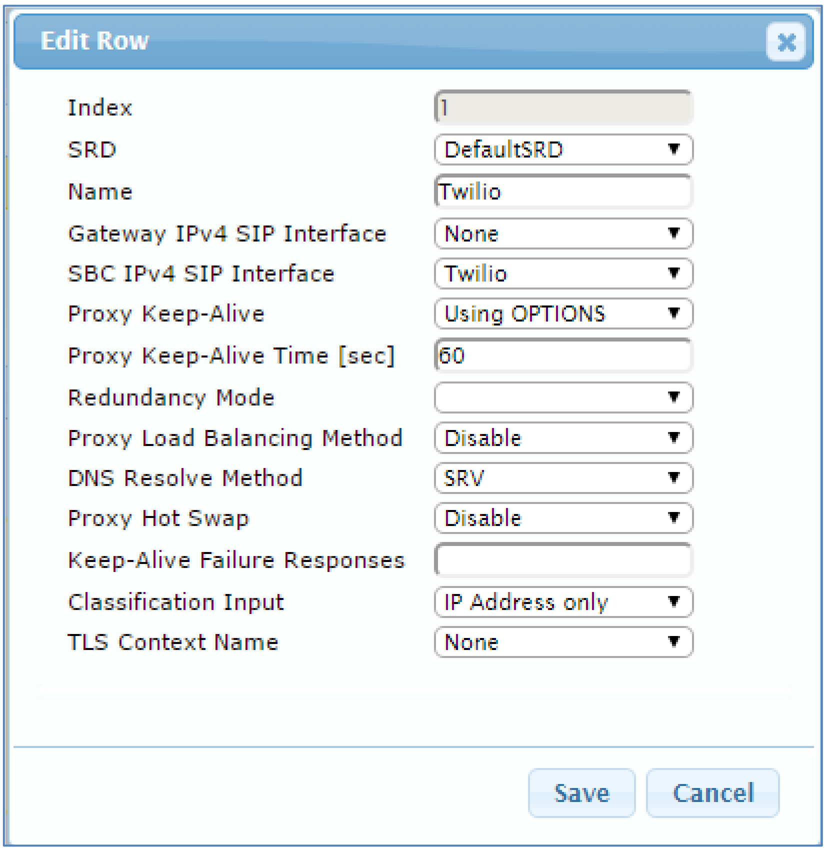
**Figure 4-10: Configuring Proxy Address for Microsoft Lync Server 2013**



4. Configure a Proxy Set for the 8BTwilio SIP Trunk:

| Parameter | Value |
|---|---|
| Proxy Set ID | **1** |
| Proxy Name | **Twilio** (see note in Section 4.4) |
| SBC IPv4 SIP Interface | **Twilio** |
| Proxy Keep Alive | **Using Options** |
| DNS Resolve Method | **SRV** |

**Figure 4-11: Configuring Proxy Set for 8BTwilio SIP Trunk**

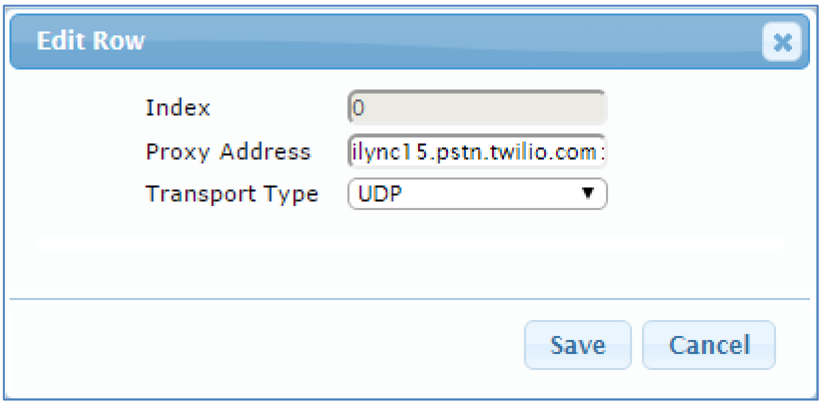



a. Configure a Proxy Address Table for Twilio Proxy Set:

b. Go to **Configuration** tab > **VoIP** menu > **VoIP Network** > **Proxy Sets Table** > **Proxy Address Table**.

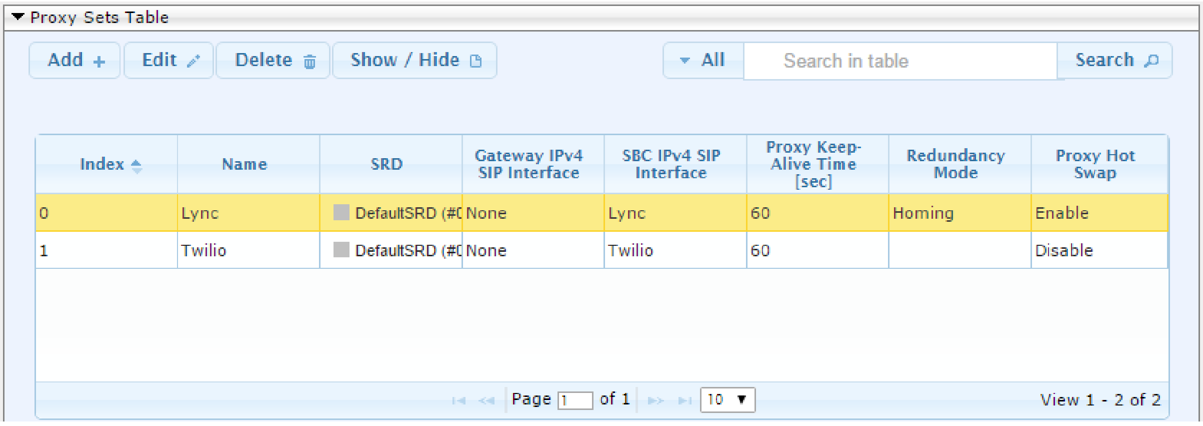
| Parameter | Value |
|---|---|
| Index | **0** |
| Proxy Address | **ilync15.pstn.twilio.com:5060**<br>( FQDN and destination port) |
| Transport Type | **UDP** |

**Figure 4-12: Configuring Proxy Address for**




The configured Proxy Sets are shown in the figure below:

**Figure 4-13: Configured Proxy Sets in Proxy Sets Table**



## 4.6 Step 6: Configure IP Profiles

This step describes how to configure IP Profiles. The IP Profile defines a set of call capabilities relating to signaling (e.g., SIP message terminations such as REFER) and media (e.g., coder and transcoding method).

In this interoperability test topology, IP Profiles need to be configured for the following IP entities:

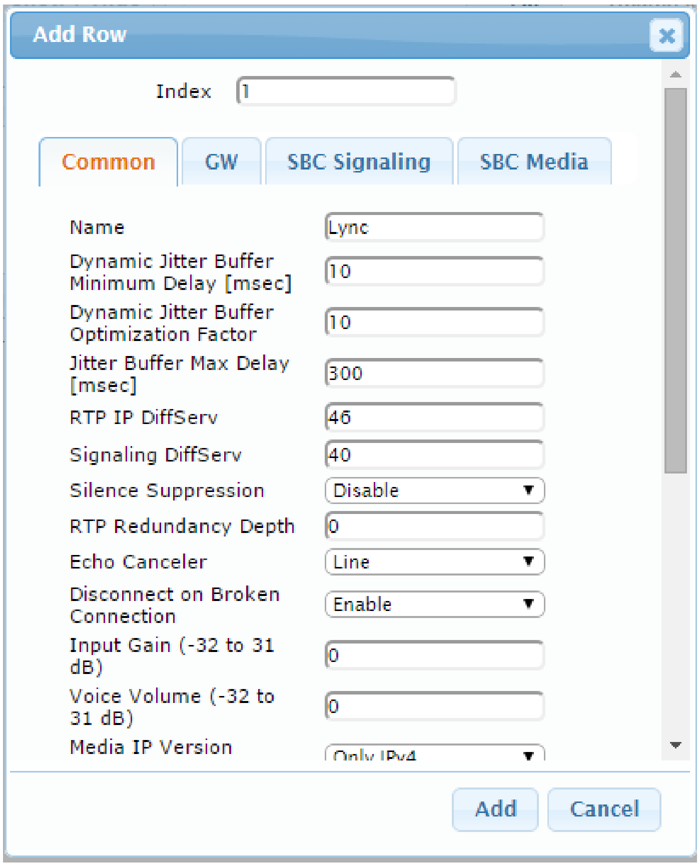
- Microsoft Lync Server 2013 - to operate in secure mode using SRTP and TLS
- 8BTwilio SIP trunk - to operate in non-secure mode using RTP and UDP

➢ **To configure IP Profile for the Lync Server 2013:**

1. Open the IP Profile Settings page (**Configuration** tab > **VoIP** > **Coders and Profiles** > **IP Profile Settings**).
2. Click **Add**.
3. Click the **Common** tab, and then configure the parameters as follows:

| Parameter | Value |
|---|---|
| Index | **1** |
| Name | **Lync** (see note in Section 4.4) |
| Symmetric MKI | **Enable** |
| MKI Size | **1** |
| Reset SRTP State Upon Re-key | **Enable** |
| Generate SRTP keys mode: | **Always** |

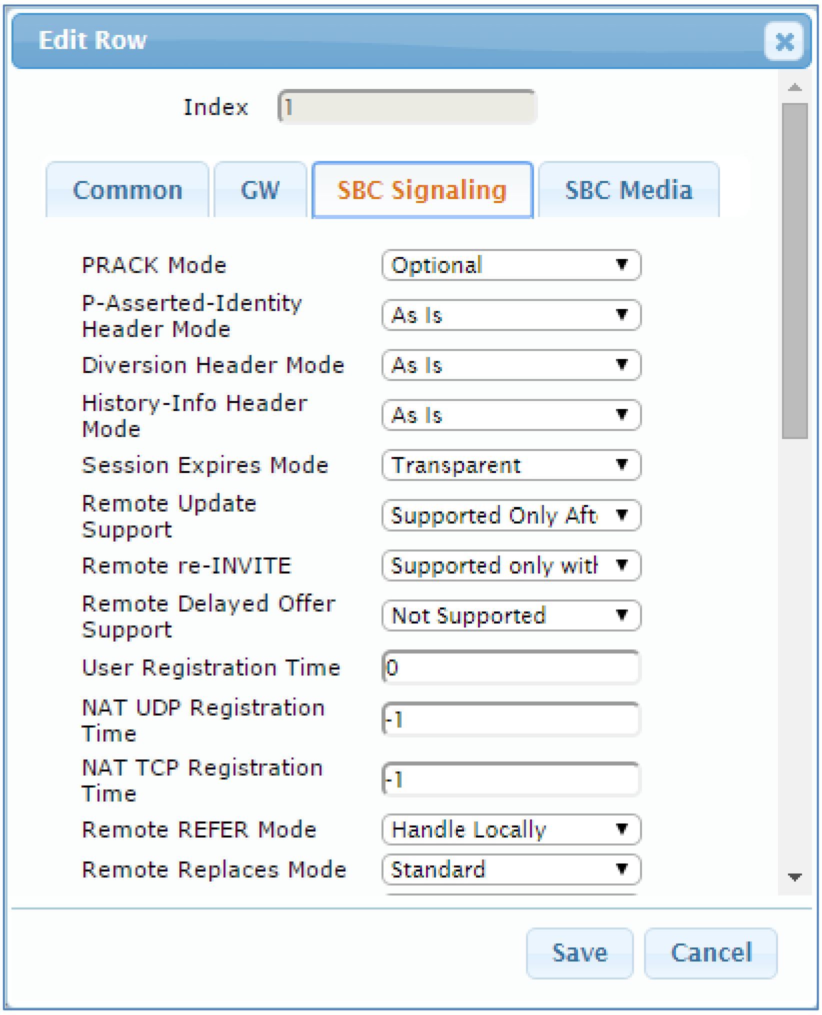
**Figure 4-14: Configuring IP Profile for Lync Server 2013 – Common Tab**



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

| Parameter | Value |
|---|---|
| PRACK Mode | **Optional** (required, as Twilio SIP Trunk does not support PRACK) |
| Remote Update Support | **Supported Only After Connect** |
| Remote re-INVITE Support | **Supported Only With SDP** |
| Remote Delayed Offer Support | **Not Supported** |
| Remote REFER Mode | **Handle Locally** (required, as Lync Server 2013 does not support receipt of SIP REFER) |
| Remote 3xx Mode | **Handle Locally** (required, as Lync Server 2013 does not support receipt of SIP 3xx responses) |
| Remote Early Media RTP Detection Behavior | **By Media** (required, as Lync Server 2013 does not send RTP immediately to remote side when it sends a SIP 18x response) |

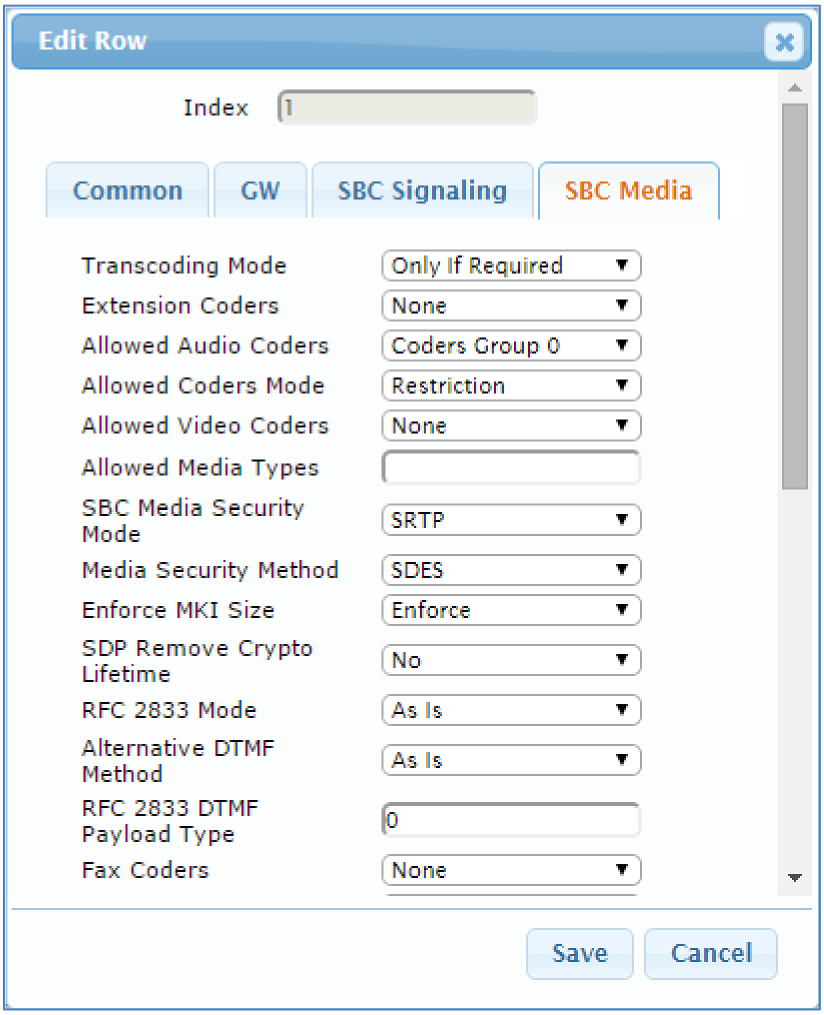
**Figure 4-15: Configuring IP Profile for Lync Server 2013 – SBC Signaling Tab**



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

| Parameter | Value |
|---|---|
| Allowed Audio Coders | **Coders Group 0** (in order to ensure that voice sent to the 8BTwilio SIP Trunk uses the G.711U-law coder only) |
| SBC Media Security Mode | **SRTP** |
| Enforce MKI Size | **Enforce** |
| RTCP Mode | **Generate Always** (required, as Twilio SIP Trunk does not send RTCP packets in active and in hold calls, and in these cases, Microsoft Lync 2013 will terminate the call with network problems as the cause) |

**Figure 4-16: Configuring IP Profile for Lync Server 2013 – SBC Media Tab**

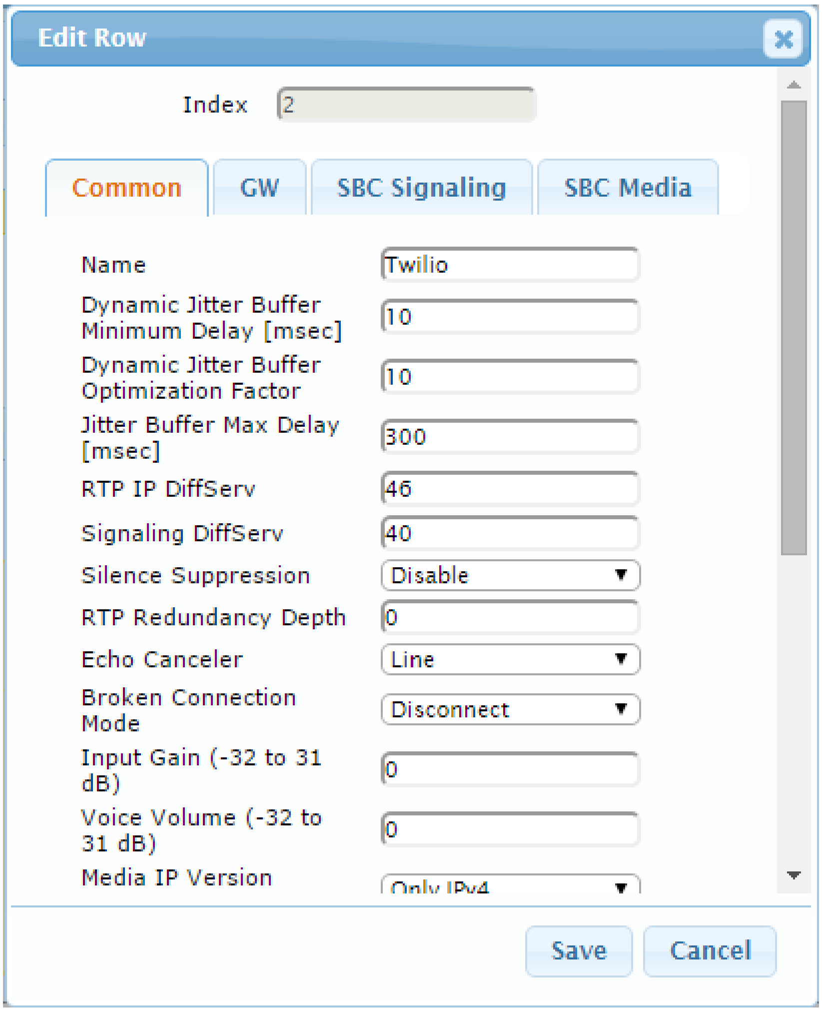


➢ **To configure an IP Profile for the 8BTwilio SIP Trunk:**

1. Click **Add**.
2. Click the **Common** tab, and then configure the parameters as follows:

| Parameter | Value |
|---|---|
| Index | **2** |
| Profile Name | **Twilio** (see note in Section 4.4) |

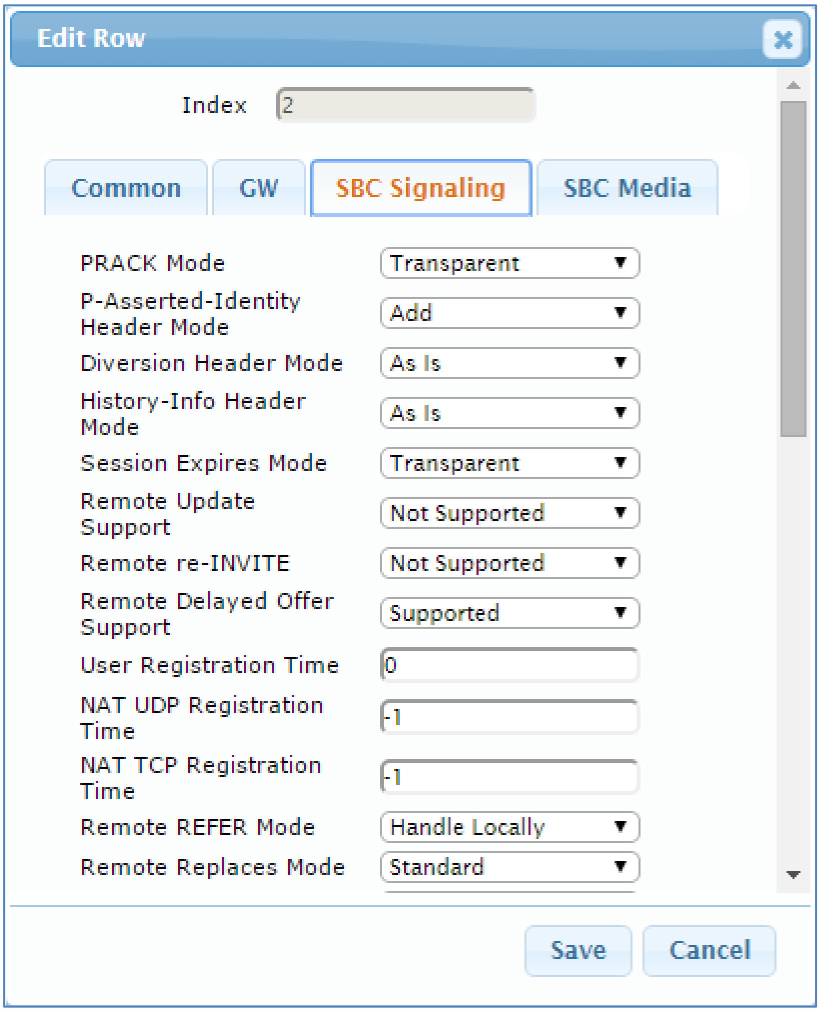
**Figure 4-17: Configuring IP Profile for 8BTwilio SIP Trunk – Common Tab**



3. Click the **SBC Signaling** tab, and then configure the parameters as follows:

| Parameter | Value |
|---|---|
| P-Asserted-Identity Header Mode | **Add** (required for anonymous calls) |
| Remote Update Support | **Not Supported** |
| Remote re-INVITE Support | **Not Supported** |
| Remote REFER Behavior | **Handle Locally** (E-SBC handles / terminates incoming REFER requests instead of forwarding them to SIP Trunk) |
| Play RBT To Transferee | **Yes** |
| Remote Hold Format | **Not Supported** |

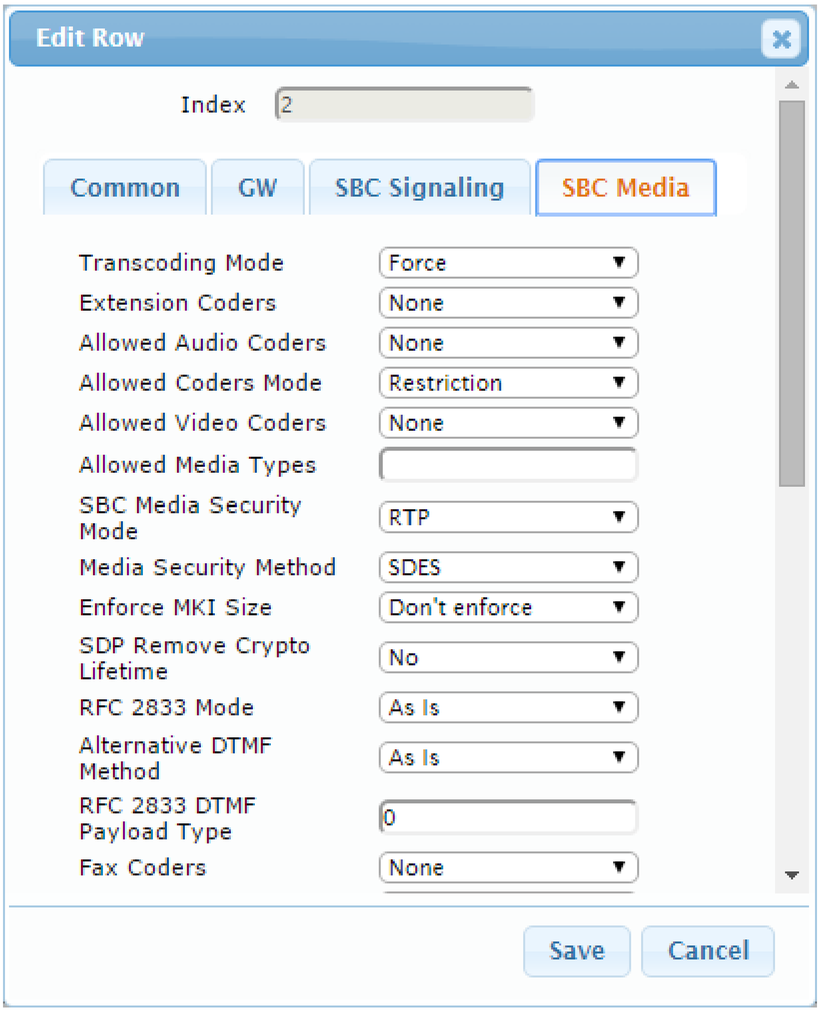
**Figure 4-18: Configuring IP Profile for 8BTwilio SIP Trunk – SBC Signaling Tab**



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

| Parameter | Value |
|---|---|
| Transcoding Mode | **Force** (required as there is a 120 seconds broken connection timeout defined on the Twilio SIP Trunk. Consequently, the SIP trunk always expects to receive RTP packets. When a call is muted or placed on Hold, no packets are sent from the Microsoft Lync Server 2013 side). |

**Figure 4-19: Configuring IP Profile for 8BTwilio SIP Trunk – SBC Media Tab**



## 4.7 Step 7: Configure IP Groups

This step describes how to configure IP Groups. The IP Group represents an IP entity on the network with which the E-SBC communicates. This can be a server (e.g., IP PBX or ITSP) or it can be a group of users (e.g., LAN IP phones). For servers, the IP Group is typically used to define the server's IP address by associating it with a Proxy Set. Once IP Groups are configured, they are used to configure IP-to-IP routing rules for denoting source and destination of the call.

In this interoperability test topology, IP Groups must be configured for the following IP entities:

- Lync Server 2013 (Mediation Server) located on LAN
- 8BTwilio SIP Trunk located on WAN

➢ **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. You can use the default IP Group (Index 0), but modify it as shown below:

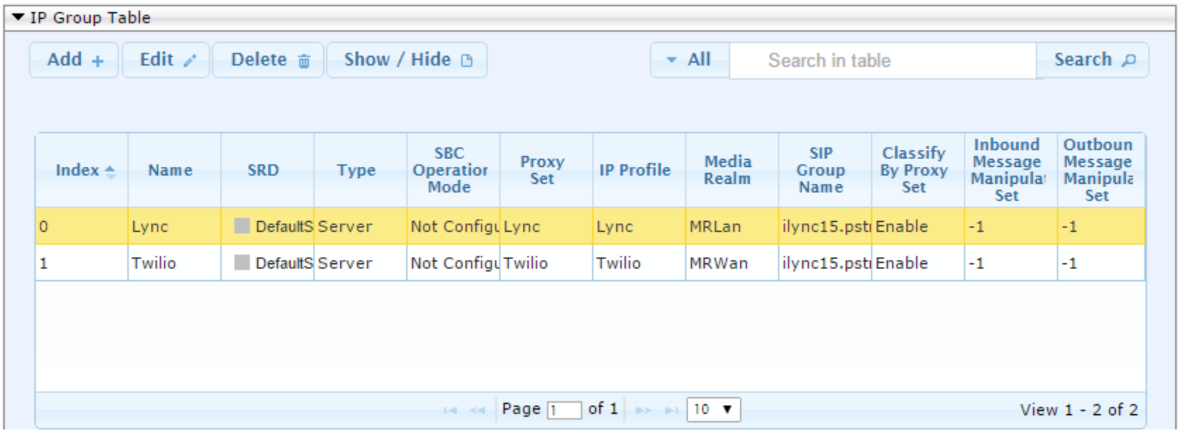
| Parameter | Value |
|---|---|
| Index | **0** |
| Name | **Lync** (see note in Section 4.4) |
| Type | **Server** |
| Proxy Set | **Lync** |
| IP Profile | **Lync** |
| Media Realm | **MRLan** |
| SIP Group Name | **ilync15.pstn.twilio.com** (according to ITSP requirement) |

3. Configure an IP Group for the 8BTwilio SIP Trunk:

| Parameter | Value |
|---|---|
| Index | **1** |
| Name | **Twilio** (see note in Section 4.4) |
| Type | **Server** |
| Proxy Set | **Twilio** |
| IP Profile | **Twilio** |
| Media Realm | **MRWan** |
| SIP Group Name | **ilync15.pstn.twilio.com** (according to ITSP requirement) |

The configured IP Groups are shown in the figure below:

**Figure 4-20: Configured IP Groups in IP Group Table**




| Index | Name | SRD | Type | SBC Operation Mode | Proxy Set | IP Profile | Media Realm | SIP Group Name | Classify By Proxy Set | Inbound Message Manipulation Set | Outbound Message Manipulation Set |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Lync | DefaultS | Server | Not Configu | Lync | Lync | MRLan | ilync15.pstı | Enable | -1 | -1 |
| 1 | Twilio | DefaultS | Server | Not Configu | Twilio | Twilio | MRWan | ilync15.pstı | Enable | -1 | -1 |

## 4.8 Step 8: Configure Allowed Coder

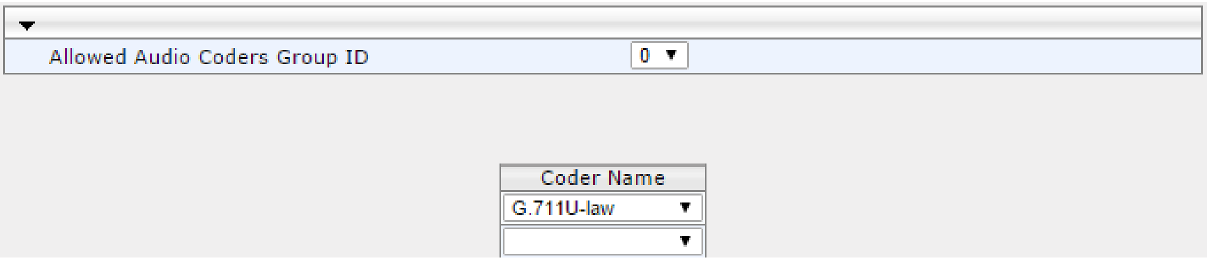
This step describes how to configure an Allowed Coders Group to ensure that voice sent to the 8BTwilio SIP Trunk uses the G.711U-law coder only. Note that this Allowed Coders Group ID was assigned to the IP Profile belonging to the 8BTwilio SIP Trunk (see Section 4.6 on page 45).

➢ **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. Configure an Allowed Coder as follows:

| Parameter | Value |
|---|---|
| Allowed Audio Coders Group ID | **0** |
| Coder Name | **G.711** |

**Figure 4-21: Configuring Allowed Coders Group for  SIP Trunk**




3. Click **Submit**.

# 4.9 Step 9: SIP TLS Connection Configuration

This section describes how to configure the E-SBC for using a TLS connection with the Lync Server 2013 Mediation Server. This is essential for a secure SIP TLS connection.

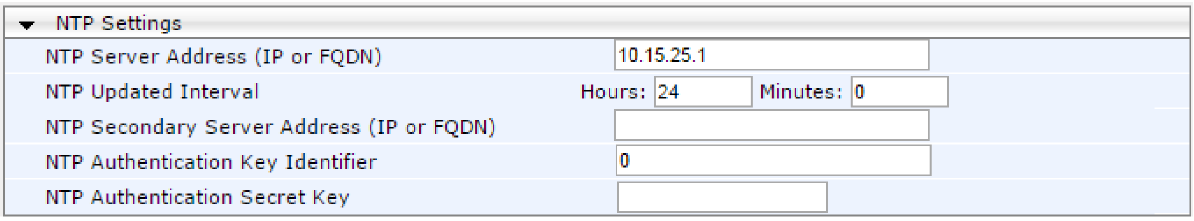
## 4.9.1 Step 9a: Configure the NTP Server Address

This step describes how to configure the NTP server's IP address. It is recommended to implement an NTP server (Microsoft NTP server or a third-party server) to ensure that the E-SBC receives the 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** > **Application Settings**).
2. In the 'NTP Server Address' field, enter the IP address of the NTP server (e.g., **10.15.25.1**).

**Figure 4-22: Configuring NTP Server Address**




3. Click **Submit**.

## 4.9.2 Step 9b: Configure a Certificate

This step describes how to exchange a certificate with Microsoft Certificate Authority (CA). The certificate is used by the E-SBC to authenticate the connection with Lync Server 2013.

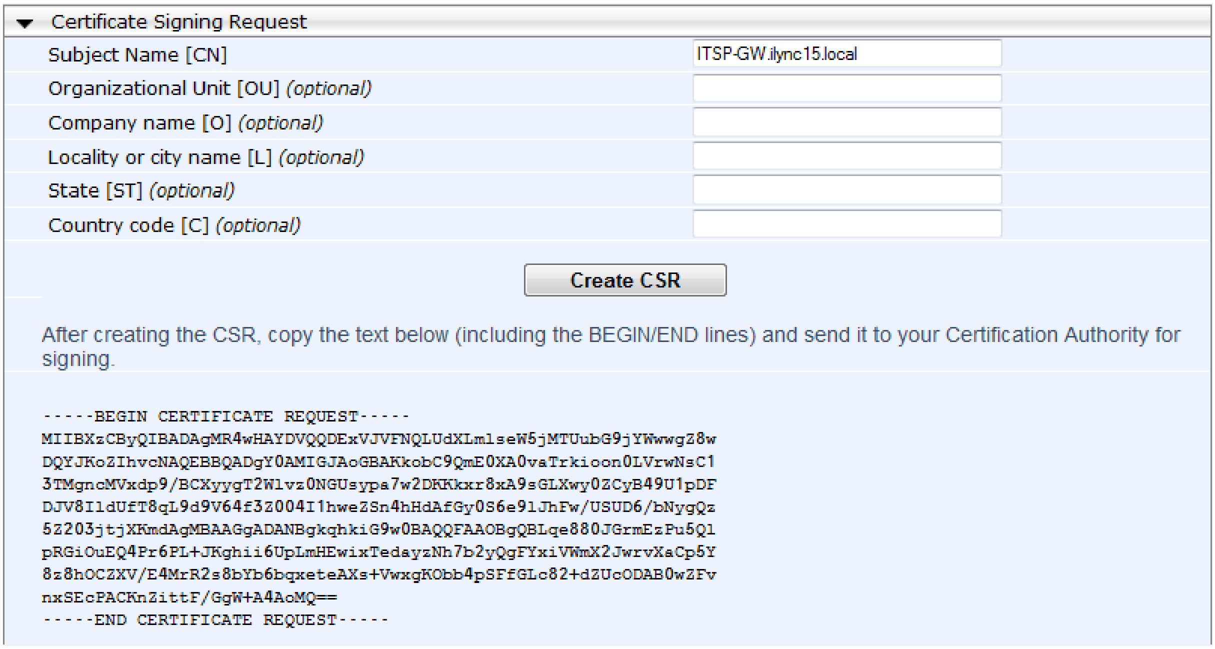
The procedure involves the following main steps:

a. Generating a Certificate Signing Request (CSR).
b. Requesting Device Certificate from CA.
c. Obtaining Trusted Root Certificate from CA.
d. Deploying Device and Trusted Root Certificates on E-SBC.

➢ **To configure a certificate:**

1. Open the TLS Contexts page (**Configuration** tab > **System** menu > **TLS Contexts**).
2. In the TLS Contexts table, select the required TLS Context index row (usually default index 0 will be used), and then click the **TLS Context Certificates** button, located at the bottom of the TLS Contexts page; the Context Certificates page appears.
3. Under the **Certificate Signing Request** group, do the following:
   a. In the 'Subject Name [CN]' field, enter the E-SBC FQDN name (e.g., **ITSP-2.ilync15.local**).
   b. Fill in the rest of the request fields according to your security provider's instructions.
4. Click the **Create CSR** button; a textual certificate signing request is displayed in the area below the button:

**Figure 4-23: Certificate Signing Request – Creating CSR**

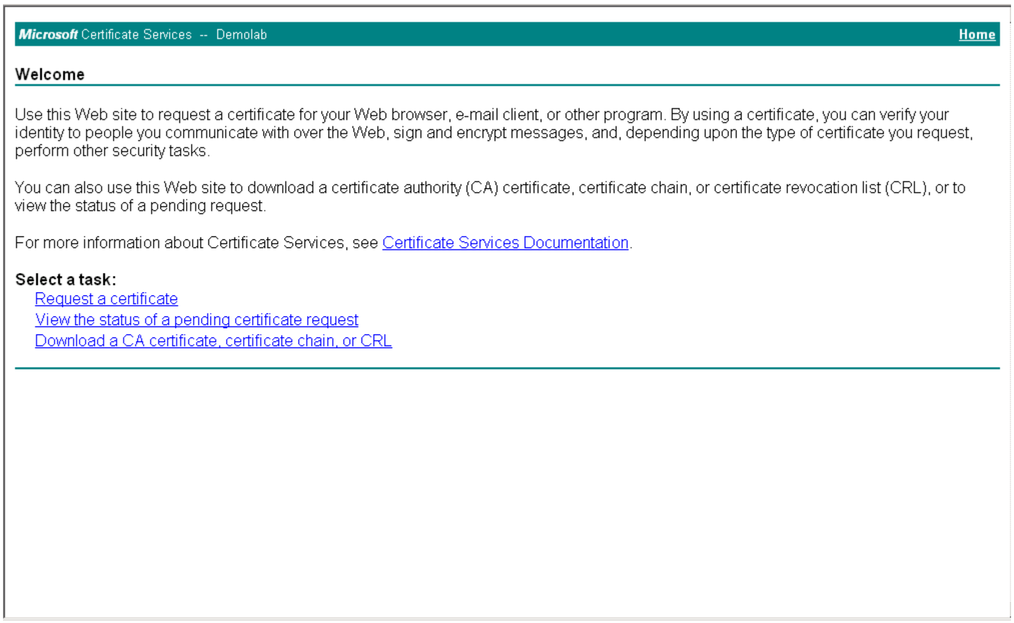



**Note:** The value entered in this field must be identical to the gateway name configured in the Topology Builder for Lync Server 2013 (see Section 3.1 on page 13).

5. Copy the CSR from the line **"----BEGIN CERTIFICATE" to "END CERTIFICATE REQUEST----"** to a text file (such as Notepad), and then save it to a folder on your computer with the file name, *certreq.txt*.

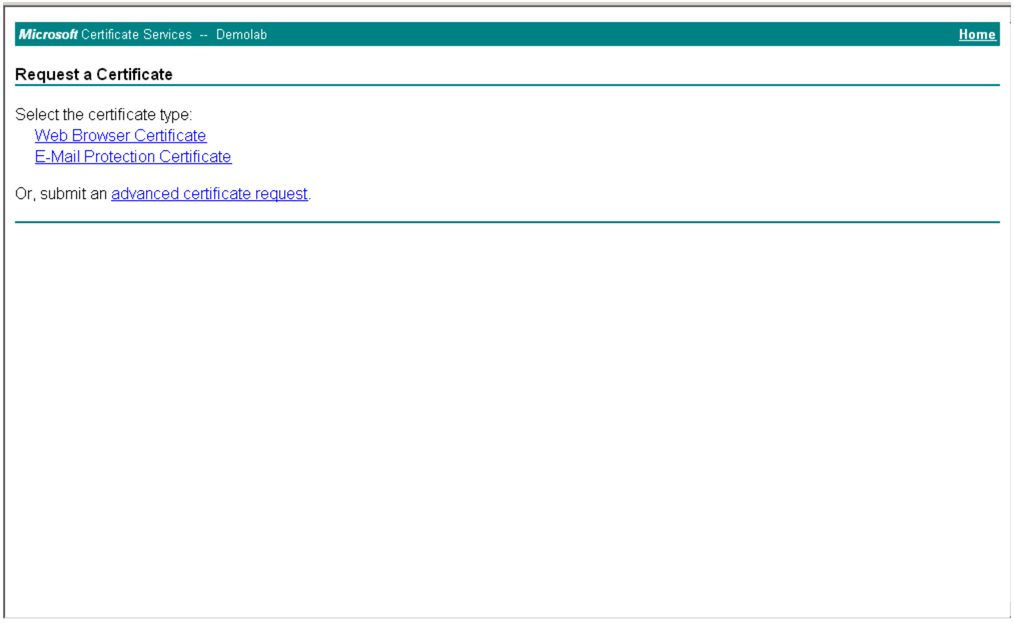
6. Open a Web browser and navigate to the Microsoft Certificates Services Web site at http://<certificate server>/CertSrv.

**Figure 4-24: Microsoft Certificate Services Web Page**



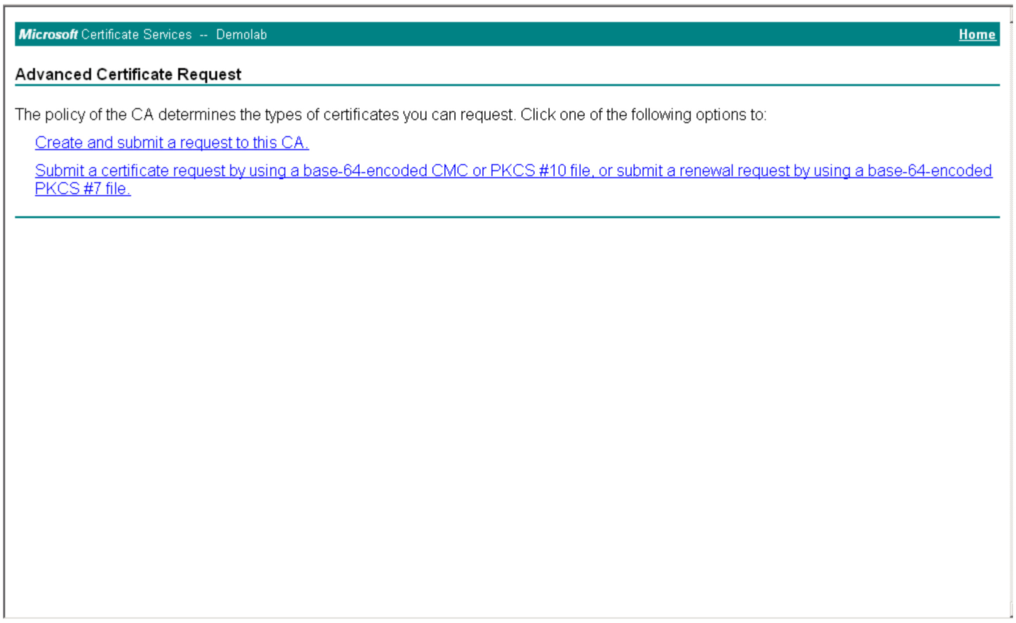

7. Click **Request a certificate**.

**Figure 4-25: Request a Certificate Page**



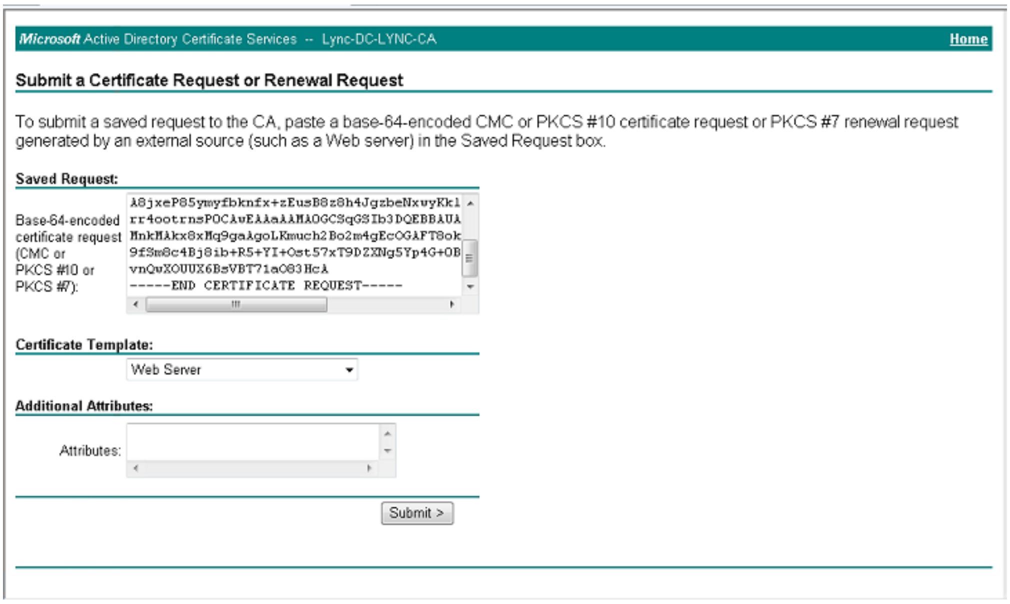

8. Click **advanced certificate request**, and then click **Next**.

**Figure 4-26: Advanced Certificate Request Page**



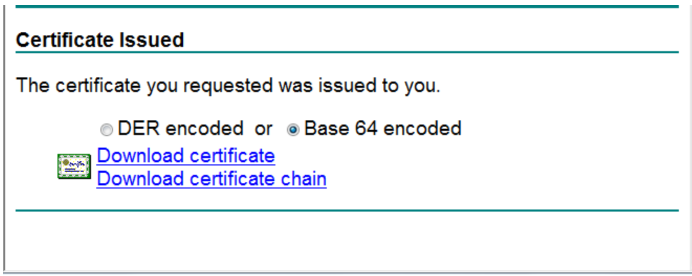

9. Click **Submit a certificate request ...**, and then click **Next**.

**Figure 4-27: Submit a Certificate Request or Renewal Request Page**



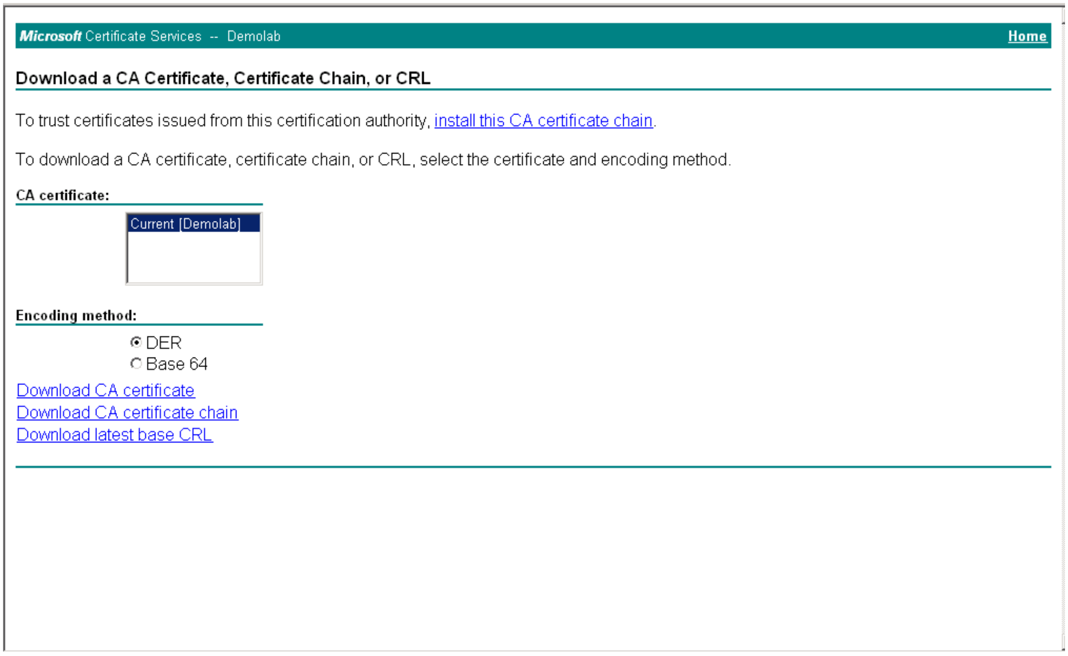

10. Open the *certreq.txt* file that you created and saved in Step 5, and then copy its contents to the 'Saved Request' field.
11. From the 'Certificate Template' drop-down list, select **Web Server**.
12. Click **Submit**.

**Figure 4-28: Certificate Issued Page**



13. Select the **Base 64 encoded** option for encoding, and then click **Download certificate**.
14. Save the file as *gateway.cer* to a folder on your computer.
15. Click the **Home** button or navigate to the certificate server at http://<Certificate Server>/CertSrv.
16. Click **Download a CA certificate**, **certificate chain, or CRL**.

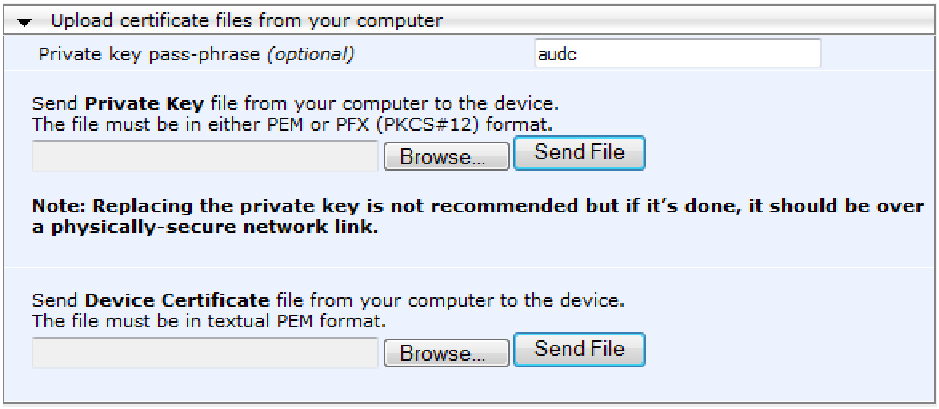
**Figure 4-29: Download a CA Certificate, Certificate Chain, or CRL Page**




17. Under the 'Encoding method' group, select the **Base 64** option for encoding.
18. Click **Download CA certificate**.
19. Save the file as *certroot.cer* to a folder on your computer.

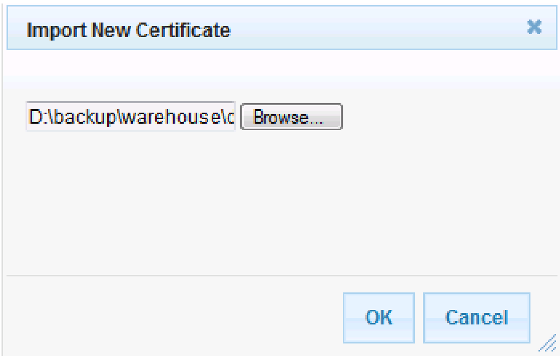
20. In the E-SBC's Web interface, return to the **TLS Contexts** page and do the following:
    a. In the TLS Contexts table, select the required TLS Context index row (usually default index 0 will be used), and then click the **TLS Context Certificates** button, located at the bottom of the TLS Contexts page; the Context Certificates page appears.
    b. 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 14, and then click **Send File** to upload the certificate to the E-SBC.

**Figure 4-30: Upload Device Certificate Files from your Computer Group**




    c. In the E-SBC's Web interface, return to the **TLS Contexts** page.
    d. 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.
    e. Click the **Import** button, and then select the certificate file to load.

**Figure 4-31: Importing Root Certificate into Trusted Certificates Store**




21. Click **OK**; the certificate is loaded to the device and listed in the Trusted Certificates store.
22. Reset the E-SBC with a burn to flash for your settings to take effect (see Section 4.15 on page 77).

## 4.10 Step 10: Configure SRTP

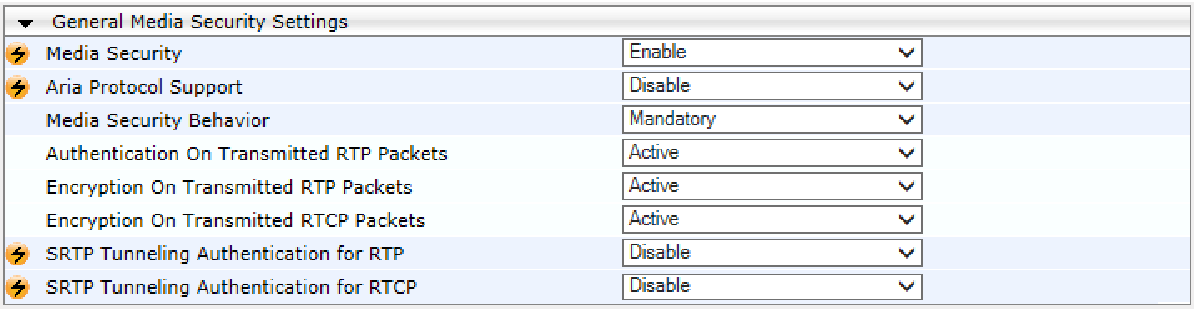
This step describes how to configure media security. If you configure the Microsoft Mediation Server to use SRTP, you need to configure the E-SBC to operate in the same manner. Note that SRTP was enabled for Lync Server 2013 when you configured an IP Profile for Lync Server 2013 (see Section 4.6 on page 45).

➢ **To configure media security:**

1. Open the Media Security page (**Configuration** tab > **VoIP** menu > **Media** menu > **Media Security**).
2. Configure the parameters as follows:

| Parameter | Value |
|---|---|
| Media Security | **Enable** |

**Figure 4-32: Configuring SRTP**




3. Click **Submit**.
4. Reset the E-SBC with a burn to flash for your settings to take effect (see Section 4.15 on page 77).

## 4.11 Step 11: Configure Maximum IP Media Channels

This step describes how to configure the maximum number of required IP media channels. The number of media channels represents the number of DSP channels that the E-SBC allocates to call sessions.

**Note:** This step is required **only** if transcoding is required. For Interoperability with Twilio SIP Trunk it is required because forced transcoding enabled in order to deal with Broken Connection Timeout on Twilio SIP trunk issue.

➢ **To configure the maximum number of IP media channels:**

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

**Figure 4-33: Configuring Number of Media Channels**


2. In the 'Number of Media Channels' field, enter the number of media channels according to your environments transcoding calls (e.g., **30**).
3. Click **Submit**.
4. Reset the E-SBC with a burn to flash for your settings to take effect (see Section 4.15 on page 77).

## 4.12 Step 12: 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 E-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 4.7 on page 44, IP Group 1 represents Lync Server 2013, and IP Group 2 represents 8BTwilio 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 8BTwilio SIP Trunk (WAN):

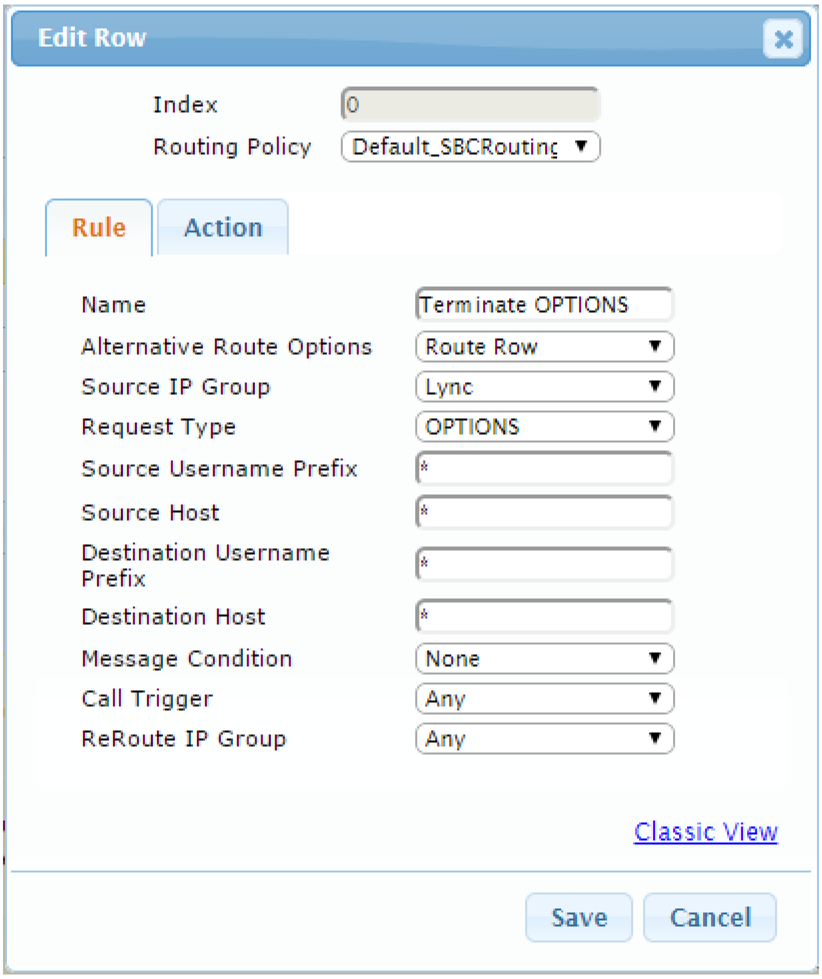
- Terminate SIP OPTIONS messages on the E-SBC that are received from the LAN
- Calls from Lync Server 2013 to 8BTwilio SIP Trunk
- Calls from 8BTwilio SIP Trunk to Lync Server 2013

➢ **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:
   a. Click **Add**.
   b. Click the **Rule** tab, and then configure the parameters as follows:

| Parameter | Value |
|---|---|
| Index | **0** |
| Name | **Terminate OPTIONS** (arbitrary descriptive name) |
| Source IP Group | **Lync** |
| Request Type | **OPTIONS** |

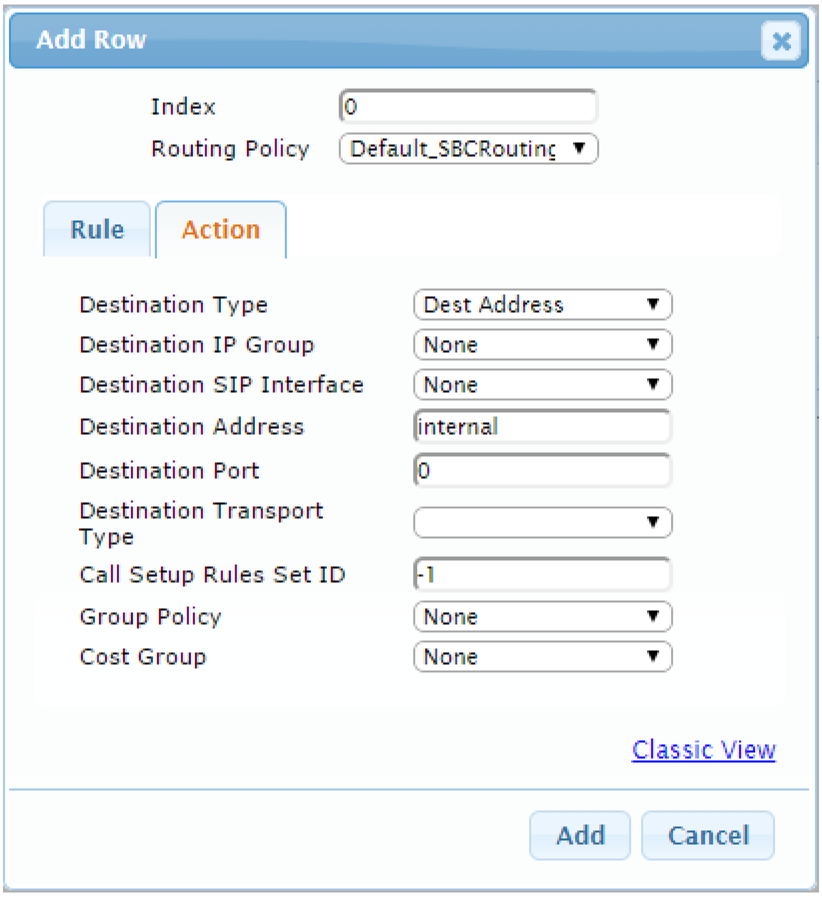
**Figure 4-34: Configuring IP-to-IP Routing Rule for Terminating SIP OPTIONS from LAN – Rule Tab**




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

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

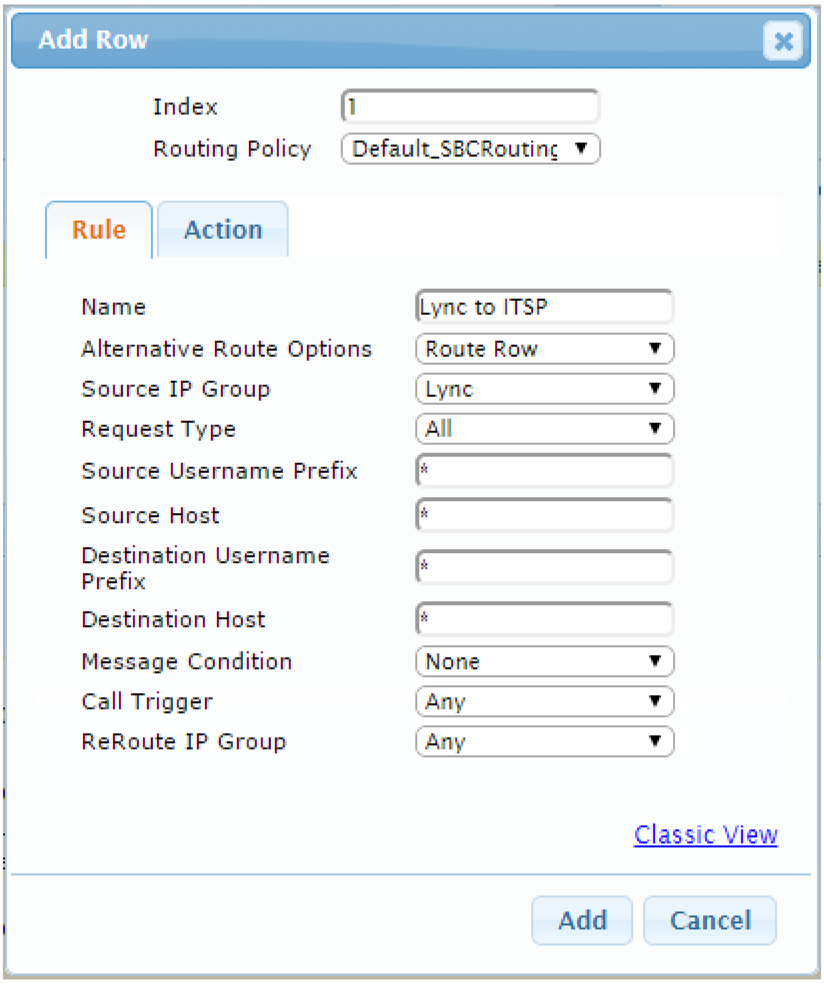
**Figure 4-35: Configuring IP-to-IP Routing Rule for Terminating SIP OPTIONS from LAN – Action Tab**




3. Configure a rule to route calls from Lync Server 2013 to 8BTwilio SIP Trunk:
   a. Click **Add**.
   b. 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 | **Lync** |

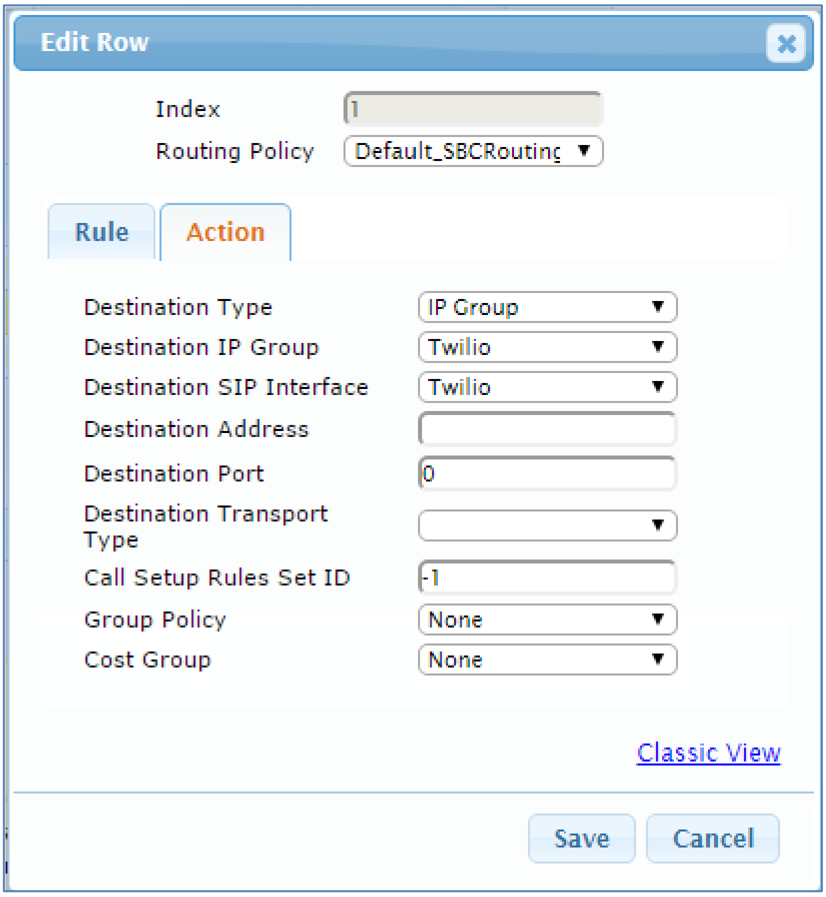
**Figure 4-36: Configuring IP-to-IP Routing Rule for Lync to ITSP – Rule tab**




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

| Parameter | Value |
|---|---|
| Destination Type | **IP Group** |
| Destination IP Group | **Twilio** |
| Destination SIP Interface | **Twilio** |

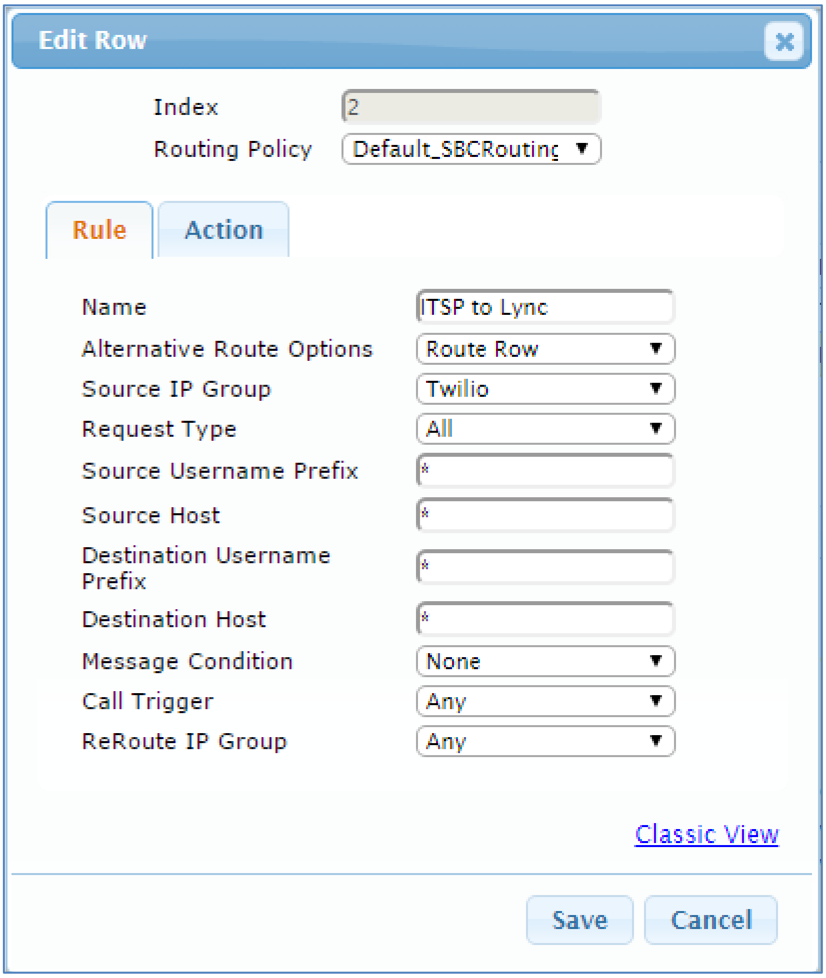
**Figure 4-37: Configuring IP-to-IP Routing Rule for Lync to ITSP – Action tab**




4. To configure rule to route calls from 8BTwilio SIP Trunk to Lync Server 2013:
   a. Click **Add**.
   b. 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 | **Twilio** |

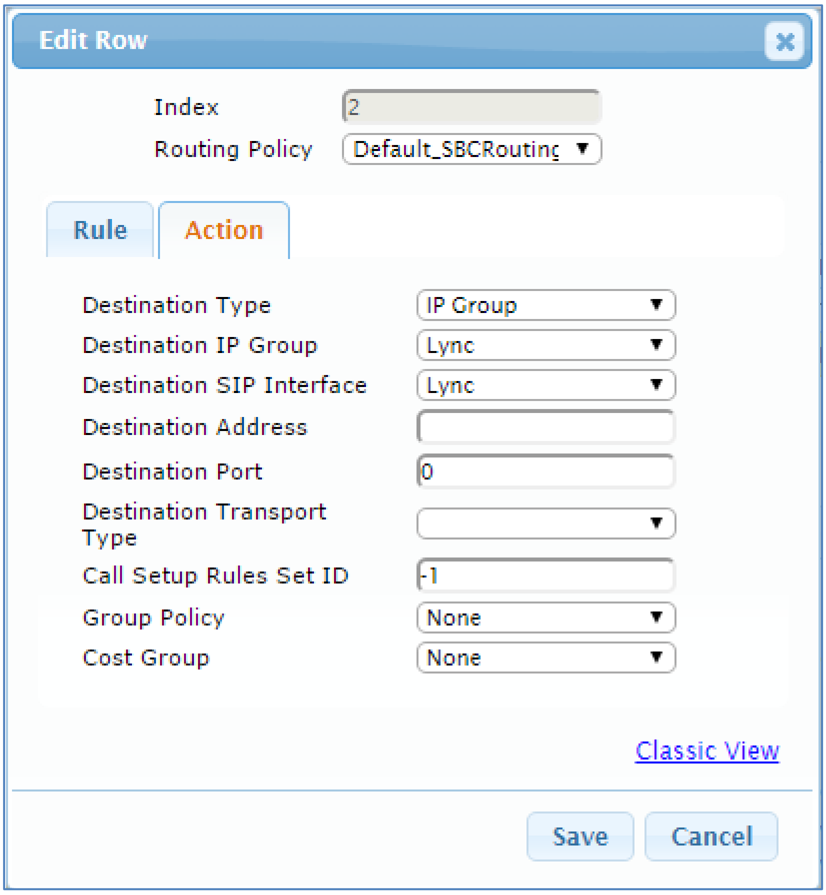
**Figure 4-38: Configuring IP-to-IP Routing Rule for ITSP to Lync – Rule tab**




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

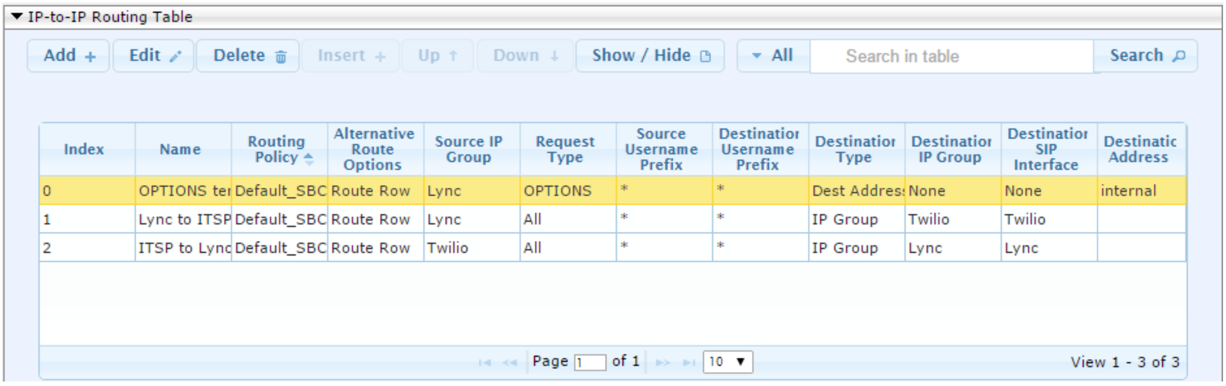
| Parameter | Value |
|---|---|
| Destination Type | **IP Group** |
| Destination IP Group | **Lync** |
| Destination SIP Interface | **Lync** |

**Figure 4-39: Configuring IP-to-IP Routing Rule for ITSP to Lync – Action tab**




The configured routing rules are shown in the figure below:

**Figure 4-40: Configured IP-to-IP Routing Rules in IP-to-IP Routing Table**


IP-to-IP Routing Table

Add + | Edit | Delete | Insert + | Up | Down | Show / Hide | All | Search in table | Search

| Index | Name | Routing Policy | Alternative Route Options | Source IP Group | Request Type | Source Username Prefix | Destination Username Prefix | Destination Type | Destination IP Group | Destination SIP Interface | Destination Address |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | OPTIONS ter | Default_SBC | Route Row | Lync | OPTIONS | * | * | Dest Address | None | None | internal |
| 1 | Lync to ITSP | Default_SBC | Route Row | Lync | All | * | * | IP Group | Twilio | Twilio | |
| 2 | ITSP to Lync | Default_SBC | Route Row | Twilio | All | * | * | IP Group | Lync | Lync | |

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

## 4.13 Step 13: Configure Message Manipulation Rules

This step describes how to configure SIP message manipulation rules. SIP message manipulation rules can include insertion, removal, and/or modification of SIP headers. Manipulation rules are grouped into Manipulation Sets, enabling you to apply multiple rules to the same SIP message (IP entity).

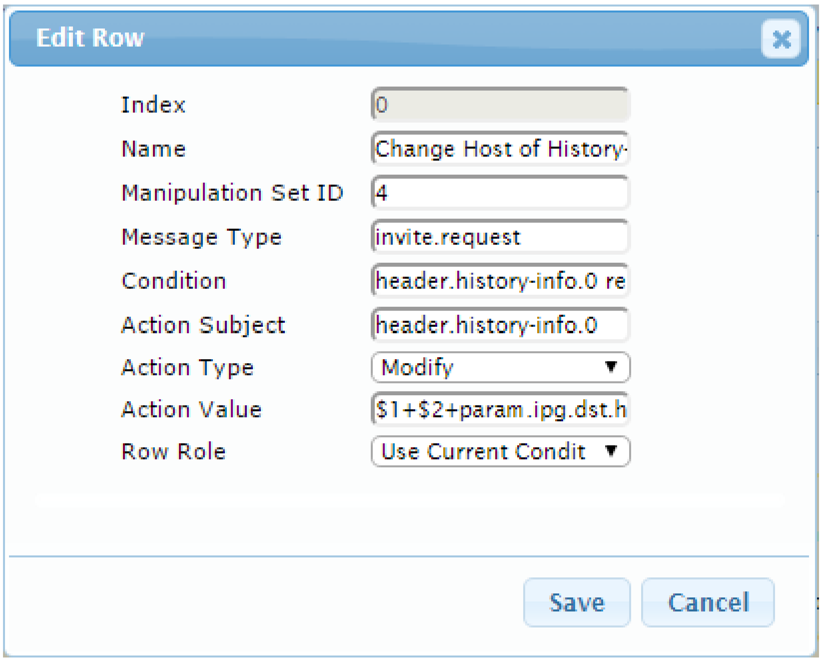
Once you have configured the SIP message manipulation rules, you need to assign them to the relevant IP Group (in the IP Group table) and determine whether they must be applied to inbound or outbound messages.

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

1. Open the Message Manipulations page (**Configuration** tab > **VoIP** menu > **SIP Definitions** > **Msg Policy & Manipulation** > **Message Manipulations**).
2. Configure a new manipulation rule (Manipulation Set 4) for 8BTwilio SIP Trunk. This rule applies to messages sent to the 8BTwilio SIP Trunk IP Group in a call forwarding scenario. This rule replaces the host part of the SIP History-Info Header with the value that was configured in the 8BTwilio SIP Trunk IP Group.

| Parameter | Value |
|---|---|
| Index | **0** |
| Name | **Change Host of History-Info.0** |
| Manipulation Set ID | **4** |
| Message Type | **invite.request** |
| Condition | **header.history-info.0 regex (.*)(@)(.*)(;user=phone)(.*)** |
| Action Subject | **header.history-info.0** |
| Action Type | **Modify** |
| Action Value | **$1+$2+param.ipg.dst.host+$4+$5** |

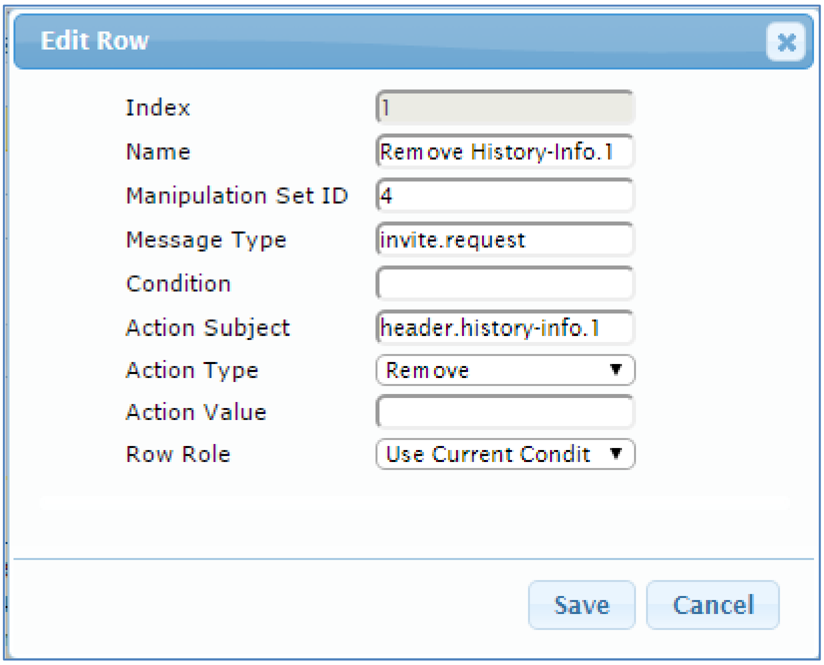
**Figure 4-41: Configuring SIP Message Manipulation Rule 0 (for 8BTwilio SIP Trunk)**



3. Configure another manipulation rule (Manipulation Set 4) for the 8BTwilio SIP Trunk. This rule also applies to messages sent to the 8BTwilio SIP Trunk IP Group in a call forwarding scenario. This rule removes SIP History-Info.1 Header.

| Parameter | Value |
|---|---|
| Index | **1** |
| Name | **Remove History-Info.1** |
| Manipulation Set ID | **4** |
| Message Type | **invite.request** |
| Action Subject | **header.history-info.1** |
| Action Type | **Remove** |

**Figure 4-42: Configuring SIP Message Manipulation Rule 1 (for 8BTwilio SIP Trunk)**



4. Configure another manipulation rule (Manipulation Set 4) for the 8BTwilio SIP Trunk. This rule applies to messages sent to the 8BTwilio SIP Trunk IP Group in a call transfer scenario. This rule replaces the host part of the SIP Referred-by Header with the value that was configured in the 8BTwilio SIP Trunk IP Group.

| Parameter | Value |
|---|---|
| Index | **2** |
| Name | **Change Referred-by Host** |
| Manipulation Set ID | **4** |
| Message Type | **invite.request** |
| Condition | **header.referred-by exists** |
| Action Subject | **header.referred-by.url.host** |
| Action Type | **Modify** |
| Action Value | **param.ipg.dst.host** |

**Figure 4-43: Configuring SIP Message Manipulation Rule 2 (for 8BTwilio SIP Trunk)**

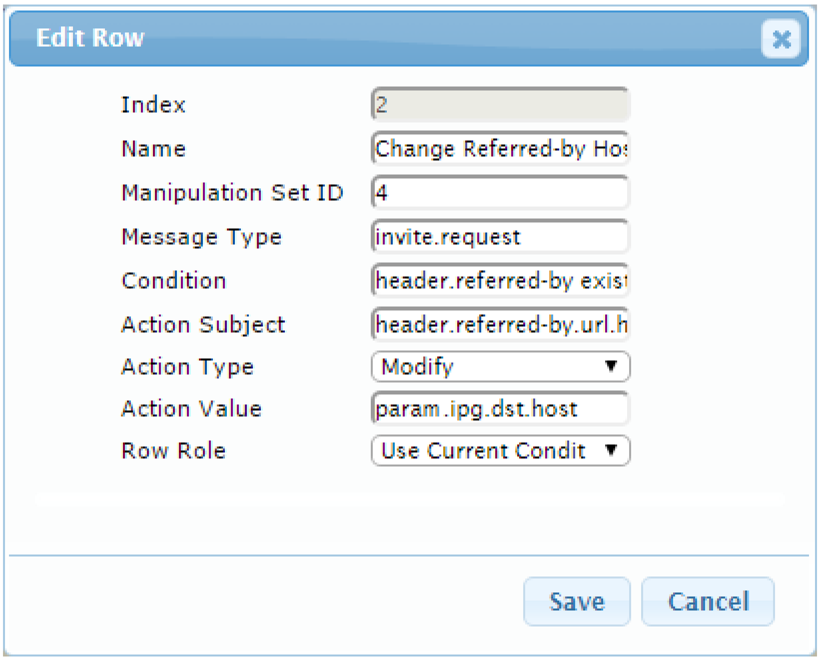
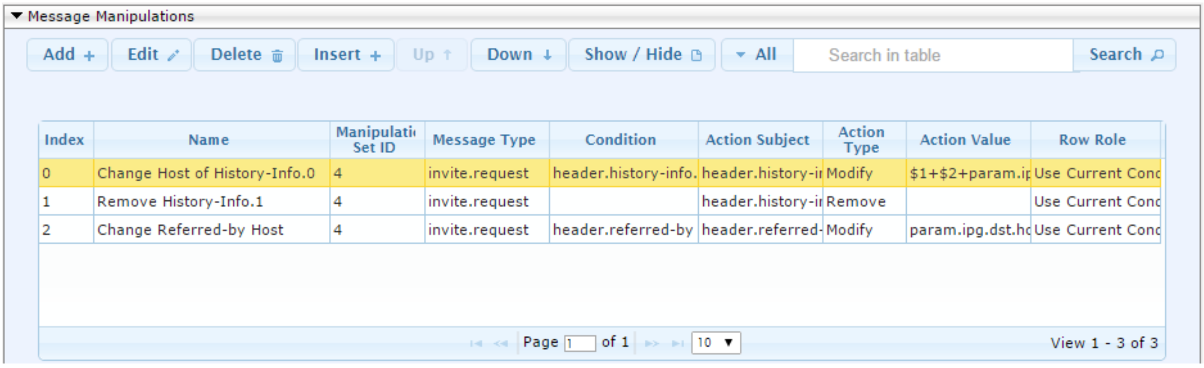


**Figure 4-44: Configured SIP Message Manipulation Rules**



Message Manipulations

Add + | Edit | Delete | Insert + | Up | Down | Show / Hide | All | Search in table | Search

| Index | Name | Manipulation Set ID | Message Type | Condition | Action Subject | Action Type | Action Value | Row Role |
|---|---|---|---|---|---|---|---|---|
| 0 | Change Host of History-Info.0 | 4 | invite.request | header.history-info. | header.history-in | Modify | $1+$2+param.ip | Use Current Cond |
| 1 | Remove History-Info.1 | 4 | invite.request | | header.history-in | Remove | | Use Current Cond |
| 2 | Change Referred-by Host | 4 | invite.request | header.referred-by | header.referred- | Modify | param.ipg.dst.ho | Use Current Cond |

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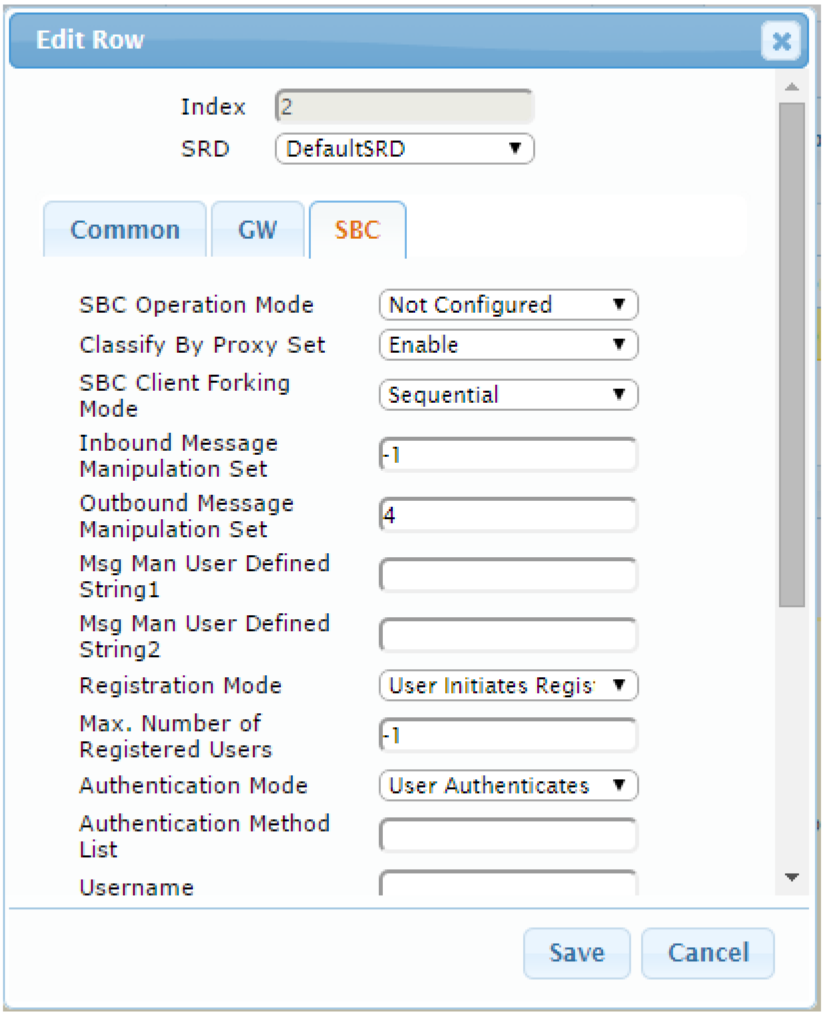
The table displayed below includes SIP message manipulation rules which are bound together by commonality via the Manipulation Set ID 4 which are executed for messages sent to the 8BTwilio SIP Trunk IP Group. These rules are specifically required to enable proper interworking between 8BTwilio SIP Trunk and Lync Server 2013. Refer to the *User's Manual* for further details on the full capabilities of header manipulation.

**SIP Message Manipulation Rules**

| Rule Index | Rule Description | Reason for Introducing Rule |
|---|---|---|
| **0** | This rule applies to messages sent to the SIP Trunk IP Group in a call forwarding scenario. This rule replaces the host part of the SIP History-Info Header with the value, configured in the 8BTwilio SIP Trunk IP Group. | To introduce Topology Hiding in the Call Forward scenarios, the host part of the SIP History-Info Header should be replaced with the value that was configured in the SIP Trunk IP Group. |
| **1** | This rule also applies to messages sent to the SIP Trunk IP Group in a call forwarding scenario. This rule removes the SIP History-Info.1 Header. | To introduce Topology Hiding in the Call Forward scenarios, the SIP History-Info.1 Header should be removed. |
| **2** | This rule applies to messages sent to the SIP Trunk IP Group in a call transfer scenario. This replaces the host part of the SIP Referred-by Header with the value, configured in the 8BTwilio SIP Trunk IP Group. | To introduce Topology Hiding in the Call Transfer scenarios, the host part of the SIP Referred-by Header should be replaced with the value that was configured in the SIP Trunk IP Group. |

5. Assign Manipulation Set ID 4 to the SIP trunk IP Group:
   a. Open the IP Group Table page (**Configuration** tab > **VoIP** menu > **VoIP Network** > **IP Group Table**).
   b. Select the row of the 8BTwilio SIP trunk IP Group, and then click **Edit**.
   c. Click the **SBC** tab.
   d. Set the 'Outbound Message Manipulation Set' field to **4**.

**Figure 4-45: Assigning Manipulation Set 4 to the 8BTwilio SIP Trunk IP Group**




   e. Click **Submit**.

# 4.14 Step 14: Miscellaneous Configuration

This section describes miscellaneous E-SBC configuration.

## 4.14.1 Step 14a: Configure Classification Table

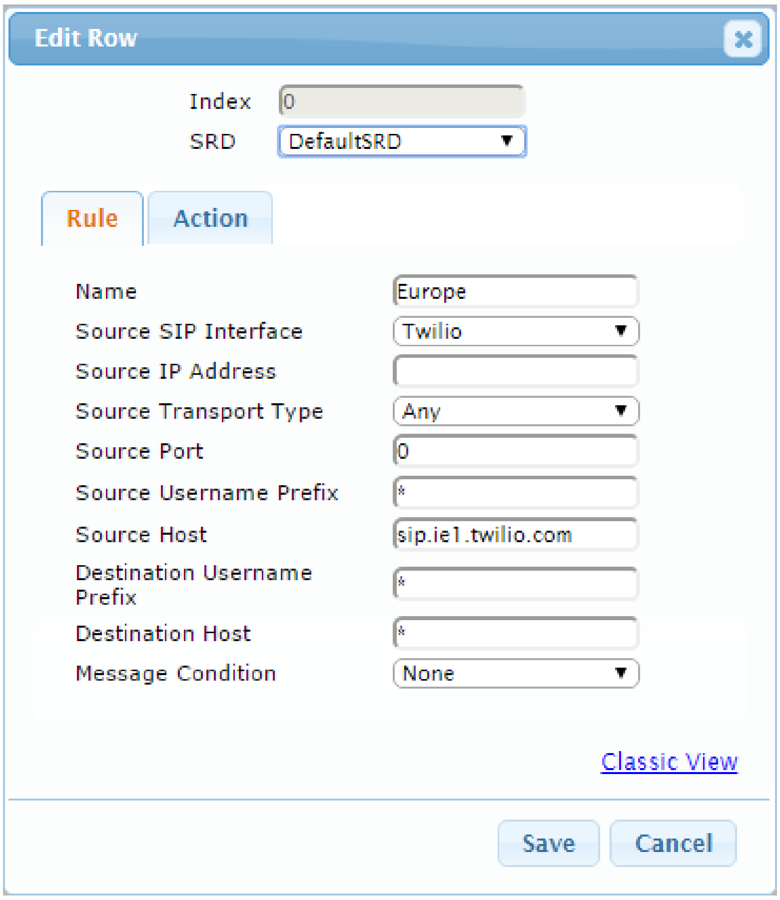
This step shows how to configure the E-SBC Classification Table. For the interoperability test topology with the 8BTwilioSIP Trunk, the **Proxy** FQDN Address is configured in the Proxy Set Table and all outgoing calls are routed to this **Proxy** FQDN Address. However incoming calls from Twilio may arrive from different global locations (Twilio has local servers in main global regions). Consequently, it's necessary to also allow SIP messages to be received from these different local 8BTwilio servers.

➢ **To configure Classification Table:**

1. Open the Classification Table page (**Configuration** tab > **VoIP** menu > **SBC** > **Routing SBC** > **Classification Table**).
2. Click **Add**.
3. Click the **Rule** tab, and then configure the parameters as follows:

| Parameter | Value |
|---|---|
| Classification Name | **Europe** (arbitrary descriptive name) |
| Source SIP Interface | **Twilio** |
| Source Host | **sip.ie1.twilio.com** (Europe local FQDN) |

**Figure 4-46: Classification Table Page – Rule Tab**



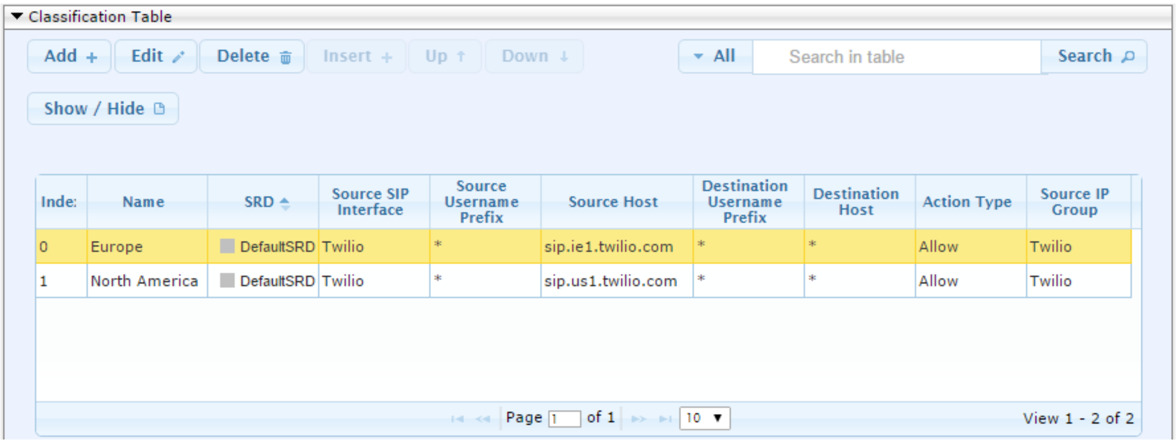
4. Click the **Action** tab, and then configure the parameters as follows:

| Parameter | Value |
|---|---|
| Action Type | **Allow** |
| Source IP Group | **Twilio** |
| IP Profile | **Twilio** |

**Figure 4-47: Classification Table Page – Action Tab**


5. Click **Submit**.

**Figure 4-48: Example of Classification Table**



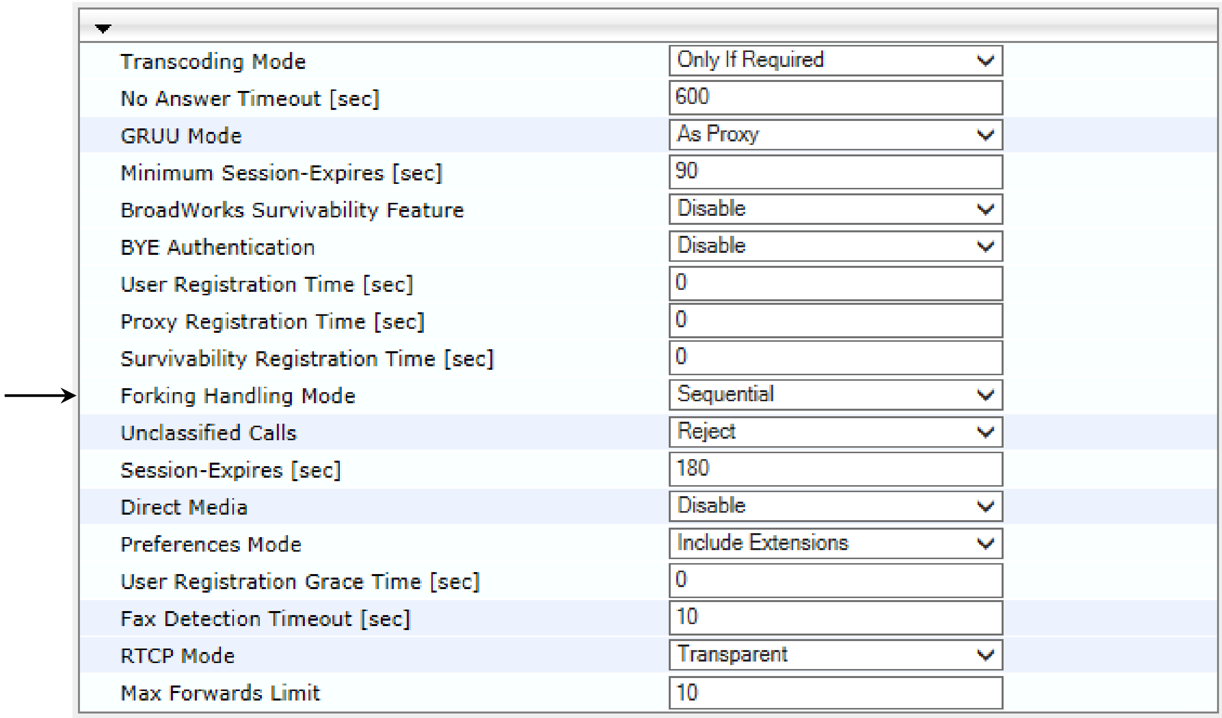
### 4.14.2 Step 14b: Configure Call Forking Mode

This step describes how to configure the E-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 E-SBC opens a voice stream according to the received SDP. The E-SBC re-opens the stream according to subsequently received 18x responses with SDP or plays a ring-back tone if a 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 'SBC Forking Handling Mode' drop-down list, select **Sequential**.

**Figure 4-49: Configuring Forking Mode**




3. Click **Submit**.

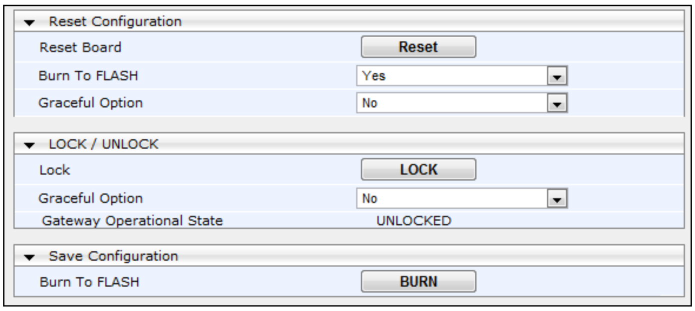
## 4.15 Step 15: Reset the E-SBC

After you have completed the configuration of the E-SBC described in this chapter, save ("burn") the configuration to the E-SBC's flash memory with a reset for the settings to take effect.

➢ **To save the configuration to flash memory:**

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

**Figure 4-50: Resetting the E-SBC**




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

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# A AudioCodes INI File

The *ini* configuration file of the E-SBC, corresponding to the Web-based configuration as described in Section 4 on page 31, is shown below:

**Note:** To load and save an ini file, use the Configuration File page (**Maintenance** tab > **Software Update** menu > **Configuration File**).

```
;**************
;** Ini File **
;**************

;Board: Mediant 800 E-SBC
;HW Board Type: 69  FK Board Type: 72
;Serial Number: 2265355
;Slot Number: 1
;Software Version: 7.00A.013.015
;DSP Software Version: 5014AE3_R => 700.32
;Board IP Address: 10.15.17.77
;Board Subnet Mask: 255.255.0.0
;Board Default Gateway: 10.15.0.1
;Ram size: 369M   Flash size: 64M   Core speed: 300Mhz
;Num of DSP Cores: 3  Num DSP Channels: 60
;Num of physical LAN ports: 12
;Profile: NONE
;;Key features:;Board Type: 72 ;Channel Type: DspCh=60 IPMediaDspCh=60
;HA ;QOE features: VoiceQualityMonitoring MediaEnhancement ;DATA
features: ;Security: IPSEC MediaEncryption StrongEncryption
EncryptControlProtocol ;DSP Voice features: RTCP-XR ;Coders: G723 G729
G728 NETCODER GSM-FR GSM-EFR AMR EVRC-QCELP G727 ILBC EVRC-B AMR-WB G722
EG711 MS_RTA_NB MS_RTA_WB SILK_NB SILK_WB SPEEX_NB SPEEX_WB OPUS_NB
OPUS_WB ;E1Trunks=2 ;T1Trunks=2 ;FXSPorts=4 ;FXOPorts=4 ;BRITrunks=4 ;IP
Media: Conf VXML ;Control Protocols: MGCP SIP SASurvivability SBC=60 MSFT
CLI TRANSCODING=60 FEU=100 TestCall=100 EMS LAD=20 ;Default
features:;Coders: G711 G726;

;------  HW components------
;
; Slot # : Module type : # of ports
;----------------------------------------------
;      1 : BRI          : 4
;      2 : FXS          : 4
;      3 : FALC56       : 1
;----------------------------------------------


[SYSTEM Params]

SyslogServerIP = 10.15.17.100
EnableSyslog = 1
;NTPServerIP_abs is hidden but has non-default value
NTPServerUTCOffset = 7200
;VpFileLastUpdateTime is hidden but has non-default value
NTPServerIP = '10.15.25.1'
```

```
;LastConfigChangeTime is hidden but has non-default value
;PM_gwINVITEDialogs is hidden but has non-default value
;PM_gwSUBSCRIBEDialogs is hidden but has non-default value
;PM_gwSBCRegisteredUsers is hidden but has non-default value
;PM_gwSBCMediaLegs is hidden but has non-default value
;PM_gwSBCTranscodingSessions is hidden but has non-default value

[BSP Params]

PCMLawSelect = 3
UdpPortSpacing = 10
EnterCpuOverloadPercent = 99
ExitCpuOverloadPercent = 95

[Analog Params]


[ControlProtocols Params]

AdminStateLockControl = 0

[MGCP Params]


[MEGACO Params]

EP_Num_0 = 0
EP_Num_1 = 1
EP_Num_2 = 1
EP_Num_3 = 0
EP_Num_4 = 0

[PSTN Params]


[SS7 Params]


[Voice Engine Params]

ENABLEMEDIASECURITY = 1
CallProgressTonesFilename = 'usa_tones_13.dat'

[WEB Params]

UseRProductName = 'Mediant 800 E-SBC'
WebLogoText = 'Twilio'
UseWeblogo = 1
;UseLogoInWeb is hidden but has non-default value
UseProductName = 1
HTTPSCipherString = 'RC4:EXP'
;HTTPSCertFileName is hidden but has non-default value
;HTTPSRootFileName is hidden but has non-default value

[SIP Params]
```

```
MEDIACHANNELS = 30
GWDEBUGLEVEL = 5
;ISPRACKREQUIRED is hidden but has non-default value
ENABLESBCAPPLICATION = 1
MSLDAPPRIMARYKEY = 'telephoneNumber'
SBCPREFERENCESMODE = 1
SBCFORKINGHANDLINGMODE = 1
ENERGYDETECTORCMD = 587202560
ANSWERDETECTORCMD = 10486144
;GWAPPCONFIGURATIONVERSION is hidden but has non-default value

[SCTP Params]


[IPsec Params]


[Audio Staging Params]


[SNMP Params]


[ PhysicalPortsTable ]

FORMAT PhysicalPortsTable_Index = PhysicalPortsTable_Port,
PhysicalPortsTable_Mode, PhysicalPortsTable_SpeedDuplex,
PhysicalPortsTable_PortDescription, PhysicalPortsTable_GroupMember,
PhysicalPortsTable_GroupStatus;
PhysicalPortsTable 0 = "GE_1", 1, 4, "User Port #0", "GROUP_1", "Active";
PhysicalPortsTable 1 = "GE_2", 1, 4, "User Port #1", "GROUP_1",
"Redundant";
PhysicalPortsTable 2 = "GE_3", 1, 4, "User Port #2", "GROUP_2", "Active";
PhysicalPortsTable 3 = "GE_4", 1, 4, "User Port #3", "GROUP_2",
"Redundant";
PhysicalPortsTable 4 = "FE_5_1", 0, 4, "User Port #4", "None", "  ";
PhysicalPortsTable 5 = "FE_5_2", 0, 4, "User Port #5", "None", "  ";
PhysicalPortsTable 6 = "FE_5_3", 0, 4, "User Port #6", "None", "  ";
PhysicalPortsTable 7 = "FE_5_4", 0, 4, "User Port #7", "None", "  ";
PhysicalPortsTable 8 = "FE_5_5", 1, 4, "User Port #8", "GROUP_5",
"Active";
PhysicalPortsTable 9 = "FE_5_6", 1, 4, "User Port #9", "GROUP_5",
"Redundant";
PhysicalPortsTable 10 = "FE_5_7", 1, 4, "User Port #10", "GROUP_6",
"Active";
PhysicalPortsTable 11 = "FE_5_8", 1, 4, "User Port #11", "GROUP_6",
"Redundant";

[ \PhysicalPortsTable ]


[ EtherGroupTable ]

FORMAT EtherGroupTable_Index = EtherGroupTable_Group,
EtherGroupTable_Mode, EtherGroupTable_Member1, EtherGroupTable_Member2;
EtherGroupTable 0 = "GROUP_1", 2, "GE_1", "GE_2";
EtherGroupTable 1 = "GROUP_2", 2, "GE_3", "GE_4";
EtherGroupTable 2 = "GROUP_3", 0, "", "";
```

```
EtherGroupTable 3 = "GROUP_4", 0, "", "";
EtherGroupTable 4 = "GROUP_5", 2, "FE_5_5", "FE_5_6";
EtherGroupTable 5 = "GROUP_6", 2, "FE_5_7", "FE_5_8";
EtherGroupTable 6 = "GROUP_7", 0, "", "";
EtherGroupTable 7 = "GROUP_8", 0, "", "";
EtherGroupTable 8 = "GROUP_9", 0, "", "";
EtherGroupTable 9 = "GROUP_10", 0, "", "";
EtherGroupTable 10 = "GROUP_11", 0, "", "";
EtherGroupTable 11 = "GROUP_12", 0, "", "";

[ \EtherGroupTable ]


[ DeviceTable ]

FORMAT DeviceTable_Index = DeviceTable_VlanID,
DeviceTable_UnderlyingInterface, DeviceTable_DeviceName,
DeviceTable_Tagging;
DeviceTable 0 = 1, "GROUP_1", "vlan 1", 0;
DeviceTable 1 = 2, "GROUP_2", "vlan 2", 0;

[ \DeviceTable ]


[ InterfaceTable ]

FORMAT InterfaceTable_Index = InterfaceTable_ApplicationTypes,
InterfaceTable_InterfaceMode, InterfaceTable_IPAddress,
InterfaceTable_PrefixLength, InterfaceTable_Gateway,
InterfaceTable_InterfaceName, InterfaceTable_PrimaryDNSServerIPAddress,
InterfaceTable_SecondaryDNSServerIPAddress,
InterfaceTable_UnderlyingDevice;
InterfaceTable 0 = 6, 10, 10.15.17.77, 16, 10.15.0.1, "Voice",
10.15.25.1, 0.0.0.0, "vlan 1";
InterfaceTable 1 = 5, 10, 195.189.192.158, 25, 195.189.192.129, "WANSP",
80.179.52.100, 80.179.55.100, "vlan 2";

[ \InterfaceTable ]


[ DspTemplates ]

;
;  *** TABLE DspTemplates ***
; This table contains hidden elements and will not be exposed.
; This table exists on board and will be saved during restarts.
;

[ \DspTemplates ]


[ WebUsers ]

FORMAT WebUsers_Index = WebUsers_Username, WebUsers_Password,
WebUsers_Status, WebUsers_PwAgeInterval, WebUsers_SessionLimit,
WebUsers_SessionTimeout, WebUsers_BlockTime, WebUsers_UserLevel,
WebUsers_PwNonce;
```

```
WebUsers 0 = "Admin",
"$1$LE0VGBxUAQFSUAJXUQANXwoPDwtaeSNwInB2c3B+eihzKSgvfDIzMDI1YGc0YWhub2hlP
GpUVwdVBlNSBgpRXV4=", 1, 0, 2, 15, 60, 200,
"62cabed25276f6d59432fcaf295a1346";
WebUsers 1 = "User",
"$1$fRwcHLO4tOHmvOKy7Oiys7m5vrbzpqfyoKL0r6v7q/iv/P35kpmUwcXBkZWYy5iaz8+Wm
NGBgoPXhdTRi4yDj94=", 1, 0, 2, 15, 60, 50,
"e124fc45691a62316416e055a60edb6f";

[ \WebUsers ]


[ TLSContexts ]

FORMAT TLSContexts_Index = TLSContexts_Name, TLSContexts_TLSVersion,
TLSContexts_ServerCipherString, TLSContexts_ClientCipherString,
TLSContexts_OcspEnable, TLSContexts_OcspServerPrimary,
TLSContexts_OcspServerSecondary, TLSContexts_OcspServerPort,
TLSContexts_OcspDefaultResponse;
TLSContexts 0 = "default", 1, "RC4:EXP", "ALL:!ADH", 0, 0.0.0.0, 0.0.0.0,
2560, 0;

[ \TLSContexts ]


[ IpProfile ]

FORMAT IpProfile_Index = IpProfile_ProfileName, IpProfile_IpPreference,
IpProfile_CodersGroupID, IpProfile_IsFaxUsed,
IpProfile_JitterBufMinDelay, IpProfile_JitterBufOptFactor,
IpProfile_IPDiffServ, IpProfile_SigIPDiffServ, IpProfile_SCE,
IpProfile_RTPRedundancyDepth, IpProfile_RemoteBaseUDPPort,
IpProfile_CNGmode, IpProfile_VxxTransportType, IpProfile_NSEMode,
IpProfile_IsDTMFUsed, IpProfile_PlayRBTone2IP,
IpProfile_EnableEarlyMedia, IpProfile_ProgressIndicator2IP,
IpProfile_EnableEchoCanceller, IpProfile_CopyDest2RedirectNumber,
IpProfile_MediaSecurityBehaviour, IpProfile_CallLimit,
IpProfile_DisconnectOnBrokenConnection, IpProfile_FirstTxDtmfOption,
IpProfile_SecondTxDtmfOption, IpProfile_RxDTMFOption,
IpProfile_EnableHold, IpProfile_InputGain, IpProfile_VoiceVolume,
IpProfile_AddIEInSetup, IpProfile_SBCExtensionCodersGroupID,
IpProfile_MediaIPVersionPreference, IpProfile_TranscodingMode,
IpProfile_SBCAllowedMediaTypes, IpProfile_SBCAllowedCodersGroupID,
IpProfile_SBCAllowedVideoCodersGroupID, IpProfile_SBCAllowedCodersMode,
IpProfile_SBCMediaSecurityBehaviour, IpProfile_SBCRFC2833Behavior,
IpProfile_SBCAlternativeDTMFMethod, IpProfile_SBCAssertIdentity,
IpProfile_AMDSensitivityParameterSuit, IpProfile_AMDSensitivityLevel,
IpProfile_AMDMaxGreetingTime, IpProfile_AMDMaxPostSilenceGreetingTime,
IpProfile_SBCDiversionMode, IpProfile_SBCHistoryInfoMode,
IpProfile_EnableQSIGTunneling, IpProfile_SBCFaxCodersGroupID,
IpProfile_SBCFaxBehavior, IpProfile_SBCFaxOfferMode,
IpProfile_SBCFaxAnswerMode, IpProfile_SbcPrackMode,
IpProfile_SBCSessionExpiresMode, IpProfile_SBCRemoteUpdateSupport,
IpProfile_SBCRemoteReinviteSupport,
IpProfile_SBCRemoteDelayedOfferSupport, IpProfile_SBCRemoteReferBehavior,
IpProfile_SBCRemote3xxBehavior, IpProfile_SBCRemoteMultiple18xSupport,
IpProfile_SBCRemoteEarlyMediaResponseType,
IpProfile_SBCRemoteEarlyMediaSupport, IpProfile_EnableSymmetricMKI,
IpProfile_MKISize, IpProfile_SBCEnforceMKISize,
IpProfile_SBCRemoteEarlyMediaRTP, IpProfile_SBCRemoteSupportsRFC3960,
IpProfile_SBCRemoteCanPlayRingback, IpProfile_EnableEarly183,
IpProfile_EarlyAnswerTimeout, IpProfile_SBC2833DTMFPayloadType,
IpProfile_SBCUserRegistrationTime, IpProfile_ResetSRTPStateUponRekey,
IpProfile_AmdMode, IpProfile_SBCReliableHeldToneSource,
```

```
IpProfile_GenerateSRTPKeys, IpProfile_SBCPlayHeldTone,
IpProfile_SBCRemoteHoldFormat, IpProfile_SBCRemoteReplacesBehavior,
IpProfile_SBCSDPPtimeAnswer, IpProfile_SBCPreferredPTime,
IpProfile_SBCUseSilenceSupp, IpProfile_SBCRTPRedundancyBehavior,
IpProfile_SBCPlayRBTToTransferee, IpProfile_SBCRTCPMode,
IpProfile_SBCJitterCompensation,
IpProfile_SBCRemoteRenegotiateOnFaxDetection,
IpProfile_JitterBufMaxDelay,
IpProfile_SBCUserBehindUdpNATRegistrationTime,
IpProfile_SBCUserBehindTcpNATRegistrationTime,
IpProfile_SBCSDPHandleRTCPAttribute,
IpProfile_SBCRemoveCryptoLifetimeInSDP, IpProfile_SBCIceMode,
IpProfile_SBCRTCPMux, IpProfile_SBCMediaSecurityMethod,
IpProfile_SBCHandleXDetect, IpProfile_SBCRTCPFeedback,
IpProfile_SBCRemoteRepresentationMode, IpProfile_SBCKeepVIAHeaders,
IpProfile_SBCKeepRoutingHeaders, IpProfile_SBCKeepUserAgentHeader,
IpProfile_SBCRemoteMultipleEarlyDialogs,
IpProfile_SBCRemoteMultipleAnswersMode, IpProfile_SBCDirectMediaTag,
IpProfile_SBCAdaptRFC2833BWToVoiceCoderBW;
IpProfile 1 = "Lync", 1, 0, 0, 10, 10, 46, 40, 0, 0, 0, 0, 2, 0, 0, 0, 0,
-1, 1, 0, 0, -1, 1, 4, -1, 1, 1, 0, 0, "", -1, 0, 0, "", 0, -1, 0, 1, 0,
0, 0, 0, 8, 300, 400, 0, 0, 0, -1, 0, 0, 1, 1, 0, 1, 1, 0, 3, 2, 1, 0, 1,
1, 1, 1, 1, 0, 1, 0, 0, 0, 0, 1, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0,
0, 300, -1, -1, 0, 0, 0, 0, 0, 0, 0, -1, -1, -1, -1, -1, 0, "", 0;
IpProfile 2 = "Twilio", 1, 0, 0, 10, 10, 46, 40, 0, 0, 0, 0, 2, 0, 0, 0,
0, -1, 1, 0, 0, -1, 1, 4, -1, 1, 1, 0, 0, "", -1, 0, 1, "", -1, -1, 0, 2,
0, 0, 1, 0, 8, 300, 400, 0, 0, 0, -1, 0, 0, 1, 3, 0, 0, 0, 1, 3, 0, 1, 0,
1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 5, 0, 0, 0, 0, 0, 1, 0,
0, 0, 300, -1, -1, 0, 0, 0, 0, 0, 0, 0, -1, -1, -1, -1, -1, 0, "", 0;

[ \IpProfile ]


[ CpMediaRealm ]

FORMAT CpMediaRealm_Index = CpMediaRealm_MediaRealmName,
CpMediaRealm_IPv4IF, CpMediaRealm_IPv6IF, CpMediaRealm_PortRangeStart,
CpMediaRealm_MediaSessionLeg, CpMediaRealm_PortRangeEnd,
CpMediaRealm_IsDefault, CpMediaRealm_QoeProfile, CpMediaRealm_BWProfile;
CpMediaRealm 0 = "MRLan", "Voice", "", 6000, 100, 6990, 1, "", "";
CpMediaRealm 1 = "MRWan", "WANSP", "", 7000, 100, 7990, 0, "", "";

[ \CpMediaRealm ]


[ SBCRoutingPolicy ]

FORMAT SBCRoutingPolicy_Index = SBCRoutingPolicy_Name,
SBCRoutingPolicy_LCREnable, SBCRoutingPolicy_LCRAverageCallLength,
SBCRoutingPolicy_LCRDefaultCost, SBCRoutingPolicy_LdapServerGroupName;
SBCRoutingPolicy 0 = "Default_SBCRoutingPolicy", 0, 1, 1, "";

[ \SBCRoutingPolicy ]


[ SRD ]

FORMAT SRD_Index = SRD_Name, SRD_BlockUnRegUsers, SRD_MaxNumOfRegUsers,
SRD_EnableUnAuthenticatedRegistrations, SRD_SharingPolicy,
SRD_UsedByRoutingServer, SRD_SBCOperationMode,
SRD_SBCRegisteredUsersClassificationMethod, SRD_SBCRoutingPolicyName;
SRD 0 = "DefaultSRD", 0, -1, 1, 0, 0, 0, -1, "Default_SBCRoutingPolicy";
```

```
[ \SRD ]


[ SIPInterface ]

FORMAT SIPInterface_Index = SIPInterface_InterfaceName,
SIPInterface_NetworkInterface, SIPInterface_ApplicationType,
SIPInterface_UDPPort, SIPInterface_TCPPort, SIPInterface_TLSPort,
SIPInterface_SRDName, SIPInterface_MessagePolicyName,
SIPInterface_TLSContext, SIPInterface_TLSMutualAuthentication,
SIPInterface_TCPKeepaliveEnable,
SIPInterface_ClassificationFailureResponseType,
SIPInterface_PreClassificationManSet, SIPInterface_EncapsulatingProtocol,
SIPInterface_MediaRealm, SIPInterface_SBCDirectMedia,
SIPInterface_BlockUnRegUsers, SIPInterface_MaxNumOfRegUsers,
SIPInterface_EnableUnAuthenticatedRegistrations,
SIPInterface_UsedByRoutingServer;
SIPInterface 0 = "Lync", "Voice", 2, 0, 0, 5067, "DefaultSRD", "",
"default", -1, 0, 500, -1, 0, "MRLan", 0, -1, -1, -1, 0;
SIPInterface 1 = "Twilio", "WANSP", 2, 5060, 0, 0, "DefaultSRD", "",
"default", -1, 0, 500, -1, 0, "MRWan", 0, -1, -1, -1, 0;

[ \SIPInterface ]


[ ProxySet ]

FORMAT ProxySet_Index = ProxySet_ProxyName,
ProxySet_EnableProxyKeepAlive, ProxySet_ProxyKeepAliveTime,
ProxySet_ProxyLoadBalancingMethod, ProxySet_IsProxyHotSwap,
ProxySet_SRDName, ProxySet_ClassificationInput, ProxySet_TLSContextName,
ProxySet_ProxyRedundancyMode, ProxySet_DNSResolveMethod,
ProxySet_KeepAliveFailureResp, ProxySet_GWIPv4SIPInterfaceName,
ProxySet_SBCIPv4SIPInterfaceName, ProxySet_SASIPv4SIPInterfaceName,
ProxySet_GWIPv6SIPInterfaceName, ProxySet_SBCIPv6SIPInterfaceName,
ProxySet_SASIPv6SIPInterfaceName;
ProxySet 0 = "Lync", 1, 60, 1, 1, "DefaultSRD", 0, "default", 1, -1, "",
"", "Lync", "", "", "", "";
ProxySet 1 = "Twilio", 1, 60, 0, 0, "DefaultSRD", 0, "", -1, 1, "", "",
"Twilio", "", "", "", "";

[ \ProxySet ]


[ IPGroup ]

FORMAT IPGroup_Index = IPGroup_Type, IPGroup_Name, IPGroup_ProxySetName,
IPGroup_SIPGroupName, IPGroup_ContactUser, IPGroup_SipReRoutingMode,
IPGroup_AlwaysUseRouteTable, IPGroup_SRDName, IPGroup_MediaRealm,
IPGroup_ClassifyByProxySet, IPGroup_ProfileName,
IPGroup_MaxNumOfRegUsers, IPGroup_InboundManSet, IPGroup_OutboundManSet,
IPGroup_RegistrationMode, IPGroup_AuthenticationMode, IPGroup_MethodList,
IPGroup_EnableSBCClientForking, IPGroup_SourceUriInput,
IPGroup_DestUriInput, IPGroup_ContactName, IPGroup_Username,
IPGroup_Password, IPGroup_UUIFormat, IPGroup_QOEProfile,
IPGroup_BWProfile, IPGroup_MediaEnhancementProfile,
IPGroup_AlwaysUseSourceAddr, IPGroup_MsgManUserDef1,
IPGroup_MsgManUserDef2, IPGroup_SIPConnect, IPGroup_SBCPSAPMode,
IPGroup_DTLSContext, IPGroup_CreatedByRoutingServer,
IPGroup_UsedByRoutingServer, IPGroup_SBCOperationMode,
IPGroup_SBCRouteUsingRequestURIPort;
```

```
IPGroup 0 = 0, "Lync", "Lync", "ilync15.pstn.twilio.com", "", -1, 0,
"DefaultSRD", "MRLan", 1, "Lync", -1, -1, -1, 0, 0, "", 0, -1, -1, "",
"", "$1$gQ==", 0, "", "", "", 0, "", "", 0, 0, "", 0, 0, -1, 0;
IPGroup 1 = 0, "Twilio", "Twilio", "ilync15.pstn.twilio.com", "", -1, 0,
"DefaultSRD", "MRWan", 1, "Twilio", -1, -1, 4, 0, 0, "", 0, -1, -1, "",
"", "$1$gQ==", 0, "", "", "", 0, "", "", 0, 0, "", 0, 0, -1, 0;

[ \IPGroup ]


[ ProxyIp ]

FORMAT ProxyIp_Index = ProxyIp_ProxySetId, ProxyIp_ProxyIpIndex,
ProxyIp_IpAddress, ProxyIp_TransportType;
ProxyIp 0 = "0", 0, "FE15.ilync15.local:5067", 2;
ProxyIp 1 = "1", 0, "ilync15.pstn.twilio.com:5060", 0;

[ \ProxyIp ]


[ IP2IPRouting ]

FORMAT IP2IPRouting_Index = IP2IPRouting_RouteName,
IP2IPRouting_RoutingPolicyName, IP2IPRouting_SrcIPGroupName,
IP2IPRouting_SrcUsernamePrefix, IP2IPRouting_SrcHost,
IP2IPRouting_DestUsernamePrefix, IP2IPRouting_DestHost,
IP2IPRouting_RequestType, IP2IPRouting_MessageConditionName,
IP2IPRouting_ReRouteIPGroupName, IP2IPRouting_Trigger,
IP2IPRouting_CallSetupRulesSetId, IP2IPRouting_DestType,
IP2IPRouting_DestIPGroupName, IP2IPRouting_DestSIPInterfaceName,
IP2IPRouting_DestAddress, IP2IPRouting_DestPort,
IP2IPRouting_DestTransportType, IP2IPRouting_AltRouteOptions,
IP2IPRouting_GroupPolicy, IP2IPRouting_CostGroup;
IP2IPRouting 0 = "OPTIONS termination", "Default_SBCRoutingPolicy",
"Lync", "*", "*", "*", "*", 6, "", "Any", 0, -1, 1, "", "", "internal",
0, -1, 0, 0, "";
IP2IPRouting 1 = "Lync to ITSP", "Default_SBCRoutingPolicy", "Lync", "*",
"*", "*", "*", 0, "", "Any", 0, -1, 0, "Twilio", "Twilio", "", 0, -1, 0,
0, "";
IP2IPRouting 2 = "ITSP to Lync", "Default_SBCRoutingPolicy", "Twilio",
"*", "*", "*", "*", 0, "", "Any", 0, -1, 0, "Lync", "Lync", "", 0, -1, 0,
0, "";

[ \IP2IPRouting ]


[ Classification ]

FORMAT Classification_Index = Classification_ClassificationName,
Classification_MessageConditionName, Classification_SRDName,
Classification_SrcSIPInterfaceName, Classification_SrcAddress,
Classification_SrcPort, Classification_SrcTransportType,
Classification_SrcUsernamePrefix, Classification_SrcHost,
Classification_DestUsernamePrefix, Classification_DestHost,
Classification_ActionType, Classification_SrcIPGroupName,
Classification_DestRoutingPolicy, Classification_IpProfileName;
Classification 0 = "Europe", "", "DefaultSRD", "Twilio", "", 0, -1, "*",
"sip.ie1.twilio.com", "*", "*", 1, "Twilio", "", "Twilio";
Classification 1 = "North America", "", "DefaultSRD", "Twilio", "", 0, -
1, "*", "sip.us1.twilio.com", "*", "*", 1, "Twilio", "", "Twilio";
```

```
[ \Classification ]


[ CodersGroup0 ]

FORMAT CodersGroup0_Index = CodersGroup0_Name, CodersGroup0_pTime,
CodersGroup0_rate, CodersGroup0_PayloadType, CodersGroup0_Sce,
CodersGroup0_CoderSpecific;
CodersGroup0 0 = "g711Ulaw64k", 20, 0, -1, 0, "";

[ \CodersGroup0 ]


[ AllowedCodersGroup0 ]

FORMAT AllowedCodersGroup0_Index = AllowedCodersGroup0_Name;
AllowedCodersGroup0 0 = "g711Ulaw64k";

[ \AllowedCodersGroup0 ]


[ MessageManipulations ]

FORMAT MessageManipulations_Index =
MessageManipulations_ManipulationName, MessageManipulations_ManSetID,
MessageManipulations_MessageType, MessageManipulations_Condition,
MessageManipulations_ActionSubject, MessageManipulations_ActionType,
MessageManipulations_ActionValue, MessageManipulations_RowRole;
MessageManipulations 0 = "Change Host of History-Info.0", 4,
"invite.request", "header.history-info.0 regex
(.*)(@)(.*)(;user=phone)(.*)", "header.history-info.0", 2,
"$1+$2+param.ipg.dst.host+$4+$5", 0;
MessageManipulations 1 = "Remove History-Info.1", 4, "invite.request",
"", "header.history-info.1", 1, "", 0;
MessageManipulations 2 = "Change Referred-by Host", 4, "invite.request",
"header.referred-by exists", "header.referred-by.url.host", 2,
"param.ipg.dst.host", 0;

[ \MessageManipulations ]


[ GwRoutingPolicy ]

FORMAT GwRoutingPolicy_Index = GwRoutingPolicy_Name,
GwRoutingPolicy_LCREnable, GwRoutingPolicy_LCRAverageCallLength,
GwRoutingPolicy_LCRDefaultCost, GwRoutingPolicy_LdapServerGroupName;
GwRoutingPolicy 0 = "GwRoutingPolicy", 0, 1, 1, "";

[ \GwRoutingPolicy ]


[ ResourcePriorityNetworkDomains ]

FORMAT ResourcePriorityNetworkDomains_Index =
ResourcePriorityNetworkDomains_Name,
ResourcePriorityNetworkDomains_Ip2TelInterworking;
ResourcePriorityNetworkDomains 1 = "dsn", 1;
ResourcePriorityNetworkDomains 2 = "dod", 1;
ResourcePriorityNetworkDomains 3 = "drsn", 1;
```

```
ResourcePriorityNetworkDomains 5 = "uc", 1;
ResourcePriorityNetworkDomains 7 = "cuc", 1;

[ \ResourcePriorityNetworkDomains ]
```

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