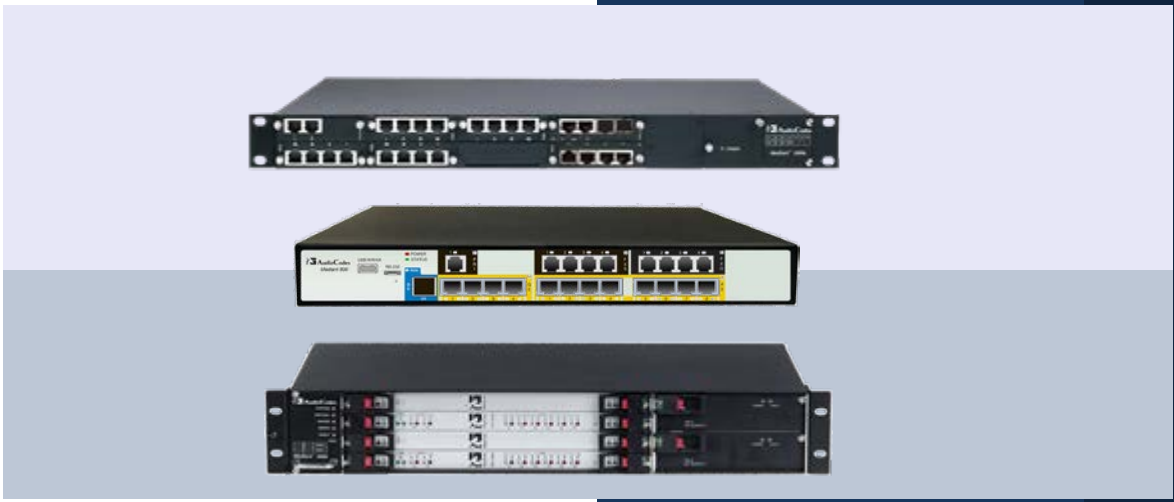
Microsoft® Lync™ Server 2013

Enhanced Gateway

Mediant Gateway family

Configuration Note

Enhanced Gateway with Lync Analog Device Feature (LAD) for Microsoft Lync Server 2013



April 2015

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Notice

This note shows how to install and configure AudioCodes' Mediant Gateway family as Enhanced Gateway, with the Lync Analog Device feature (LAD) deployed in the Microsoft Lync Server 2013 environment.

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Abbreviations and Terminology

The following table describes the terms used throughout this document.

Term	Refers To
Device	Enhanced Gateway
ATA	AudioCodes MP-1xx Analog Telephone Adapter
FXS	Foreign eXchange Station
Lync Server	Microsoft Lync Server 2013

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

Related Documentation

Manual Name
Mediant 800 Gateway and E-SBC User's Manual
Mediant 1000B Gateway & E-SBC User's Manual
Mediant 3000 User's Manual
Mediant 800 Gateway and E-SBC Hardware Installation Manual
Mediant 1000B Gateway and E-SBC Hardware Installation Manual
Mediant 3000 SIP Installation Manual

Document Revision Record

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40145	Document released.
40146	‘Registration Time’ parameter added.

1 Introduction

This note shows how to install and configure AudioCodes' Enhanced Gateway, which is deployed in the Lync Server environment.

The Enhanced Gateway consists of the following entities:

- Gateway entity, interfacing Microsoft Lync with digital trunks
- SBC entity, interfacing Microsoft Lync with analog devices

The device is typically co-located with Microsoft's Mediation Server at the enterprise headquarters. The Mediation Server is the entity responsible for interfacing the Lync Server network with the gateway, which provides legacy connections to one or more of the following:

- Analog Devices (such as fax machines and telephones)
- Public Switched Telephone Network (PSTN)
- Private Branch Exchange (PBX)

In a Lync Server environment, the device provides a connection to AudioCodes' MediaPack 1xx series which *must* be used as an Analog Telephone Adapter (ATA). The ATA provides a Foreign eXchange Station (FXS) port interface for connecting Analog Devices.

This note shows how to configure the device to communicate with the ATA. It also shows how to configure the ATA to communicate with the *device*.

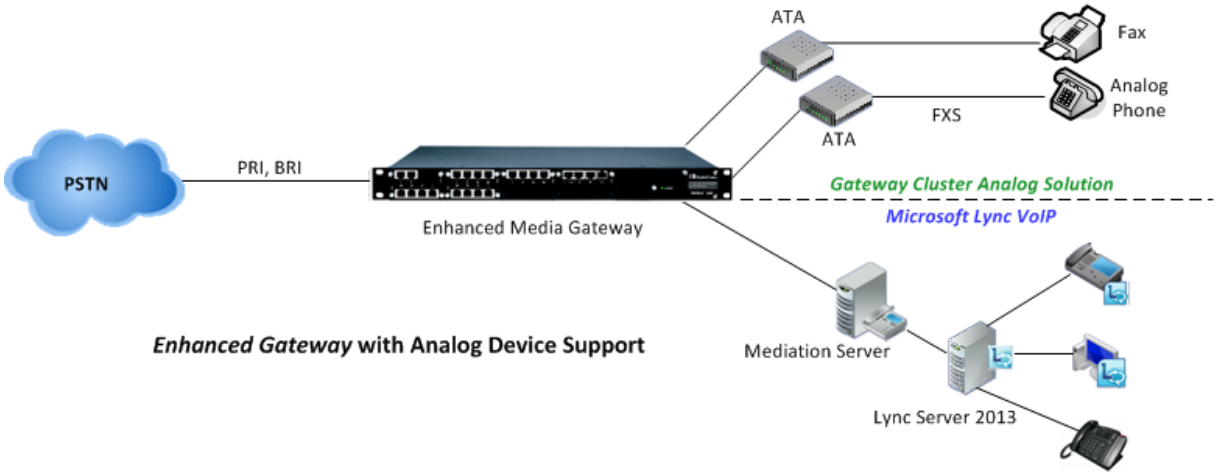
Note:

- This document does not show how to configure Analog Devices connected directly to the Enhanced Gateway's FXS ports.
- If your configuration does not include Analog Devices, see the Enhanced Gateway for Microsoft Lync Server 2013 Configuration Note.

Note: This document specifies using the LAD Feature Key, which uses AudioCodes' MP-1xx as the ATA to the Lync environment through AudioCodes' SBC. If you configure the Analog Device to forward calls, you need to acquire the SBC Feature Key.

The figure below shows the high-level architecture of the Enhanced Gateway with Analog Devices.

Figure 1-1: High-Level Architecture of the Enhanced Gateway with Analog Devices



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2 Component Information

2.1 AudioCodes Devices

GW Vendor	AudioCodes
Models	▪ Mediant 800 Gateway & E-SBC ▪ Mediant 1000B Gateway & E-SBC ▪ Mediant 3000 Gateway & E-SBC
Software Version	SIP_ 6.80A.258.002 or later
Protocol	▪ PRI /BRI (to PSTN) ▪ SIP/TCP or TLS (to Lync Server) ▪ SIP/UDP or TCP (to ATA)
Additional Notes	None

2.2 Microsoft Lync Server 2013

Vendor	Microsoft
Model	Microsoft Lync
Software Version	Release 2013 5.0.8308.0 or later
Protocol	SIP
Additional Notes	None

2.3 AudioCodes ATA

GW Vendor	AudioCodes
Models	▪ MediaPack MP-11x ▪ MediaPack MP-124
Software Version	SIP_6.60A.290.005 or later SIP_6.80A.248.003 or later
Protocol	▪ FXS (to Analog Devices) ▪ SIP/UDP or TCP (to AudioCodes *device*)
Additional Notes	None

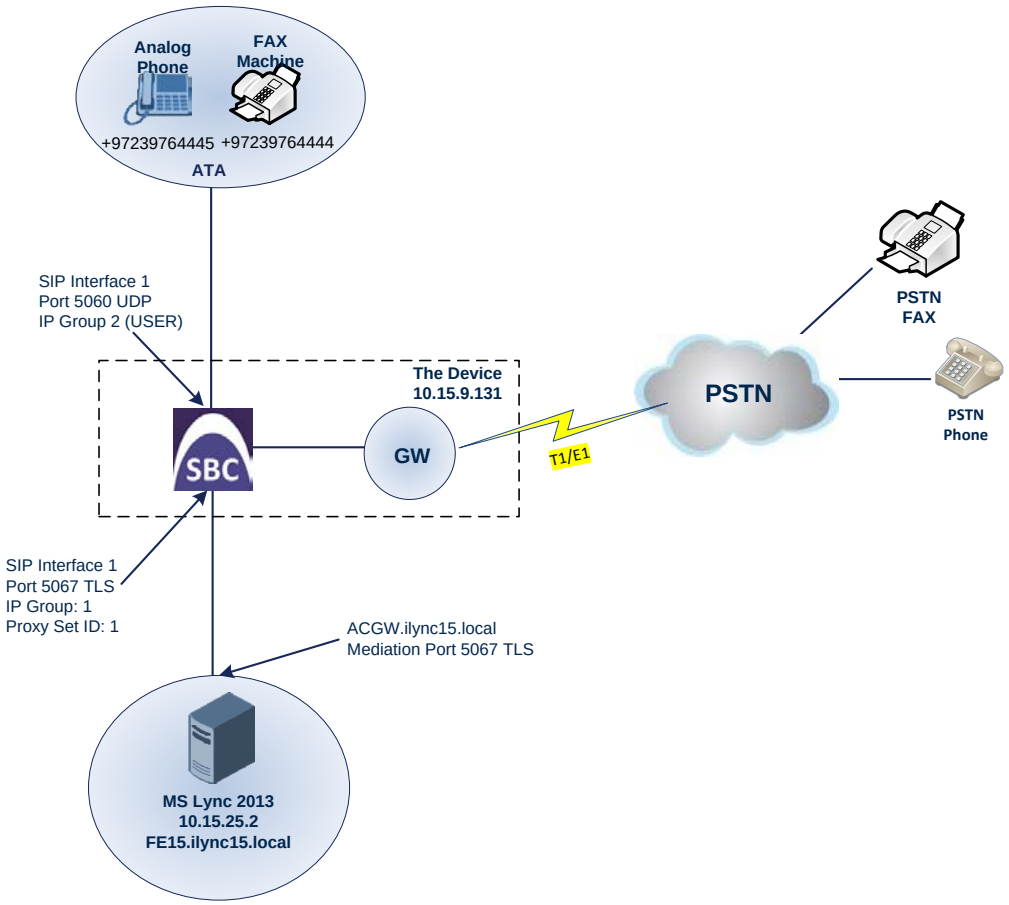
2.4 Deploying the Device (Topology)

This document uses the following example scenario for showing how to deploy the device:

- The enterprise deploys Lync Server in its private network for enhanced communications within the enterprise.
- The enterprise wants to offer its employees enterprise voice capabilities and to connect the enterprise to the PSTN network using an E1/T1 service.
- The enterprise wants to connect Analog Devices, that interact with Lync Server, for management, monitoring, and security.
- Analog Devices are configured using the Lync Server Management Shell.
- AudioCodes' solution offers a single device that consists of the following entities:
  - The Gateway entity is used to manage the connection between the Lync Server and the E1/T1 trunk.
  - The SBC entity is used to manage the connection between the Lync Server and the Analog Devices via the ATA (the SBC entity acts as their gateway to the Lync Server):
    - The SBC entity communicates with Lync Server 2013
      The SBC entity is configured as a PSTN gateway on the Lync topology builder (the trunk is also created).

The figure below shows the device entities interworking with PSTN, Lync Server 2013 and the ATA:

Figure 2-1: Interworking Device Entities



2.5 Setup Environment

The table below shows the elements in the setup environment.

Table 2-1: Elements in the Setup Environment

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

2.6 Call Flows in Different Scenarios

The table below shows call flows in different scenarios.

Table 2-2: Call Flows in Different Scenarios

Scenario	Flow
Call from PSTN to Lync client	PSTN → GW → Lync
Call from PSTN to analog phone	PSTN → GW → Lync → SBC → ATA
Call from PSTN to fax machine	PSTN → GW → Lync → SBC → ATA
Call from ATA FAX machine to PSTN	ATA → SBC → Lync → SBC/GW → PSTN
Call from ATA analog phone to PSTN	ATA → SBC → Lync → SBC/GW → PSTN
Call from ATA analog phone to Lync client	ATA → SBC → Lync
Call from Lync client to PSTN	Lync → SBC/GW → PSTN
Call from Lync client to ATA analog phone	Lync → SBC → ATA
Call between two ATA fax machines	ATA → SBC → Lync → SBC → ATA
Call between two ATA analog phones	ATA → SBC → Lync → SBC → ATA

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3 Accessing the Device

The Gateway features an embedded Web server (*Web interface*) which you can use to configure the device. Before configuring the device in this user-friendly graphical user interface (GUI), you must access it with the default VoIP / Management LAN IP address (described below) and then change the address to suit the networking scheme in which your Enhanced Gateway is deployed.

3.1 Initially Accessing the Device

Before configuring the device, you must access it with the default VoIP / Management LAN IP address shown in the table below.

PSTN Gateway Default IP Addresses

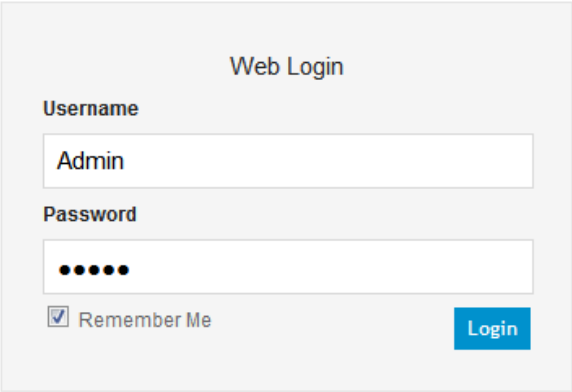
Device Name	IP Address	Subnet Mask	Prefix Length
Mediant 3000	▪ TP-6310 or TP-8410 blade in Slot 1: 10.1.10.10 ▪ TP-6310 or TP-8410 blade in Slot 3: 10.1.10.11 (HA mode)	255.255.0.0	16
Mediant 1000B	192.168.0.2	255.255.255.0	24
Mediant 800	192.168.0.2	255.255.255.0	24

➢ **To initially access the PSTN gateway:**

1. Connect the first LAN port on the device directly to a PC, using a straight-through Ethernet cable.
2. Make sure your PC is configured with an IP address in the same subnet as the Gateway.
3. Open a standard internet browser and then in the URL address field, enter the default VoIP / Management LAN IP address (e.g., **192.168.0.2**).

   The login screen opens, prompting you to log in with your login credentials:

Figure 3-1: Login Screen



4. Log in with the default, case-sensitive Username (**Admin**) and Password (**Admin**), and then click **OK**; the Web interface opens, displaying the Home page. See the next section in order to assign an IP address to the device.

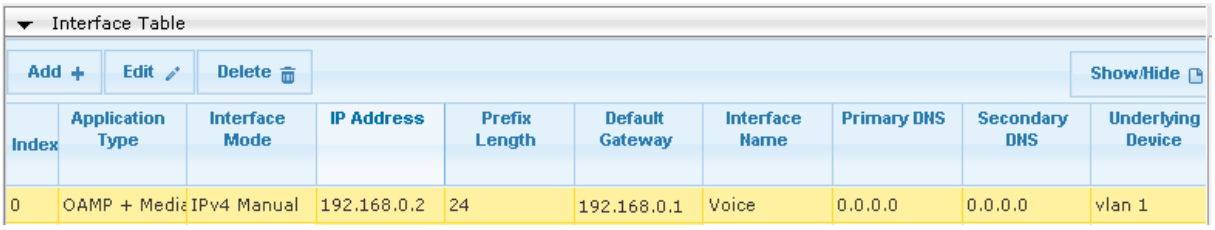
3.1.1 Assigning IP Address to the Device

This section shows how to assign an IP address to the device.

➢ **To assign an IP address to the device:**

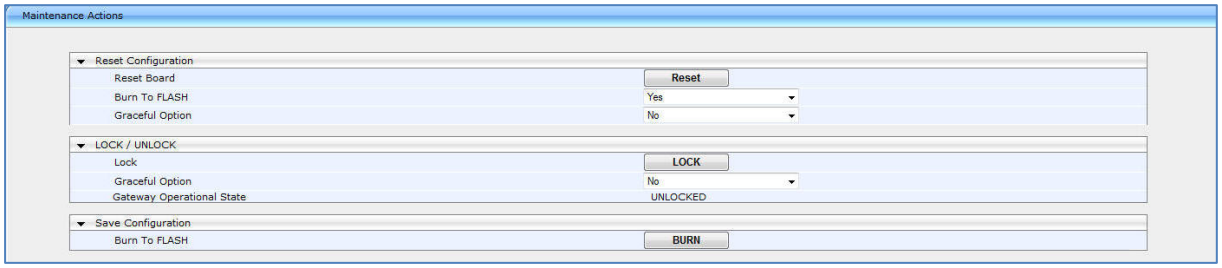
1. Open the IP Interfaces Table page (**Configuration** tab > **VoIP** menu > **Network** > **IP Interfaces Table**).
2. Select the **Index** row corresponding to the Application Type **OAMP + Media + Control** (i.e., the VoIP and Management LAN interface), and then click **Edit**.

Figure 3-2: IP Settings Screen (Multiple Network Interface)



3. Configure a LAN network address that corresponds to your network IP addressing scheme.
4. Click **Apply**, and then click **Done** to apply and validate your settings.
5. On the toolbar, from the **Device Actions** dropdown, choose **Reset**, and then in the Maintenance Actions page, click the **Reset** button; the gateway resets and your settings are saved to the flash memory.

Figure 3-3: Maintenance Actions: Reset Gateway



Maintain the cabled connection between the gateway's LAN port and the PC.

4 Configuring the Device

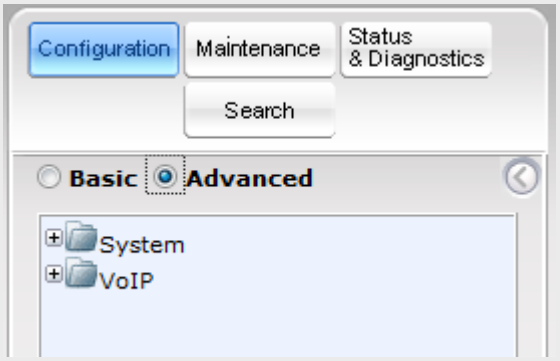
This section shows how to configure the device for scenarios in which it will be used to connect the Microsoft Lync environment to the PSTN, as well for scenarios in which there are Analog Devices communicating with Lync Server.

Configuration is performed using the Enhanced Gateway's embedded Web server (*Web interface*).

Note:

- The E-SBC must be installed with a Software Feature Key (SFK) that includes:
  - √ Microsoft
  - √ LAD
  - √ Security
  - √ RTP
  - √ SIP

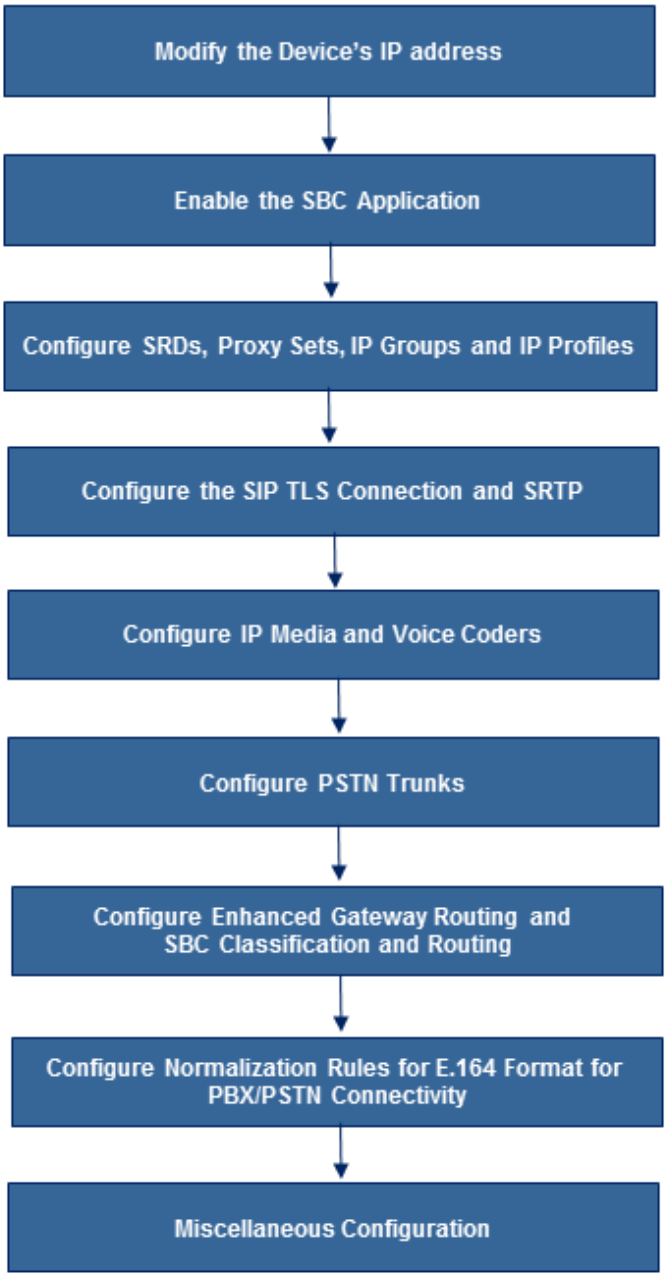
  For more information about the SFK, contact AudioCodes.
- The scope of this document does *not* cover security aspects of connecting a SIP Trunk to the Lync Server environment. Security measures should be implemented in accordance with your organization's security policies. For basic security guidelines,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



  When the E-SBC is reset, the Web interface reverts to **Basic** display.
- This document applies to Microsoft Lync Server 2013.

The flowchart below shows the device configuration steps:

Figure 4-1: Steps to Configure the Device for PSTN and Analog Device



4.1 Step 1: Modify the Device's IP Address

This section shows how to modify the device's IP address.

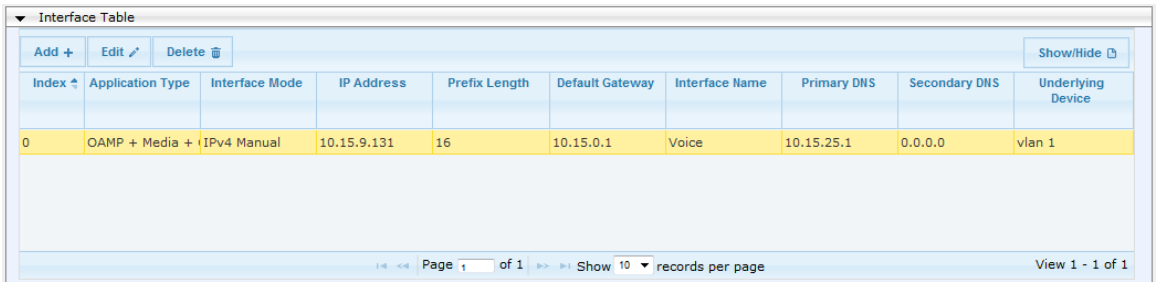
➢ **To modify the existing LAN network interface:**

1. Open the IP Interfaces Table page (**Configuration** tab > **VoIP** menu > **Network** > **IP Interfaces Table**).
2. Select the 'Index' row adjacent to Application Type **OAMP + Media + Control** and click **Edit**.
3. Configure like this:

Parameter	Value for IPv4	Value for IPv6
Application Type	OAMP + Media + Control (application)	Media + Control. The OAMP application can be configured only with IPv4.
Interface Mode	IPv4 Manual	IPv6 Manual
IP Address	10.15.9.131 (device IP address)	2001::131 (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	Default Gateway 10.15.0.1	2001::1
Interface Name	Arbitrary descriptive name "Voice"	IP6Voice
Primary DNS Server IP Address	DNS IP address 10.15.25.1	2001::10
Underlying Device	vlan 1	vlan 1

4. Click **Submit**.
5. Reset the device with a **Burn to Flash** for this setting to take effect (see Section 4.17 on page 67).

Figure 4-2: Configured Network Interfaces in IP Interfaces Table



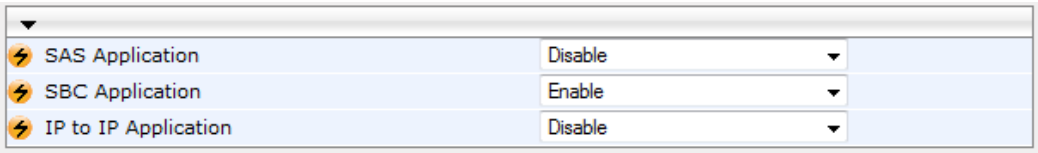
4.2 Step 2: Enable the SBC Application

This step shows how to enable the SBC application.

➢ **To enable the SBC application:**

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

Figure 4-3: Applications Enabling



2. From the 'SBC Application' dropdown, select **Enable**.
3. Reset the device with a **Burn to Flash** for this setting to take effect. See also Section 4.17 on page 67.

4.3 Step 3: Configure SRDs

This step shows 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 Configure Media Realms

A Media Realm represents a set of ports, associated with an IP interface, used by the SBC entity and the Gateway entity to transmit or receive media (RTP or SRTP).
Media Realms are associated with SRDs or IP Groups.

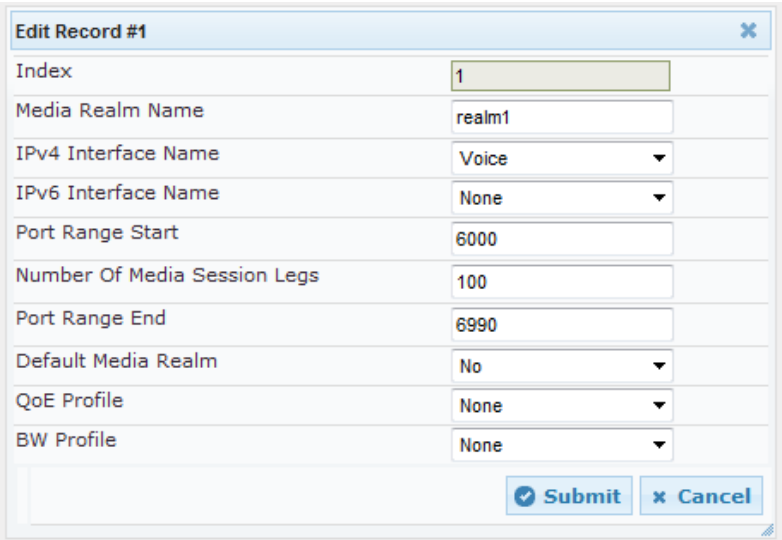
The simplest way is to configure one Media Realm for internal (LAN) traffic as shown below (applied to the example scenario).

➢ **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:
   a. Configure these parameters:

Parameter	Example Setting
Index	1
Media Realm Name	realm1 (an arbitrary name)
IPv4 Interface Name	Voice (the interface name)
IPv6 Interface Name	IP6Voice (the interface name). Note: Only applicable if using IPv6.
Port Range Start	6000 (a number representing the lowest UDP port number to be used for media on the LAN)
Number of Media Session Legs	100 (the number of media sessions assigned with the port range)

Figure 4-4: Configuring a Media Realm



   b. Click **Submit**.

4.3.2 Configure SRDs

This section shows how to configure the SRDs.

The simplest method for configuring SRDs is to configure a single SRD for internal (LAN) traffic as shown below, applied to the example scenario.

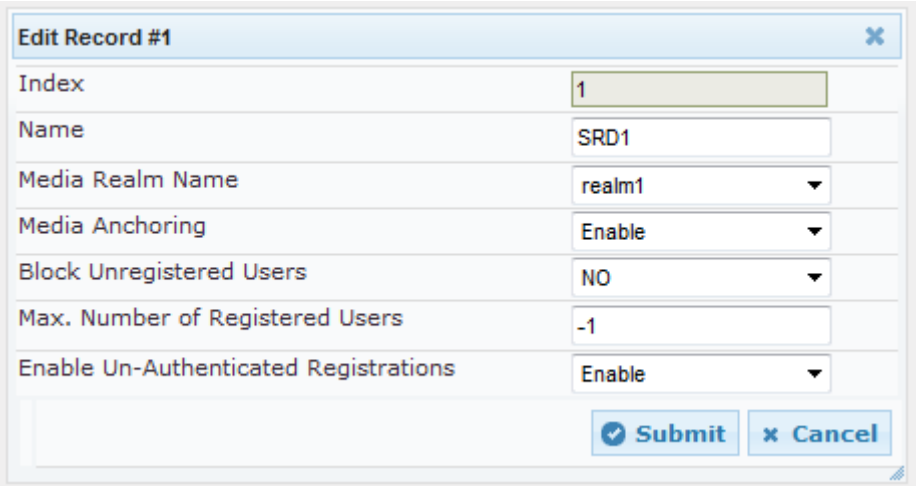
Note that this SRD will later be associated with IP Groups.

➢ **To configure the SRDs:**

1. Open the SRD Table page (**Configuration** tab > **VoIP** menu > **VoIP Network** > **SRD Table**).
2. Add an SRD:
   a. Configure these parameters:

Parameter	Example Setting
SRD Index	**1**
SRD Name	SRD1 (descriptive name for the SRD)
Media Realm	Realm1 (associates the SRD with a Media Realm)

Figure 4-5: Configuring the LAN SRD



   b. Click **Submit**.

4.3.3 Configure a SIP Signaling Interface

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.

The procedure below shows how to add a SIP interface. In the example scenario, one SIP interface is added for the SBC entity in the device.

➢ **To add a SIP interface:**

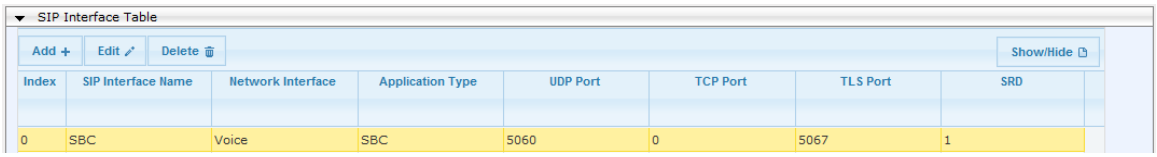
1. Open the SIP Interface Table page (**Configuration** tab > **VoIP** menu > **VoIP Network** > **SIP Interface Table**).
2. Add a SIP interface for the SBC entity:
   a. Click **Add**.
   b. Configure these parameters:

Parameter	Example Setting
Index	0
Interface Name	SBC (arbitrary descriptive name)
Network Interface	Voice (for IPv4) / "IP6Voice" (for IPv6)
Application Type	SBC
UDP Port	5060 (listening port to the ATA entity)
TCP Port	0
TLS Port	5067 (listening port to Mediation Server Trunk ACGW.iLync15.local)
SRD	1

   c. Click **Submit**.

The configured SIP Interface table is shown below:

Figure 4-6: Required SIP Interface Table



4.4 Step 4: Configure Proxy Sets

This step shows 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, the 'Microsoft Lync Server 2013' Proxy Set is added. Note that this Proxy Set will later be associated with IP Groups.

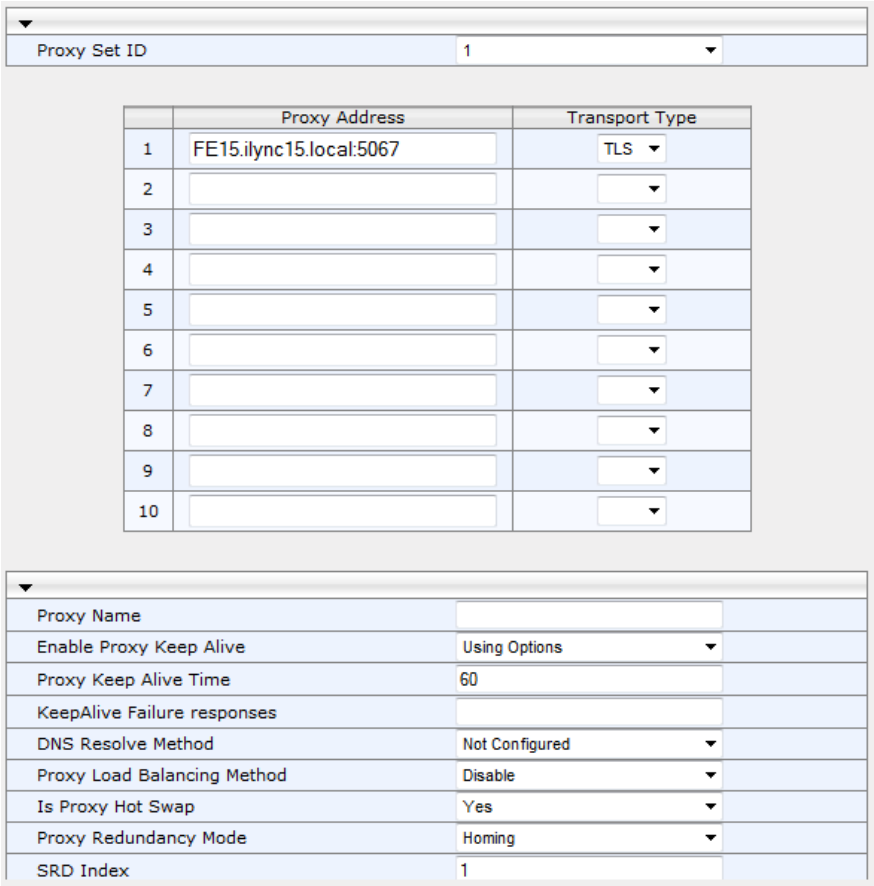
➢ **To add a Proxy Set:**

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

Parameter	Example Setting
Proxy Set ID	1
Proxy Address	"FE15.ilync15.local:5067" (Lync Mediation Server 2013 FQDN and destination port for Gateway Trunk)
Transport Type	TLS
Enable Proxy Keep Alive	Using Options
Proxy Load Balancing Method	Round Robin
Is Proxy Hot Swap	Yes
SRD Index	1 (Enables classification by Proxy Set for this SRD in the IP Group belonging to it)

   b. Click **Submit**.

Figure 4-7: Proxy Set for Microsoft Lync Server 2013



4.5 Step 5: Configure IP Groups

This step shows how to create IP Groups. An IP Group represents a SIP entity behavior in the device's network. In the example scenario, the following IP Groups are added:

- Microsoft Lync Server 2013
- Analog Devices (assigned as User type and registered to the SBC)

Note that these IP Groups are later used by the device for routing calls.

➢ **To configure IP Groups:**

1. Open the IP Group Table page (**Configuration** tab > **VoIP** > **Control Network** > **IP Group Table**).
2. Add an IP Group for the Lync Server:
   a. Click **Add**.
   b. Select the **Common** tab, and then 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	realm1
IP Profile ID	1

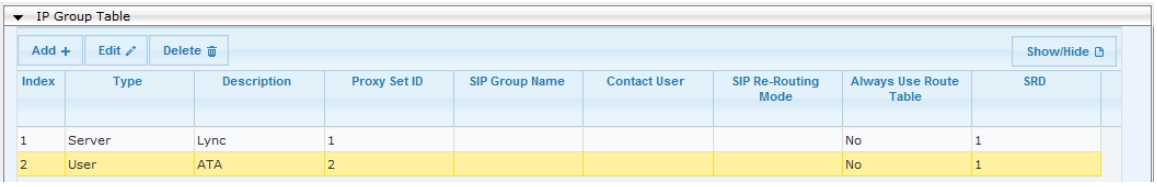
3. Add an IP Group for the Analog Devices:
   a. Click **Add**.
   b. Configure the parameters like this:

Parameter	Example Setting
Index	2
Type	User
Description	ATA (a descriptive name)
SRD	1
Media Realm Name	realm1
IP Profile ID	2 (this IP Profile is defined in Section 4.6 on page 27).

   c. Click **Submit**.

The figure below shows the configured IP Group table:

Figure 4-8: Configured IP Group Table



4.6 Step 6: Configure IP Profiles

This step shows 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 – the Lync Server and the Analog Device.

Note that the IP Profiles were assigned to the relevant IP Group in the previous step (see Section 4.5 on page 26).

In the example scenario, two IP Profiles are added for the following entities:

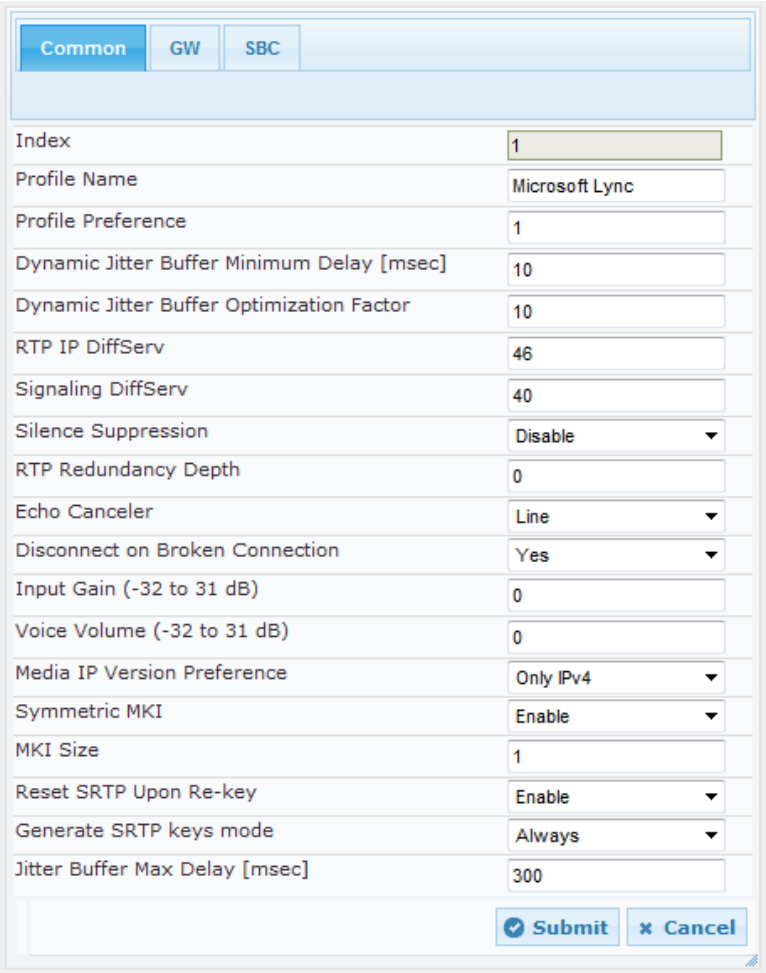
- Microsoft Lync Server 2013 - to operate in secure mode using SRTP and TLS
- Analog Device - to operate in non-secure mode using RTP and UDP

➢ **To configure IP Profiles:**

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

Parameter	Value
Index	1
Profile Name	Lync (arbitrary descriptive name)
Symmetric MKI	Enable
Media IP Version Preference	Only IPv4 / Only IPv6
MKI Size	1
Reset SRTP State Upon Re-key	Enable
Generate SRTP keys mode:	Always

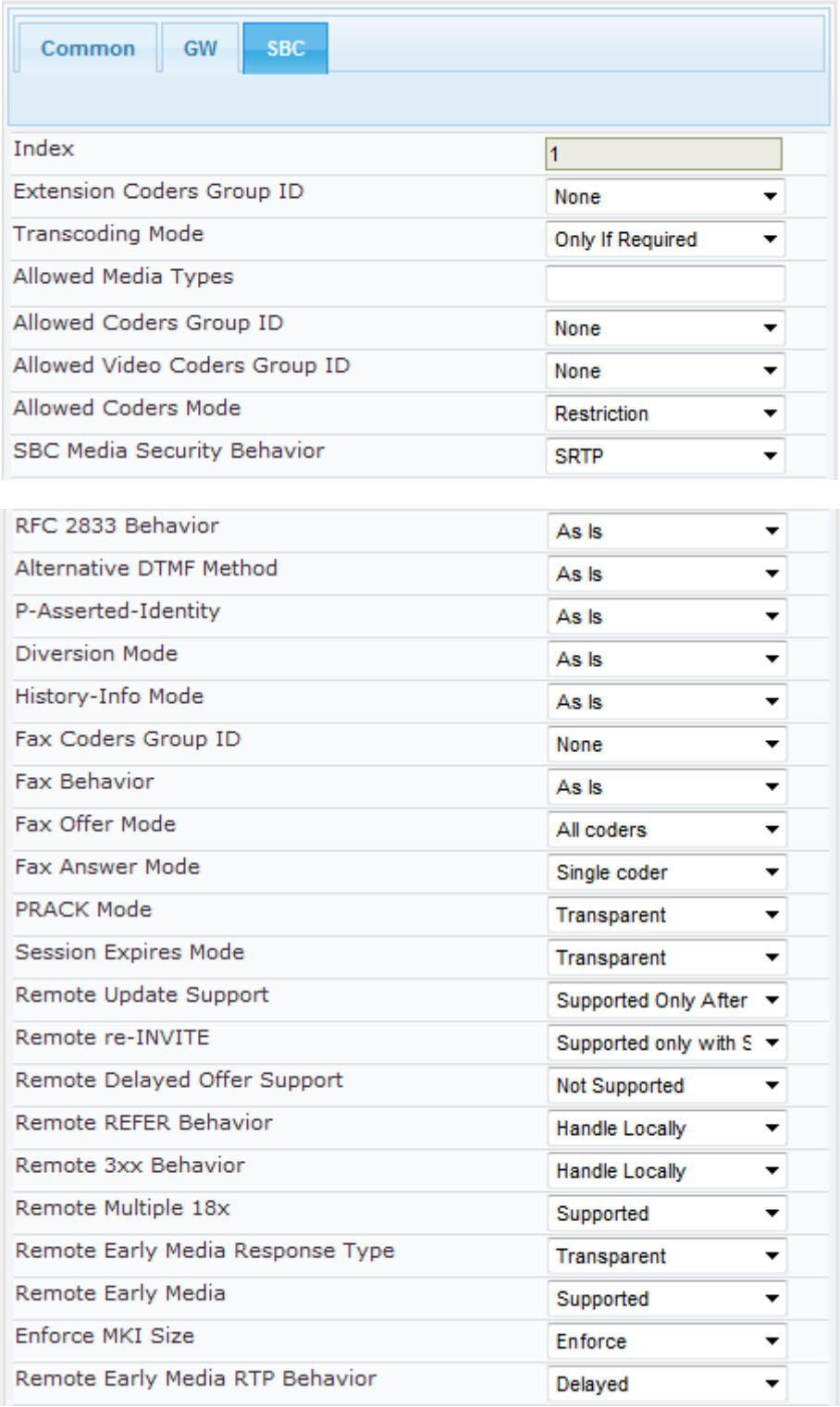
Figure 4:9: Configuring IP Profile for Lync Server 2013 - Common Tab



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

Parameter	Value
Media Security Behavior	SRTP
Remote Update Support	Supported Only After Connect
Remote Re-Invite Support	Supported Only With SDP
Remote Delayed Offer Support	Not Supported
Remote Refer Behavior	Handle Locally (required, as Lync Server 2013 does not support receipt of SIP REFER)
Remote 3xx Behavior	Handle Locally (required, as Lync Server 2013 does not support receipt of SIP 3xx responses)
Enforce MKI Size	Enforce
Remote Early Media RTP Behavior	Delayed (required, as Lync Server 2013 does not send RTP immediately to remote side when it sends a SIP 18x response)

Figure 4-10: Configuring IP Profile for Lync Server 2013 - SBC Tab

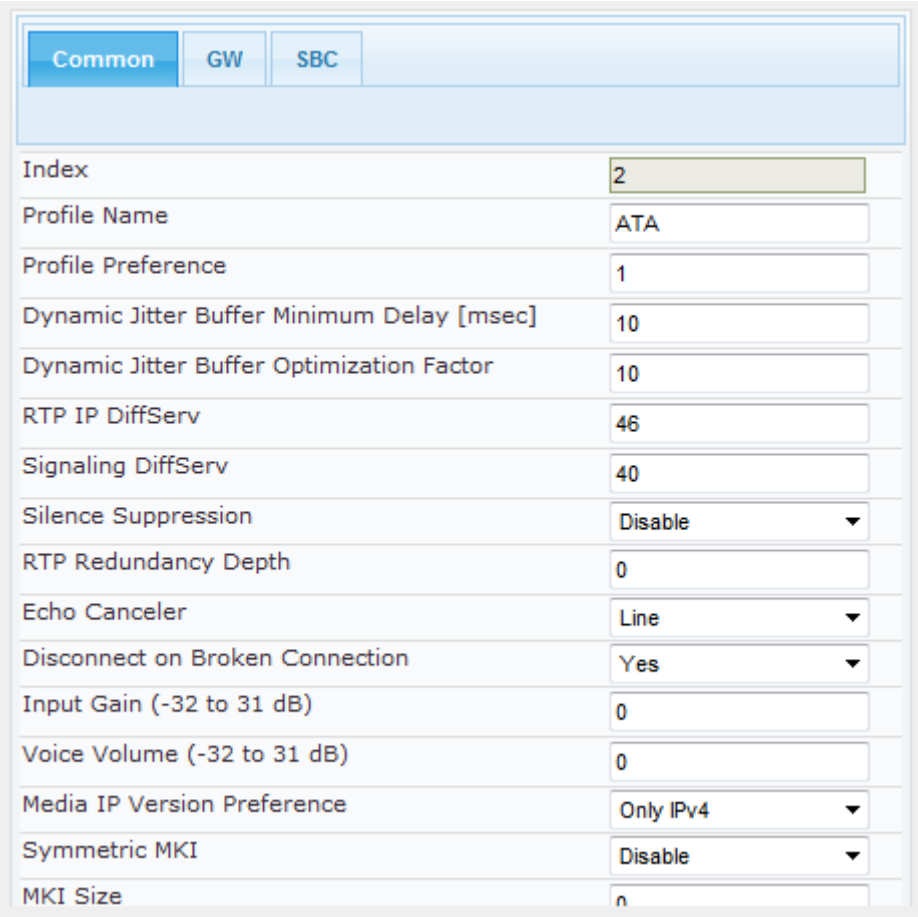


➢ **To configure an IP Profile for the Analog device:**

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

Parameter	Value
Index	2
Profile Name	ATA (arbitrary descriptive name)
Media IP Version Preference	Only IPv4 / Only IPv6

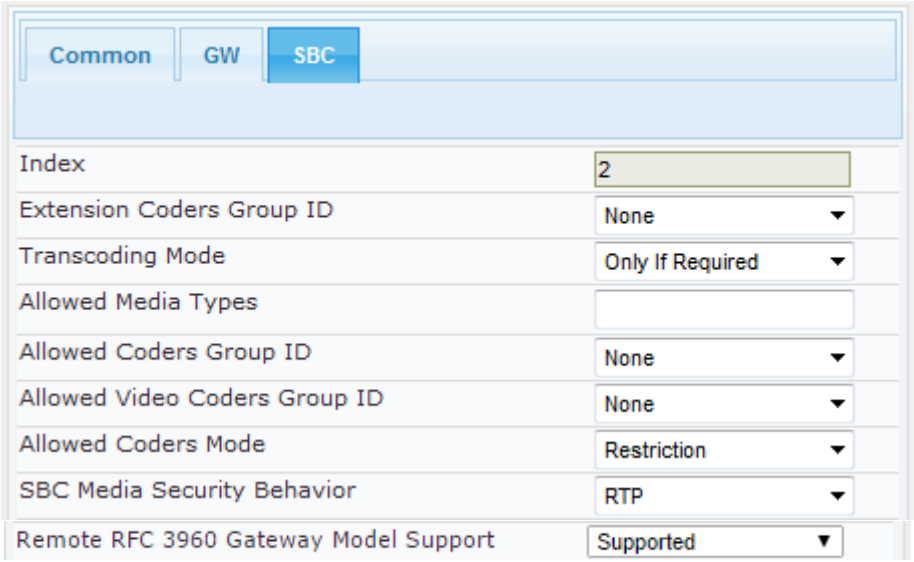
Figure 4-11: Configuring IP Profile for ATA Common Tab



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

Parameter	Value
Profile ID	2
Media Security Behavior	RTP
Remote RFC 3960 Gateway Model Support	Supported (AudioCodes' ATA is capable of receiving 18x messages with delayed RTP)

Figure 4-12: Configuring IP Profile for ATA - SBC Tab



4.7 Step 7: Configure a SIP TLS Connection

This step shows how to configure the device to use a TLS connection with the Lync 2013 Mediation Server. This step is mandatory to secure a SIP TLS connection.

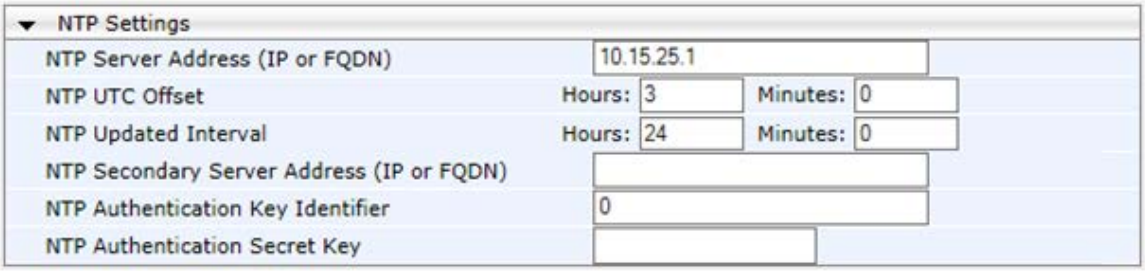
4.7.1 Configure the NTP Server Address

This step shows 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 make sure the *device* receives an accurate and current date and time. This is necessary for validating the 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 IP Address' field, enter the IP address of the NTP server (e.g., 10.15.25.1).

Figure 4-13: Configuring the NTP Server IP Address



3. Click **Submit**.

4.7.2 Configure the DNS Server

Configure the IP address of the Domain Name System (DNS) servers. This is mandatory if the Mediation Server is configured with FQDN. If so, the DNS is used to resolve it into an IP address.

The procedure for configuring the DNS is described in Section 4.1 on page 19.

4.7.3 Configure a Certificate

This step shows 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.

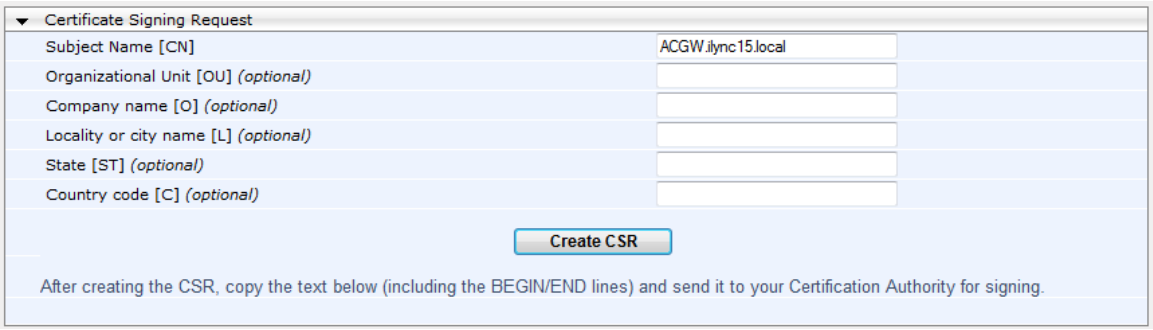
c. Obtaining Trusted Root Certificate from CA.

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, and then click the **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., **ACGW.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 4-14: Certificates Page - Creating CSR

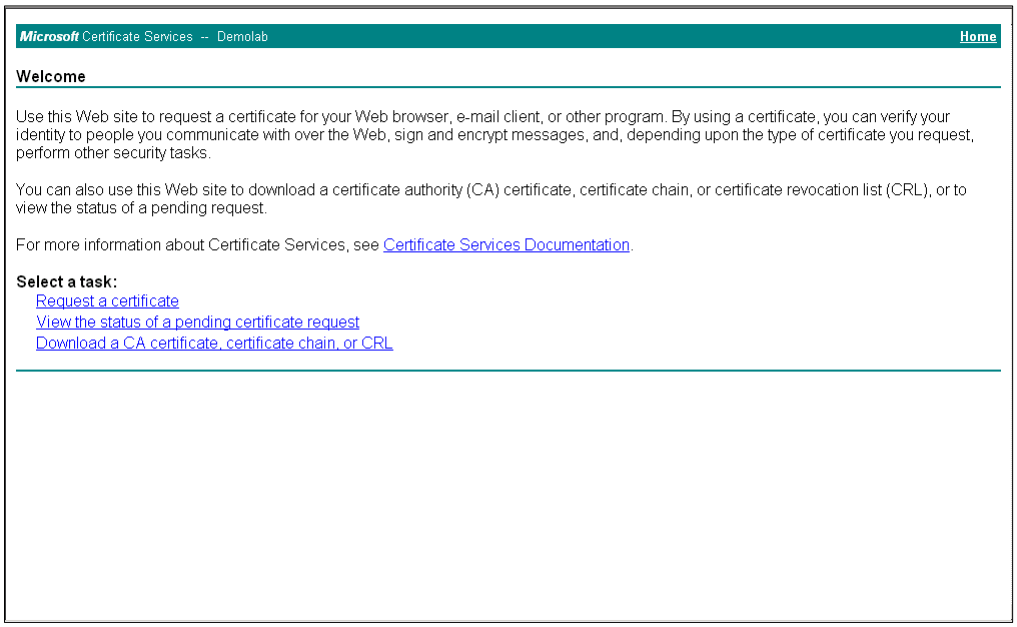


Note: The value entered in this field must be identical to the Gateway name configured in the Topology Builder for Lync Server 2013.

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*.

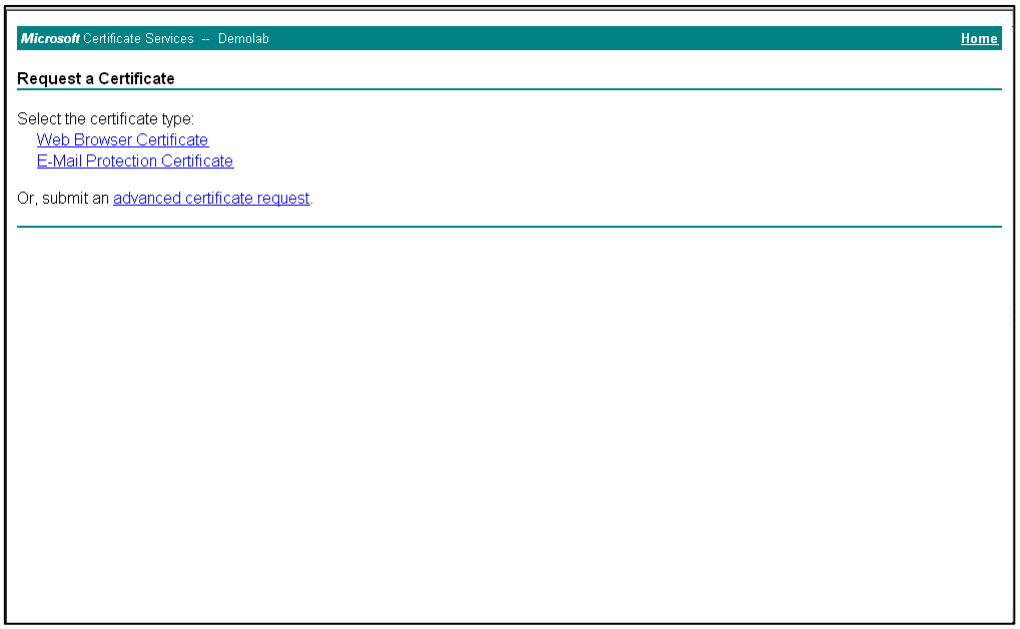
6. Open a Web browser and navigate to the Microsoft Certificates Services Web site at http://<certificate server>/CertSrv.

Figure 4-15: Microsoft Certificate Services Web Page



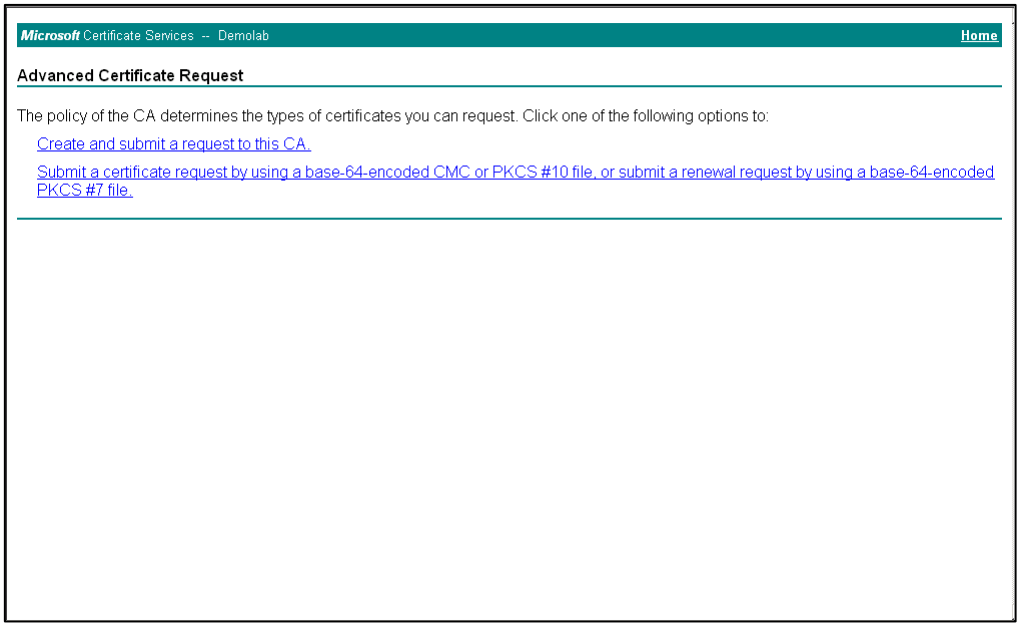
7. Click **Request a certificate**.

Figure 4-16: Request a Certificate Page



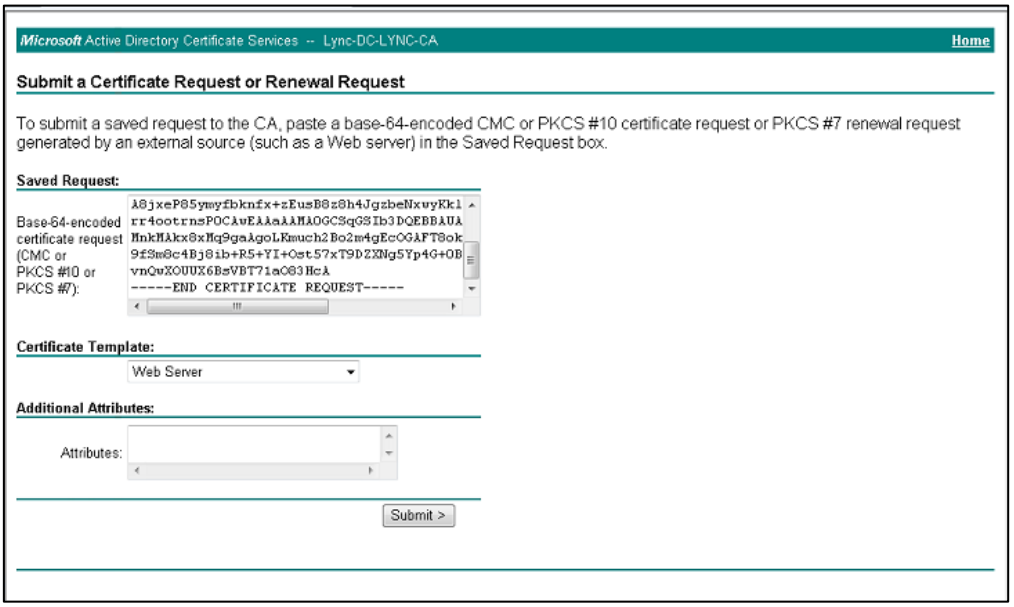
8. Click **advanced certificate request**, and then click **Next**.

Figure 4-17: Advanced Certificate Request Page



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

Figure 4-18: Submit a Certificate Request or Renewal Request Page

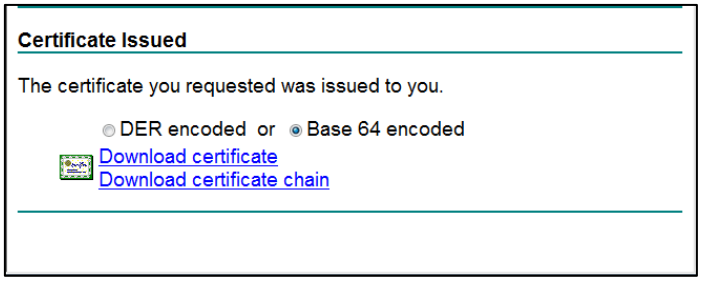


10. Open the *certreq.txt* file that you created and saved in Step 5, and then copy its contents to the 'Saved Request' field.

11. From the 'Certificate Template' dropdown, select **Web Server**.

12. Click **Submit**.

Figure 4-19: 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, which is at http://<Certificate Server>/CertSrv.
16. Click **Download a CA certificate**, **certificate chain, or CRL**.

Figure 4-20: 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 this:

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 14, and then click **Send File** to upload the certificate to the E-SBC.

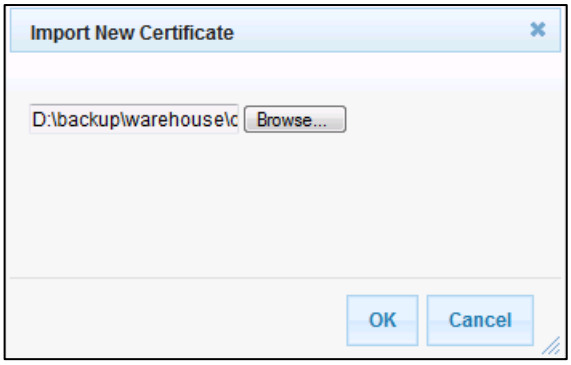
Figure 4-21: Upload Device Certificate Files from your Computer Group

b. In the E-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 4-22: 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 4.17 on page 67).

4.8 Step 8: Configure SRTP

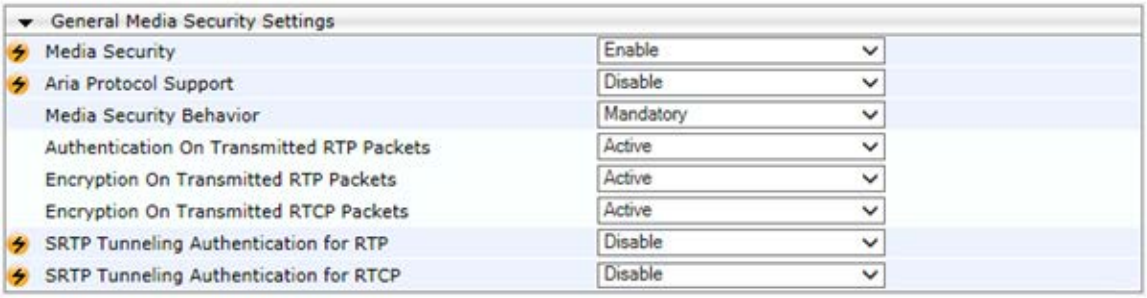
This step shows how to configure media security. If you configure the Microsoft Mediation Server to use Secure Real-Time Transport Protocol (SRTP), configure the device to do so as well.

Note that SRTP was enabled for Lync Server when you added and configured an IP Profile for Lync Server (see Section 4.6 on page 27).

➢ **To configure media security:**

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

Figure 4-23: Media Security Page



2. Configure the parameter like this:

Parameter	Example Setting
Media Security	Enable

3. Click **Submit**.
4. Reset the device with a burn to flash for your settings to take effect (see Section 4.17 on page 67).

4.9 Step 9: Configure IP Media

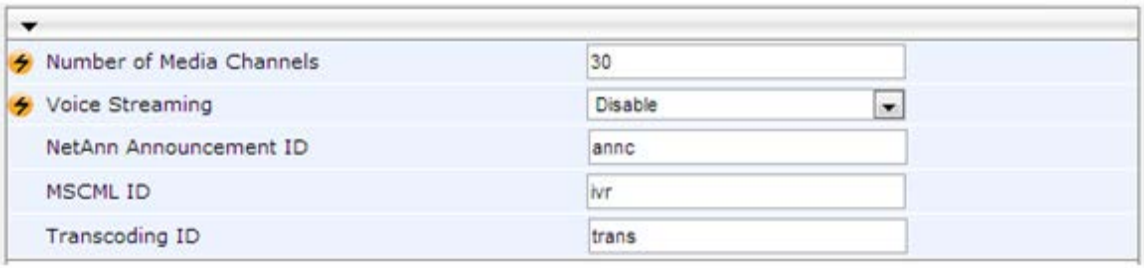
This step shows how to configure the number of media channels for IP-based media. To perform coder transcoding, define Digital Signaling Processors (DSP) channels. The number of media channels represents the number of DSP channels that the SBC entity allocates to sessions.

Note: This step is required *only* if transcoding is required (for example Voice Transcoding G.711 to G.729). To use Transcoding, you need to acquire a DSP Feature Key. This step is unnecessary in this environment (in which there are only AudioCodes ATAs).

➢ **To configure IP media:**

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

Figure 4-24: 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. Reset the device with a **burn to flash** for this setting to take effect (see Section 4.17 on page 67).

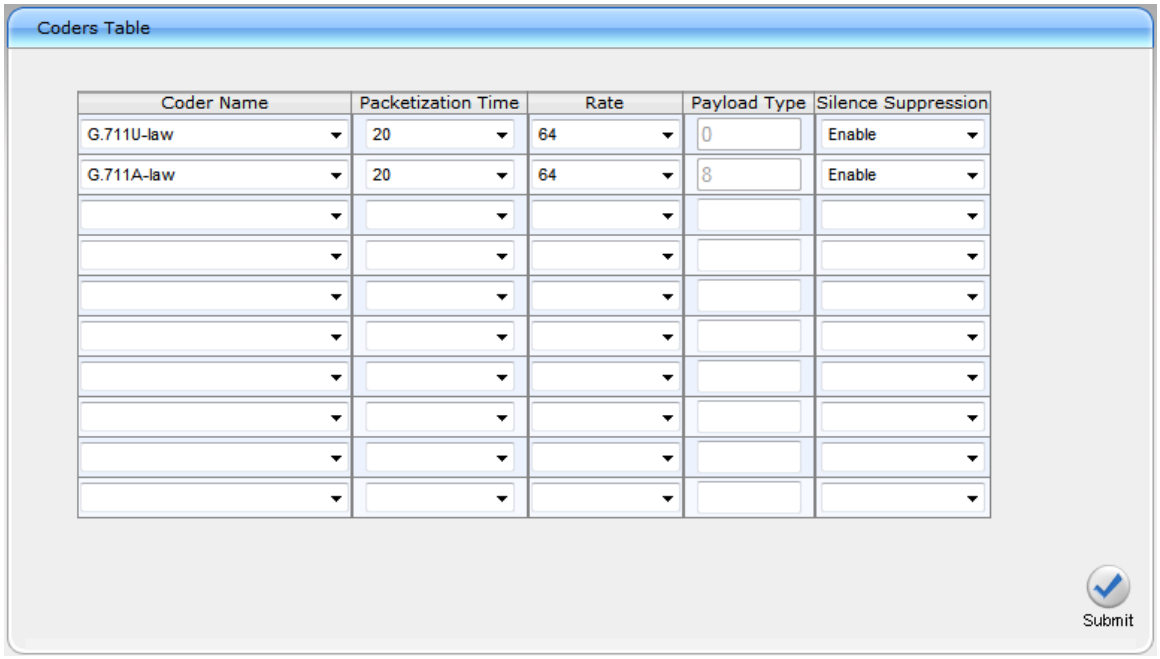
4.10 Step 10: Configure Voice Coders

The device communicates with the Mediation Server using G.711 A-law or G.711 μ-law (Mu-Law) voice coder. In addition, silence suppression can be enabled per coder, which is recommended for improving the performance with the Mediation Server. The procedure below shows how you can change the default coder.

➢ **To configure the voice coder and silence suppression:**

1. Open the Coders page (**Configuration** tab > **VoIP** menu > **Coders And Profiles** > **Coders**).

Figure 4-25: Coders Table Page



2. From the 'Coder Name' dropdown, select the required coder.
3. From the 'Silence Suppression' dropdown, select **Enable**.
4. Click **Submit**.

Note: The Coder Table above represents Coder Group ID 0. To apply this Coder Group to an SBC entity, you need to assign it in the corresponding IP Profile (see Section 4.5 on page 26).

4.11 Step 11: Configure PSTN Trunks

This section shows how to configure PRI (i.e., E1/T1) or BRI trunks connected to the Enhanced Gateway. Procedures are:

- Enable Trunks. See Section 4.11.1 on page 41.
- Configure the Channel Select Method. See Section 4.11.2 on page 42.
- Configure the Trunk. See Section 4.11.3 on page 43.
- Configure the TDM Bus. See Section 4.11.4 on page 45.

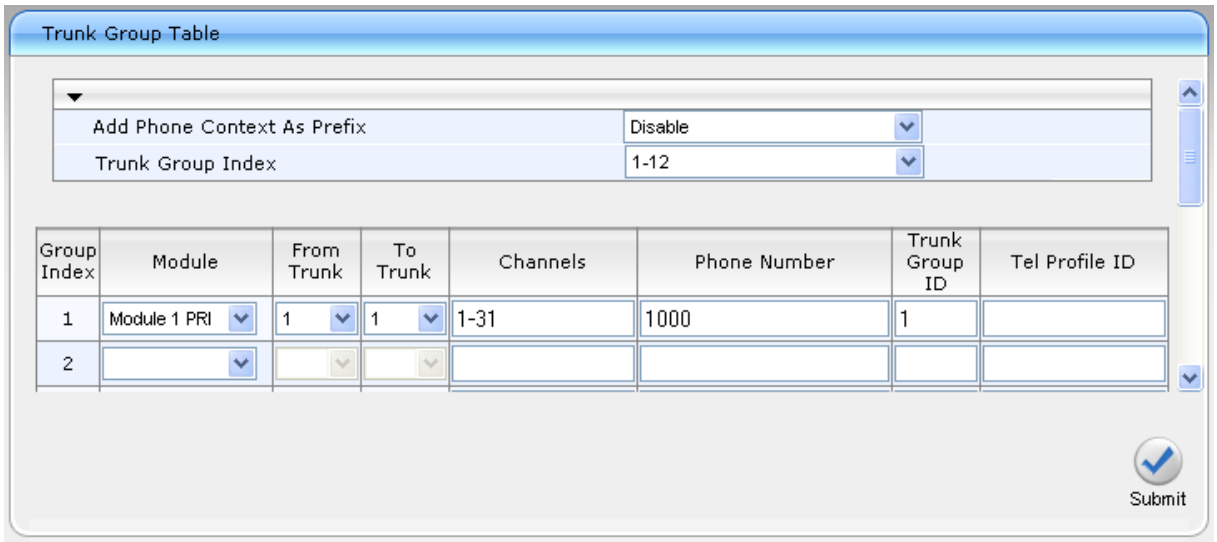
4.11.1 Enable Trunks

To enable trunks, you need to assign them to Trunk Groups, as shown below.

➢ **To enable trunks:**

1. Open the Trunk Group Table page (**Configuration** tab > **VoIP** menu > **GW and IP to IP** > **Trunk Group** > **Trunk Group**).

Figure 4-26: Trunk Group Table Page



2. In the 'Module' column, select the module number and type (e.g., PRI) on which the trunks are located.
3. In the 'From Trunk' and 'To Trunk' columns, select the physical trunk range.
4. In the 'Channel(s)' column, enter the B-channels (e.g., 1-31) that you wish to enable.
5. In the 'Phone Number' column, enter the phone number (e.g., 1000) for the first channel; phone numbers 1001, 1002, 1003, etc., are sequentially assigned to subsequent channels. Note that these numbers are used internally.
6. In the 'Trunk Group ID' column, enter the ID for the Trunk Group.
7. Click **Submit**.

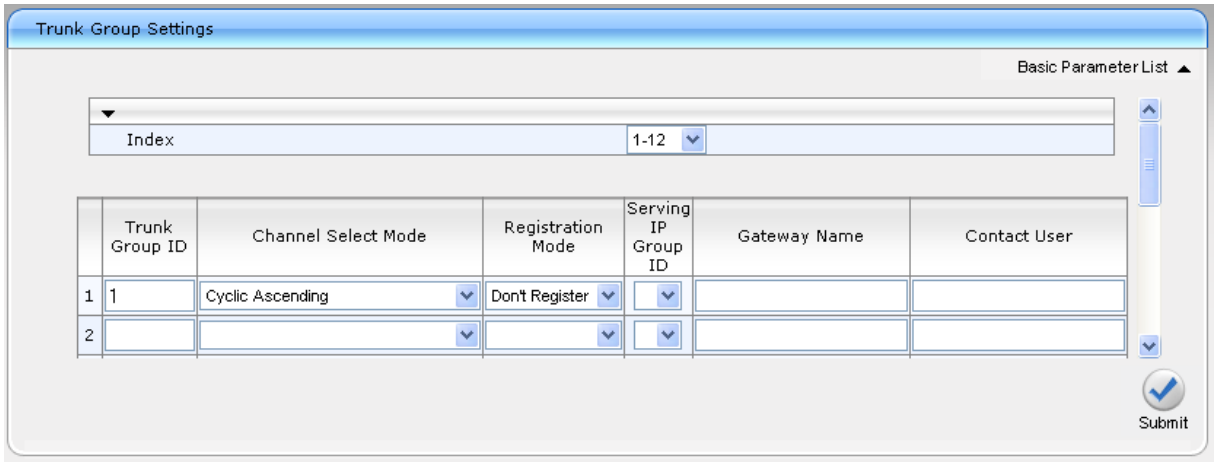
4.11.2 Configure the Channel Select Method

After enabling the trunks and assigning them to Trunk Groups, you need to configure the method by which IP-to-Tel calls are assigned to channels within the Trunk Group.

➢ **To configure the channel select mode:**

1. Open the Trunk Group Settings page (**Configuration** tab > **VoIP** menu > **GW and IP to IP** > **Trunk Group** > **Trunk Group Settings**).

Figure 4-27: Trunk Group Settings Page



2. In the 'Trunk Group ID' column, enter the Trunk Group ID that you want to configure.
3. From the 'Channel Select Mode' dropdown, select the method by which IP-to-Tel calls are assigned to channels pertaining to the Trunk Group (i.e. Cyclic Ascending).
4. From the 'Registration Mode' dropdown list, select **Don't Register**.
5. Click **Submit**.

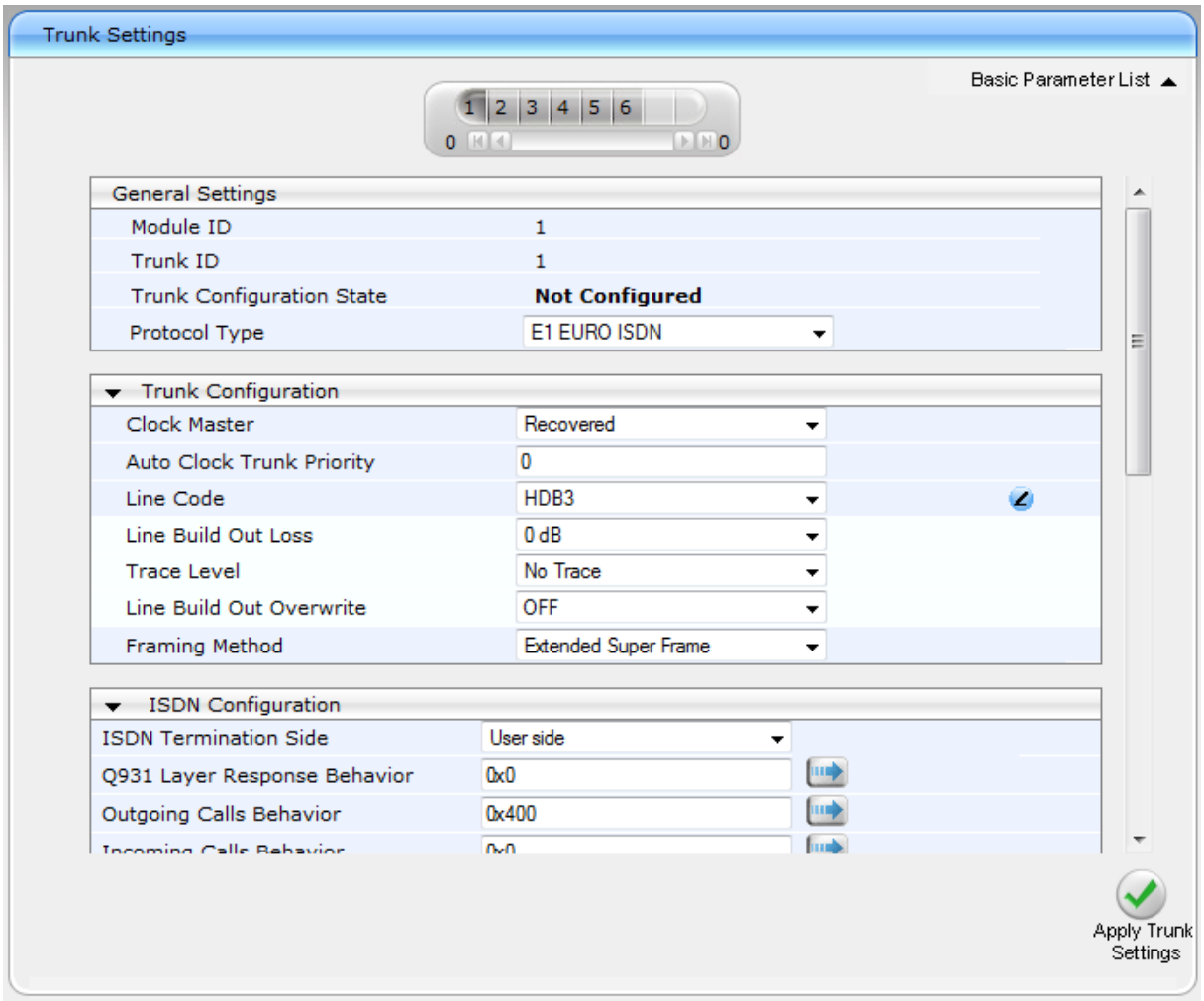
4.11.3 Configure the Trunk

This section shows how to configure the physical trunk (basic configuration).

➢ **To configure the physical trunk:**

1. Open the Trunk Settings page (**Configuration** tab > **VoIP** menu > **PSTN** > **Trunk Settings**).

Figure 4-28: Trunk Settings Page



2. Uppermost in the page, a bar with trunk number icons displays the status of each trunk:
   - Grey - disabled
   - Green - active
   - Yellow - RAI alarm
   - Red - LOS / LOF alarm
   - Blue - AIS alarm
   - Orange - D-channel alarm (ISDN only)

   Select the Trunk that you want to configure, by clicking the desired trunk number icon.
3. If the trunk is new, configure the trunk as required. If the trunk was previously configured, click the **Stop Trunk** button to de-activate the trunk.

4. Basic trunk configuration:
   a. From the ‘Protocol Type’ dropdown, select the required trunk protocol.

Notes:

- If the ‘Protocol Type’ field displays 'NONE' (i.e., no protocol type selected) and no other trunks have been configured, then after selecting a PRI protocol type you must reset the Enhanced Gateway.
- To delete a previously configured trunk, set the 'Protocol Type' parameter to **None**.
- For further information and options, refer to the Gateway's *User's Manual*.

   b. From the 'Clock Master' dropdown, select the trunk's clock source:
      - **Recovered**: the clock source is recovered from the trunk.
      - **Generated**: the clock source is provided by the internal TDM bus clock source (according to the parameter 'TDM Bus Clock Source' – see Section 4.11.4 on page 45).
   c. From the 'Line Code' dropdown, select the line code:
      - **B8ZS** (bipolar 8-zero substitution) for T1 trunks only
      - **HDB3** (high-density bipolar 3) for E1 trunks only
      - **AMI** (for E1 and T1)
   d. From the 'Framing Method' dropdown, select the required framing method. For E1 trunks, always set this parameter to **Extended Super Frame**.
   e. To configure whether the trunk connected to the PBX is 'User' or 'Network' side, select **User side** or **Network side** from the 'ISDN Termination' dropdown.
5. Continue configuring the trunk according to your requirements.
6. When you have completed the configuration, click the **Apply Trunk Settings** button to apply the changes to the selected trunk.
7. On the toolbar, click **Burn** to save the changes to the Enhanced Gateway's flash memory.
8. Reset the device with a **burn to flash** for this setting to take effect (see Section 4.17 on page 67).

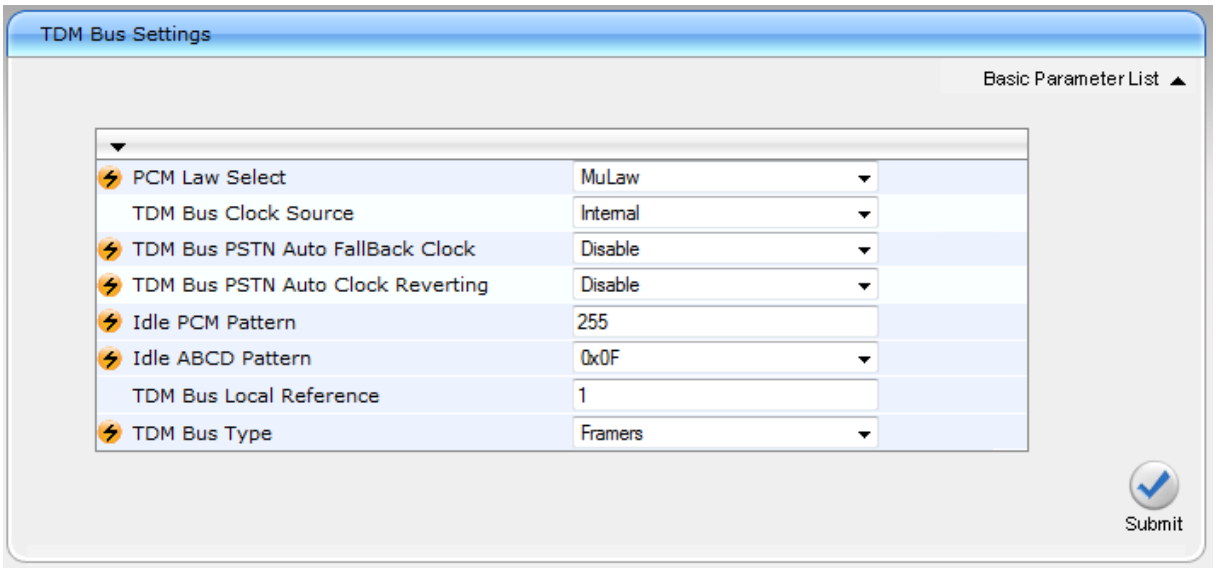
4.11.4 Configure the TDM Bus

This section shows how to configure the Enhanced Gateway's TDM bus.

➢ **To configure the TDM bus:**

1. Open the TDM Bus Settings page (**Configuration** tab > **VoIP** menu > **TDM** > **TDM Bus Settings**).

Figure 4-29: TDM Bus Settings Page



2. Configure the TDM bus parameters according to your deployment requirements. Below is a description of some of the main TDM parameters:
   a. **PCM Law Select:** defines the type of PCM companding law in the input/output TDM bus. Typically, A-Law is used for E1 and Mu-Law for T1/J1.
   b. **TDM Bus Clock Source:** defines the clock source to which the Enhanced Gateway synchronizes - generate clock from local source (Internal), or recover clock from PSTN line (Network).
   c. **TDM Bus Local Reference:** defines the physical trunk ID from which the Enhanced Gateway recovers (receives) its clock synchronization when the TDM Bus Clock Source is configured to recover the clock from the PSTN line.
3. Click **Submit** to apply your changes.
4. On the toolbar, click **Burn** to save the settings to the Enhanced Gateway's flash memory.
5. Reset the device with a **burn to flash** for this setting to take effect (see Section 4.17 on page 67).

4.12 Step 12: Configure Enhanced Gateway Routing

The section shows how to route calls between the IP side (i.e., Lync Server and SBC entity) to the Trunk Side (e.g., PRI) in the Gateway entity.

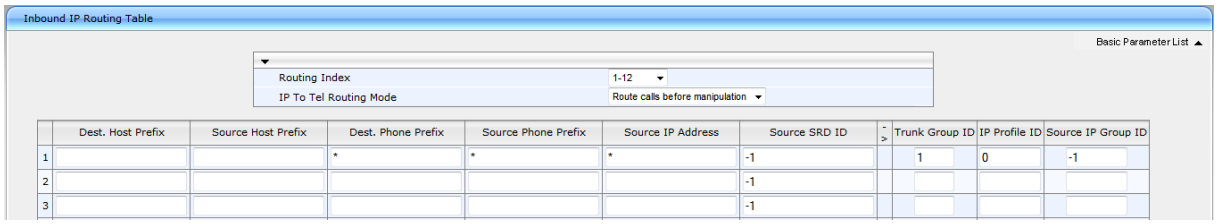
4.12.1 Configure IP-to-Trunk Group Routing

This section shows how to configure an IP-to-Trunk Group routing rule, whereby all incoming calls (i.e., from the Mediation Server or SBC entity) are routed to Trunk Group 1 (which you configured in Section 4.11.1 on page 41).

➢ **To configure an IP-to-Trunk Group routing rule:**

1. Open the Inbound IP Routing Table page (**Configuration** tab > **VoIP** menu > **GW and IP to IP** > **Routing** > **IP to Trunk Group Routing**).

Figure 4-30: Inbound IP Routing Table Page



2. In the first table entry row, enter the asterisk (*) sign in the 'Dest. Phone Prefix' and in the 'Source Phone Prefix' fields.
3. In the 'Trunk Group ID' field, enter the Trunk Group to where the calls must be routed.
4. Click **Submit**.

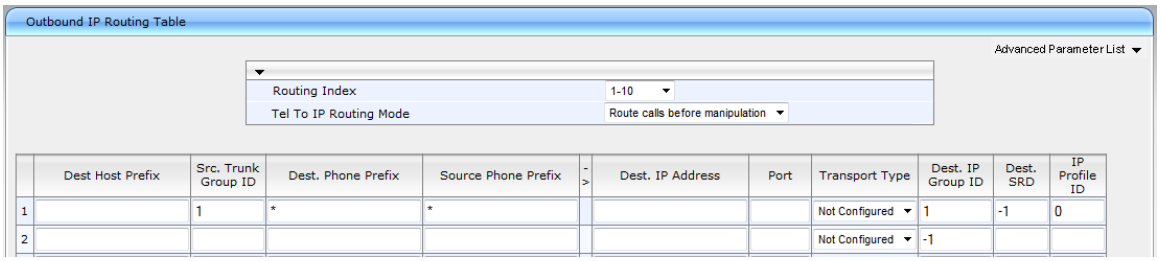
4.12.2 Configure Tel-to-IP Routing

This section shows how to configure a Tel-to-IP routing rule whereby all calls from the Trunk Group 1 (i.e., PSTN) are routed to the Mediation Server.

➢ **To configure a Tel-to-IP Group routing rule:**

1. Open the Outbound IP Routing Table page (**Configuration** tab > **VoIP** menu > **GW and IP to IP** > **Routing** > **Tel to IP Routing**).

Figure 4-31: Outbound IP Routing Table Page



2. All calls from Source Trunk Group ID '1' are sent to 'Dest. IPGroup ID' 1 (i.e., to the Lync Mediation Server).
3. Click **Submit**.

4.13 Step 13: Configure SBC Classification and Routing

This section shows how to classify the Analog Device in the SBC entity.

4.13.1 Configure Classification Rules

This section shows how to configure Classification rules.

Classification rules are used to classify incoming SIP dialog-initiating requests (e.g., SIP INVITE messages) to source IP Groups, from where the SIP dialog request originated.

In the example scenario, one classification rule is added:

- Classification of the Analog Device users. In the example below, the classification is set by the Source Host name.

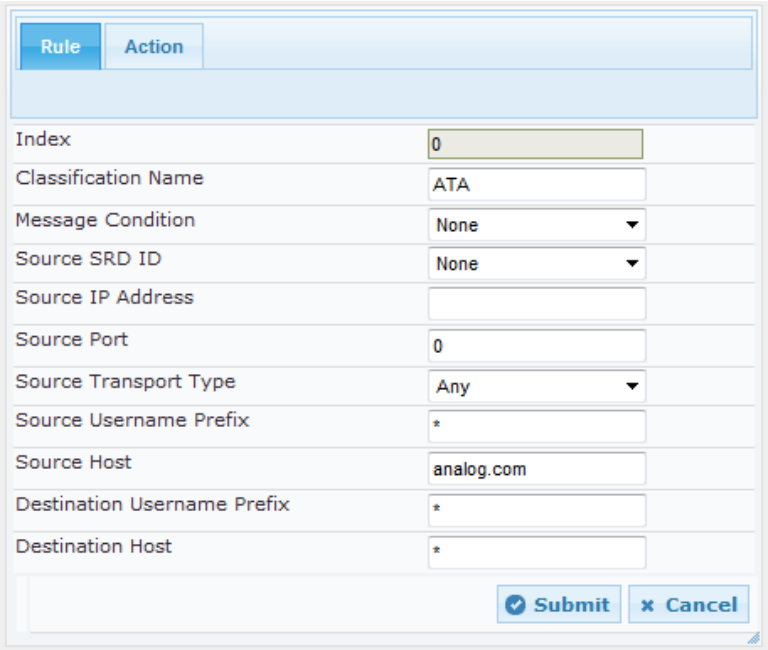
  Note that this host name must also be configured on the ATA device (see Section A.8 on page 77).

➢ **To add a Classification rule:**

1. Open the Classification Table page (**Configuration** > **VoIP** > **SBC** > **Routing SBC** > **Classification Table**).
2. Add a rule to match Source Host to IP Group:
   a. Click **Add**.
   b. Configure the parameters as follows:

Parameter	Settings
Index	0
Source Host	analog.com

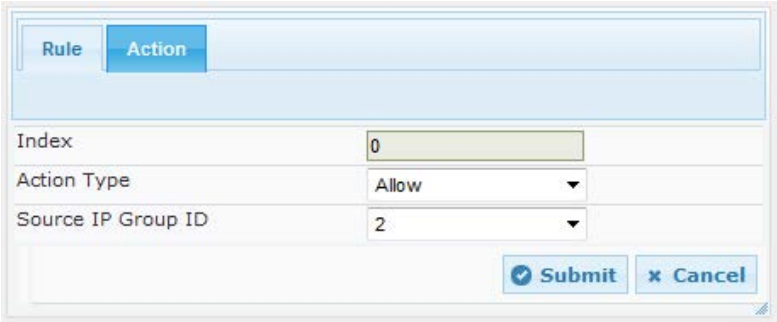
Figure 4-32: Classification - Rule Tab



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

Parameter	Settings
Action Type	Allow
Source IP Group ID	2

Figure 4-33: Classification - Action Tab



4. Click Submit.

4.13.2 Configure IP-to-IP Call Routing Rules

This step shows how to configure IP-to-IP call routing rules.

These rules define the route for forwarding SIP messages (e.g., INVITE) received on one IP interface, to another.

The SIP message is routed according to a rule whose configured input characteristics (e.g., Source IP Group) match those of the message. If the characteristics of an incoming message do not match the first rule in the table, they are then compared to the second rule, and so on, until a matching rule is located. If no rule is matched, the message is rejected.

In the example scenario, you need to add the following IP-to-IP routing rules to route calls between the different IP Groups:

- Terminate SIP Registration messages received from the ATA/LAD
- Terminate SIP OPTIONS messages received from the Lync
- Route calls from Lync to the ATA by the Analog Device number range
- Route all other calls from Lync to the Gateway (PSTN)
- Default route calls towards Lync

The routing rules use IP Groups to denote call source and destination. As configured in Section 4.4 on page 24, IP Group ID 1 is assigned to Lync Server 2013, and IP Group ID 2 is assigned to Analog Device users.

The figure below shows the configured routing rules (representing the configuration in this section) in the IP-to-IP Routing Table:

Figure 4-34: IP-to-IP Routing Table

IP-to-IP Routing Table

Add + | Insert + | Edit | Delete | Up ↑ | Down ↓ | Show/Hide

Index	Route Name	Source Host	Destination Username Prefix	Destination Host	Message Condition	ReRoute IP Group ID	Call Trigger	Call Setup Rules Set ID	Destination Type	Destination SRD ID
0	ATA Registratior	*	*	*	None	-1	Any	-1	IP Group	None
1	OPTIONS Termi	*	*	*	None	-1	Any	-1	Dest Address	None
2	Lync to ATA	*	+9723976444[4-5]	*	None	-1	Any	-1	IP Group	None
3	Lync to PSTN	*	*	*	None	-1	Any	-1	Gateway	None
4	Any to lync	*	*	*	None	-1	Any	-1	IP Group	None

Note: The routing configuration may change according to the local deployment topology.

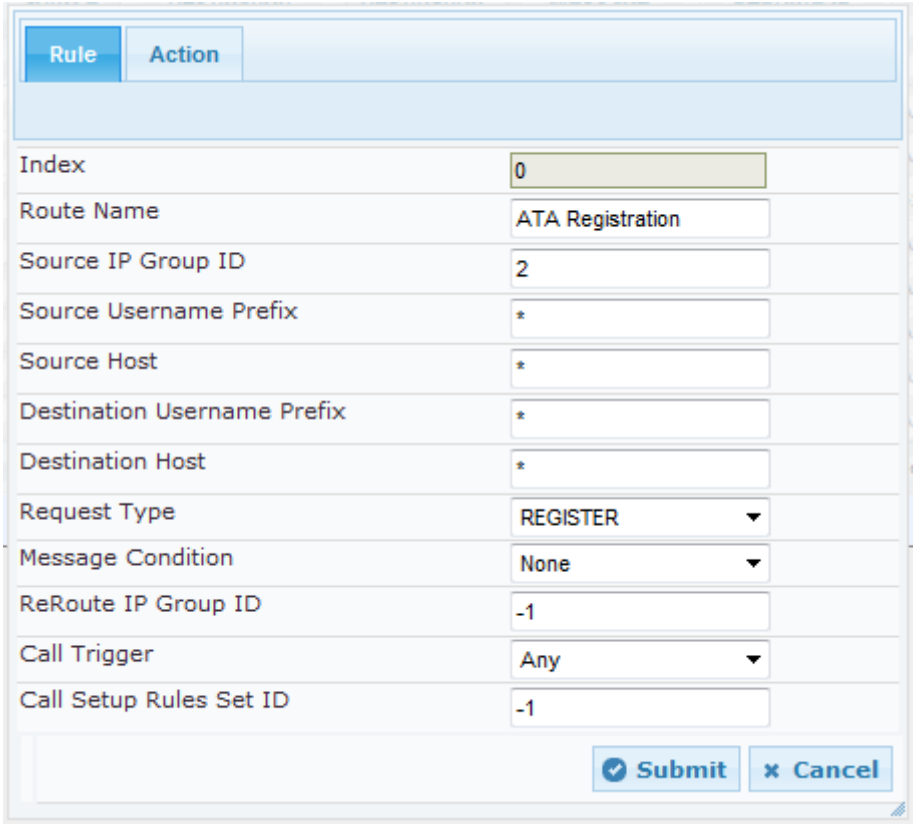
➢ **To add IP-to-IP routing rules:**

1. Open the IP2IP Routing Table page (**Configuration** > **VoIP** > **SBC** > **Routing SBC** > **IP to IP Routing Table**).
2. Add a rule to terminate SIP Registration messages received from the ATA:
   a. Click **Add**.
   b. Click the **Rule** tab, and then configure the parameters as follows:

Parameter	Settings
Index	0
Route Name	ATA Registration (arbitrary descriptive name)
Source IP Group ID	2
Request Type	REGISTER

   c. Click **Submit**.

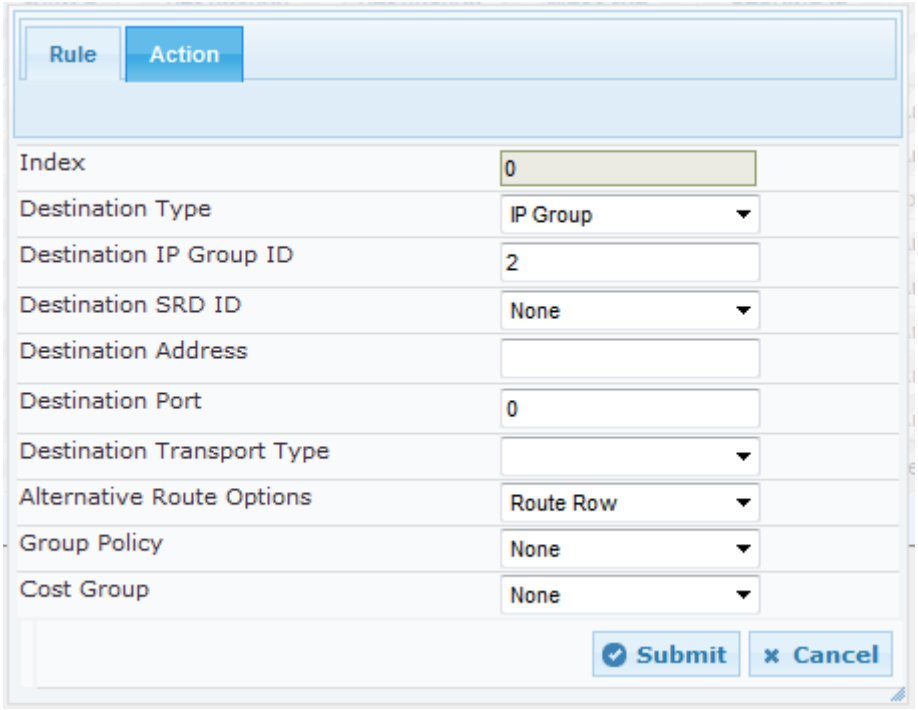
Figure 4-35: Configuring IP-to-IP Routing Rule for Terminating SIP Registration from ATA – Rule Tab



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

Parameter	Value
Destination Type	IP Group
Destination IP Group ID	2

Figure 4-36: Configuring IP-to-IP Routing Rule for Terminating SIP Registration from ATA – Action Tab

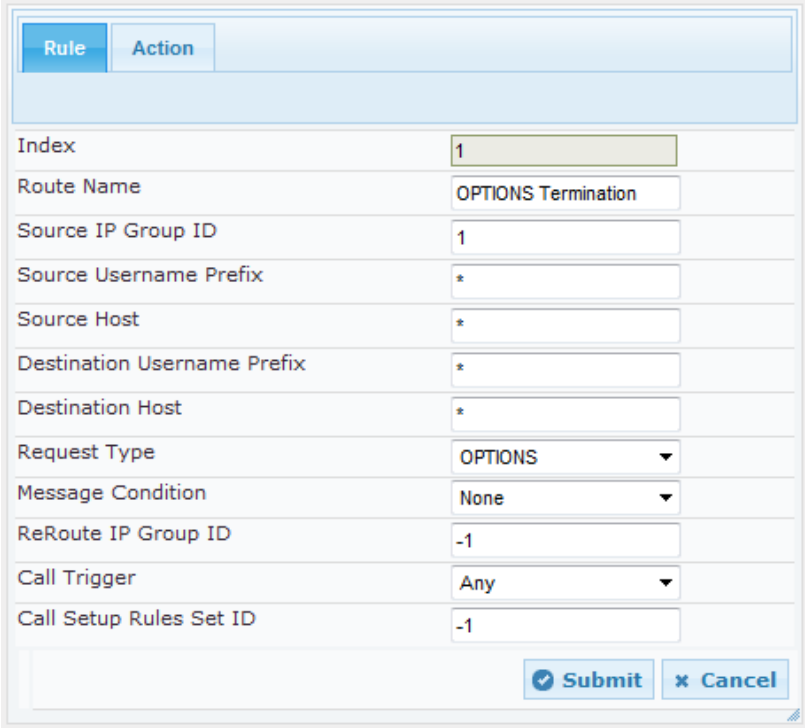


3. Add a rule to terminate SIP OPTIONS messages received from the Lync Server:
   a. Click **Add**.
   b. Configure the parameters as follows:

Parameter	Settings
Index	0
Route Name	OPTIONS termination (arbitrary descriptive name)
Source IP Group ID	1
Request Type	OPTIONS

   c. Click **Submit**.

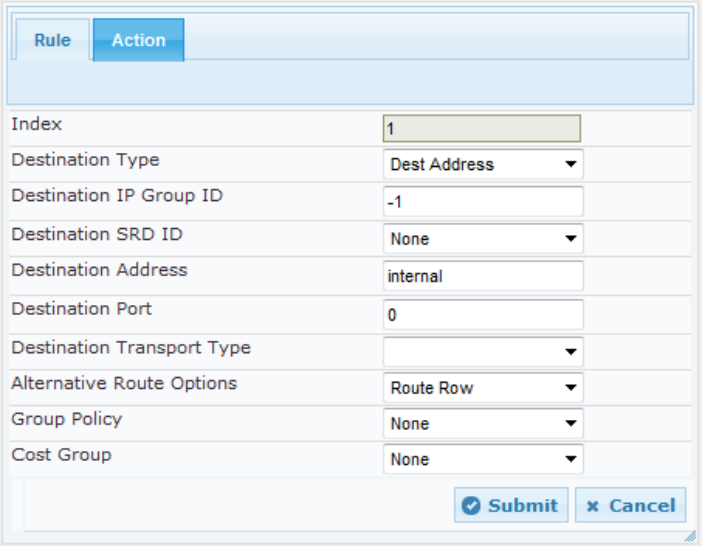
Figure 4-37: Configuring IP-to-IP Routing Rule for Terminating SIP OPTIONS from Lync – Rule Tab



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

Parameter	Value
Destination Type	Dest Address
Destination Address	internal

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



5. Add a rule to route calls from the Lync Server to the ATA by the Analog Device number range:
   a. Click **Add**.
   b. Configure the parameters as follows:

Parameter	Settings
Index	2
Source IP Group ID	1
Destination Username Prefix	+9723976444[4-5]
Destination Type	IP Group
Destination IP Group ID	2

   c. Click **Submit**.

Figure 4-39: IP-to-IP Routing Rule for Analog Device Range – Rule Tab

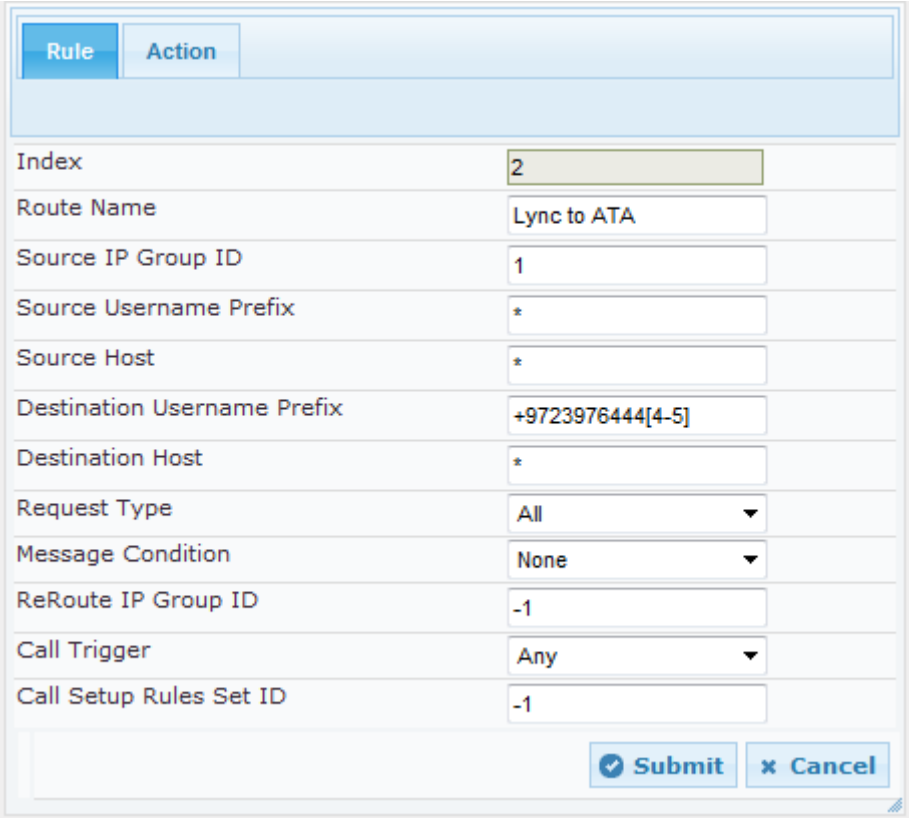
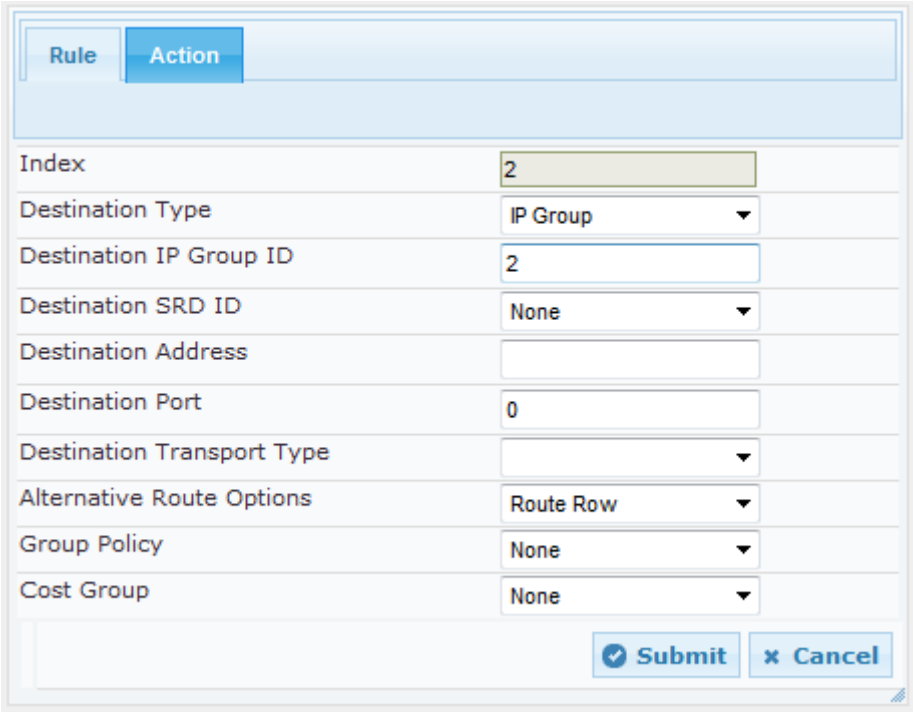


Figure 4-40: Configuring IP-to-IP Routing Rule for Analog Device Range – Action Tab



6. Add a rule to route any other number from Lync Server to Gateway's IP Group (PSTN):
   a. Click **Add**.
   b. Configure the parameters as follows:

Parameter	Settings
Index	3
Source IP Group ID	1
Destination Type	Gateway
Destination IP Group ID	-1

   c. Click **Submit**.

Figure 4-41: IP-to-IP Routing Rule to the Gateway – Rule Tab

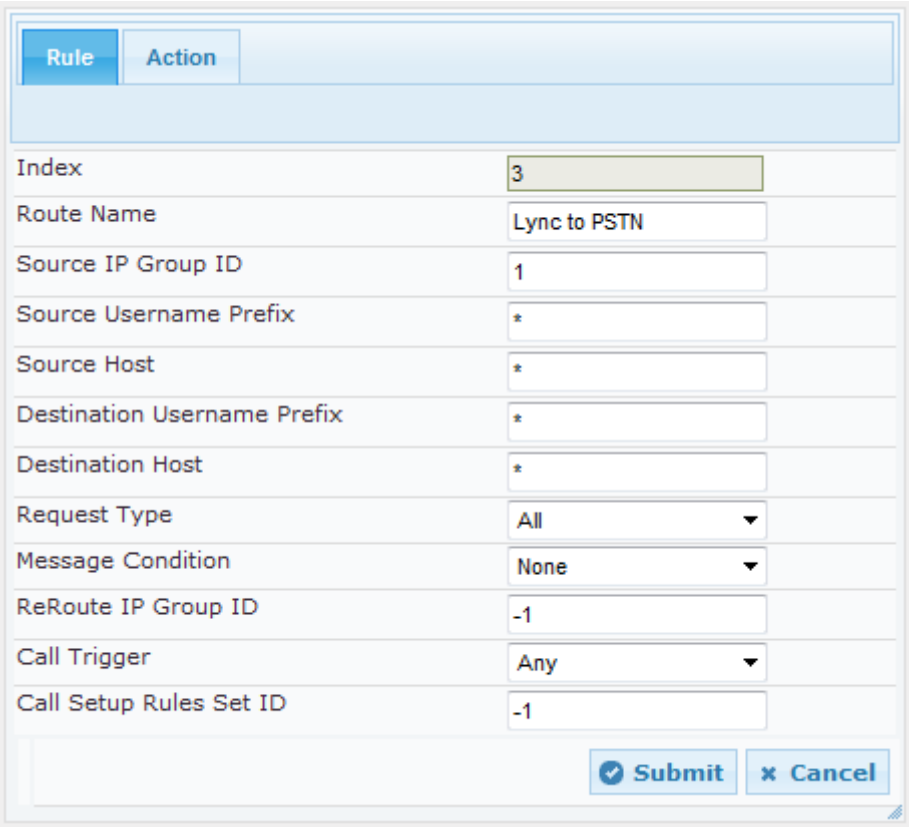
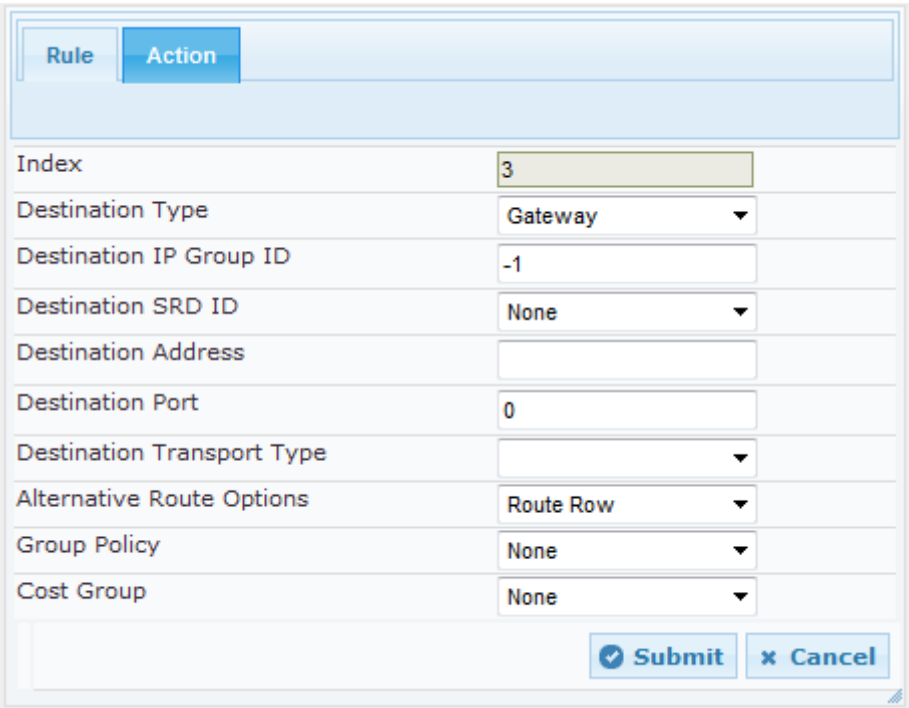


Figure 4-42: IP-to-IP Routing Rule to the Gateway – Action Tab



7. Add a rule to default route calls towards the Lync Server:
   a. Click **Add**.
   b. Configure the parameters as follows:

Parameter	Settings
Index	4
Source IP Group ID	-1
Destination Type	IP Group
Destination IP Group ID	1

   c. Click **Submit**.

Figure 4-43: IP-to-IP Default Routing Rule to Lync Server – Rule Tab

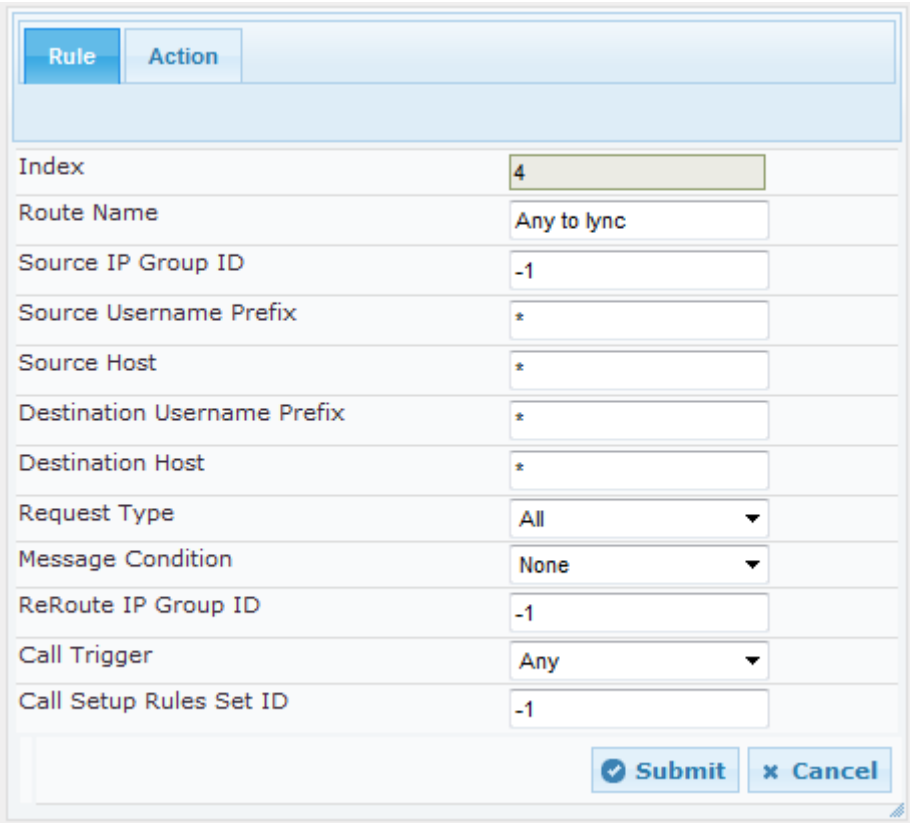
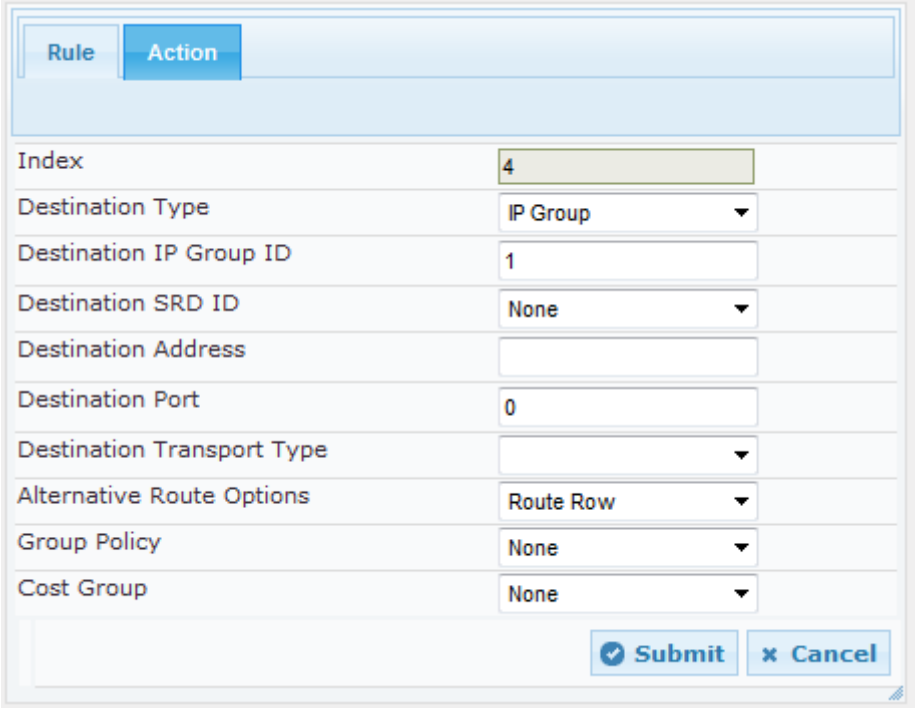


Figure 4-44: IP-to-IP Default Routing Rule to Lync Server – Action Tab



4.14 Step 14: Configure Normalization Rules for E.164 Format for PBX/PSTN Connectivity

Microsoft Lync 2013 implements the standard E.164 format, while the PBX or PSTN implements other number formats for dialing. If the Enhanced Gateway is connected to a PBX or directly to the PSTN, it may need to perform number manipulations for the called and/or calling number to match the PBX or PSTN dialing rules or to match Microsoft Lync 2013 E.164 format.

The Gateway entity must therefore be configured with manipulation rules to translate (i.e., normalize) numbers dialed in standard E.164 format to various formats, and vice versa. Manipulation must be performed for outbound calls (i.e., calls received from Microsoft Lync clients through Microsoft Lync 2013) and inbound calls (i.e., calls destined to Lync clients).

Number manipulation (and mapping of NPI/TON to SIP messages) rules are configured in the following Manipulation Tables:

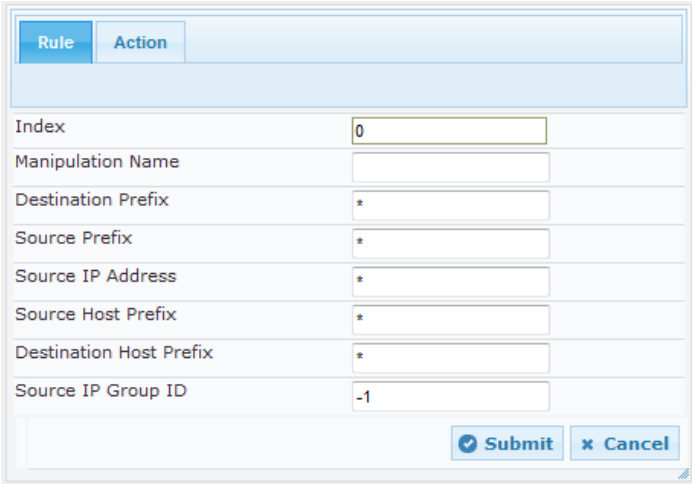
- **For Tel-to-IP calls:**
  - Destination Phone Number Manipulation Table for Tel-to-IP Calls
  - Source Phone Number Manipulation Table for Tel-to-IP Calls
- **For IP-to-Tel calls:**
  - Destination Phone Number Manipulation Table for IP-to-Tel Calls
  - Source Phone Number Manipulation Table for IP-to-Tel Calls

Number manipulation configuration examples are provided for inbound and outbound calls in Section 4.14.1.

➢ **To configure number manipulation rules:**

1. Open the required Number Manipulation page (**Configuration** tab > **VoIP** menu > **GW and IP to IP** submenu > **Manipulations** > **Dest Number IP->Tel** or **Dest Number Tel->IP** or **Source Number IP->Tel** or **Source Number Tel->IP**); the relevant Manipulation table page is displayed.
2. Click the **Add** button; this screen is displayed:

Figure 4-45: Example Dest Number IP->Tel Number Manipulation Rule



3. Click the **Rule** tab, and then configure the matching characteristics.
4. Click the **Action** tab, and then configure the manipulation operation.
5. Click **Submit** to apply your changes.

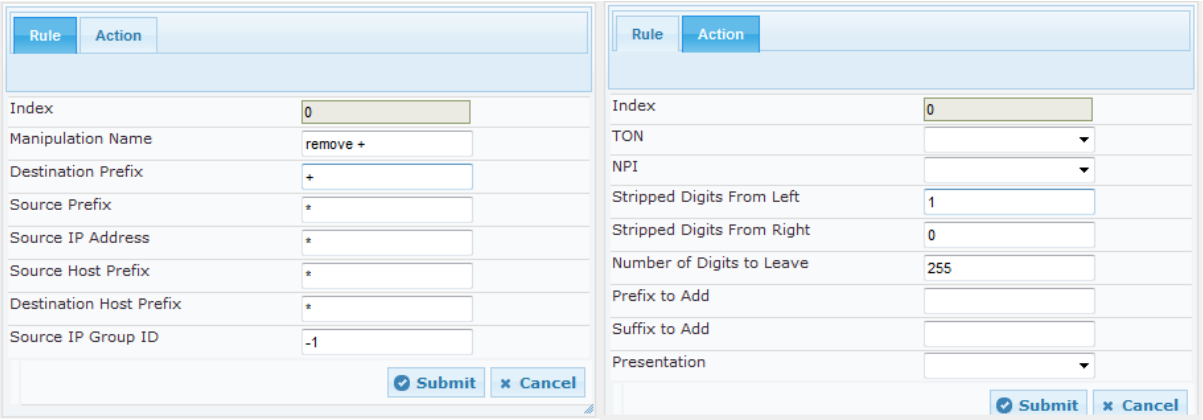
4.14.1 Number Manipulation Examples

Two examples are provided below for number manipulation.

4.14.1.1 Example Number Manipulation IP to Tel

The example below shows a manipulation rule that removes the plus sign ("+") from the destination number when the destination number prefix is a plus sign ("+").

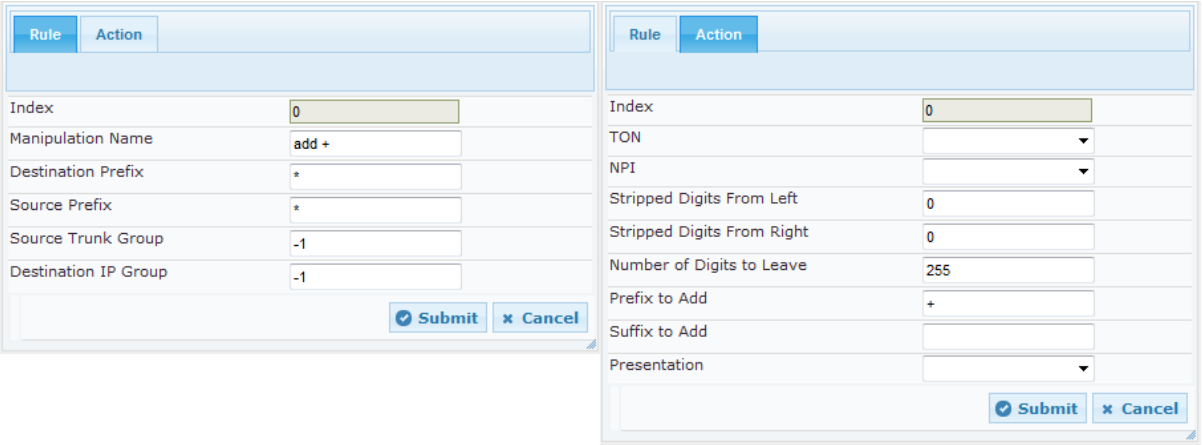
Figure 4-46: Destination Number Manipulation Rule for IP→Tel Calls



4.14.1.2 Example Number Manipulation Tel to IP

The example below shows a manipulation rule that adds the plus sign ("+") to the destination number, when the destination number prefix is any number ("*").

Figure 4-47: Destination Number Manipulation Rule for Tel→IP Calls



Note: Adapt the Manipulation Table according to your environment's dial plan.

4.15 Step 15: Configure Failover

This step shows how to configure failover actions for the Gateway entity and the SBC entity. The step isn't required if you only use one Mediation Server.

4.15.1 Configure a Keep Alive Failure Response

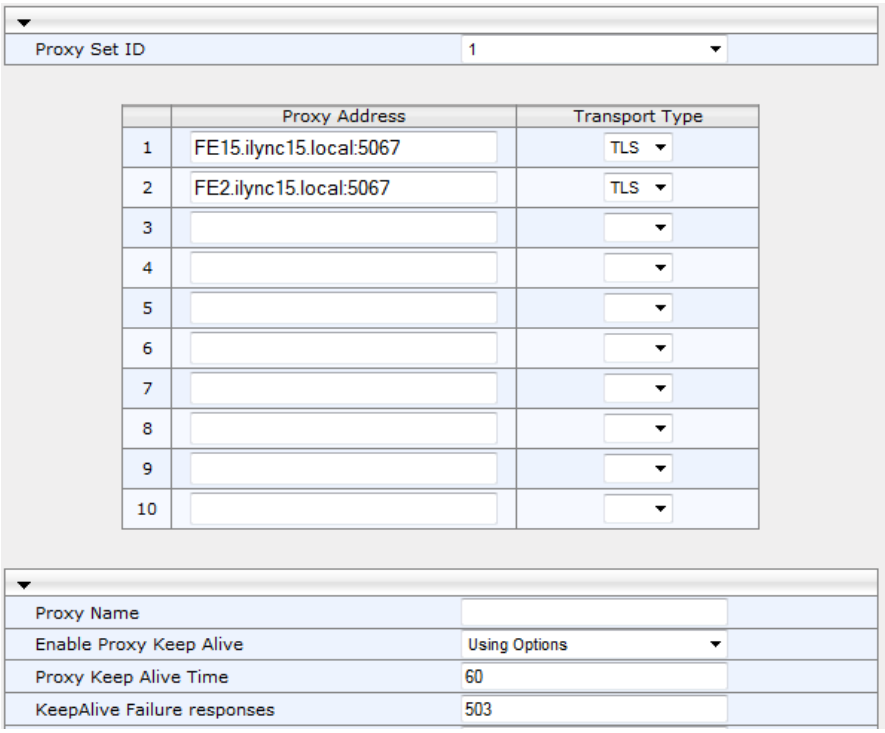
Defines SIP response codes. If a response is received in response to a keep-alive message using SIP OPTIONS, the device considers the Proxy as down.

When the Enhanced Gateway receives a SIP 503 response (from the Mediation Server), it functions as if the Lync Server is down, and will route the call to the next Lync Server.

➢ **To configure a Keep Alive Failure Response:**

1. Open the Proxy Sets Table page (**Configuration** tab > **VoIP** > **Control Network** > **Proxy Sets Table**).
2. Select Proxy Set ID **'1'** (i.e., Lync Server).

Figure 4-48: Proxy Sets Table Page



3. In the 'KeepAlive Failure responses' field, enter the release cause **503**.
4. Click **Submit**.

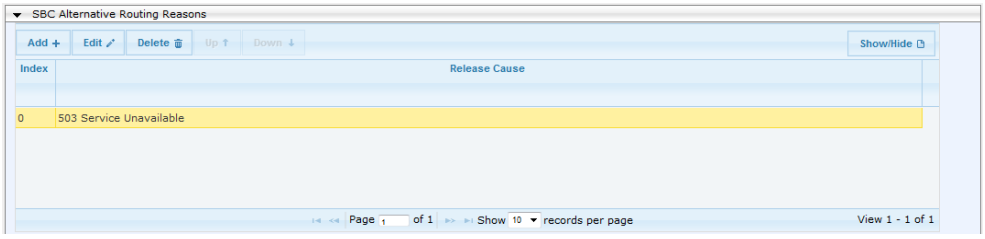
4.15.2 Configure Alternative Routing

When the device receives a SIP 503 response from the Mediation Server in response to an INVITE from the ATA or from the PSTN, it re-sends the INVITE to the redundant Mediation Server. To accomplish this, you need to configure the receipt of a SIP 503 response as a reason for IP alternative routing.

➢ **To configure alternative routing:**

1. Open the **SBC Alternative Routing Reasons** page (**Configuration** > **VoIP** > **SBC** > **Routing SBC** > **SBC Alternative Routing Reasons**).

Figure 4-49: SBC Alternative Routing Page



2. Click **Add**.
3. In Release Cause, choose **503 Service Unavailable** from the dropdown.
4. Click **Submit**.

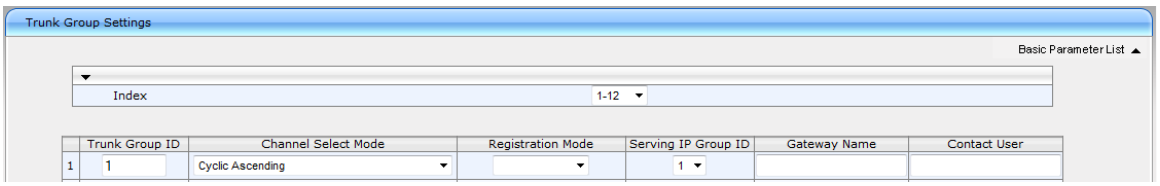
4.15.3 Configure Serving IP Group ID for Alternative Routing

When the Gateway receives a SIP 503 response from the Mediation Server in response to an INVITE from the E1/T1 Trunk, in order to re-send the INVITE to the redundant Mediation Server you need to set the Lync IP Group as the Serving IP Group.

➢ **To configure the Serving IP Group ID for alternative routing:**

1. Open the Trunk Group Settings page (**Configuration** tab > **VoIP** menu > **GW and IP to IP** > **Trunk Group > Trunk Group Settings**).

Figure 4-50: Trunk Group Settings Page



2. Select Index **1**.
3. From the 'Serving IP Group ID' dropdown, select **1** (i.e., Lync IP Group).
4. Click **Submit**.

Note: For the failover to function, set the 'Is Proxy Hot Swap' parameter to **Yes** on the Lync Proxy Set (i.e., Proxy Set 1).

4.16 Step 16: Configure Miscellaneous Settings

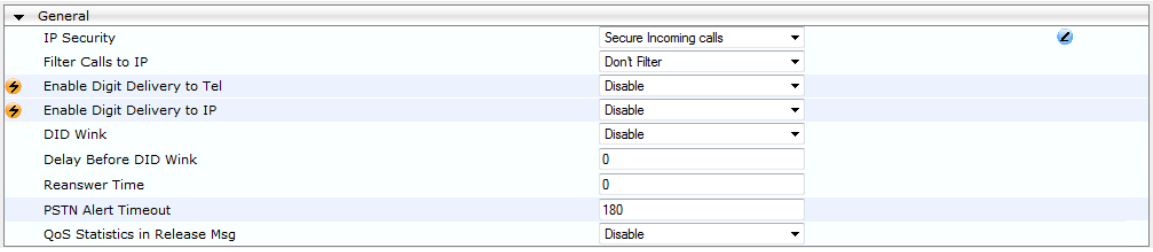
4.16.1 Restrict Communications to Mediation Server Only

This section shows how to restrict IP communications by allowing communications only between the Enhanced Gateway and the Mediation Server. This ensures that the Enhanced Gateway accepts and sends SIP calls *only* from and to the Mediation Server (as required by Microsoft). This is performed by enabling the IP Security feature and then defining the allowed ("administrative" list) IP addresses (or FQDNs) in the Proxy Set table (see Section 4.14.4 on page 24)

➢ **To allow IP communications only between the Enhanced Gateway and Mediation Server:**

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

Figure 4-51: Advanced Parameters Page



2. From the 'IP Security' dropdown, select **Secure Incoming calls.**
3. Click **Submit**.

4.16.2 Configure Comfort Noise and Gain Control

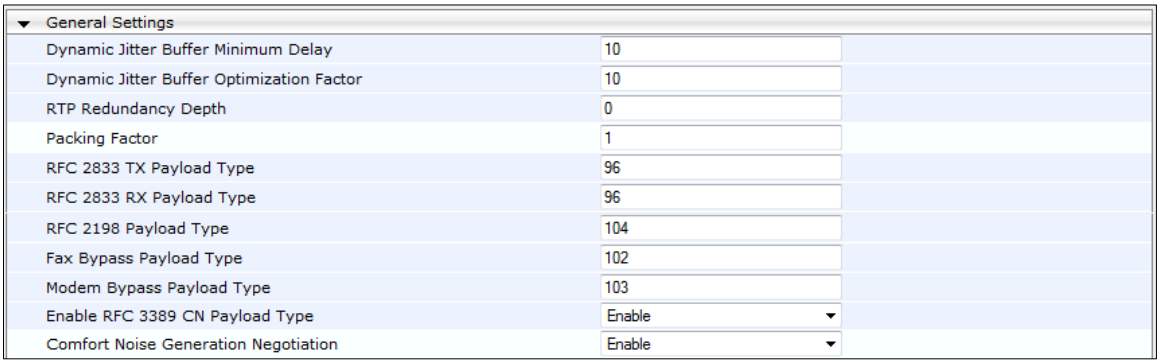
The Microsoft Lync network provides high voice quality by implementing suppression of typing noise during calls and improved generation of "comfort noise," which reduces hissing and smoothes over the discontinuous flow of audio packets. You may need to configure the Enhanced Gateway to match these voice quality features, by enabling silence suppression, comfort noise generation, automatic gain control (AGC), and echo canceller (enabled by default).

Note: Silence suppression is configured per coder type, as shown in Section 4.10 on page 40.

➢ **To configure voice quality:**

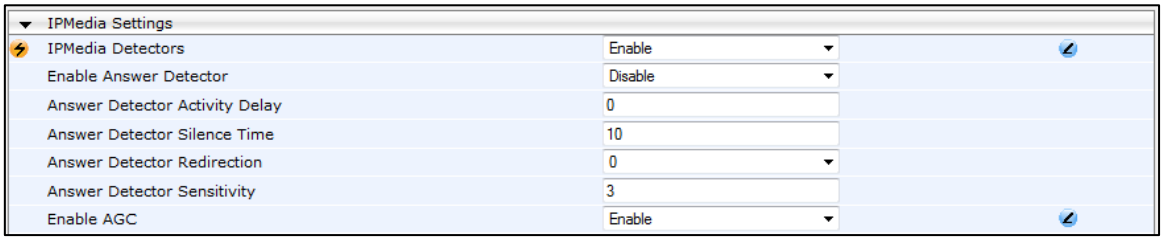
1. Open the RTP/RTCP Settings page (**Configuration** tab > **VoIP** menu > **Media** > **RTP/RTCP Settings**).

Figure 4-52: RTP/RTCP Settings Page



2. From the 'Enable RFC 3389 CN payload Type' dropdown, select **Enable**.
3. From the 'Comfort Noise Generation Negotiation' dropdown, select **Enable** to enable comfort noise generation.
4. Click **Submit**.
5. Open the IPMedia Settings page (**Configuration** tab > **VoIP** menu > **Media** > **IPMedia Settings**).

Figure 4-53: IPMedia Settings Page



6. From the 'IPMedia Detectors' dropdown, select **Enable**.
7. From the 'Enable AGC' dropdown, select **Enable**.
8. Click **Submit** to apply your changes.
9. Reset the device with a **burn to flash** for this setting to take effect (see Section 4.17 on page 67).

4.16.3 Configure Early Media

Early media refers to audio and video that is exchanged before a call is accepted by the recipient. Early media generated by the caller includes voice commands or dual-tone multi frequency (DTMF) tones to activate interactive voice response (IVR) systems. Early media generated by the call recipient include ringback tones, announcements, and requests for input.

Enhanced early media support in Microsoft Lync 2013 enables a caller to hear a ringback tone generated by the call recipient's mobile phone. This is also the case in team-call scenarios, where a call is routed to two team members, one of whom has configured simultaneous ringing for his or her mobile phone.

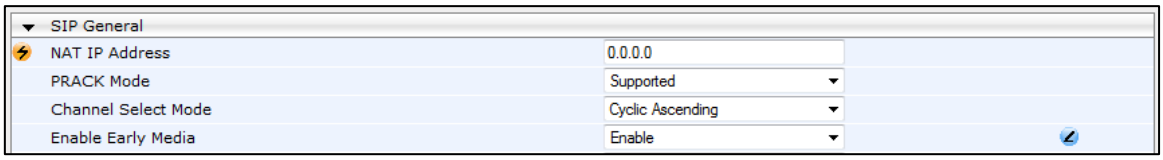
According to Microsoft Lync 2013 requirements, Enhanced gateway must send a SIP 183 with SDP immediately after it receives an INVITE. The RTP packets however, will not be sent until the Enhanced gateway receives an ISDN Progress, Alerting and Progress Indicator or Connect message. For example, if the Enhanced gateway receives ISDN Progress, it starts sending RTP packets according to initial negotiation; however, there is no need to re-send the 183 response.

You may need to configure the Enhanced gateway's early media feature to support the Microsoft Lync 2013 enhanced early media feature.

➢ **To configure the Early Media feature:**

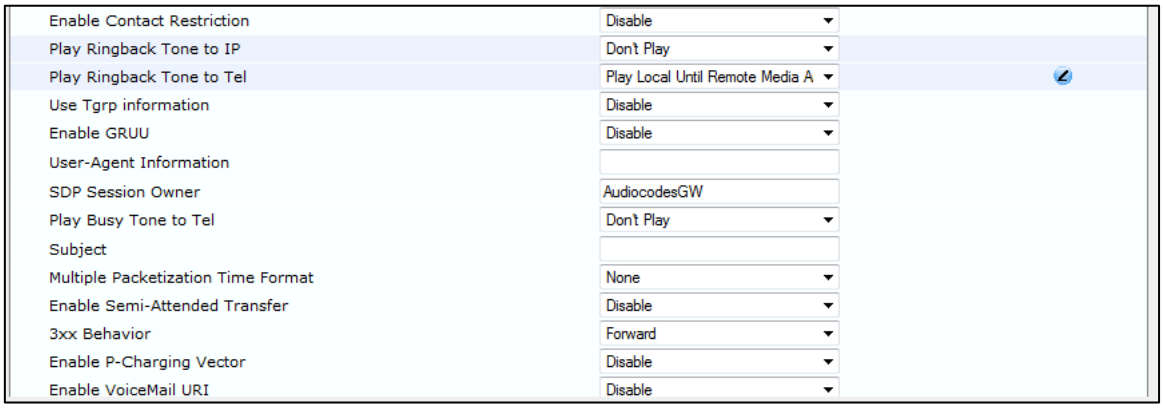
1. Open the SIP General Parameters page (**Configuration** tab > **VoIP** menu > **SIP Definitions** > **SIP General Parameters**).
2. From the 'Enable Early Media' dropdown, select **Enable**.

Figure 4-54: SIP General Parameters Page (1)



3. From the 'Play Ringback Tone to Tel' dropdown, select **Play Local Until Remote Media Arrive**. If a SIP 180 response is received and the voice channel is already open (due to a previous 183 early media response or due to an SDP in the current 180 response), the Enhanced Gateway plays a local ringback tone if there are no prior received RTP packets. It stops playing the tone as soon as it starts receiving RTP packets. At this stage, if the Enhanced Gateway receives additional 18x responses, it does not resume playing the local ringback tone.

Figure 4-55: SIP General Parameters Page (2)

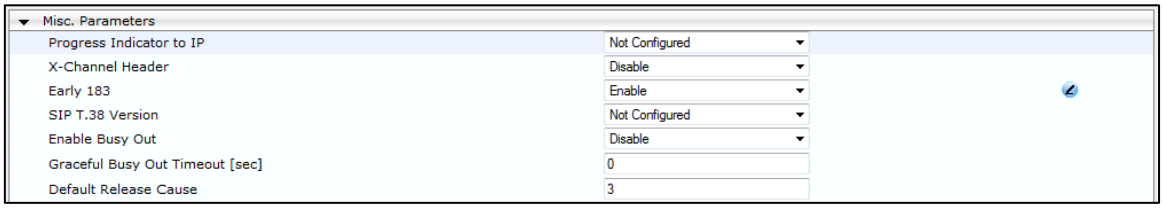


4. From the 'Forking Handling Mode' dropdown, select **Sequential handling**. If an 18x response with SDP is received, the device opens a voice stream according to the

received SDP. The device re-opens the stream according to subsequently received 18x responses with SDP.

5. Click **Submit** to apply your changes.
6. Open the Advanced Parameters page (**Configuration** tab > **VoIP** menu > **SIP Definitions** > **Advanced Parameters**).

Figure 4-56: Advanced Parameters Page



7. From the 'Enable Early 183' dropdown, select **Enable**.
8. Click **Submit** to apply your changes.

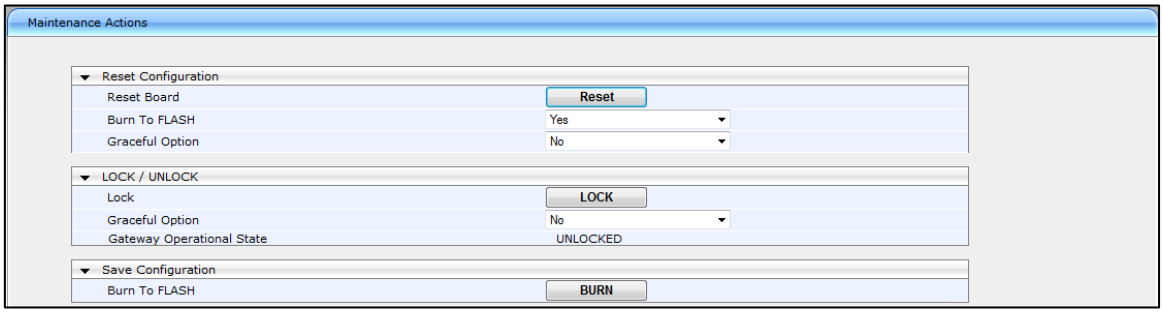
4.17 Step 17: Reset the Device

After finishing configuring the device as shown in the steps above, burn the configuration to the device's flash memory and reset it.

➢ **To reset the device:**

1. Open the Maintenance Actions page (**Maintenance** tab > **Maintenance** menu > **Maintenance Actions**).
2. Under the 'Save Configuration' group, click the **BURN** button; a confirmation message appears when the configuration is successfully saved.
3. Click the **Reset** button to reset the device.

Figure 4-57: Reset the Device



Note: Reset with BURN to FLASH is required.

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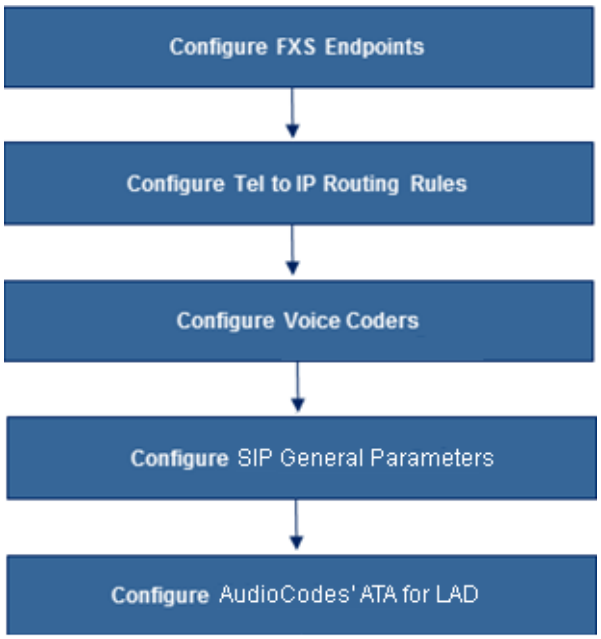
A Configuring AudioCodes Analog Telephone Adapters (ATA)

This section shows how to configure the Analog Telephone Adapter (ATA) device. The configuration ensures that the ATA routes its calls to the AudioCodes Enhanced Gateway.

The section is only relevant if the ATA device is an AudioCodes MP-1xx series device.

The flowchart below summarizes the steps for configuring the ATA.

Figure A-1: Configuring the ATA: Steps Summary



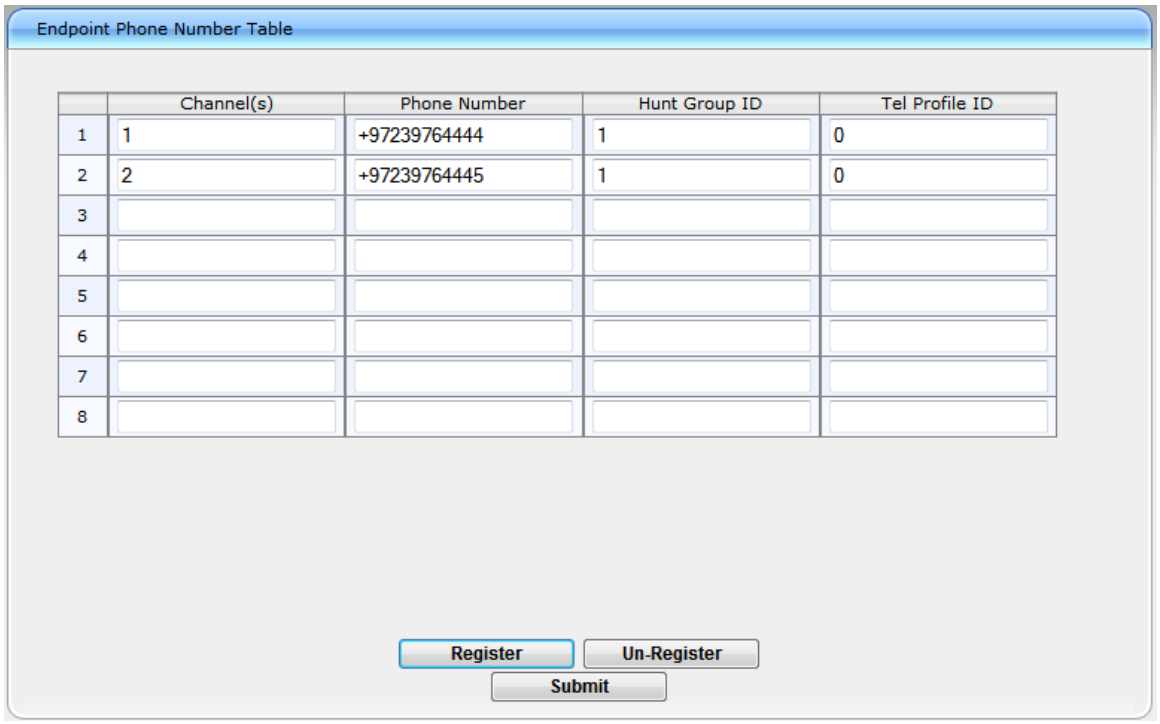
A.1 Configure FXS Endpoints

This section shows how to activate the MP-1xx ports (endpoints), by defining them with telephone numbers. The configuration below uses the example of one ATA (IP address 10.15.0.4), with analog numbers +97239764444 and +97239764445.

➢ **To configure endpoints:**

1. Open the Endpoint Phone Number Table page (**Configuration** tab > **VoIP** menu > **GW and IP to IP** > **Hunt Group** > **Endpoint Phone Number**).

Figure A-2: Endpoint Phone Number Table Page



2. In the 'Phone number' field, enter the phone number of the FXS endpoint (e.g., +97239764444 and ++97239764445).
3. Click **Submit**.

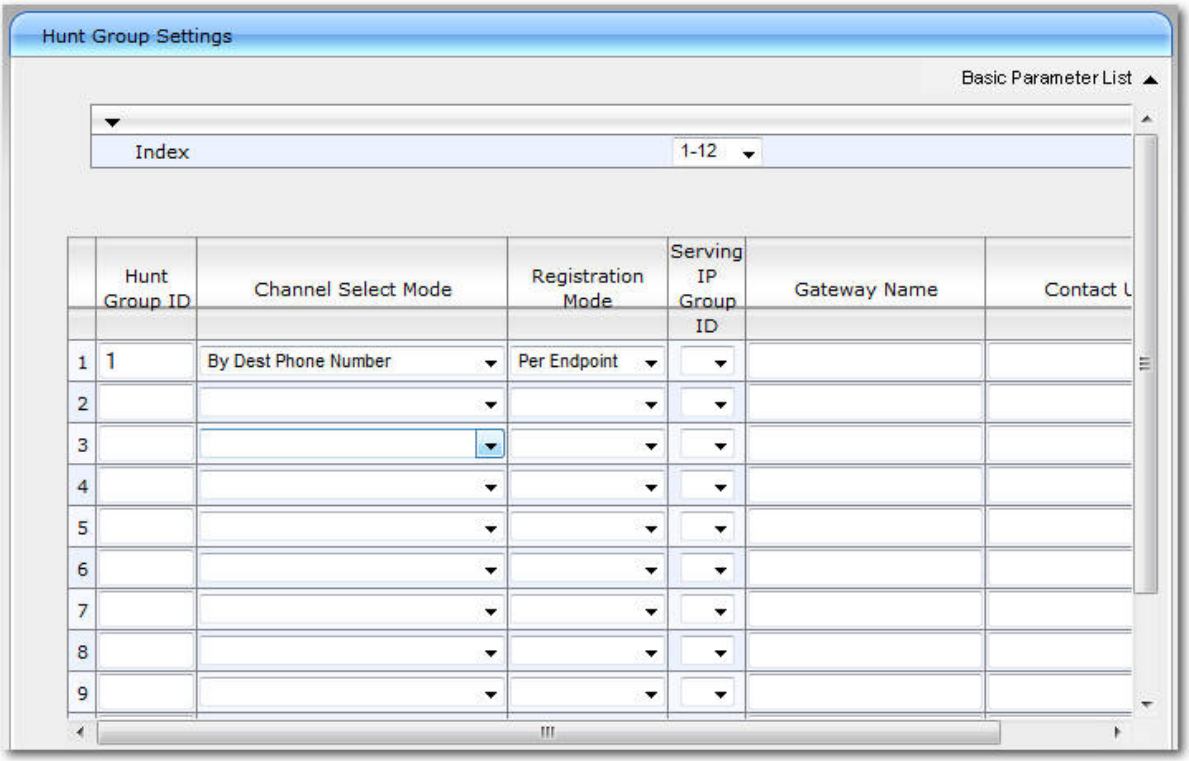
A.2 Configure Trunk Group Settings

This section shows how to configure trunk group settings.

➢ **To configure trunk group settings:**

1. Open the Trunk Group Settings page (**Configuration** tab > **VoIP** menu > **GW and IP to IP** > **Hunt Group** sub-menu > **Hunt Group Settings**).

Figure A-3: Hunt Group Settings Page



2. In the 'Trunk Group ID' field, enter **1**.
3. In the 'Channel Select Mode' dropdown, select **By Dest Phone Number**.
4. In the Registration Mode' dropdown, select **Per Endpoint**.
5. Click **Submit**.

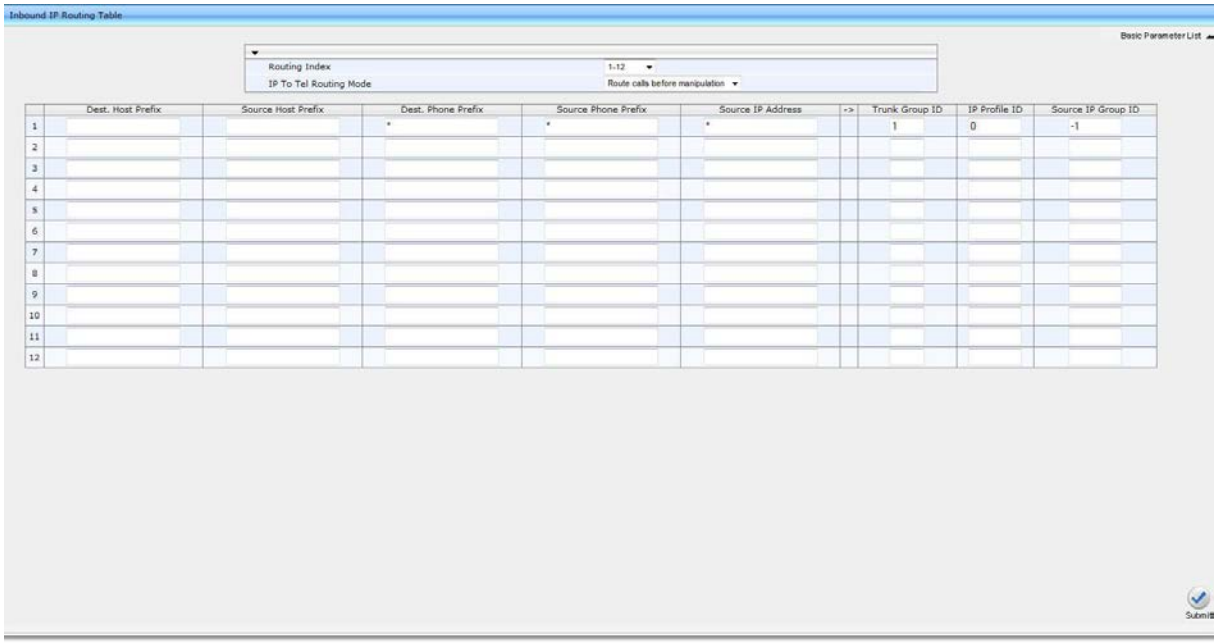
A.3 Configure IP To Trunk Group Routing

This section shows how to configure IP to Trunk Group Routing.

➢ **To configure IP To Trunk Group Routing:**

1. Open the IP to Hunt Group Routing Table page (**Configuration** tab > **VoIP** menu > **GW and IP to IP** > **Routing** > **IP to Trunk Group Routing**).

Figure A-4: IP to Trunk Group Routing Page



2. In the 'Trunk Group ID' field, enter **1**.
3. In the 'Source Phone Prefix', 'Dest Phone Prefix' and 'Source IP Address' fields, enter an * (asterisk).
4. In the 'IP Profile ID' field, enter **0**.
5. In the 'Source IP Group ID' field, enter **-1**.
6. Click **Submit**.

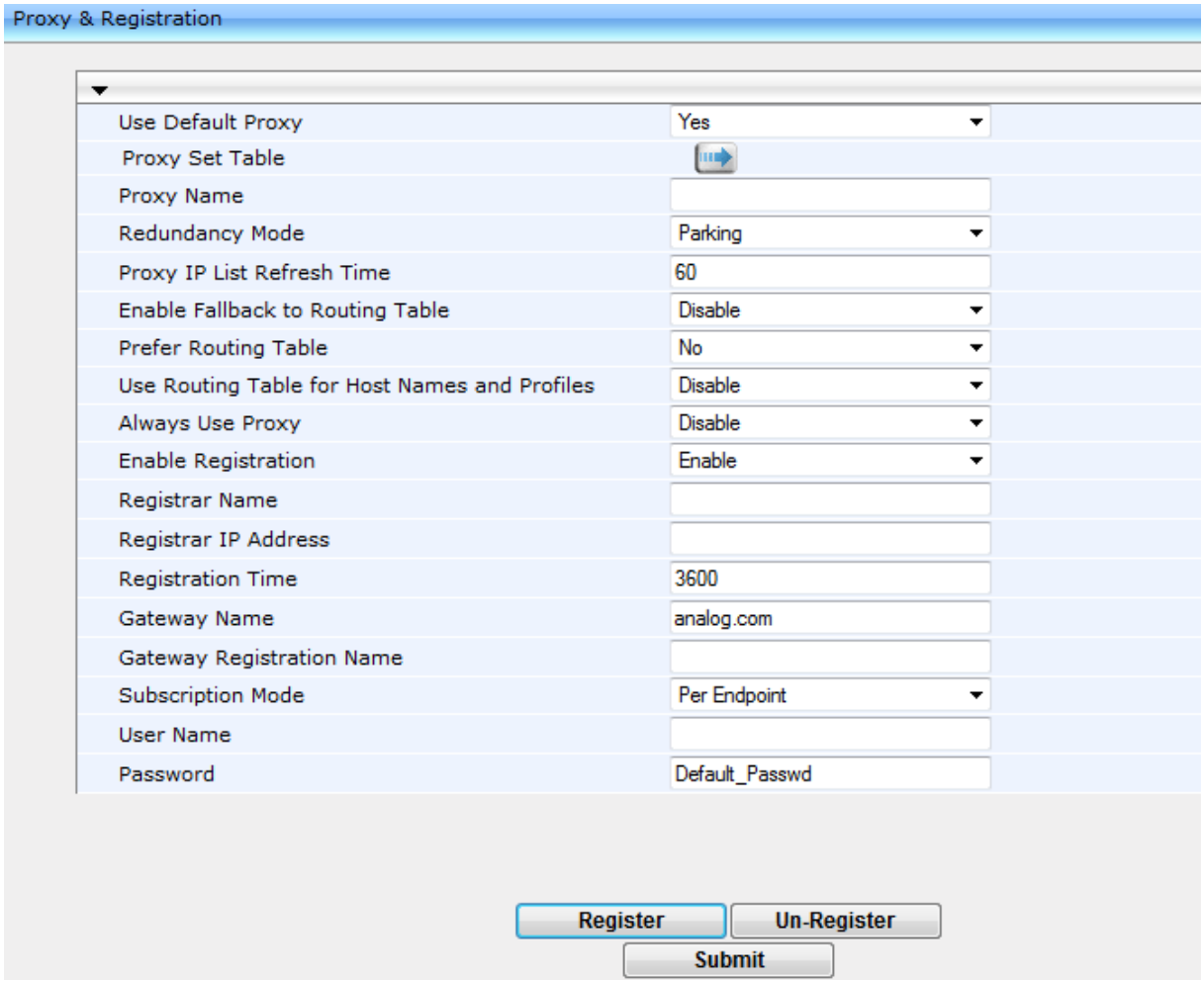
A.4 Configure Proxy & Registrations

This section shows how to configure Proxy & Registrations.

➢ **To configure Proxy & Registrations:**

1. Open the Proxy & Registration page (**Configuration** tab > **VoIP** menu > **SIP Definitions** > **Proxy & Registration**).

Figure A-5: SIP Proxy and Registration



2. In the 'Use Default Proxy' field, enter **Yes**.
3. In the 'Enable registration' field, select **Enable**.
4. In the 'Registration Time' field, enter **3600**.
5. Click **Submit**.

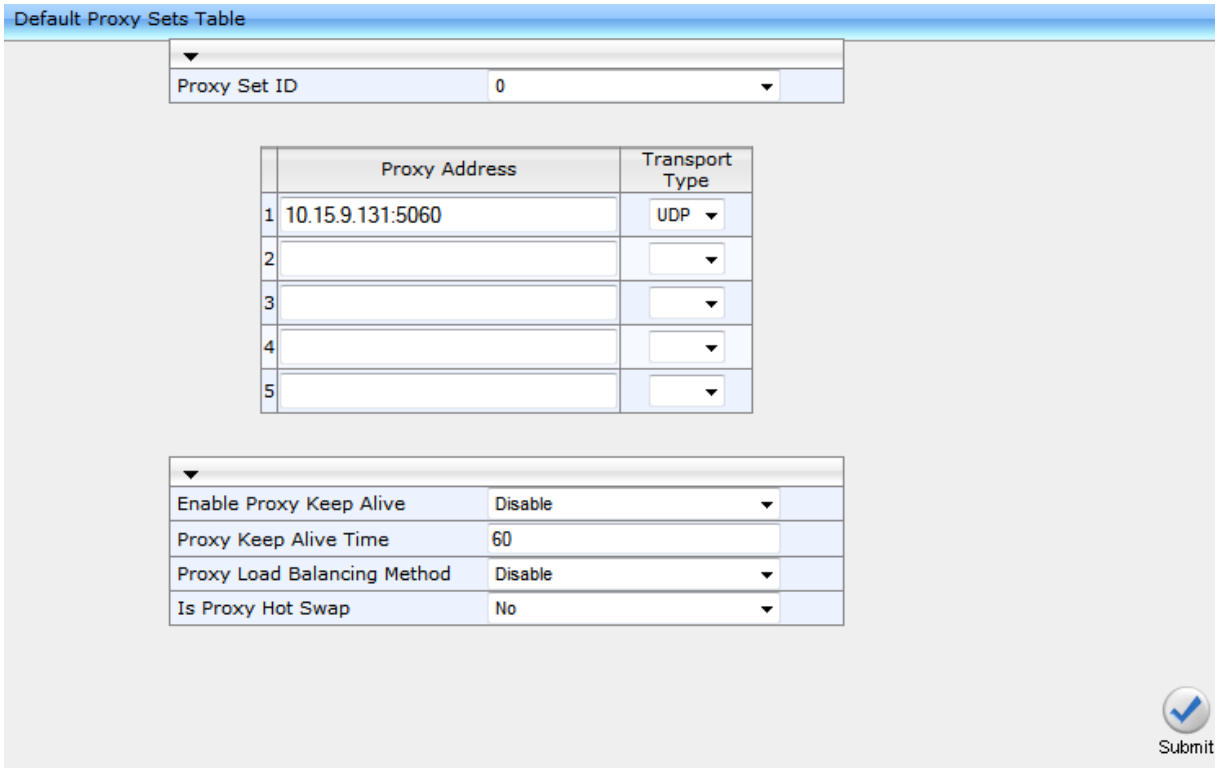
A.5 Configure Proxy Sets

This section shows how to configure Proxy Sets.

➢ **To configure Proxy Sets:**

1. Open the Proxy Sets Table page (**Configuration** tab > **VoIP** menu > **Control Network**> **Proxy Sets Table**).

Figure A-6: Proxy Sets Table



2. In the 'Proxy Address' field, enter the FQDN and Destination Port of the device (the SBC entity).
3. In the 'Transport Type' dropdown, select **UDP**.
4. Click **Submit**.

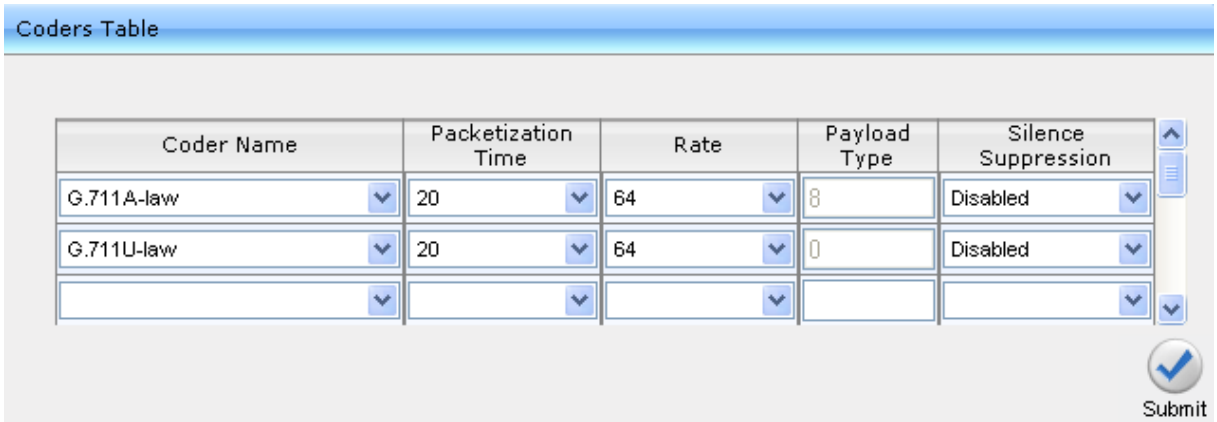
A.6 Configure Coders

This section shows how to configure MP-11x coders.

➢ **To configure MP-11x coders:**

1. Open the Coders page (**Configuration** tab > **VoIP** menu > **Coders And Profiles** sub-menu > **Coders**).

Figure A-7: Coders Table Page



2. From the Coders Table dropdowns, select coders and attributes in order of preference, with the first entry the preferred entry, and the others following in descending order of preference.
3. Select the **G.711A-law and G.711U-law** coders, as shown in the figure above.
4. From the 'Silence Suppression' dropdown, select **Disabled** as shown in the figure above.
5. Click **Submit**.

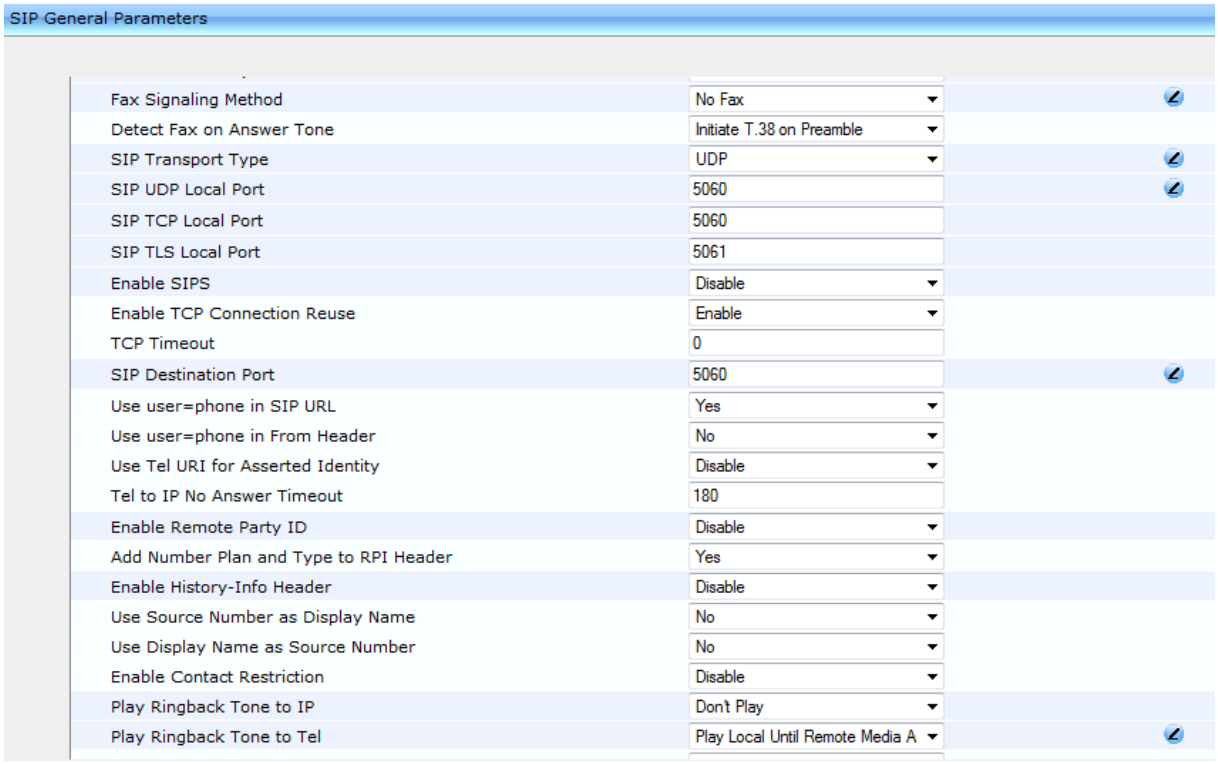
A.7 Configure SIP General Parameters

This section shows how to configure SIP General Parameters on the MP-1xx.

➢ **To configure the SIP General Parameters:**

1. Open the SIP General Parameters page (**Configuration** tab > **VoIP** menu > **SIP Definitions** > **General Parameters**).

Figure A-8: SIP General Parameters Page



2. From the 'Fax Signaling Method' dropdown, verify that **No Fax** is selected.
3. From the 'SIP Transport Type' dropdown, verify that **UDP** is selected.
4. In the 'SIP UDP Local Port' field, verify that **5060** is set.
5. In the 'SIP Destination Port' field, verify that **5060** is set, corresponding to the UDP listening port of the device (the SBC entity).
6. From the 'Play Ringback Tone to Tel' dropdown, select **Play Local Until Remote Media Arrive**.
7. Click **Submit**.

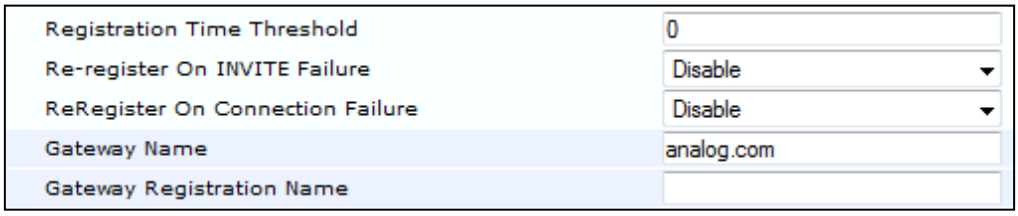
A.8 Configure Gateway Name

The device needs to recognize incoming calls from the Analog Device. To do this, the ATA must send the INVITEs with the host name as configured in the SBC Classification Table. You must therefore configure the ATA with a Gateway name corresponding to the name configured in the device's Classification Table (see Section 4.13 on page 48).

➢ **To configure the Gateway name:**

1. Open the Proxy & Registration page (**Configuration** tab > **VoIP** menu > **SIP Definitions** > **Proxy & Registration**).

Figure A-9: Proxy & Registration Page



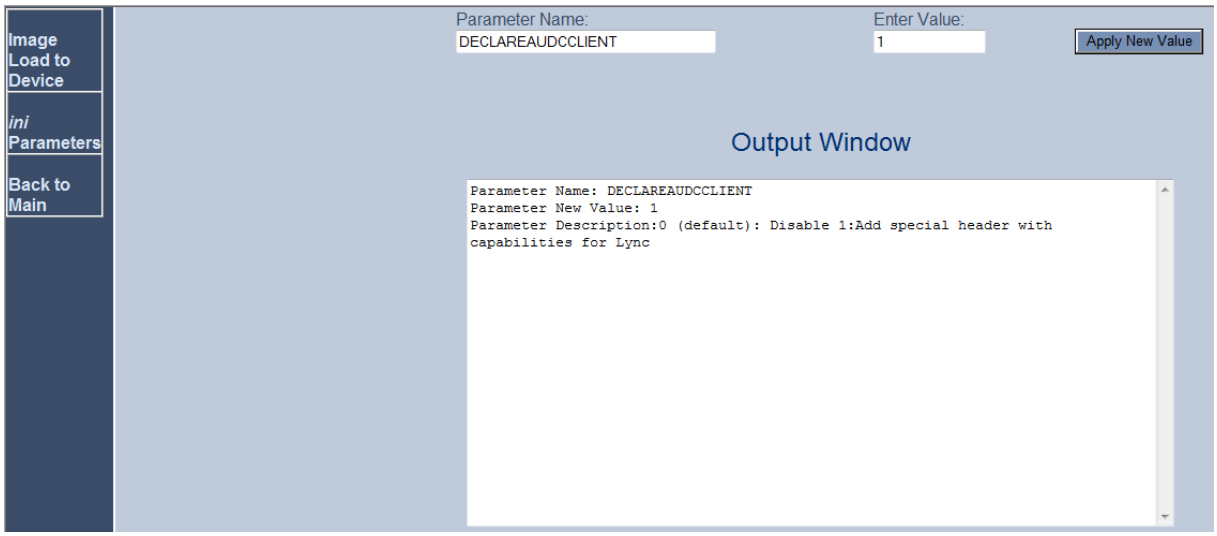
2. In the 'Gateway Name' field, enter an identifying name (e.g., **analog.com**).
3. Click **Submit** to apply your settings.

A.9 Configure AudioCodes' ATA for LAD

➢ **To configure AudioCodes' ATA for LAD:**

1. Open the Admin page: append the case-sensitive suffix 'AdminPage' to the device's IP address in your Web browser's URL field (e.g., http://10.15.0.4/AdminPage).
2. In the left pane, click ***ini* Parameters**.

Figure A-10: AdminPage



3. Enter the following value in the 'Parameter Name' and 'Enter Value' fields:

Parameter	Value
DECLAREAUDCCLIENT	1 (adds a special header with capabilities for Lync)

4. Click the **Apply New Value** button for each field.

Note: This parameter classifies the MP-1xx's clients as LAD in the SBC.

B Configuring Lync Server 2013

This appendix shows how to configure Microsoft Lync Server 2013 topology builder to operate with AudioCodes' device's entities.

The appendix also shows how to configure an Analog Device via the Lync Management Shell.

Note: Routes, Dial plans, voice policies, and PSTN usages are also needed for the deployment of VoIP in the enterprise, but they're beyond the scope of this document.

B.1 Configure the E-SBC as an IP / PSTN Gateway

This section shows how to configure the Gateway entity as an IP/PSTN Gateway, and to associate it with the Mediation Server.

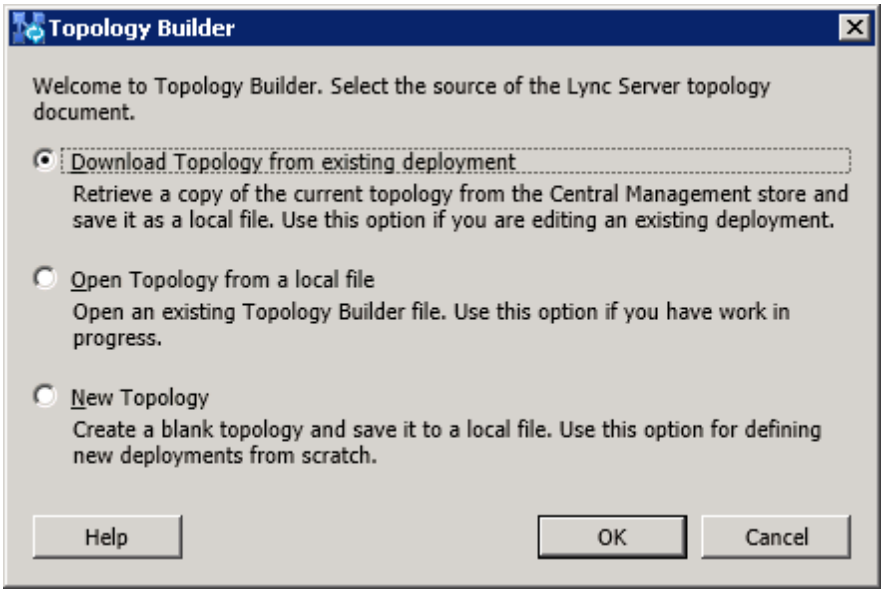
➢ **To configure the E-SBC as an IP/PSTN Gateway and associate it with the Mediation Server:**

1. On the server where the Topology Builder is installed, start the Lync Server 2013 Topology Builder (point to Windows **Start** menu, click **All Programs**, and then click **Lync Server Topology Builder**).

Figure B-1: Starting the Lync Server Topology Builder

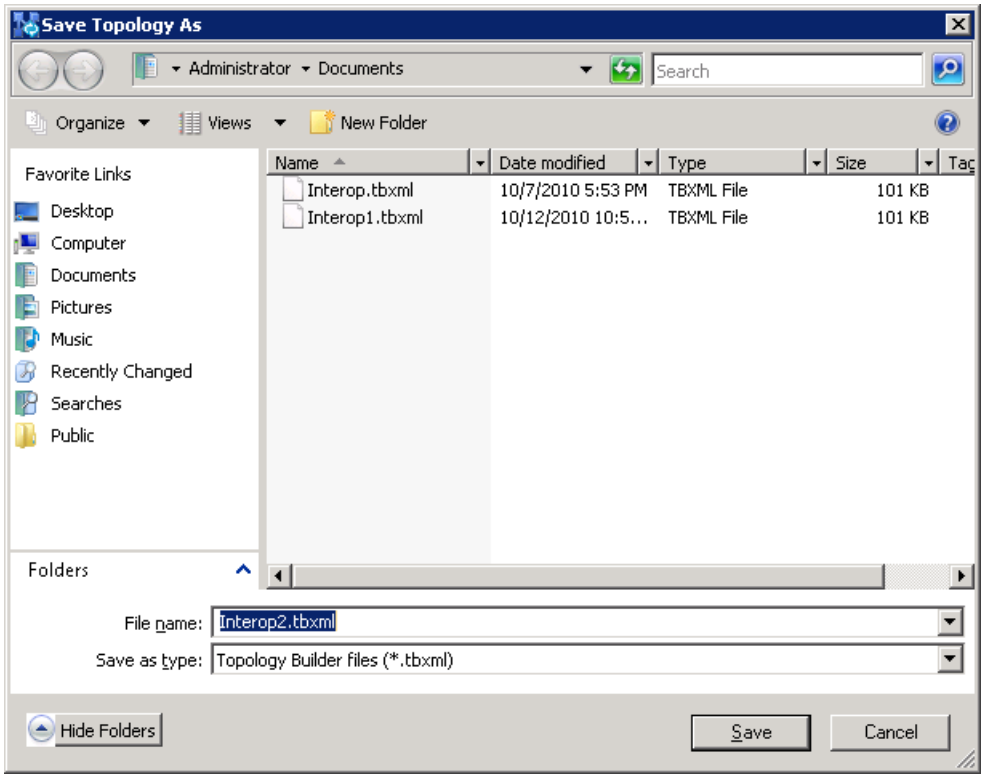
The following screen is displayed:

Figure B-2: Topology Builder Options



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

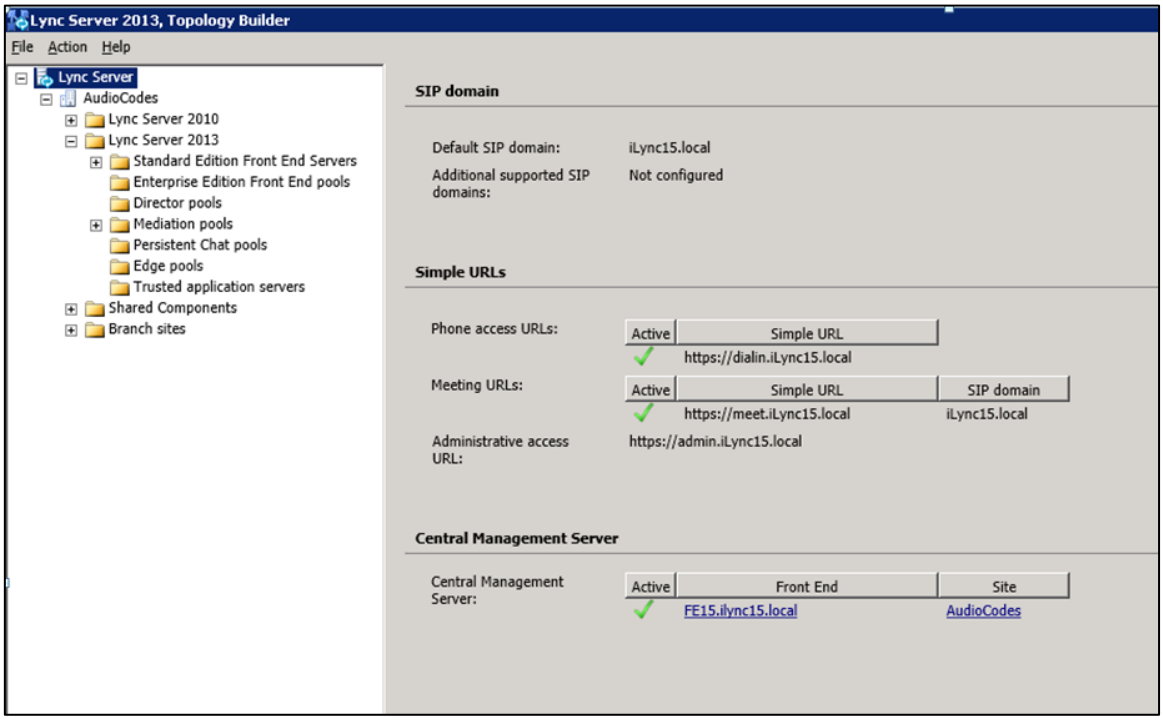
Figure B-3: Save Topology



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

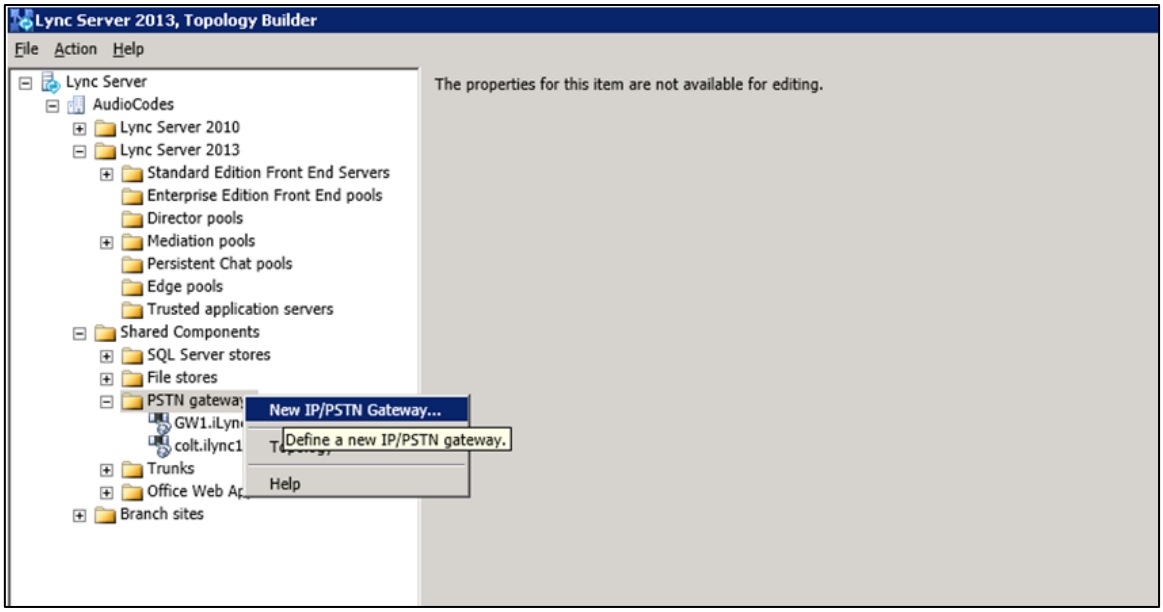
The Topology Builder screen with the downloaded topology is displayed:

Figure B-4: Downloaded Topology



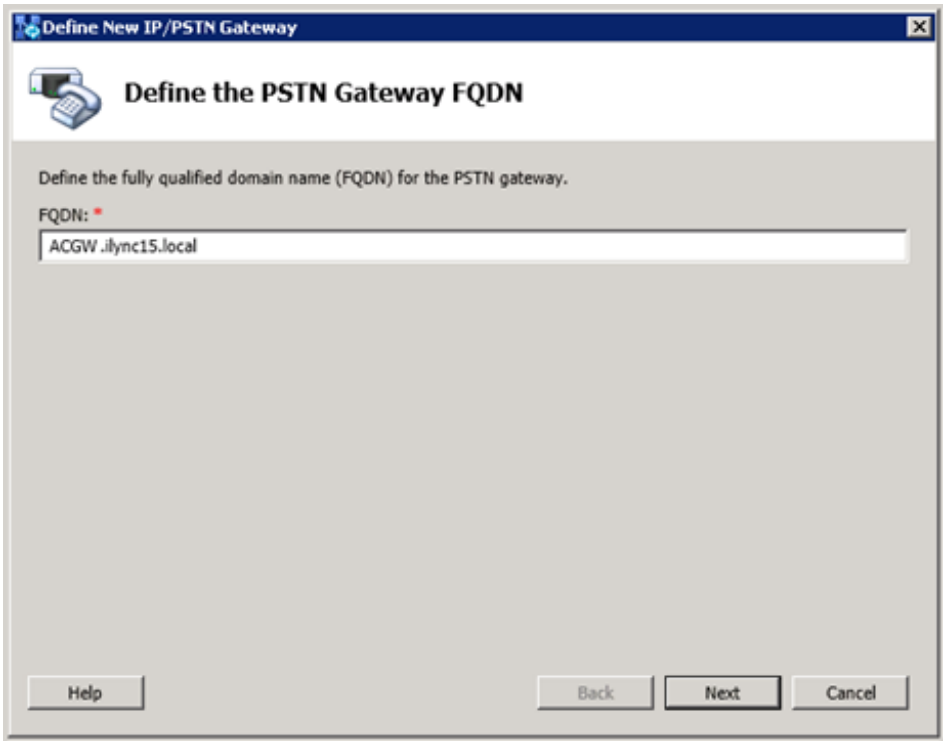
4. In the tree, select **Lync Server 2013** > **Site name** (i.e., AudioCodes) > **Shared Components** > **PSTN Gateways**.
5. Right-click the **PSTN gateways** folder, and then in the pop-up, choose **New IP/PSTN Gateway** as shown below:

Figure B-5: Choosing New IP/PSTN Gateway



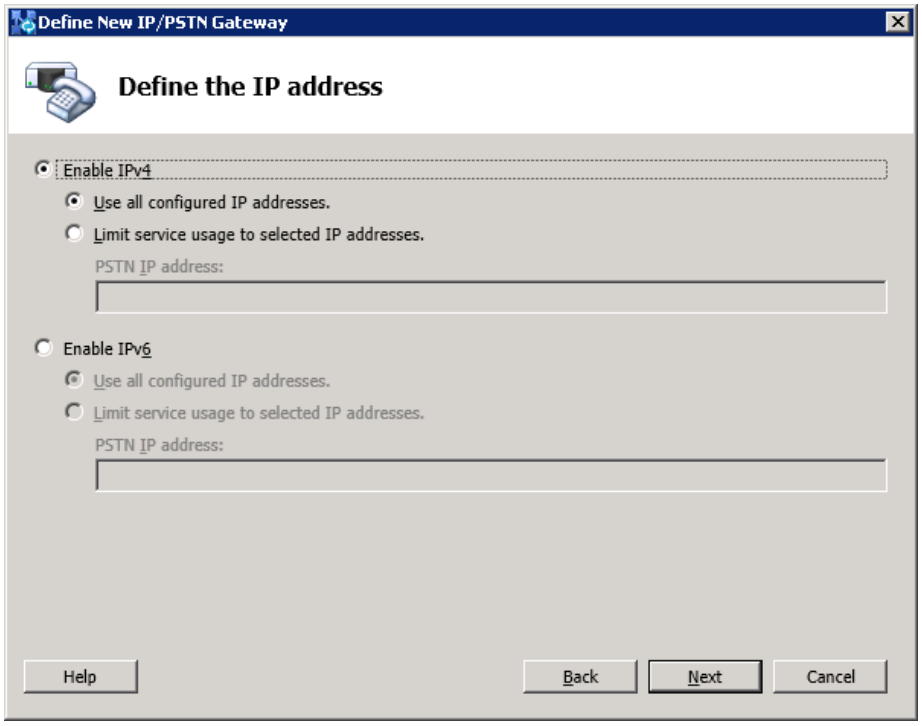
The following screen opens:

Figure B-6: Define New IP/PSTN Gateway



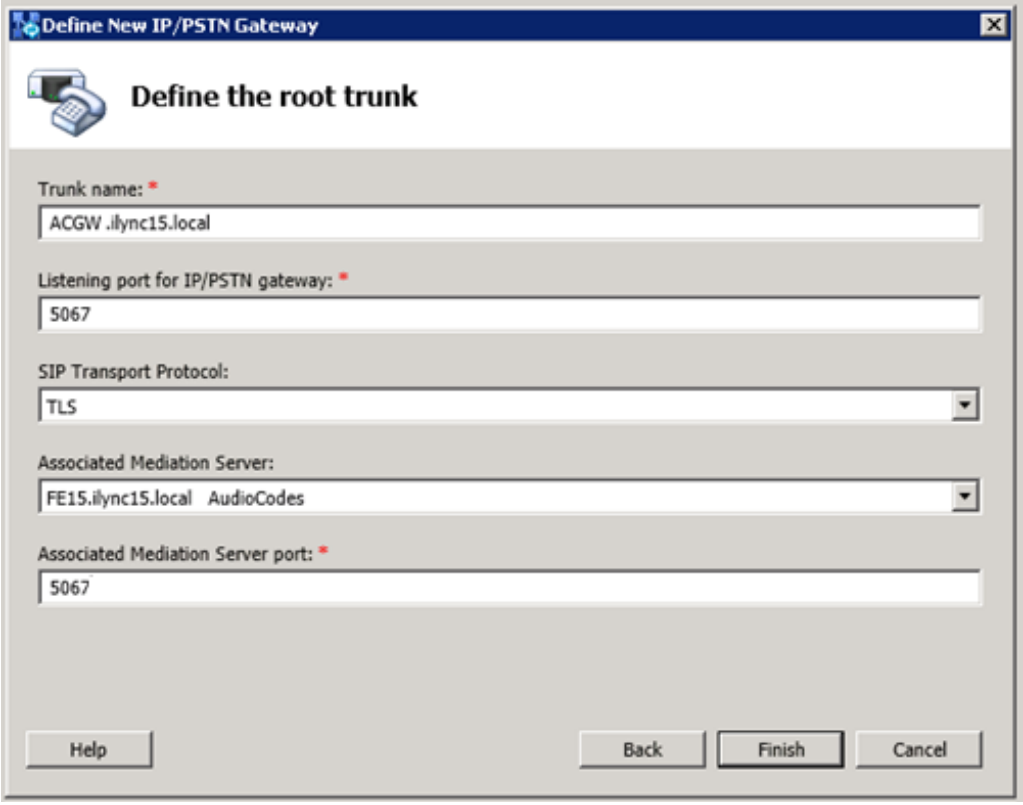
6. Enter the Fully Qualified Domain Name (FQDN) of the Device (i.e., "ACGW.ilync15.local"); this FQDN should be updated in the relevant DNS record; click **Next**; the 'Define the IP address' screen is displayed:

Figure B-7: Define the IP Address



7. Define the listening mode (IPv4 or IPv6) of the IP address of your new PSTN gateway, and then click **Next**; the 'Define the root trunk' screen is displayed:

Figure B-8: Define the Root Trunk



8. 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 of the Mediation Server FQDN, Mediation Server listening port (TLS or TCP), Gateway IP, and FQDN and Gateway listening port.
   Note:

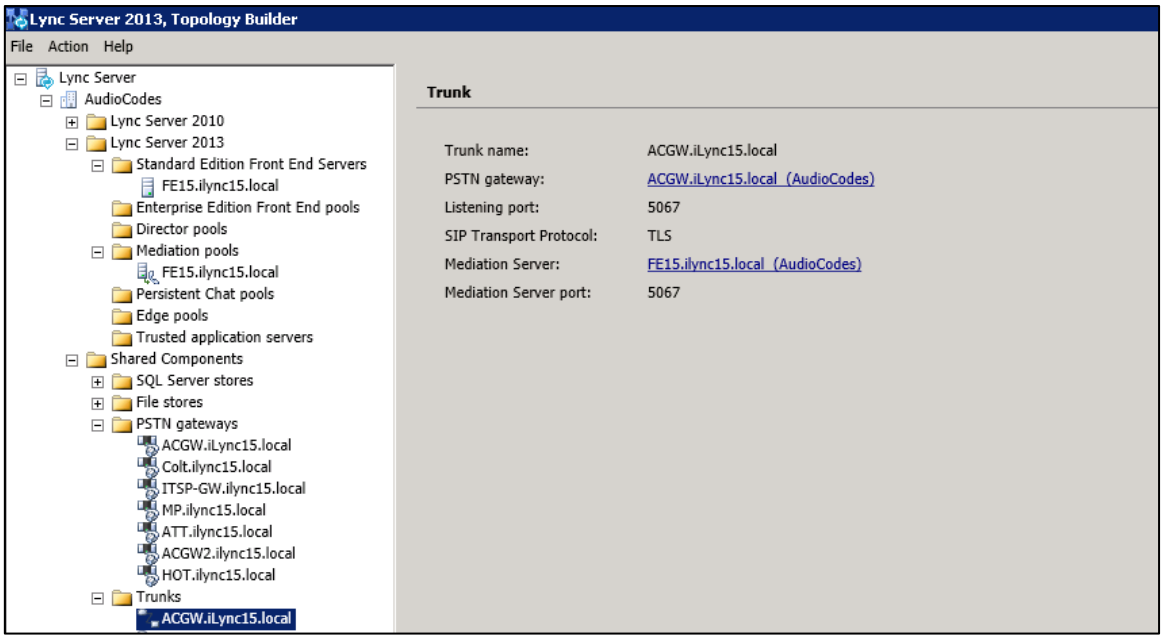
   - When defining a PSTN Gateway in the Topology Builder, you must define a root trunk to successfully add the PSTN Gateway to your topology.
   - The root trunk cannot be removed until the associated PSTN gateway is removed.

   a. Enter the FQDN of the Gateway (e.g., "ACGW.ilync15.local").
   b. In the 'Listening Port for IP/PSTN Gateway' field, type the listening port that the Gateway will use for SIP messages from the Mediation Server that will be associated with the root trunk of the PSTN gateway (i.e. 5067).
   c. In the 'SIP Transport Protocol' field, enter the transport type (i.e., **TLS**) that the trunk uses.
   d. In the 'Associated Mediation Server' field, select the Mediation Server to associate with the root trunk of this PSTN Gateway.
   e. In the 'Associated Mediation Server port' field, enter the listening port that the Mediation Server will use for SIP messages from the Gateway (i.e., **5067**).

9. Click **Finish**.

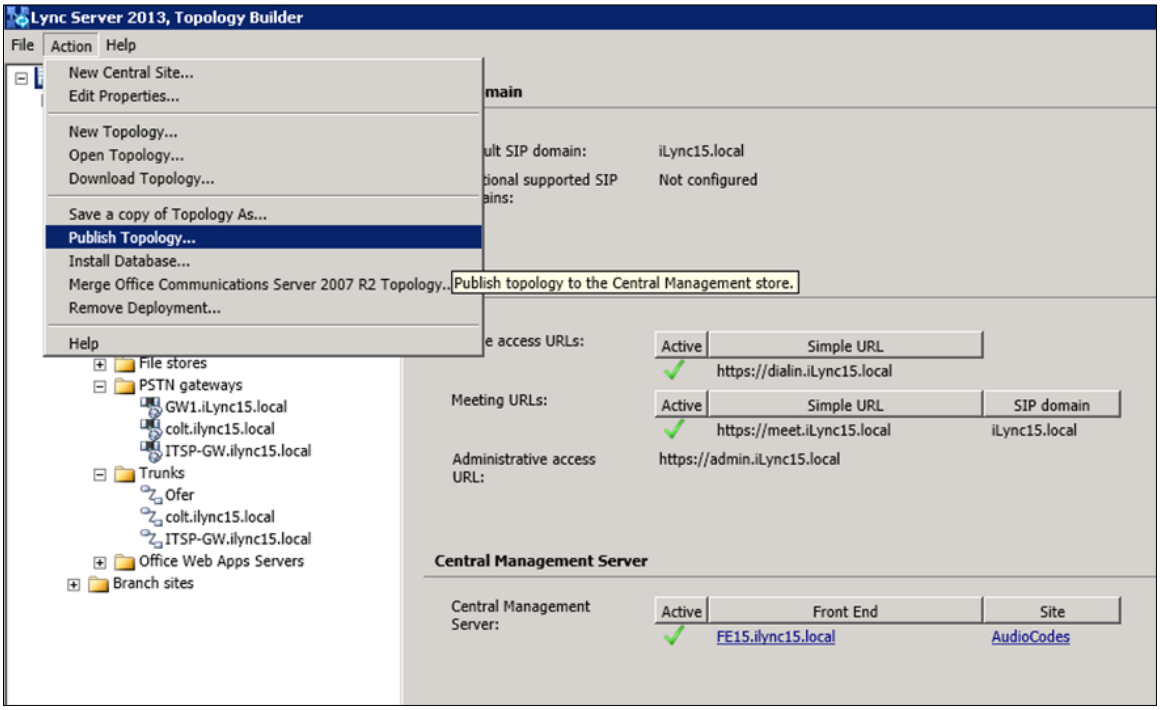
   The Gateway is added as a PSTN Gateway and a trunk is created as shown below:

Figure B-9: Gateway entity Added as an IP/PSTN Gateway and Trunk created



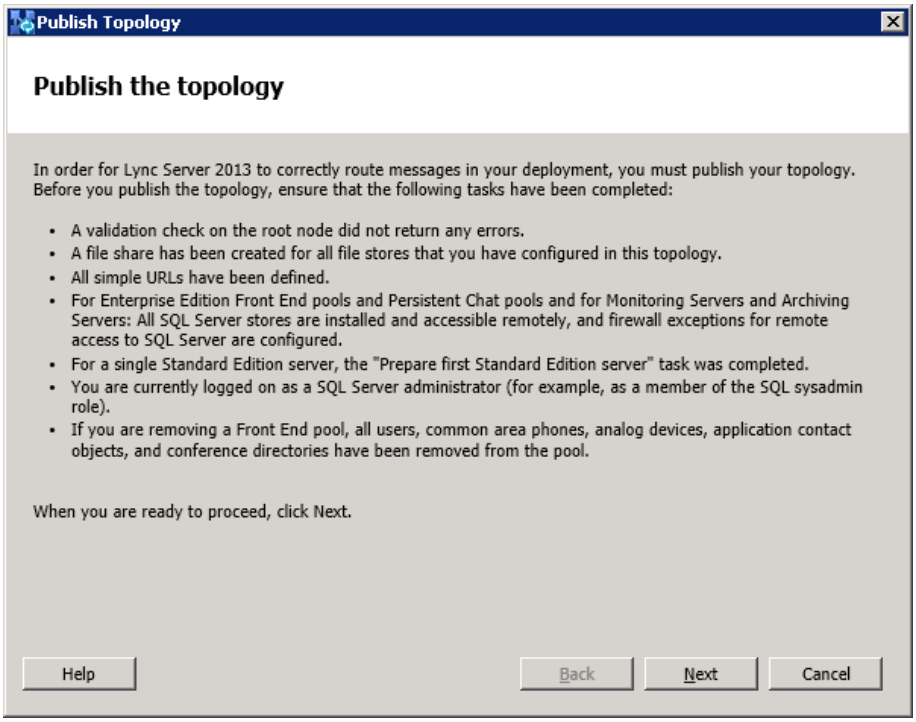
10. In the Navigation tree, select the root item **Lync Server** , and then in the Main Menu, choose **Action** > **Publish Topology**, as shown below:

Figure B-10: Choosing Publish Topology



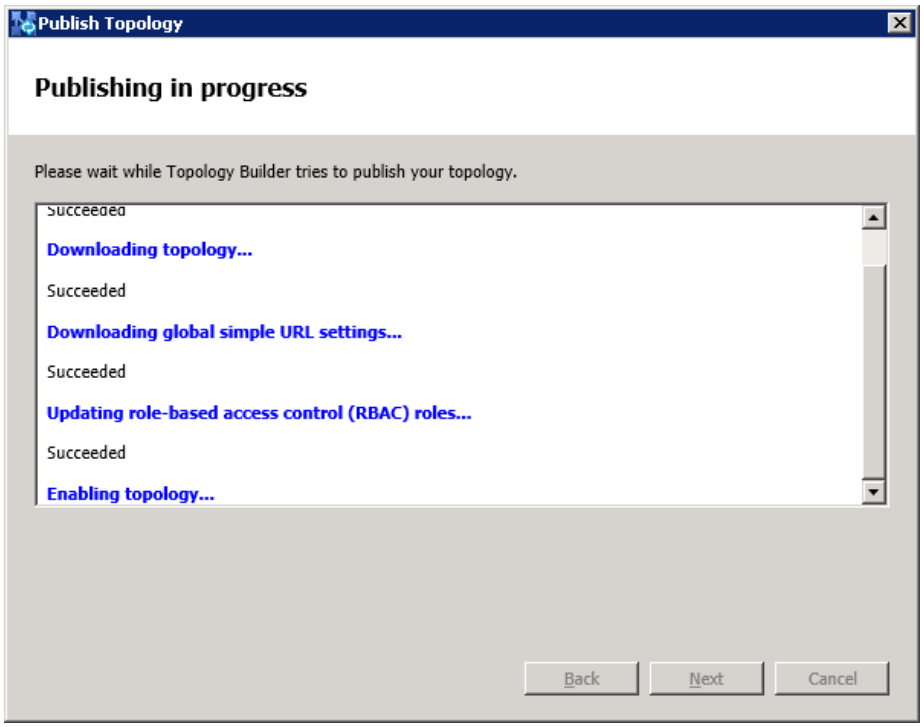
The Publish Topology screen is displayed:

Figure B-11: Publish Topology Screen



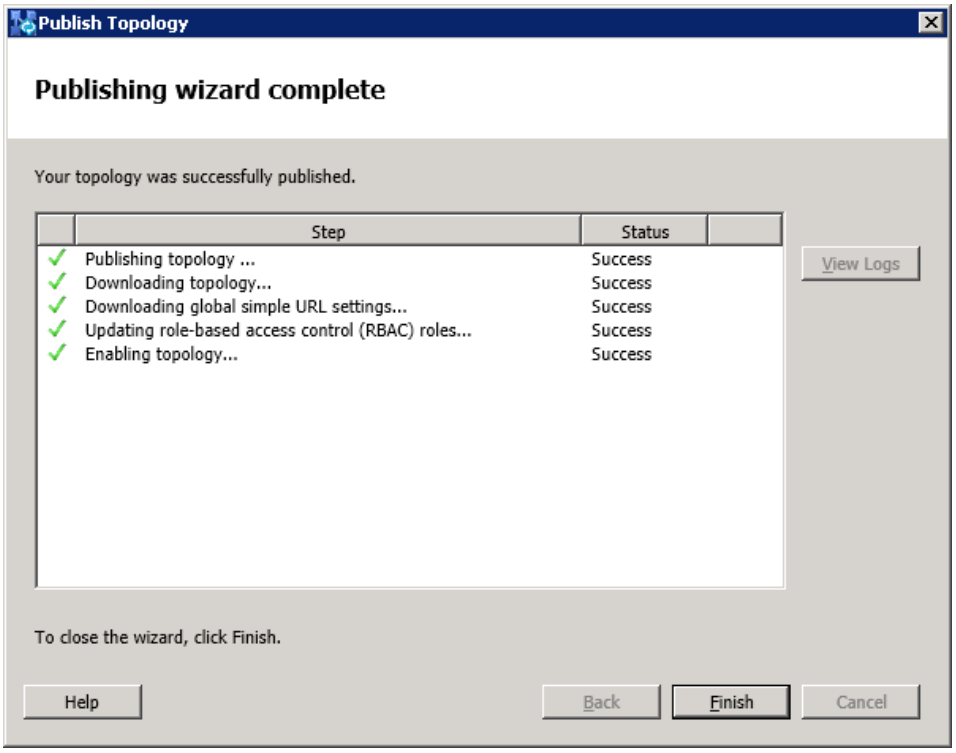
11. Click **Next**; the Topology Builder starts to publish your topology, as shown below:

Figure B-12: Publish Topology Progress Screen



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

Figure B-13: Publish Topology Successfully Completed



13. Click **Finish**.

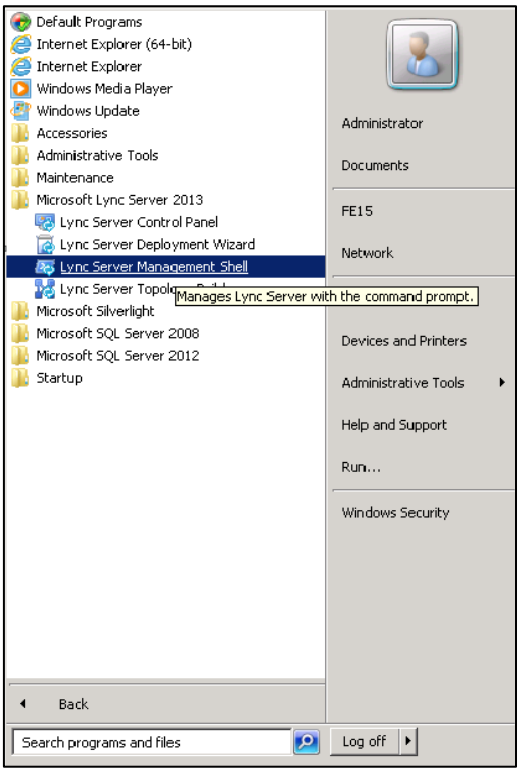
B.2 Configure the Analog Device in the Lync Server Management Shell

The Lync Server supports Analog Devices: analog audio phones and fax machines. You can configure the qualified gateways to support use of Analog Devices in the Lync Server environment. After you do this, Analog Devices use Lync Server to make and receive calls, and Lync Server makes routing decisions and logs calls in call detail records (CDRs) for Analog Devices, in a similar manner as for any other device.

➢ **To configure the Analog Device and associate it with the device:**

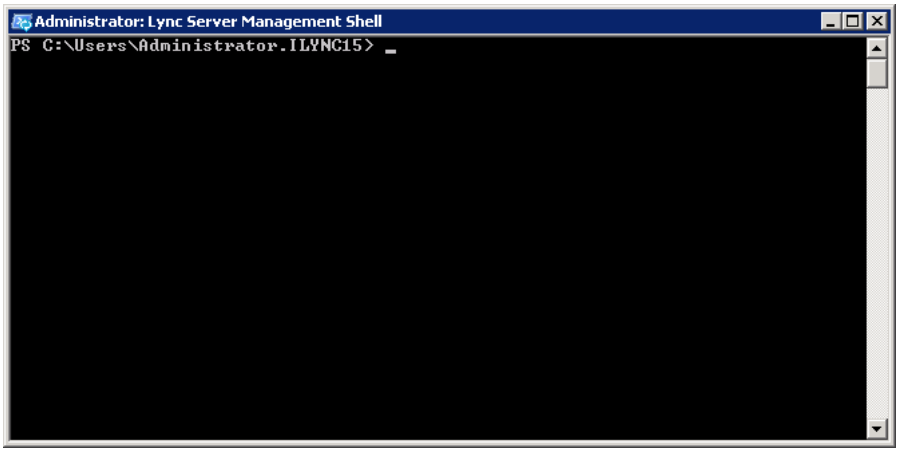
1. In Lync Server 2013, start the Lync Server Management Shell (point to the Windows **Start** menu, click **All Programs**, and then click **Lync Server Management Shell**).

Figure B-14: Starting the Lync Server Management Shell



The following screen is displayed:

Figure B-15: Management Shell CLI



2. To create a new instance of an Analog Device that you can manage with Lync Server, use the **`New-CsAnalogDevice`** cmdlet.
3. Below are two examples for the Analog Device (FAX and Analog Phone):

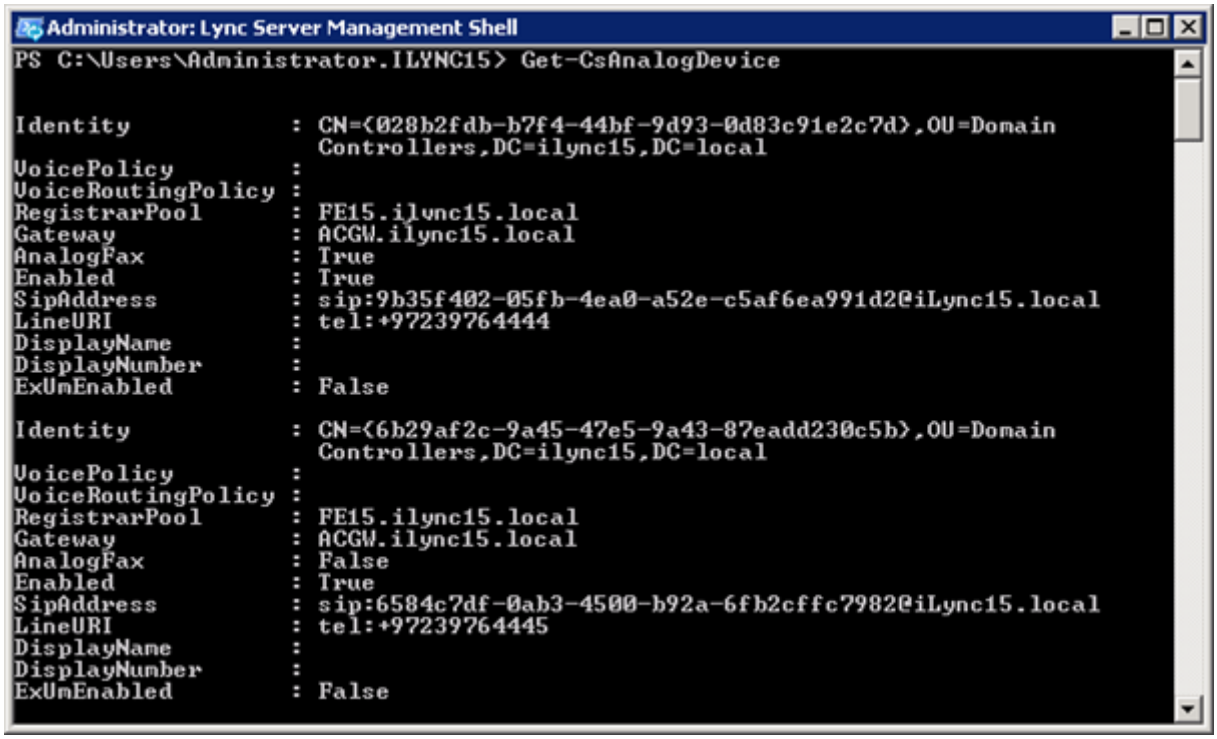
```
New-CsAnalogDevice -LineUri tel:+97239764444 -DisplayName
"Floor3-FAX" –RegistrarPool FE15.ilync15.local -AnalogFax
$True -Gateway ACGW.ilync15.local -OU "OU=Domain
Controllers,DC=ilync15,DC=local"

New-CsAnalogDevice -LineUri tel:+97239764445 -DisplayName
"Floor3-Phone" –RegistrarPool FE15.ilync15.local -AnalogFax
$False -Gateway ACGW.ilync15.local -OU "OU=Domain
Controllers,DC=ilync15,DC=local"
```

The above commands create a new Analog Device with the phone number (LineUri) +97239764444 and +97239764445 respectively. The phone number must be specified using E.164 format. In addition to the 'LineUri' parameter, the other parameters used in this cmdlet are as follows:

- **DisplayName:** Specifies the AD DS display name of the device.
- **RegistrarPool:** Specifies the Registrar pool.
- **AnalogFax:** If set to $False, specifies that this is a phone and not a fax machine.
- **Gateway:** Specifies the IP address or FQDN of the PSTN Gateway. In our example scenario, the SBC entity serves the Analog Devices (i.e., ACGW.ilync15.local).
- **OU:** Specifies the distinguished name (DN) of the AD DS organizational unit (OU) where the contact object for the device should be created.

4. To obtain information about the configured Analog Devices in the Lync Server, use the **`Get-CsAnalogDevice`** cmdlet.

Figure B-16: View Analog Devices Information



Configuration Note

www.audiocodes.com