

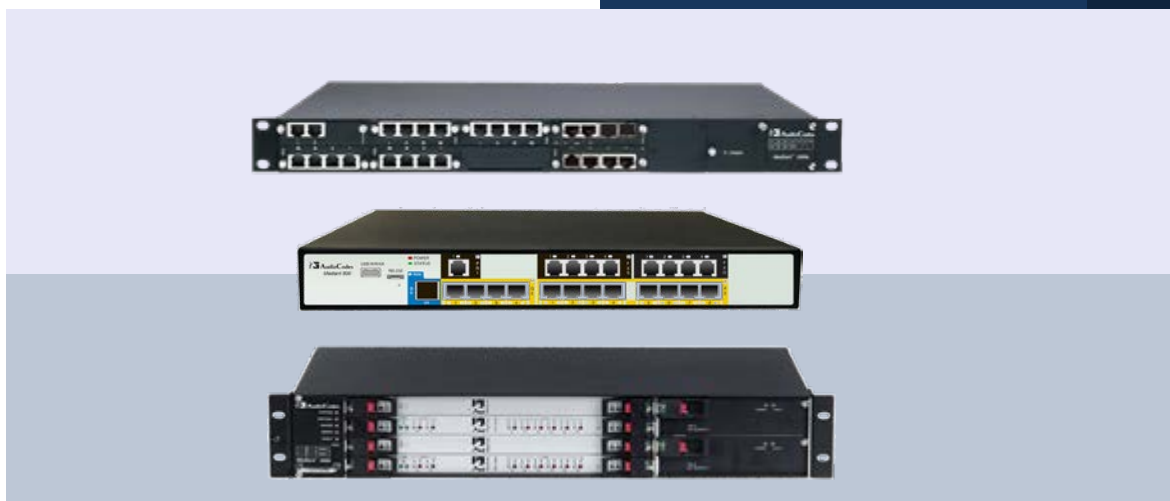
Microsoft® Lync™ Server 2013

Enhanced Gateway

Mediant Gateway family

## Configuration Note

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



**Microsoft Partner**

Gold Communications



April 2015

Document #: LTRT-40146



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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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Date Published: April-12-2015

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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

LTRT	Description
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*.

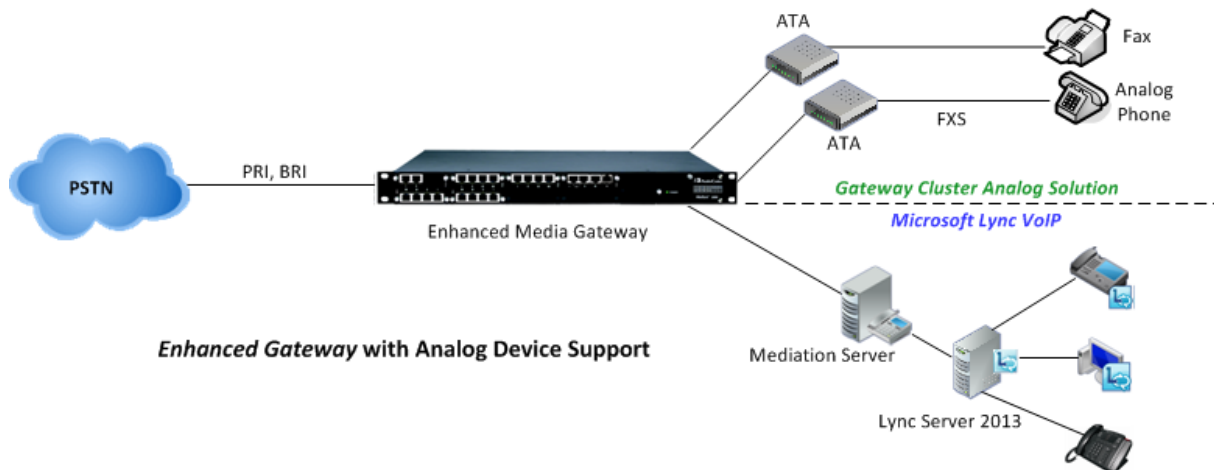
**Note:**

- 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

<b>GW Vendor</b>	AudioCodes
<b>Models</b>	<ul style="list-style-type: none"><li>▪ Mediant 800 Gateway &amp; E-SBC</li><li>▪ Mediant 1000B Gateway &amp; E-SBC</li><li>▪ Mediant 3000 Gateway &amp; E-SBC</li></ul>
<b>Software Version</b>	SIP_ 6.80A.258.002 or later
<b>Protocol</b>	<ul style="list-style-type: none"><li>▪ PRI /BRI (to PSTN)</li><li>▪ SIP/TCP or TLS (to Lync Server)</li><li>▪ SIP/UDP or TCP (to ATA)</li></ul>
<b>Additional Notes</b>	None

### 2.2 Microsoft Lync Server 2013

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

### 2.3 AudioCodes ATA

<b>GW Vendor</b>	AudioCodes
<b>Models</b>	<ul style="list-style-type: none"><li>▪ MediaPack MP-11x</li><li>▪ MediaPack MP-124</li></ul>
<b>Software Version</b>	SIP_6.60A.290.005 or later SIP_6.80A.248.003 or later
<b>Protocol</b>	<ul style="list-style-type: none"><li>▪ FXS (to Analog Devices)</li><li>▪ SIP/UDP or TCP (to AudioCodes <i>device</i>)</li></ul>
<b>Additional Notes</b>	None

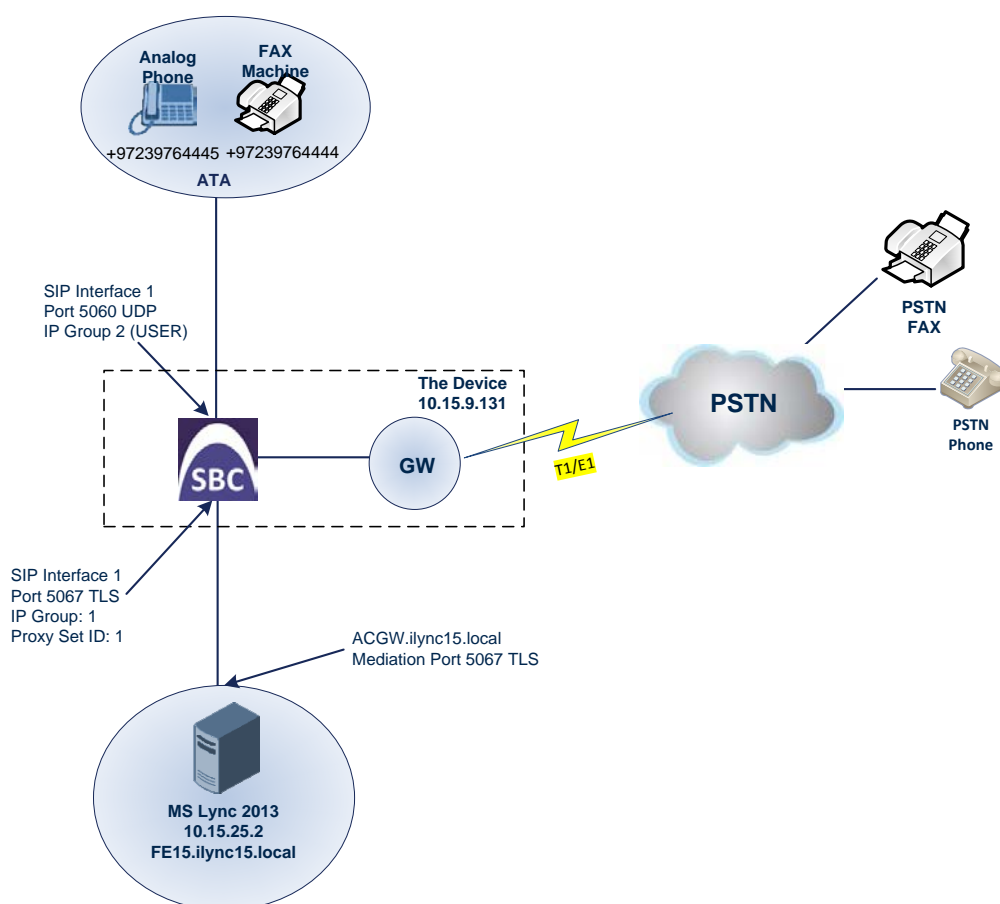
## 2.4 Deploying the Device (Topology)

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
<b>Network</b>	<ul style="list-style-type: none"> <li>The Microsoft Lync Server 2013 environment is located in the enterprise's LAN</li> <li>The ATA is also located in the enterprise's LAN</li> </ul>
<b>Signaling Transcoding</b>	<ul style="list-style-type: none"> <li>Microsoft Lync Server 2013 operates with SIP-over-TLS transport type</li> <li>ATA operates with SIP-over-UDP transport type</li> </ul>
<b>Codecs Transcoding</b>	<ul style="list-style-type: none"> <li>Microsoft Lync Server 2013 supports G.711A-law and G.711U-law coders</li> <li>The ATA supports G.711A-law, G.711U-law</li> </ul>
<b>Media Transcoding</b>	<ul style="list-style-type: none"> <li>Microsoft Lync Server 2013 operates with SRTP media type</li> <li>The ATA operates with RTP media type</li> </ul>

## 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	<ul style="list-style-type: none"><li>TP-6310 or TP-8410 blade in Slot 1: 10.1.10.10</li><li>TP-6310 or TP-8410 blade in Slot 3: 10.1.10.11 (HA mode)</li></ul>	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**

The image shows a web browser window titled "Web Login". It contains two input fields: "Username" with the text "Admin" and "Password" with masked characters (dots). Below the password field is a checkbox labeled "Remember Me" which is checked. To the right of the checkbox is a blue "Login" button.

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)**

Interface Table									
Add +			Edit			Delete			Show/Hide
Index	Application Type	Interface Mode	IP Address	Prefix Length	Default Gateway	Interface Name	Primary DNS	Secondary DNS	Underlying Device
0	OAMP + Media	IPv4 Manual	192.168.0.2	24	192.168.0.1	Voice	0.0.0.0	0.0.0.0	vlan 1

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**

Maintenance Actions	
<div>Reset Configuration</div> <div>Reset Board</div> <div>Burn To FLASH</div> <div>Graceful Option</div>	<div>Reset</div> <div>Yes</div> <div>No</div>
<div>LOCK / UNLOCK</div> <div>Lock</div> <div>Graceful Option</div> <div>Gateway Operational State</div>	<div>LOCK</div> <div>No</div> <div>UNLOCKED</div>
<div>Save Configuration</div> <div>Burn To FLASH</div>	<div>BURN</div>

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*).

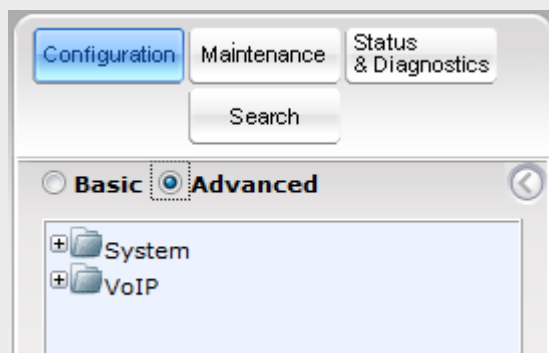
**Note:**

- 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:

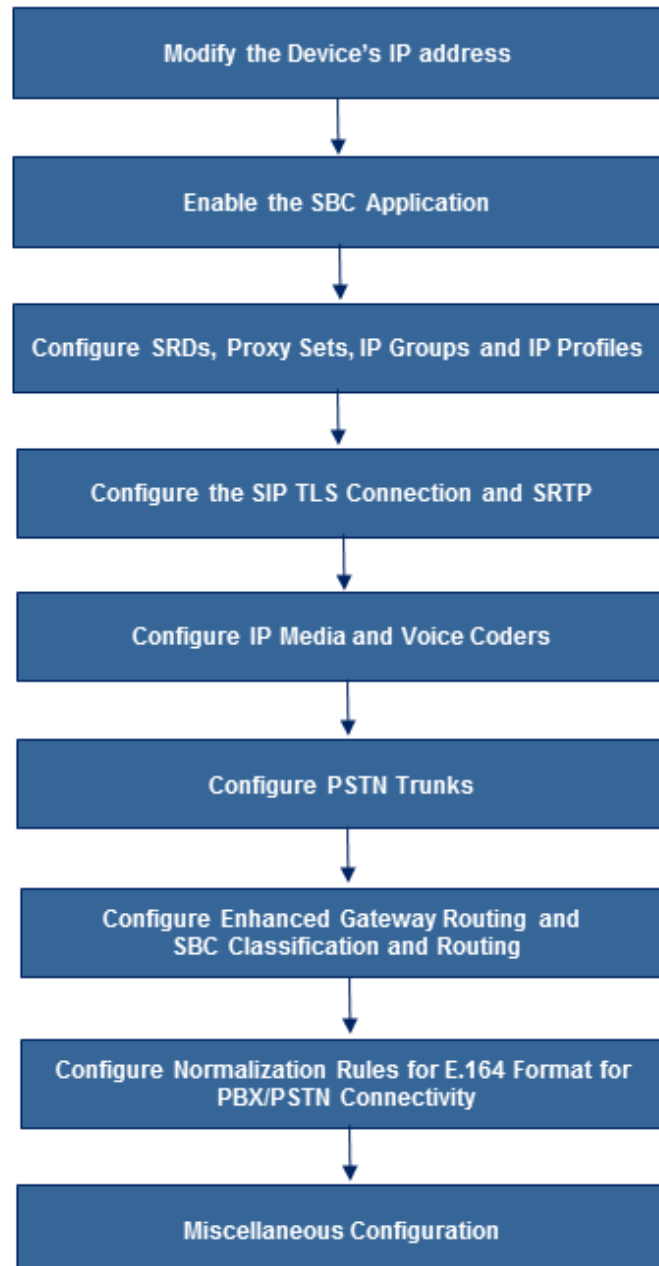


When the E-SBC is reset, the Web interface reverts to **Basic** display.

- 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**

Interface Table									
Add + Edit ✎ Delete 🗑			Show/Hide ☷						
Index ↑	Application Type	Interface Mode	IP Address	Prefix Length	Default Gateway	Interface Name	Primary DNS	Secondary DNS	Underlying Device
0	OAMP + Media +	IPv4 Manual	10.15.9.131	16	10.15.0.1	Voice	10.15.25.1	0.0.0.0	vlan 1
<div> <span>⏪</span> <span>⏩</span> <span>Page 1 of 1</span> <span>Show 10 records per page</span> <span>View 1 - 1 of 1</span> </div>									

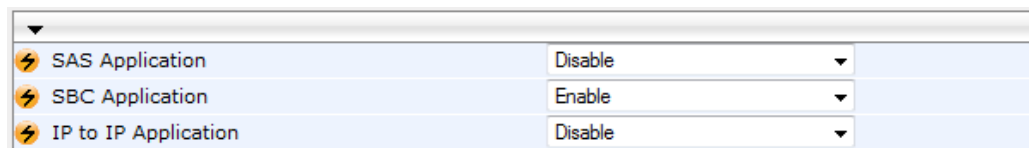
## 4.2 Step 2: Enable the SBC Application

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**



⚡ SAS Application	Disable	▼
⚡ SBC Application	Enable	▼
⚡ IP to IP Application	Disable	▼

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**

Edit Record #1	
Index	1
Media Realm Name	realm1
IPv4 Interface Name	Voice
IPv6 Interface Name	None
Port Range Start	6000
Number Of Media Session Legs	100
Port Range End	6990
Default Media Realm	No
QoS Profile	None
BW Profile	None
<input type="button" value="Submit"/> <input type="button" value="Cancel"/>	

- 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.

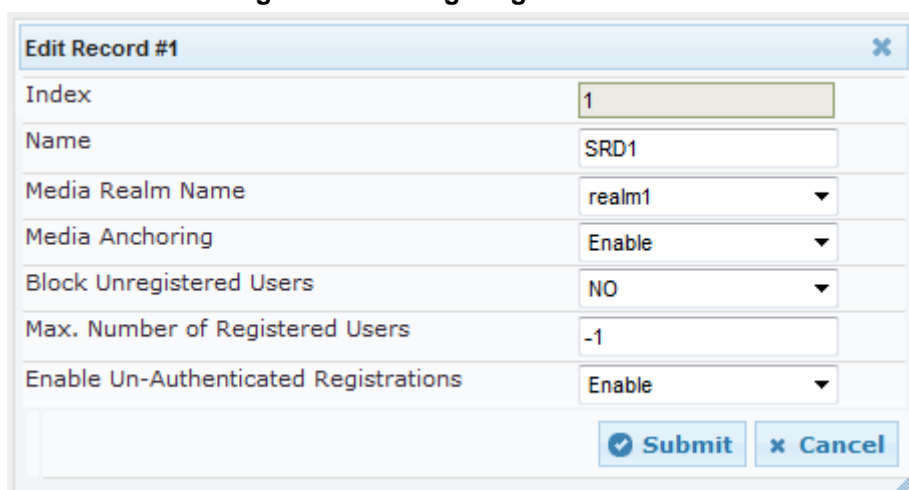
Note that this SRD will later be associated with IP Groups.

➤ **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**



Edit Record #1	
Index	1
Name	SRD1
Media Realm Name	realm1
Media Anchoring	Enable
Block Unregistered Users	NO
Max. Number of Registered Users	-1
Enable Un-Authenticated Registrations	Enable
<input type="button" value="Submit"/> <input type="button" value="Cancel"/>	

- 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**

The screenshot shows a web interface titled "SIP Interface Table". It has buttons for "Add +", "Edit", and "Delete". A "Show/Hide" button is in the top right. The table below has columns: Index, SIP Interface Name, Network Interface, Application Type, UDP Port, TCP Port, TLS Port, and SRD. The first row contains the values: 0, SBC, Voice, SBC, 5060, 0, 5067, and 1.

Index	SIP Interface Name	Network Interface	Application Type	UDP Port	TCP Port	TLS Port	SRD
0	SBC	Voice	SBC	5060	0	5067	1

## 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**

Proxy Set ID		1
	Proxy Address	Transport Type
1	FE15.ilync15.local:5067	TLS
2		
3		
4		
5		
6		
7		
8		
9		
10		

Proxy Name	
Enable Proxy Keep Alive	Using Options
Proxy Keep Alive Time	60
KeepAlive Failure responses	
DNS Resolve Method	Not Configured
Proxy Load Balancing Method	Disable
Is Proxy Hot Swap	Yes
Proxy Redundancy Mode	Homing
SRD Index	1

## 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

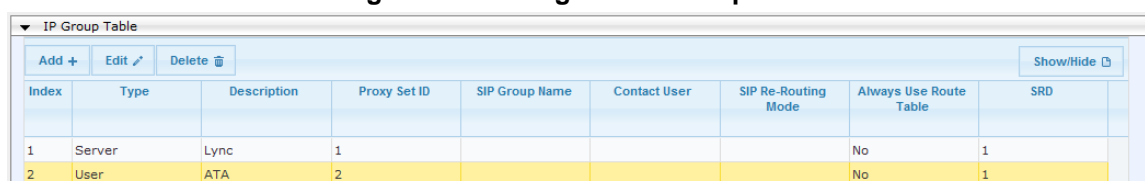
3. Add an IP Group for the Analog Devices:
  - a. Click **Add**.
  - b. Configure the parameters like this:

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**



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

## 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**

Common	GW	SBC
Index	1	
Profile Name	Microsoft Lync	
Profile Preference	1	
Dynamic Jitter Buffer Minimum Delay [msec]	10	
Dynamic Jitter Buffer Optimization Factor	10	
RTP IP DiffServ	46	
Signaling DiffServ	40	
Silence Suppression	Disable	
RTP Redundancy Depth	0	
Echo Canceler	Line	
Disconnect on Broken Connection	Yes	
Input Gain (-32 to 31 dB)	0	
Voice Volume (-32 to 31 dB)	0	
Media IP Version Preference	Only IPv4	
Symmetric MKI	Enable	
MKI Size	1	
Reset SRTP Upon Re-key	Enable	
Generate SRTP keys mode	Always	
Jitter Buffer Max Delay [msec]	300	
<input type="button" value="Submit"/> <input type="button" value="Cancel"/>		

- 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**

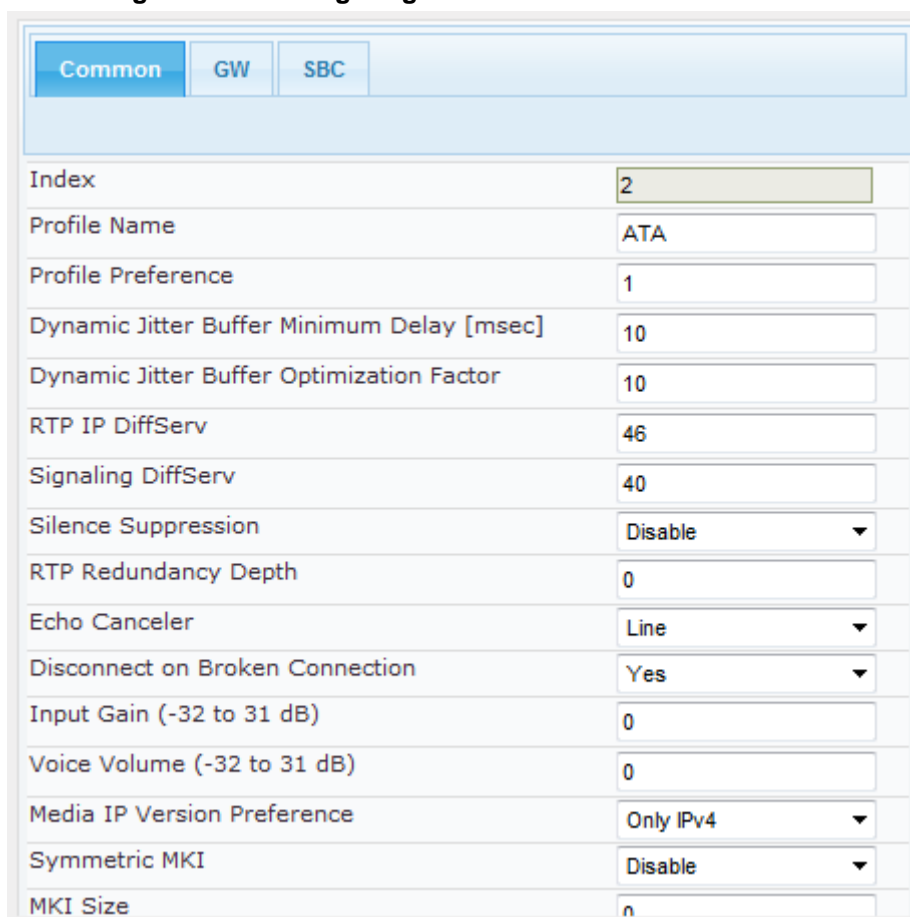
<div>Common</div> <div>GW</div> <div>SBC</div>	
Index	1
Extension Coders Group ID	None
Transcoding Mode	Only If Required
Allowed Media Types	
Allowed Coders Group ID	None
Allowed Video Coders Group ID	None
Allowed Coders Mode	Restriction
SBC Media Security Behavior	SRTP
RFC 2833 Behavior	As Is
Alternative DTMF Method	As Is
P-Asserted-Identity	As Is
Diversion Mode	As Is
History-Info Mode	As Is
Fax Coders Group ID	None
Fax Behavior	As Is
Fax Offer Mode	All coders
Fax Answer Mode	Single coder
PRACK Mode	Transparent
Session Expires Mode	Transparent
Remote Update Support	Supported Only After
Remote re-INVITE	Supported only with S
Remote Delayed Offer Support	Not Supported
Remote REFER Behavior	Handle Locally
Remote 3xx Behavior	Handle Locally
Remote Multiple 18x	Supported
Remote Early Media Response Type	Transparent
Remote Early Media	Supported
Enforce MKI Size	Enforce
Remote Early Media RTP Behavior	Delayed

➤ **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**



Parameter	Value
Index	2
Profile Name	ATA
Profile Preference	1
Dynamic Jitter Buffer Minimum Delay [msec]	10
Dynamic Jitter Buffer Optimization Factor	10
RTP IP DiffServ	46
Signaling DiffServ	40
Silence Suppression	Disable
RTP Redundancy Depth	0
Echo Canceled	Line
Disconnect on Broken Connection	Yes
Input Gain (-32 to 31 dB)	0
Voice Volume (-32 to 31 dB)	0
Media IP Version Preference	Only IPv4
Symmetric MKI	Disable
MKI Size	n

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**

Common    GW <b>SBC</b>	
Index	2
Extension Coders Group ID	None ▼
Transcoding Mode	Only If Required ▼
Allowed Media Types	
Allowed Coders Group ID	None ▼
Allowed Video Coders Group ID	None ▼
Allowed Coders Mode	Restriction ▼
SBC Media Security Behavior	RTP ▼
Remote RFC 3960 Gateway Model Support	Supported ▼

## 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.

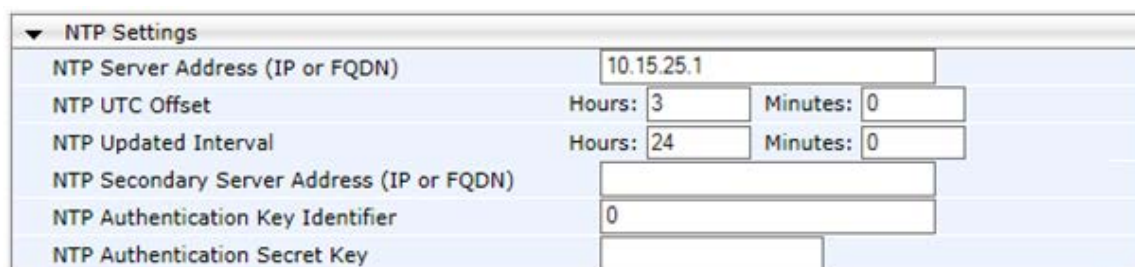
### 4.7.1 Configure the NTP Server Address

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**



NTP Settings	
NTP Server Address (IP or FQDN)	10.15.25.1
NTP UTC Offset	Hours: 3 Minutes: 0
NTP Updated Interval	Hours: 24 Minutes: 0
NTP Secondary Server Address (IP or FQDN)	
NTP Authentication Key Identifier	0
NTP Authentication Secret Key	

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.

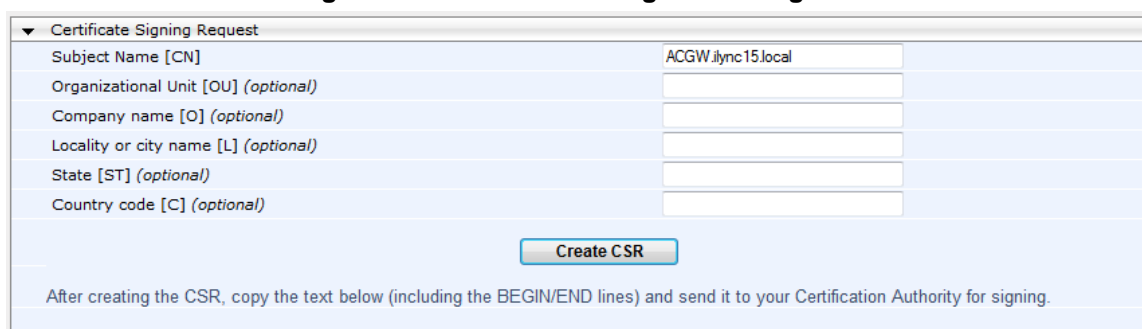
The procedure involves the following main steps:

- 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**

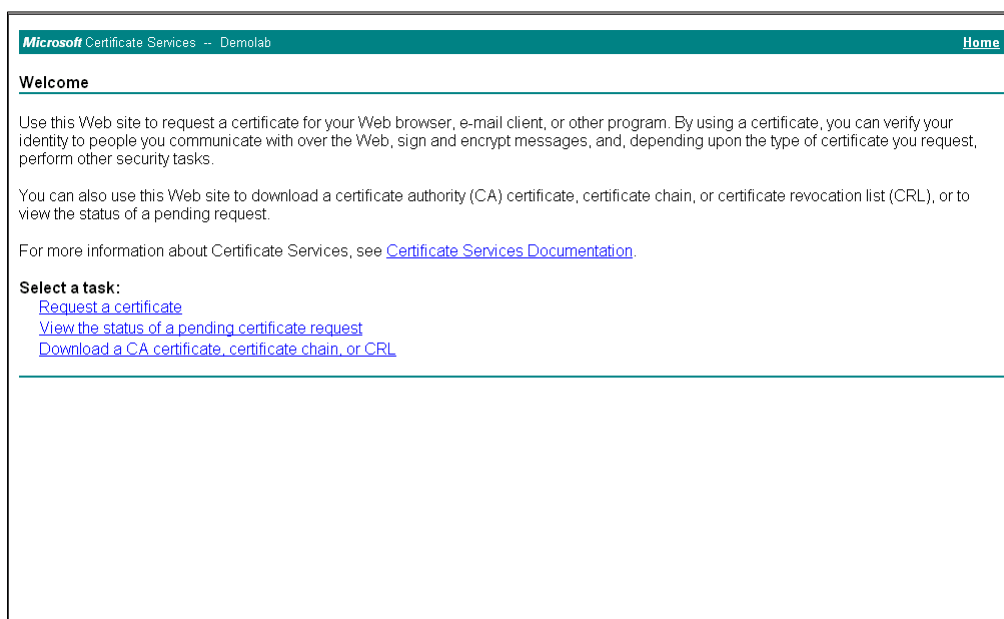



**Note:** The value entered in this field must be identical to the Gateway name configured in the Topology Builder for Lync Server 2013.

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

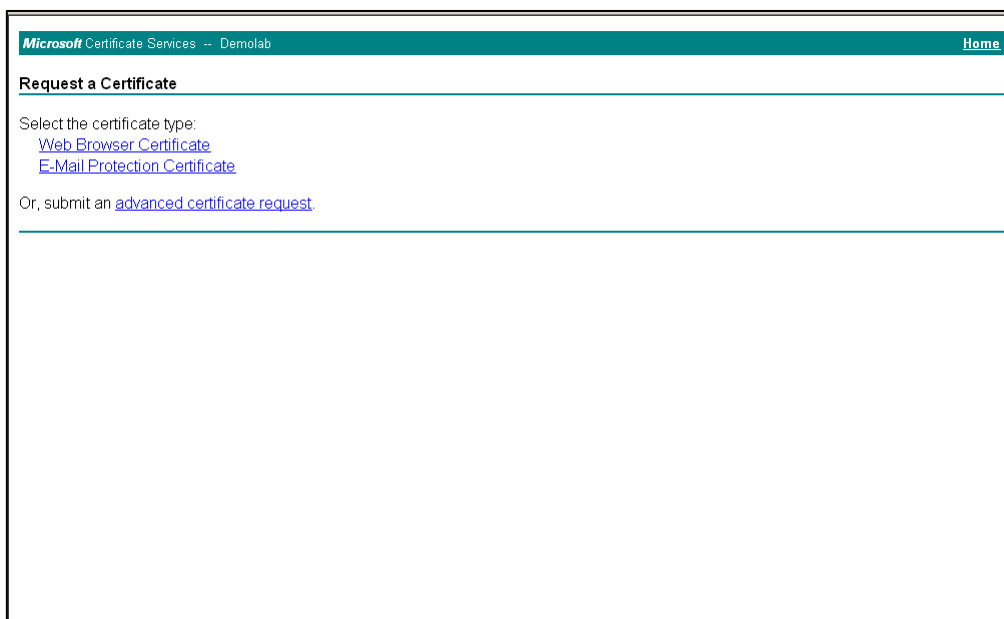
6. Open a Web browser and navigate to the Microsoft Certificates Services Web site at <http://<certificate server>/CertSrv>.

**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

Microsoft Certificate Services -- Demolab Home

### Advanced Certificate Request

The policy of the CA determines the types of certificates you can request. Click one of the following options to:

- [Create and submit a request to this CA.](#)
- [Submit a certificate request by using a base-64-encoded CMC or PKCS #10 file, or submit a renewal request by using a base-64-encoded PKCS #7 file.](#)

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

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

Microsoft Active Directory Certificate Services -- Lync-DC-LYNC-CA Home

### Submit a Certificate Request or Renewal Request

To submit a saved request to the CA, paste a base-64-encoded CMC or PKCS #10 certificate request or PKCS #7 renewal request generated by an external source (such as a Web server) in the Saved Request box.

**Saved Request:**

Base-64-encoded certificate request (CMC or PKCS #10 or PKCS #7):

```

A8jxeP85ymyfbknfx+zFusB8z8h4JgzbeNxvyKk1
rr4ootrnsPOCAvEAAaAAHA0GCSq0S1b3DQEBBAU
HnkHAAkx8xHq9gaAgoLEmuch2Bo2m4gEcOGAFT8ok
9fSm8c4Bj81b+R5+VI+Oet.57xT9DZXNg5Tp4G+OB
vnQwXOUUX6BwVBT71aO83HcA
-----END CERTIFICATE REQUEST-----

```

**Certificate Template:**

Web Server

**Additional Attributes:**

Attributes:


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

**Figure 4-19: Certificate Issued Page**

**Certificate Issued**

The certificate you requested was issued to you.

☐ DER encoded or ☒ Base 64 encoded


[Download certificate](#)  
[Download certificate chain](#)

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**

Microsoft Certificate Services -- Demolab
Home

**Download a CA Certificate, Certificate Chain, or CRL**

To trust certificates issued from this certification authority, [install this CA certificate chain](#).

To download a CA certificate, certificate chain, or CRL, select the certificate and encoding method.

**CA certificate:**

Current [Demolab]

**Encoding method:**

☒ DER  
☐ Base 64

[Download CA certificate](#)  
[Download CA certificate chain](#)  
[Download latest base CRL](#)

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:
- Scroll down to the **Upload certificate 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**

▼ Upload certificate files from your computer

Private key pass-phrase (optional)

Send **Private Key** file from your computer to the device.  
The file must be in either PEM or PFX (PKCS#12) format.

**Note: Replacing the private key is not recommended but if it's done, it should be over a physically-secure network link.**

Send **Device Certificate** file from your computer to the device.  
The file must be in textual PEM format.

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

**Figure 4-22: Importing Root Certificate into Trusted Certificates Store**

Import New Certificate

D:\backup\warehouse\c

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

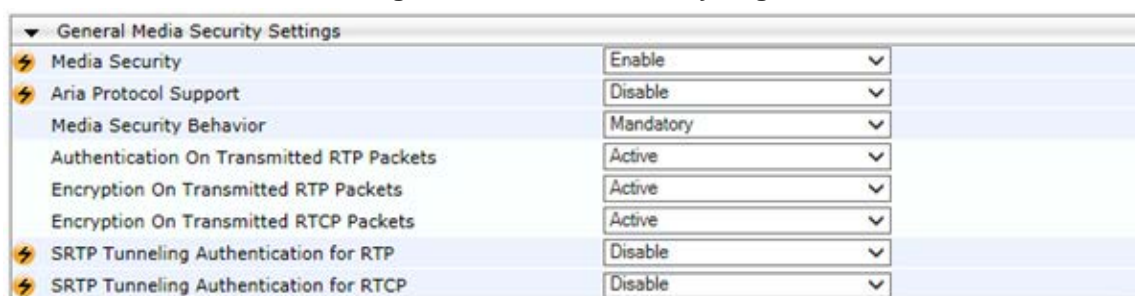
This step shows how to configure media security. If you configure the Microsoft Mediation Server to use Secure Real-Time Transport Protocol (SRTP), configure the device to do so as well.

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**



General Media Security Settings	
Media Security	Enable
Aria Protocol Support	Disable
Media Security Behavior	Mandatory
Authentication On Transmitted RTP Packets	Active
Encryption On Transmitted RTP Packets	Active
Encryption On Transmitted RTCP Packets	Active
SRTP Tunneling Authentication for RTP	Disable
SRTP Tunneling Authentication for RTCP	Disable

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**

Number of Media Channels	<input type="text" value="30"/>
Voice Streaming	<input type="text" value="Disable"/>
NetAnn Announcement ID	<input type="text" value="annc"/>
MSCML ID	<input type="text" value="ivr"/>
Transcoding ID	<input type="text" value="trans"/>

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).

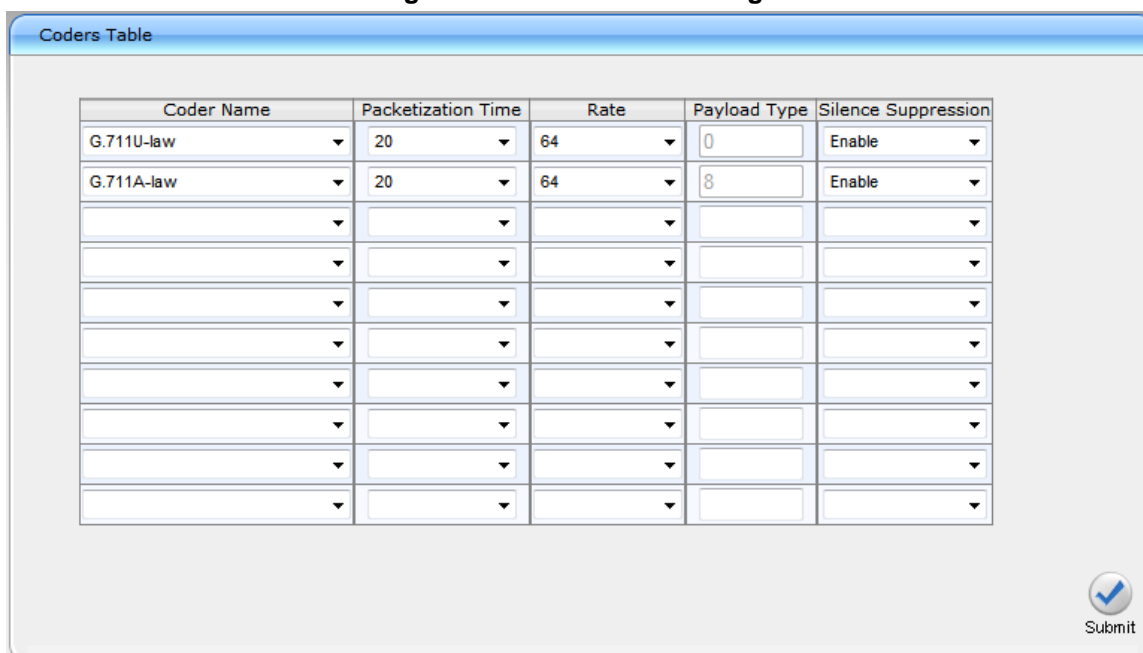
## 4.10 Step 10: Configure Voice Coders

The device communicates with the Mediation Server using G.711 A-law or G.711  $\mu$ -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**



Coder Name	Packetization Time	Rate	Payload Type	Silence Suppression
G.711U-law	20	64	0	Enable
G.711A-law	20	64	8	Enable

Submit

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**

Group Index	Module	From Trunk	To Trunk	Channels	Phone Number	Trunk Group ID	Tel Profile ID
1	Module 1 PRI	1	1	1-31	1000	1	
2							

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**.

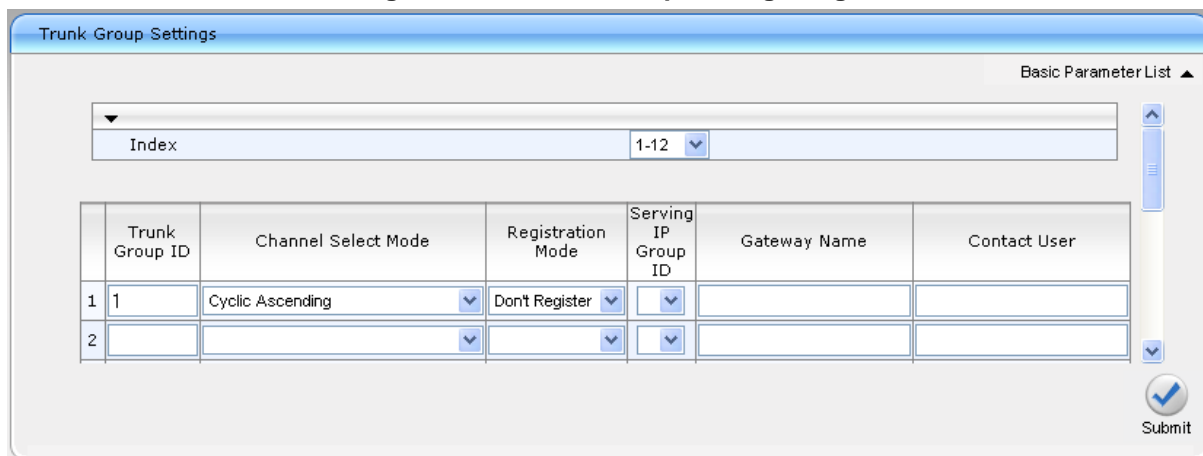
## 4.11.2 Configure the Channel Select Method

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**



Index	Trunk Group ID	Channel Select Mode	Registration Mode	Serving IP Group ID	Gateway Name	Contact User
1	1	Cyclic Ascending	Don't Register			
2						

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**

Basic Parameter List ▲	
PCM Law Select	MuLaw
TDM Bus Clock Source	Internal
TDM Bus PSTN Auto FallBack Clock	Disable
TDM Bus PSTN Auto Clock Reverting	Disable
Idle PCM Pattern	255
Idle ABCD Pattern	0x0F
TDM Bus Local Reference	1
TDM Bus Type	Framers

Submit

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.

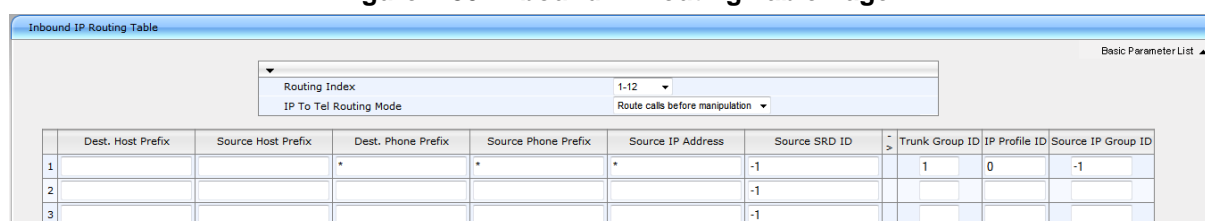
### 4.12.1 Configure IP-to-Trunk Group Routing

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**



	Dest. Host Prefix	Source Host Prefix	Dest. Phone Prefix	Source Phone Prefix	Source IP Address	Source SRD ID	Trunk Group ID	IP Profile ID	Source IP Group ID
1			*	*	*	-1	1	0	-1
2						-1			
3						-1			

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**

	Dest. Host Prefix	Src. Trunk Group ID	Dest. Phone Prefix	Source Phone Prefix	Dest. IP Address	Port	Transport Type	Dest. IP Group ID	Dest. SRD	IP Profile ID
1		1	*	*			Not Configured	1	-1	0
2							Not Configured	-1		

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.

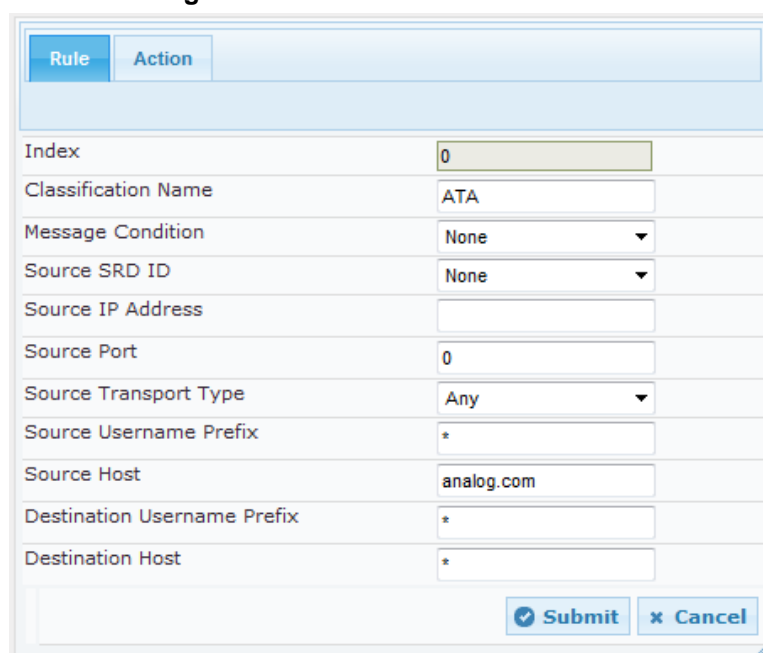
Note that this host name must also be configured on the ATA device (see Section A.8 on page 77).

#### ➤ 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



Rule	Action
Index	0
Classification Name	ATA
Message Condition	None
Source SRD ID	None
Source IP Address	
Source Port	0
Source Transport Type	Any
Source Username Prefix	*
Source Host	analog.com
Destination Username Prefix	*
Destination Host	*



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**

The screenshot shows a configuration window titled "Classification - Action Tab". It has two tabs: "Rule" and "Action", with "Action" being the active tab. The window contains three input fields: "Index" with the value "0", "Action Type" with a dropdown menu showing "Allow", and "Source IP Group ID" with a dropdown menu showing "2". At the bottom right, there are two buttons: "Submit" (with a checkmark icon) and "Cancel" (with an 'x' icon).

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										
<div> Add + Insert + Edit ✎ Delete 🗑 Up ↑ Down ↓ Show/Hide ☐ </div>										
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 Registration	*	*	*	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**.

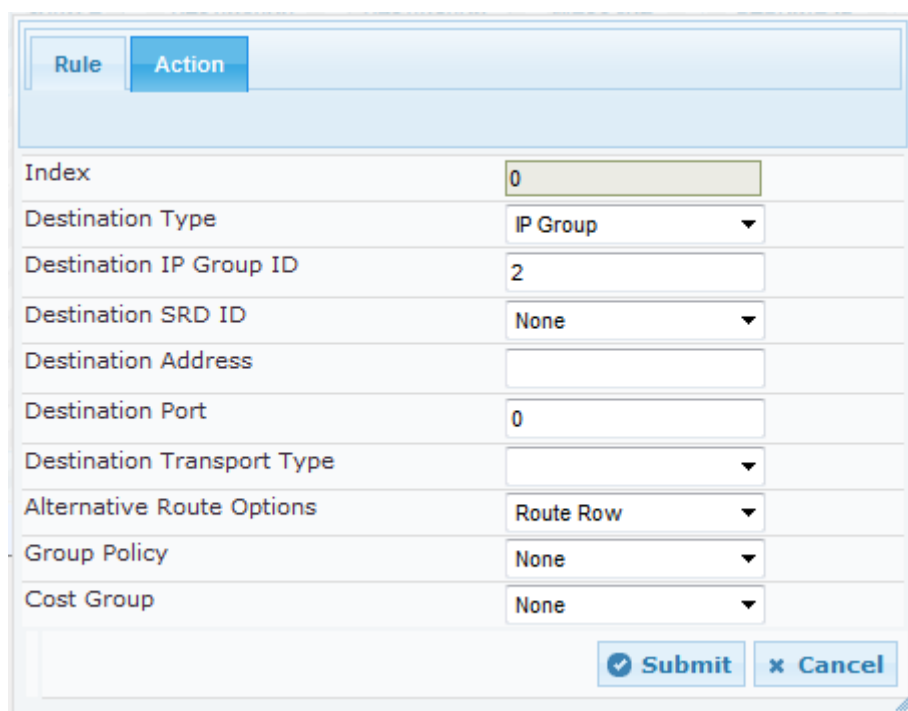
**Figure 4-35: Configuring IP-to-IP Routing Rule for Terminating SIP Registration from ATA – Rule Tab**

Parameter	Value
Index	0
Route Name	ATA Registration
Source IP Group ID	2
Source Username Prefix	*
Source Host	*
Destination Username Prefix	*
Destination Host	*
Request Type	REGISTER
Message Condition	None
ReRoute IP Group ID	-1
Call Trigger	Any
Call Setup Rules Set ID	-1

- 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**



Field	Value
Index	0
Destination Type	IP Group
Destination IP Group ID	2
Destination SRD ID	None
Destination Address	
Destination Port	0
Destination Transport Type	
Alternative Route Options	Route Row
Group Policy	None
Cost Group	None

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**

The screenshot shows the 'Rule' tab of a configuration window. The 'Index' is 1. The 'Route Name' is 'OPTIONS Termination'. The 'Source IP Group ID' is 1. The 'Source Username Prefix' is \*. The 'Source Host' is \*. The 'Destination Username Prefix' is \*. The 'Destination Host' is \*. The 'Request Type' is 'OPTIONS'. The 'Message Condition' is 'None'. The 'ReRoute IP Group ID' is -1. The 'Call Trigger' is 'Any'. The 'Call Setup Rules Set ID' is -1. At the bottom right are 'Submit' and 'Cancel' buttons.

Index	1
Route Name	OPTIONS Termination
Source IP Group ID	1
Source Username Prefix	*
Source Host	*
Destination Username Prefix	*
Destination Host	*
Request Type	OPTIONS
Message Condition	None
ReRoute IP Group ID	-1
Call Trigger	Any
Call Setup Rules Set ID	-1

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**

The screenshot shows the 'Action' tab of the configuration window. The 'Index' is 1. The 'Destination Type' is 'Dest Address'. The 'Destination IP Group ID' is -1. The 'Destination SRD ID' is 'None'. The 'Destination Address' is 'internal'. The 'Destination Port' is 0. The 'Destination Transport Type' is empty. The 'Alternative Route Options' is 'Route Row'. The 'Group Policy' is 'None'. The 'Cost Group' is 'None'. At the bottom right are 'Submit' and 'Cancel' buttons.

Index	1
Destination Type	Dest Address
Destination IP Group ID	-1
Destination SRD ID	None
Destination Address	internal
Destination Port	0
Destination Transport Type	
Alternative Route Options	Route Row
Group Policy	None
Cost Group	None

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**

Rule	Action
Index	2
Route Name	Lync to ATA
Source IP Group ID	1
Source Username Prefix	*
Source Host	*
Destination Username Prefix	+9723976444[4-5]
Destination Host	*
Request Type	All
Message Condition	None
ReRoute IP Group ID	-1
Call Trigger	Any
Call Setup Rules Set ID	-1
<input type="button" value="Submit"/> <input type="button" value="Cancel"/>	

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

Rule		Action	
Index	2		
Destination Type	IP Group		
Destination IP Group ID	2		
Destination SRD ID	None		
Destination Address			
Destination Port	0		
Destination Transport Type			
Alternative Route Options	Route Row		
Group Policy	None		
Cost Group	None		
		Submit	Cancel

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**

Rule	Action
Index	3
Route Name	Lync to PSTN
Source IP Group ID	1
Source Username Prefix	*
Source Host	*
Destination Username Prefix	*
Destination Host	*
Request Type	All
Message Condition	None
ReRoute IP Group ID	-1
Call Trigger	Any
Call Setup Rules Set ID	-1
<input type="button" value="Submit"/> <input type="button" value="Cancel"/>	

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

Rule	Action
Index	3
Destination Type	Gateway
Destination IP Group ID	-1
Destination SRD ID	None
Destination Address	
Destination Port	0
Destination Transport Type	
Alternative Route Options	Route Row
Group Policy	None
Cost Group	None
<input type="button" value="Submit"/> <input type="button" value="Cancel"/>	



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**

The screenshot shows a configuration window titled "Rule" and "Action". The "Rule" tab is selected. The window contains the following fields and values:

Index	4
Route Name	Any to lync
Source IP Group ID	-1
Source Username Prefix	*
Source Host	*
Destination Username Prefix	*
Destination Host	*
Request Type	All
Message Condition	None
ReRoute IP Group ID	-1
Call Trigger	Any
Call Setup Rules Set ID	-1

At the bottom right, there are two buttons: "Submit" (with a checkmark icon) and "Cancel" (with an 'x' icon).

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

Rule	Action
Index	4
Destination Type	IP Group ▼
Destination IP Group ID	1
Destination SRD ID	None ▼
Destination Address	
Destination Port	0
Destination Transport Type	▼
Alternative Route Options	Route Row ▼
Group Policy	None ▼
Cost Group	None ▼
<input type="button" value="✓ Submit"/> <input type="button" value="✕ Cancel"/>	

## 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**

Rule	Action
Index	0
Manipulation Name	
Destination Prefix	*
Source Prefix	*
Source IP Address	*
Source Host Prefix	*
Destination Host Prefix	*
Source IP Group ID	-1

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**

Rule	Action
Index	0
Manipulation Name	remove +
Destination Prefix	+
Source Prefix	*
Source IP Address	*
Source Host Prefix	*
Destination Host Prefix	*
Source IP Group ID	-1
<input type="button" value="Submit"/> <input type="button" value="Cancel"/>	

Rule	Action
Index	0
TON	
NPI	
Stripped Digits From Left	1
Stripped Digits From Right	0
Number of Digits to Leave	255
Prefix to Add	
Suffix to Add	
Presentation	
<input type="button" value="Submit"/> <input type="button" value="Cancel"/>	

### 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**

Rule	Action
Index	0
Manipulation Name	add +
Destination Prefix	*
Source Prefix	*
Source Trunk Group	-1
Destination IP Group	-1
<input type="button" value="Submit"/> <input type="button" value="Cancel"/>	

Rule	Action
Index	0
TON	
NPI	
Stripped Digits From Left	0
Stripped Digits From Right	0
Number of Digits to Leave	255
Prefix to Add	+
Suffix to Add	
Presentation	
<input type="button" value="Submit"/> <input type="button" value="Cancel"/>	



**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**

Proxy Set ID: 1		
	Proxy Address	Transport Type
1	FE15.ilync15.local:5067	TLS
2	FE2.ilync15.local:5067	TLS
3		
4		
5		
6		
7		
8		
9		
10		

Proxy Name	
Enable Proxy Keep Alive	Using Options
Proxy Keep Alive Time	60
KeepAlive Failure responses	503

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



Index	Release Cause
0	503 Service Unavailable

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

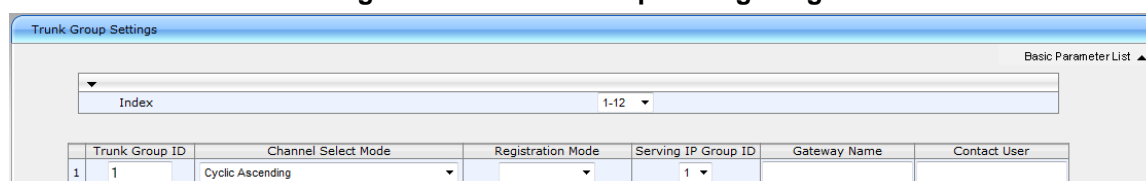
## 4.15.3 Configure Serving IP Group ID for Alternative Routing

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



Index	Trunk Group ID	Channel Select Mode	Registration Mode	Serving IP Group ID	Gateway Name	Contact User
1	1	Cyclic Ascending		1		

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

General	
IP Security	Secure Incoming calls
Filter Calls to IP	Don't Filter
Enable Digit Delivery to Tel	Disable
Enable Digit Delivery to IP	Disable
DID Wink	Disable
Delay Before DID Wink	0
Reanswer Time	0
PSTN Alert Timeout	180
QoS Statistics in Release Msg	Disable

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

General Settings	
Dynamic Jitter Buffer Minimum Delay	10
Dynamic Jitter Buffer Optimization Factor	10
RTP Redundancy Depth	0
Packing Factor	1
RFC 2833 TX Payload Type	96
RFC 2833 RX Payload Type	96
RFC 2198 Payload Type	104
Fax Bypass Payload Type	102
Modem Bypass Payload Type	103
Enable RFC 3389 CN Payload Type	Enable
Comfort Noise Generation Negotiation	Enable

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

IPMedia Settings	
IPMedia Detectors	Enable
Enable Answer Detector	Disable
Answer Detector Activity Delay	0
Answer Detector Silence Time	10
Answer Detector Redirection	0
Answer Detector Sensitivity	3
Enable AGC	Enable

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)**

▼ SIP General		
NAT IP Address	0.0.0.0	
PRACK Mode	Supported	▼
Channel Select Mode	Cyclic Ascending	▼
Enable Early Media	Enable	▼

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)**

Enable Contact Restriction	Disable	▼
Play Ringback Tone to IP	Don't Play	▼
Play Ringback Tone to Tel	Play Local Until Remote Media A	▼
Use Tgrp information	Disable	▼
Enable GRUU	Disable	▼
User-Agent Information		
SDP Session Owner	AudiocodesGW	
Play Busy Tone to Tel	Don't Play	▼
Subject		
Multiple Packetization Time Format	None	▼
Enable Semi-Attended Transfer	Disable	▼
3xx Behavior	Forward	▼
Enable P-Charging Vector	Disable	▼
Enable VoiceMail URI	Disable	▼

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**

Misc. Parameters	
Progress Indicator to IP	Not Configured
X-Channel Header	Disable
Early 183	Enable
SIP T.38 Version	Not Configured
Enable Busy Out	Disable
Graceful Busy Out Timeout [sec]	0
Default Release Cause	3

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

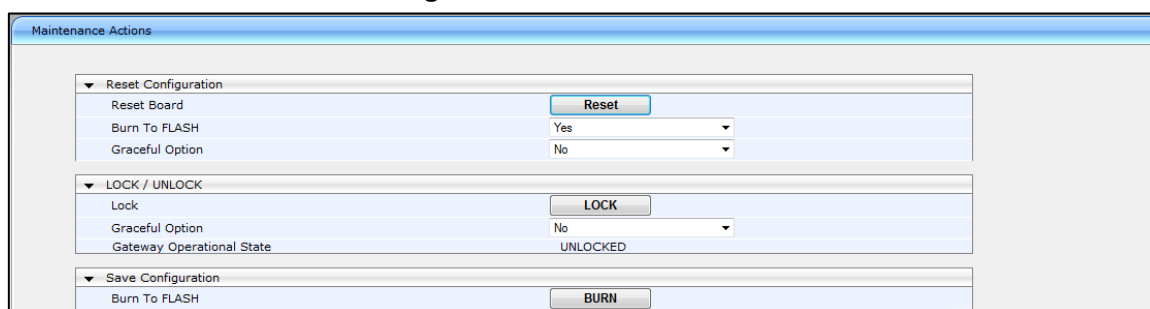
## 4.17 Step 17: Reset the Device

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**



The screenshot shows the 'Maintenance Actions' page with three main sections:

- Reset Configuration:** Includes 'Reset Board' with a 'Reset' button, 'Burn To FLASH' with a 'Yes' dropdown, and 'Graceful Option' with a 'No' dropdown.
- LOCK / UNLOCK:** Includes 'Lock' with a 'LOCK' button, 'Graceful Option' with a 'No' dropdown, and 'Gateway Operational State' with a 'UNLOCKED' status.
- Save Configuration:** Includes 'Burn To FLASH' with a 'BURN' button.



**Note:** Reset with BURN to FLASH is required.

This page is intentionally left blank.

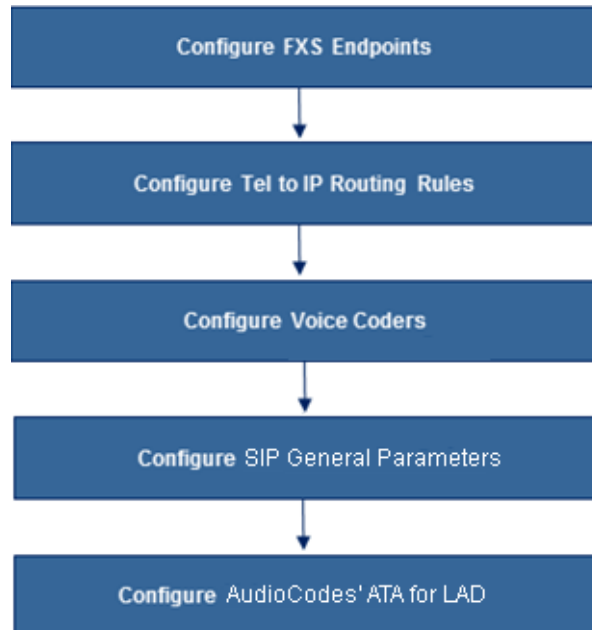
## A Configuring AudioCodes Analog Telephone Adapters (ATA)

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**



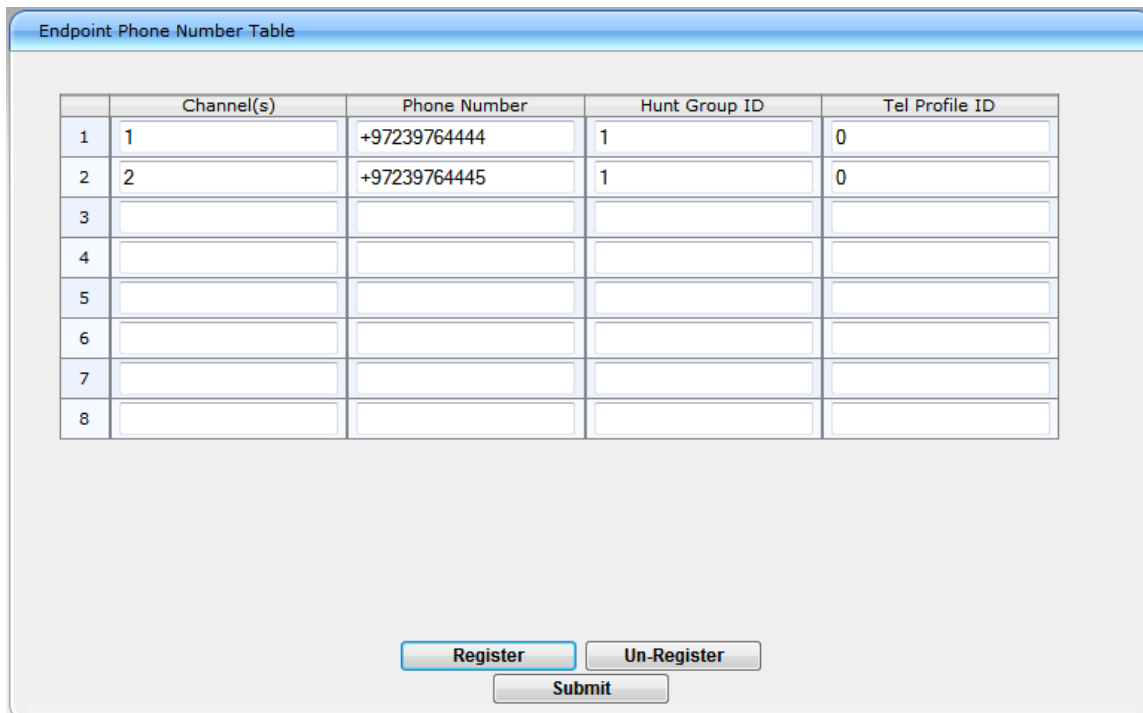
## A.1 Configure FXS Endpoints

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**



	Channel(s)	Phone Number	Hunt Group ID	Tel Profile ID
1	1	+97239764444	1	0
2	2	+97239764445	1	0
3				
4				
5				
6				
7				
8				

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**

Index	Hunt Group ID	Channel Select Mode	Registration Mode	Serving IP Group ID	Gateway Name	Contact List
1	1	By Dest Phone Number	Per Endpoint	1		
2						
3						
4						
5						
6						
7						
8						
9						

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**.

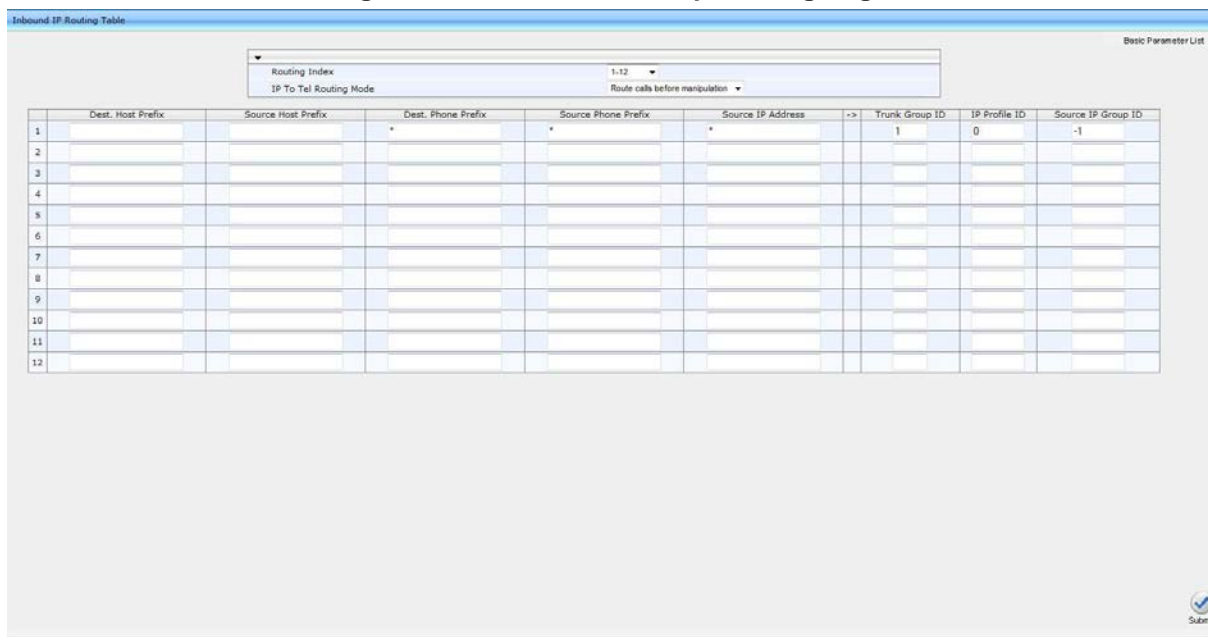
## A.3 Configure IP To Trunk Group Routing

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**



	Dest. Host Prefix	Source Host Prefix	Dest. Phone Prefix	Source Phone Prefix	Source IP Address	Trunk Group ID	IP Profile ID	Source IP Group ID
1			*	*	*	1	0	-1
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

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**

Proxy & Registration	
Use Default Proxy	Yes
Proxy Set Table	
Proxy Name	
Redundancy Mode	Parking
Proxy IP List Refresh Time	60
Enable Fallback to Routing Table	Disable
Prefer Routing Table	No
Use Routing Table for Host Names and Profiles	Disable
Always Use Proxy	Disable
Enable Registration	Enable
Registrar Name	
Registrar IP Address	
Registration Time	3600
Gateway Name	analog.com
Gateway Registration Name	
Subscription Mode	Per Endpoint
User Name	
Password	Default_Passwd

**Register** **Un-Register**  
**Submit**

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**

Default Proxy Sets Table

Proxy Set ID: 0

	Proxy Address	Transport Type
1	10.15.9.131:5060	UDP
2		
3		
4		
5		

Enable Proxy Keep Alive	Disable
Proxy Keep Alive Time	60
Proxy Load Balancing Method	Disable
Is Proxy Hot Swap	No

Submit

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**

Coder Name	Packetization Time	Rate	Payload Type	Silence Suppression
G.711A-law	20	64	8	Disabled
G.711U-law	20	64	0	Disabled

Submit

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**

SIP General Parameters		
Fax Signaling Method	No Fax	
Detect Fax on Answer Tone	Initiate T.38 on Preamble	
SIP Transport Type	UDP	
SIP UDP Local Port	5060	
SIP TCP Local Port	5060	
SIP TLS Local Port	5061	
Enable SIPS	Disable	
Enable TCP Connection Reuse	Enable	
TCP Timeout	0	
SIP Destination Port	5060	
Use user=phone in SIP URL	Yes	
Use user=phone in From Header	No	
Use Tel URI for Asserted Identity	Disable	
Tel to IP No Answer Timeout	180	
Enable Remote Party ID	Disable	
Add Number Plan and Type to RPI Header	Yes	
Enable History-Info Header	Disable	
Use Source Number as Display Name	No	
Use Display Name as Source Number	No	
Enable Contact Restriction	Disable	
Play Ringback Tone to IP	Don't Play	
Play Ringback Tone to Tel	Play Local Until Remote Media A	

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**

Registration Time Threshold	<input type="text" value="0"/>
Re-register On INVITE Failure	<input type="text" value="Disable"/>
ReRegister On Connection Failure	<input type="text" value="Disable"/>
Gateway Name	<input type="text" value="analog.com"/>
Gateway Registration Name	<input type="text"/>

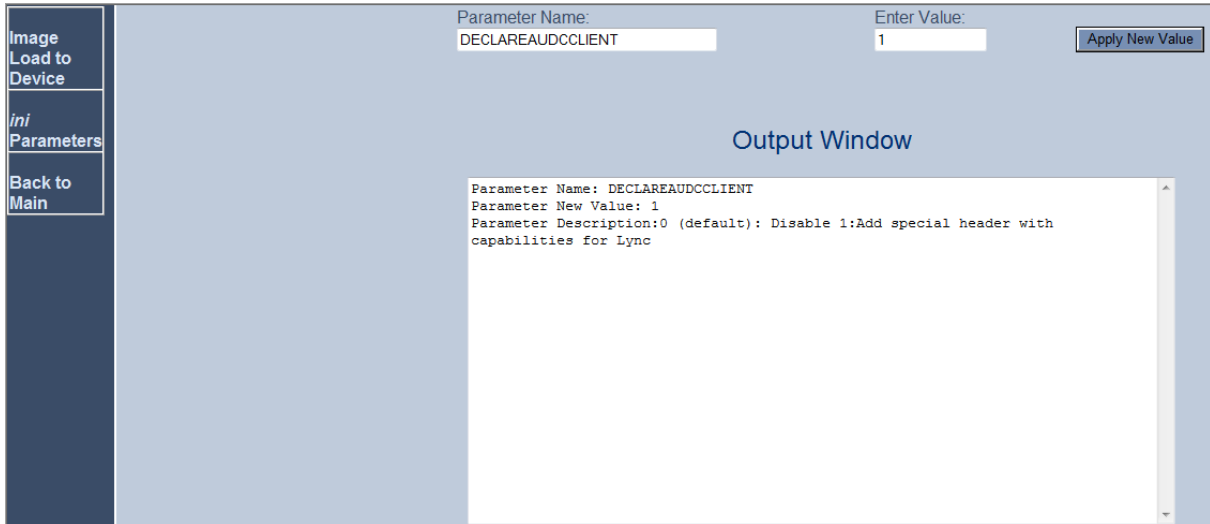
2. In the 'Gateway Name' field, enter an identifying name (e.g., **analog.com**).
3. Click **Submit** to apply your settings.

## 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.



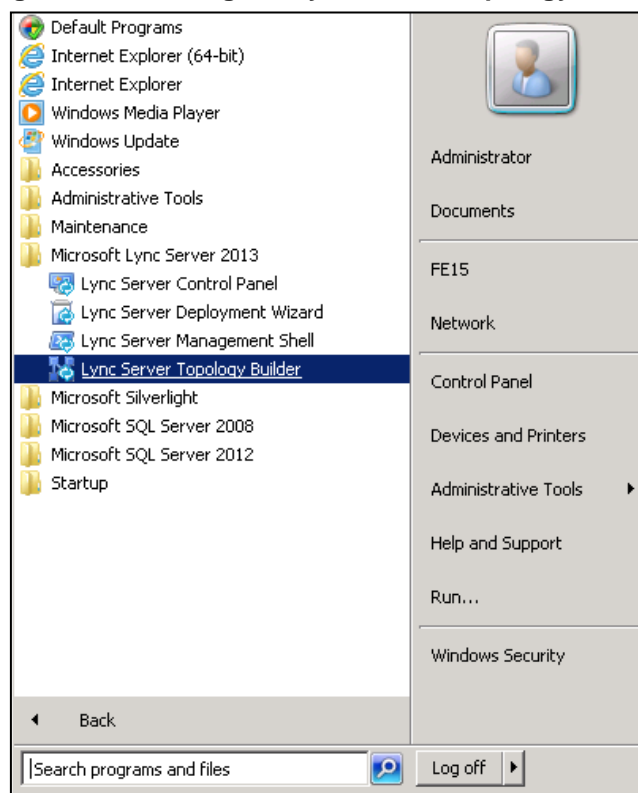
**Note:** Routes, Dial plans, voice policies, and PSTN usages are also needed for the deployment of VoIP in the enterprise, but they're beyond the scope of this document.

### 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.

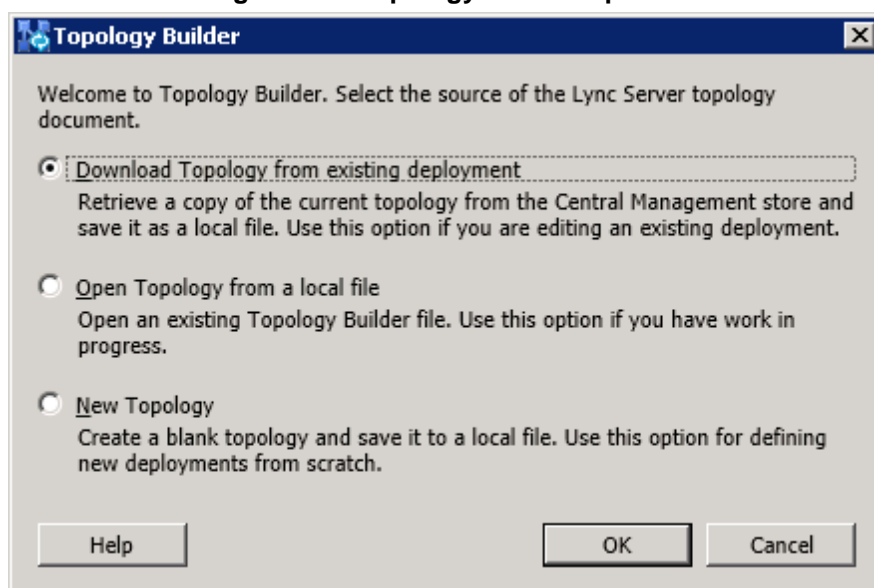
- **To configure the E-SBC as an IP/PSTN Gateway and associate it with the Mediation Server:**
- 1. On the server where the Topology Builder is installed, start the Lync Server 2013 Topology Builder (point to Windows **Start** menu, click **All Programs**, and then click **Lync Server Topology Builder**).

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



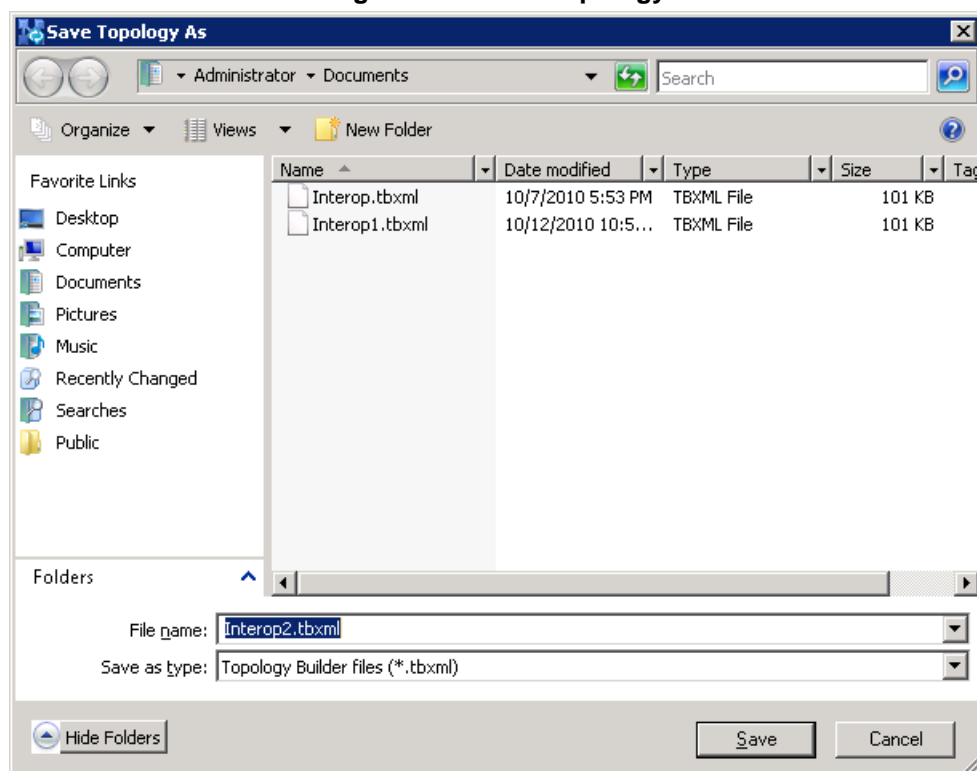
The following screen is displayed:

**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**

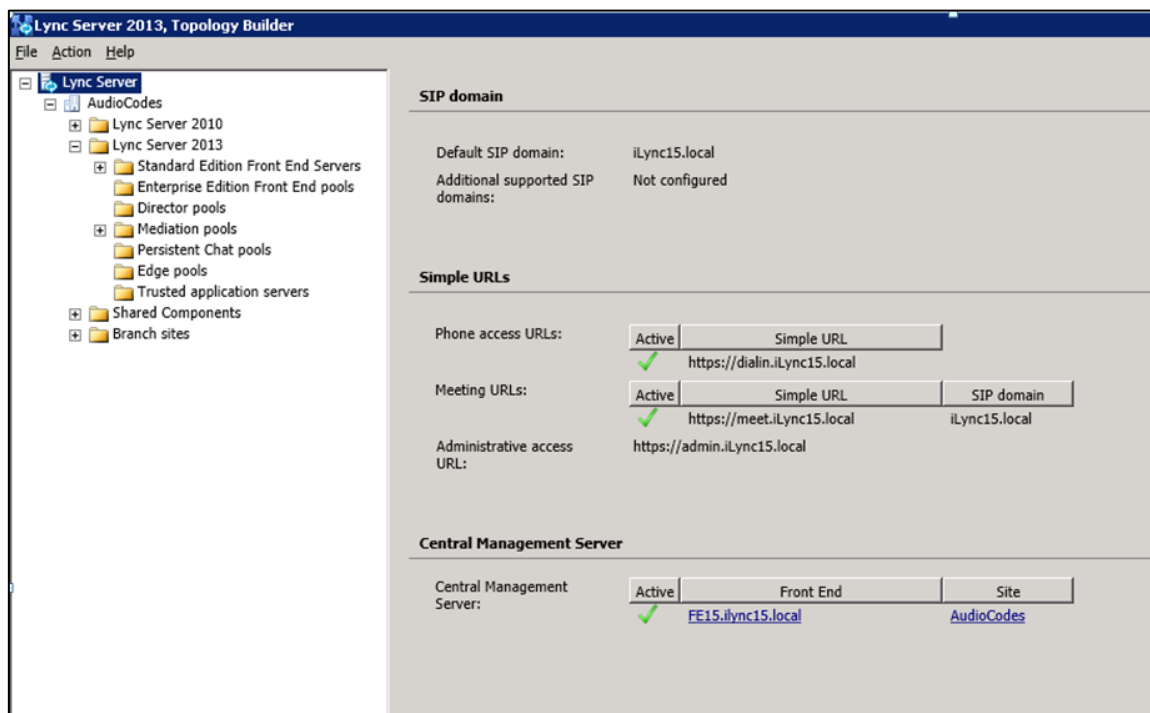


3. Enter a name for the topology file, and then click **Save**. This step lets you roll back from any changes you make during the installation.



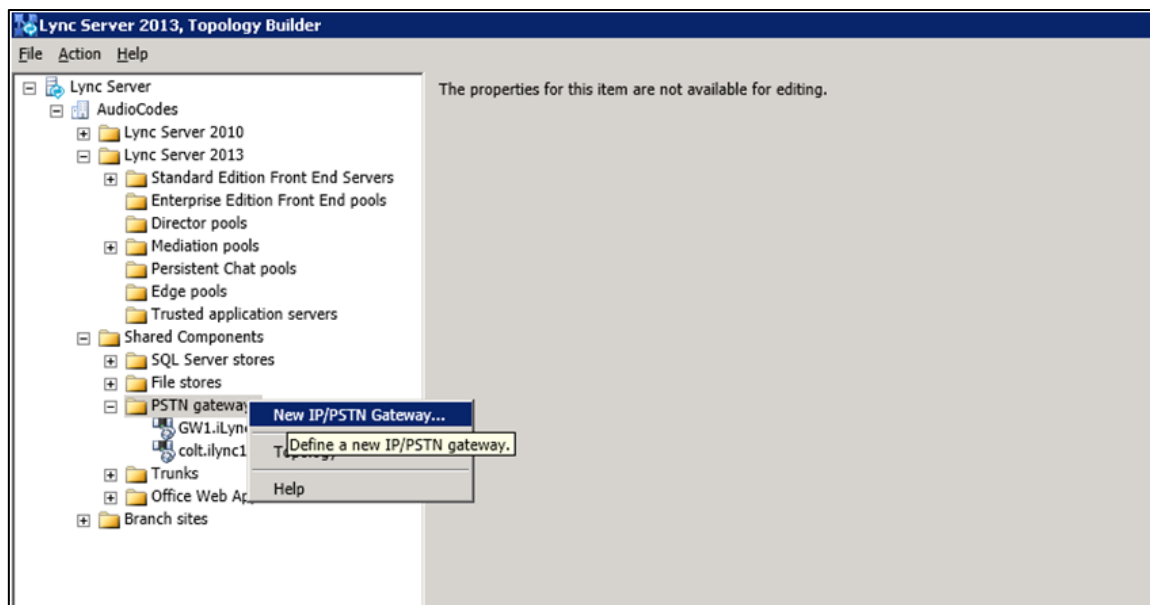
The Topology Builder screen with the downloaded topology is displayed:

**Figure B-4: Downloaded Topology**



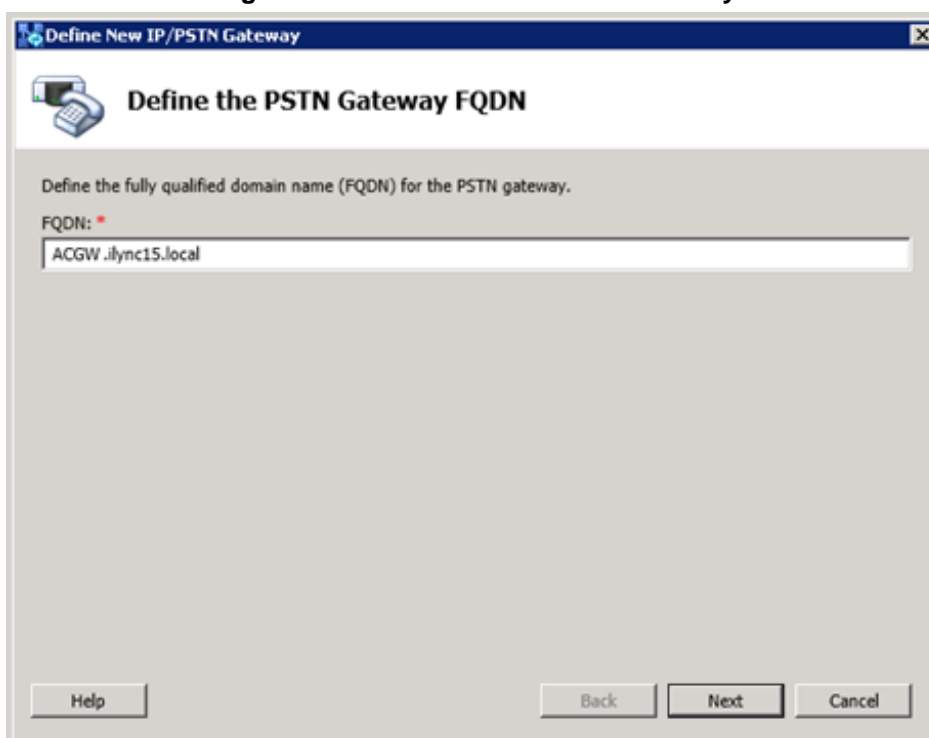
4. In the tree, select **Lync Server 2013 > Site name** (i.e., AudioCodes) > **Shared Components > PSTN Gateways**.
5. Right-click the **PSTN gateways** folder, and then in the pop-up, choose **New IP/PSTN Gateway** as shown below:

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



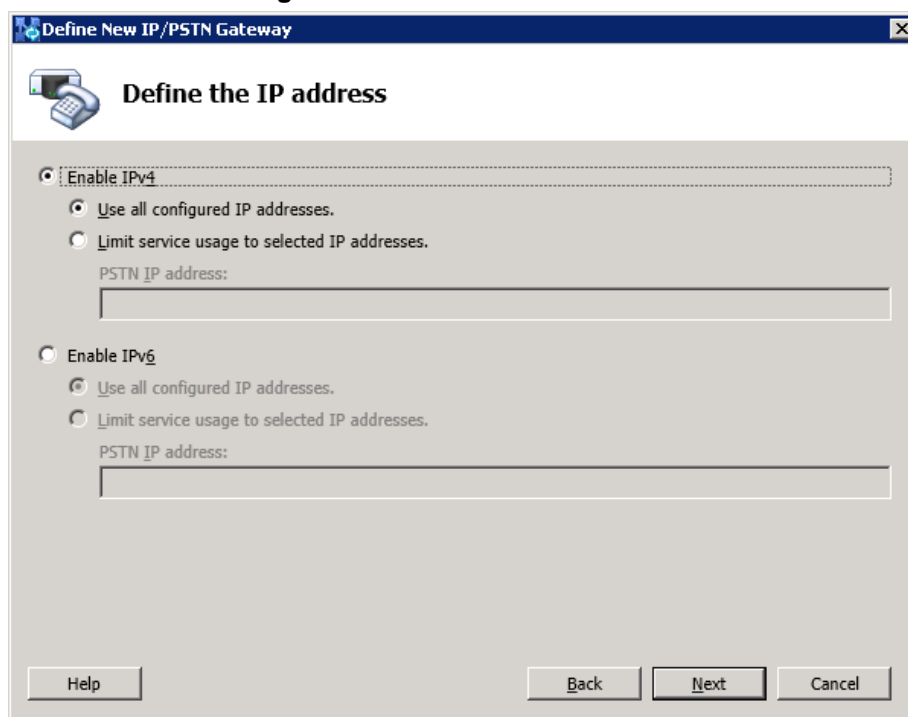
The following screen opens:

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



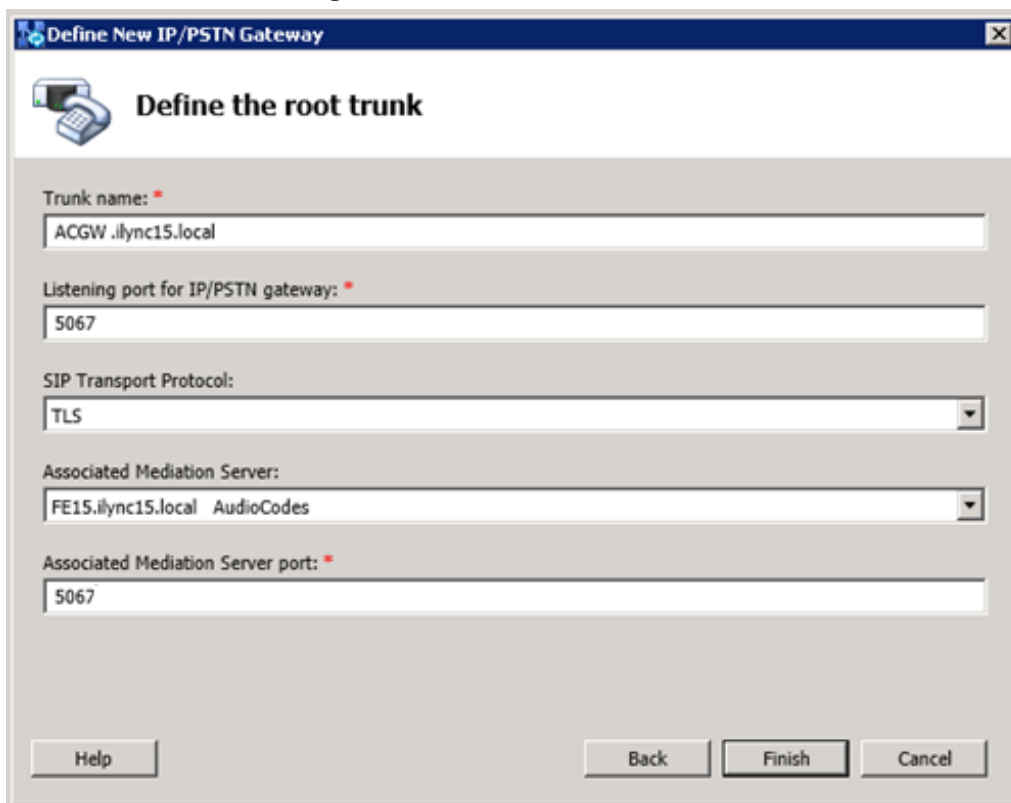
6. Enter the Fully Qualified Domain Name (FQDN) of the Device (i.e., "ACGW.ilync15.local"); this FQDN should be updated in the relevant DNS record; click **Next**; the 'Define the IP address' screen is displayed:

**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**



The screenshot shows a Windows-style dialog box titled "Define New IP/PSTN Gateway". Inside, there is a sub-header "Define the root trunk" with a telephone icon. The dialog contains several input fields and dropdown menus:

- Trunk name:** A text box containing "ACGW.ilync15.local".
- Listening port for IP/PSTN gateway:** A text box containing "5067".
- SIP Transport Protocol:** A dropdown menu with "TLS" selected.
- Associated Mediation Server:** A dropdown menu with "FE15.ilync15.local AudioCodes" selected.
- Associated Mediation Server port:** A text box containing "5067".

At the bottom of the dialog, there are four buttons: "Help", "Back", "Finish", and "Cancel".

# 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.

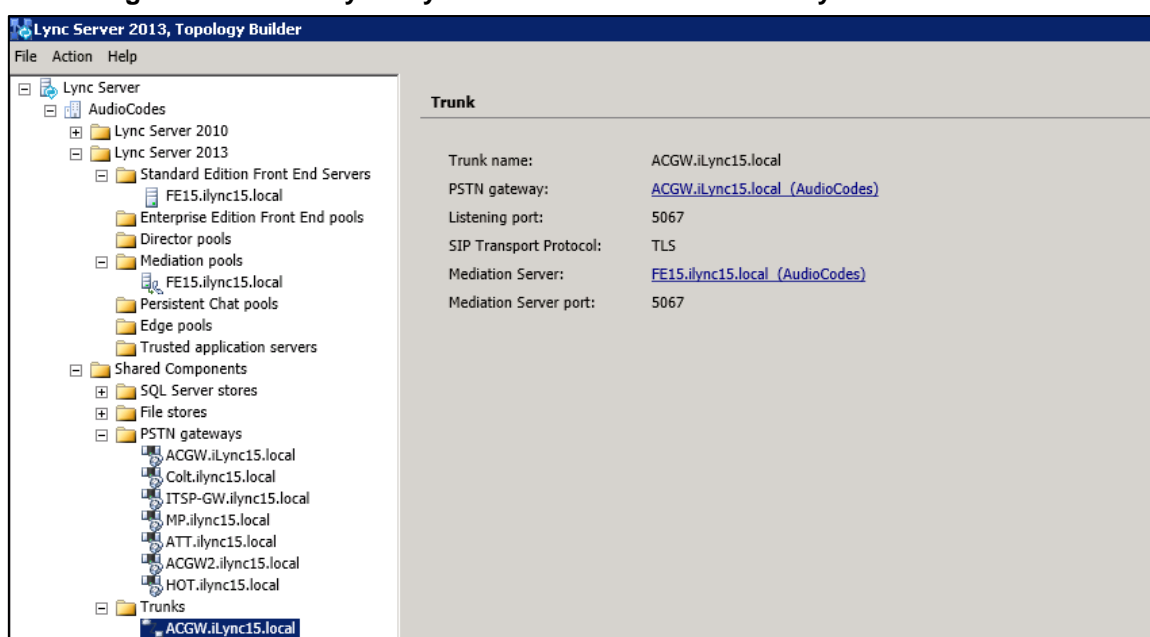
Note:

- 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**.

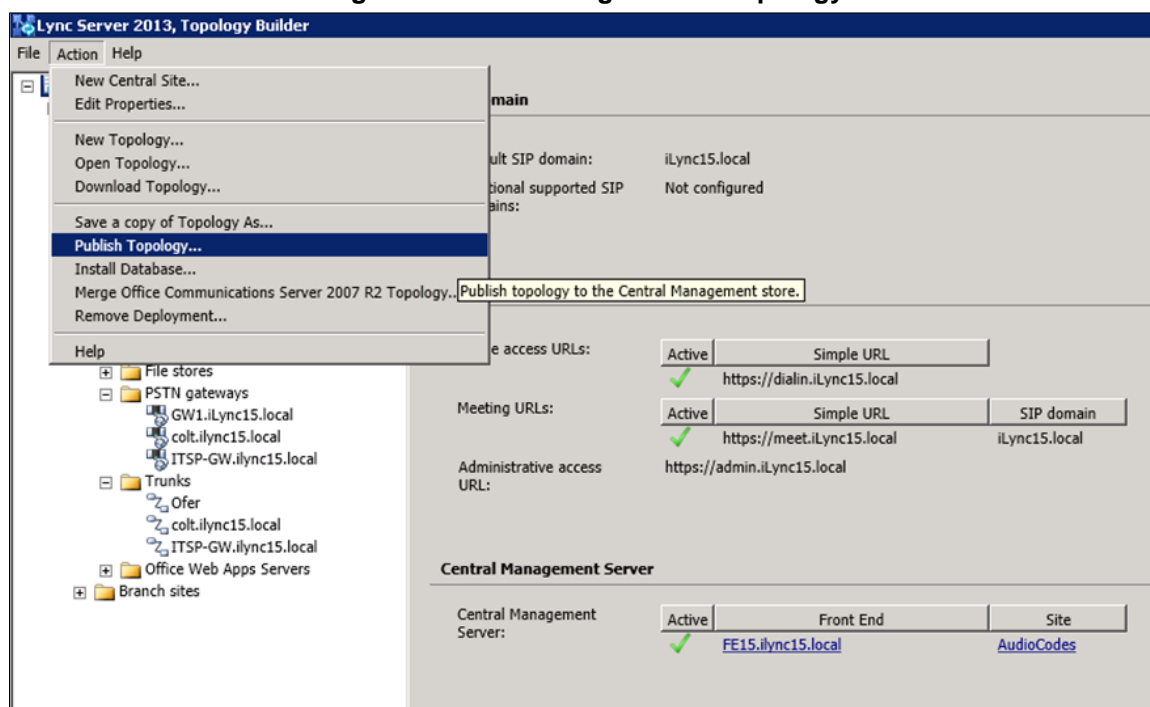
The Gateway is added as a PSTN Gateway and a trunk is created as shown below:

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



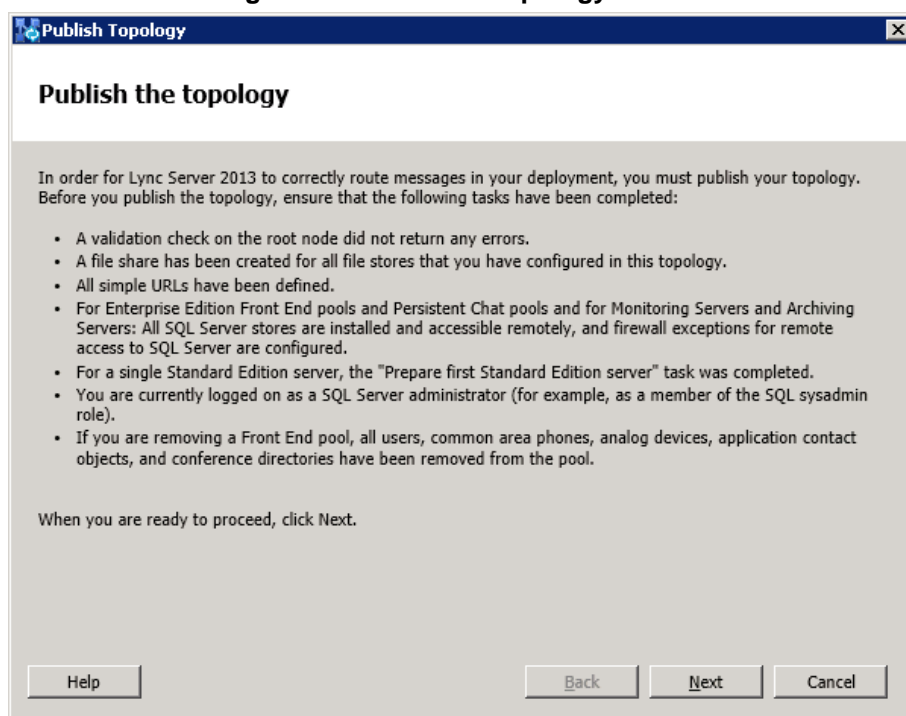
10. In the Navigation tree, select the root item **Lync Server** , and then in the Main Menu, choose **Action > Publish Topology**, as shown below:

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



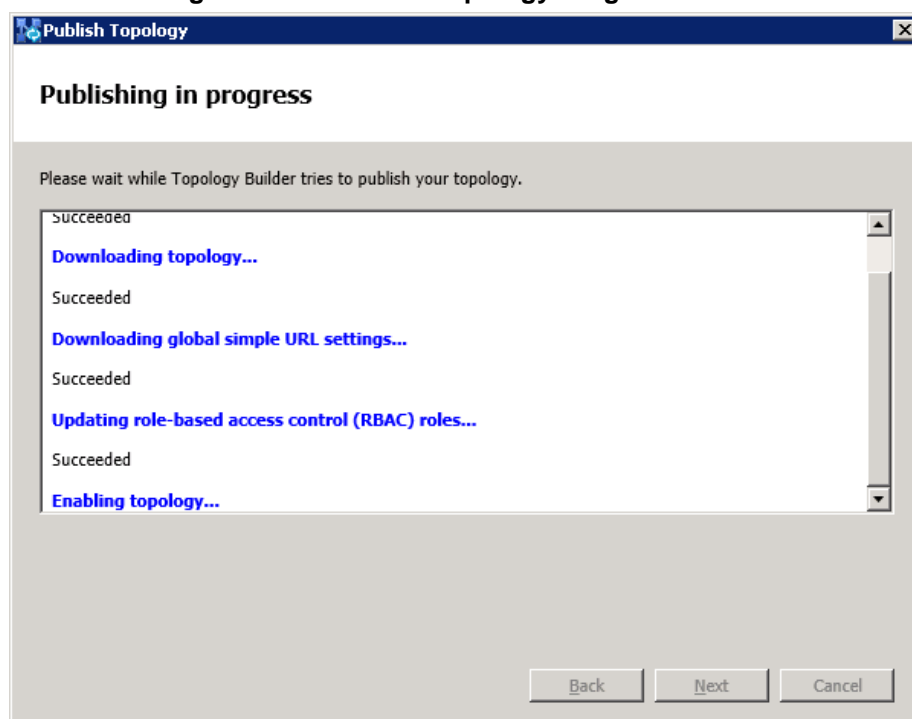
The Publish Topology screen is displayed:

**Figure B-11: Publish Topology Screen**



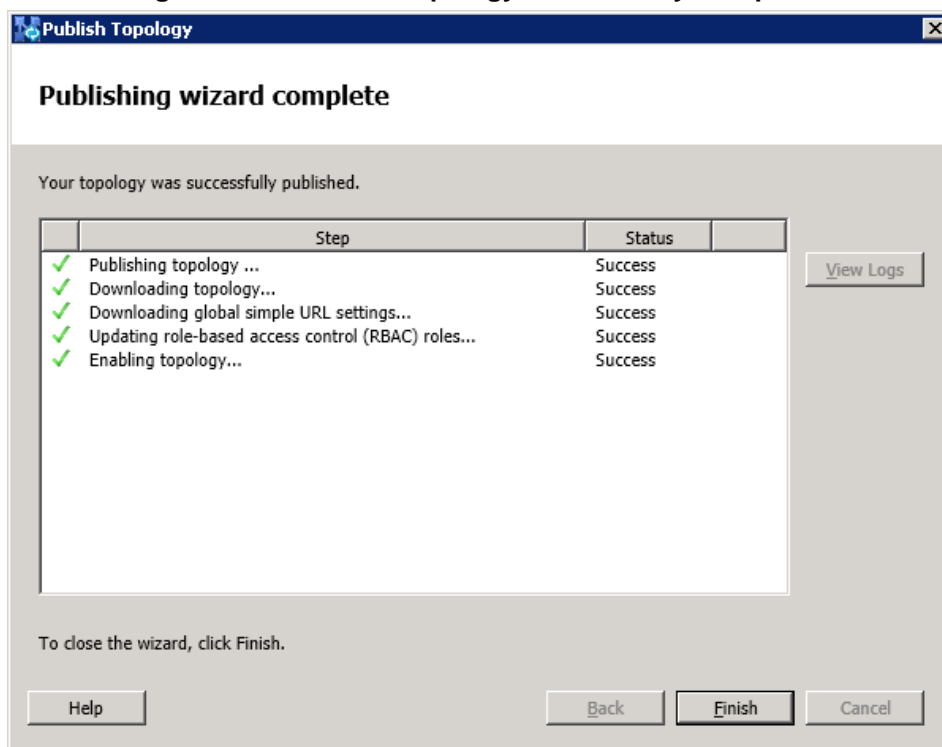
11. Click **Next**; the Topology Builder starts to publish your topology, as shown below:

**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**.

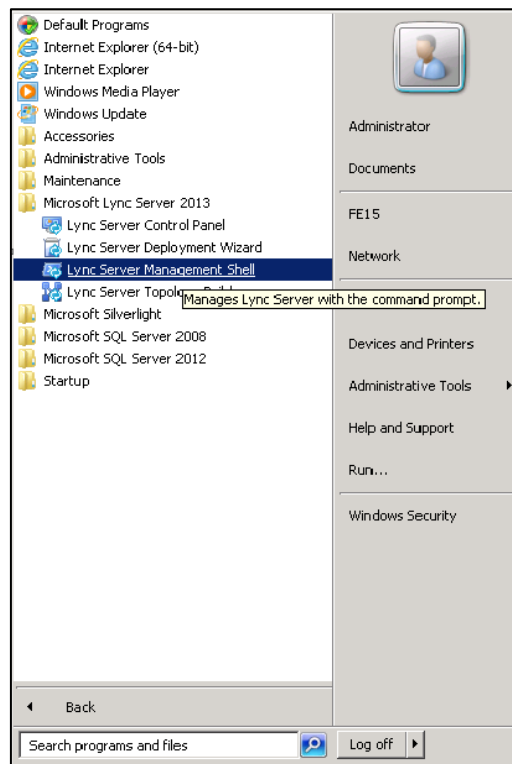
## B.2 Configure the Analog Device in the Lync Server Management Shell

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:**

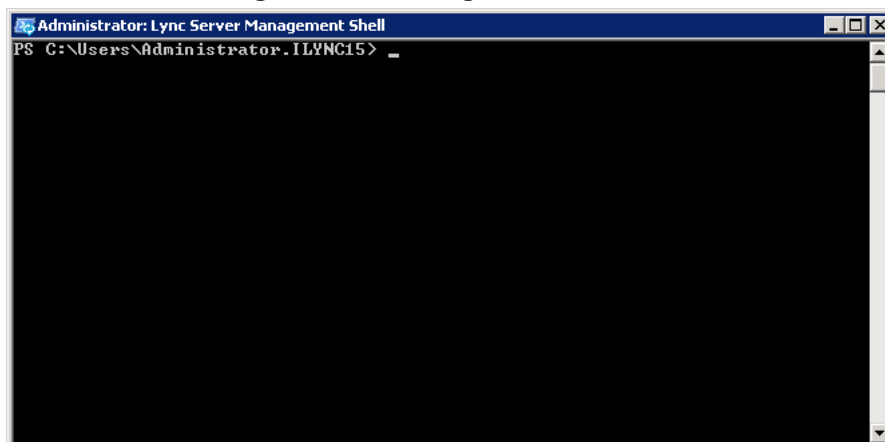
1. In Lync Server 2013, start the Lync Server Management Shell (point to the Windows **Start** menu, click **All Programs**, and then click **Lync Server Management Shell**).

**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):

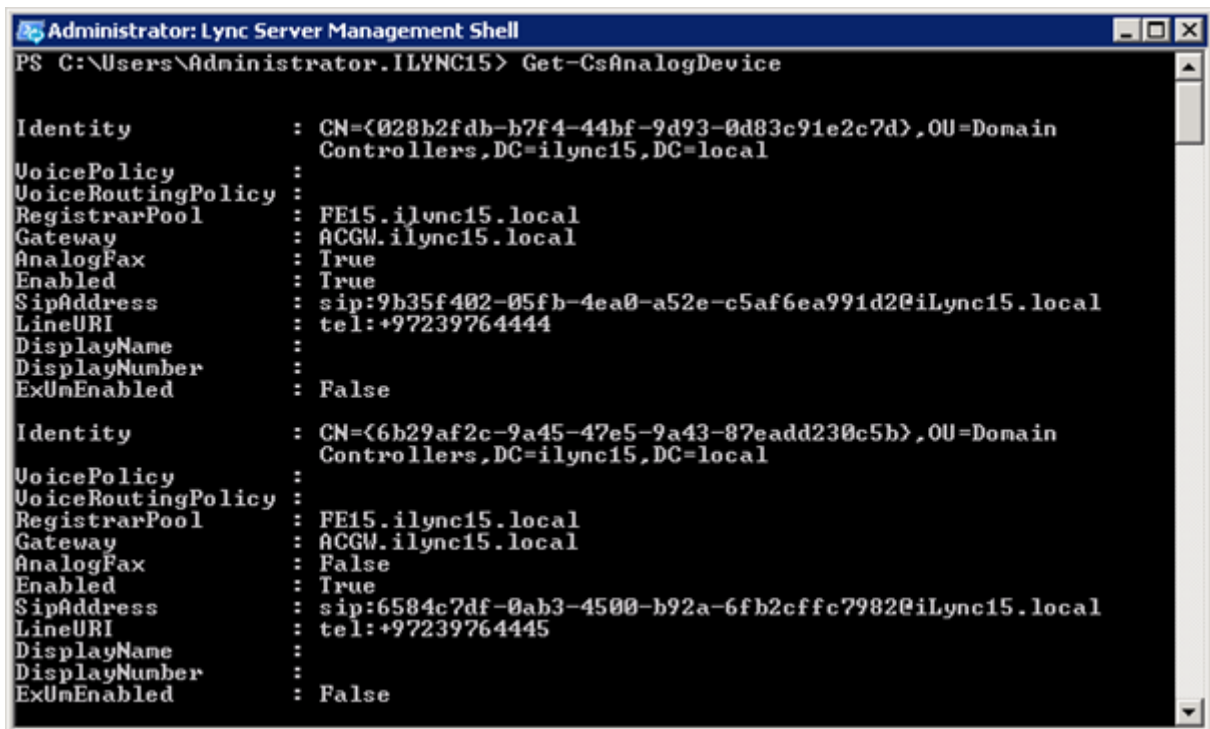
```
New-CsAnalogDevice -LineUri tel:+97239764444 -DisplayName
"Floor3-FAX" -RegistrarPool FE15.ilync15.local -AnalogFax
$True -Gateway ACGW.ilync15.local -OU "OU=Domain
Controllers,DC=ilync15,DC=local"
```

```
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