Installation & Maintenance Manual

Mediant 2600B

Survivable Branch Availability (SBA) for Microsoft Skype for Business

Version 7.0

Contents

Notice

This manual describes the installation and maintenance of AudioCodes Mediant 2600B Survivable Branch Appliance (SBA).

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Date Published:May-02-2016

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Abbreviations and Terminology

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

Throughout this manual and unless otherwise specified, the term *device* refers to the Mediant 2600B SBA.

Related Documentation

Manual Name
Mediant 2600B SBA Quick Guide
Mediant 2600B SBA Hardware Installation Manual

Notes and Warnings

Warning: The device is an INDOOR unit and thus, must be installed ONLY indoors. In addition, Ethernet port interface cabling must be routed only indoors and must not exit the building.

Avertissement: L'appareil est une unité d'INTERIEUR et doit donc obligatoirement être installé en intérieur. En outre, le câblage de l'interface du port Ethernet doit être acheminé uniquement en intérieur et ne doit pas sortir du bâtiment.

Warning: Installation of this device must be in a weather protected location of maximum ambient temperature of 40°C.

Avertissement: L'installation de cet appareil doit avoir lieu dans un local protégé des intempéries de température ambiante maximale de 40°C.

Warning: This device must be installed only in a restricted access location.

Avertissement: L'entretien de maintenance de cet appareil doit être effectué uniquement par un personnel de service qualifié dans des locaux à accès limité et l'appareil étant branché à une prise mise à la masse.

Warning: Service of the device must be made only by qualified service personnel.

Warning: The device must be connected only to a grounded AC mains power socket.

1 Introduction

This document provides step-by-step instructions on installing and configuring the Survivable Branch Appliance (SBA) application running on AudioCodes Mediant 2600B OSN, located at the remote branch office and deployed in the Skype for Business environment. The Mediant 2600B SBA includes an OSN Server platform with Windows Server 2012 R2 operating system and Mediation Server software installation (MSI), and an E-SBC device, all in a single appliance chassis.

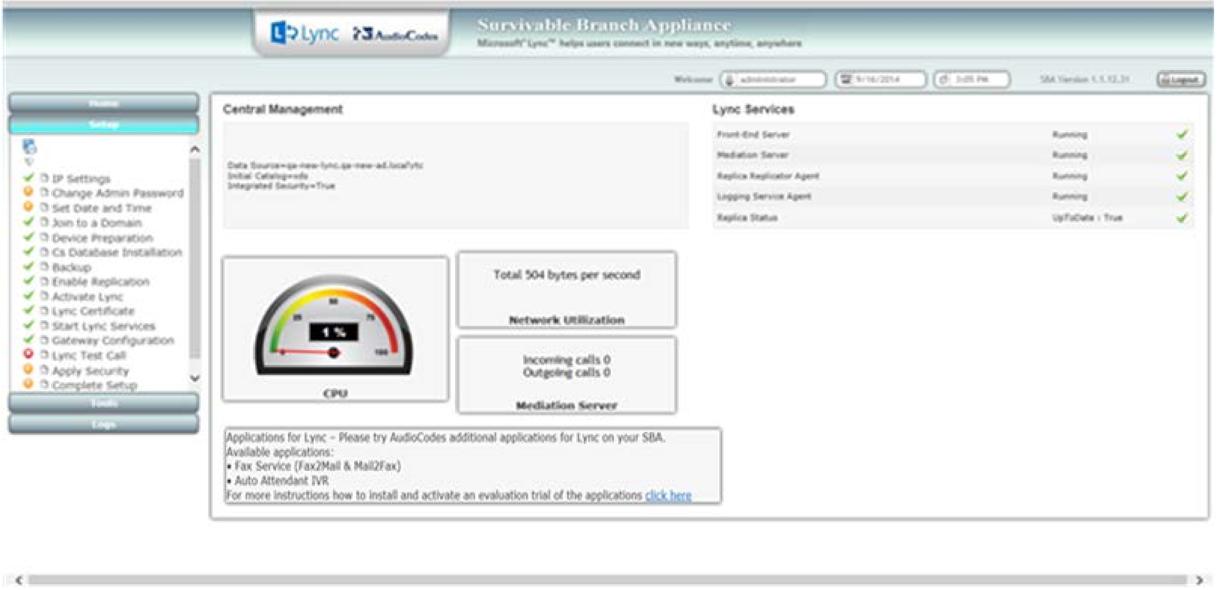
Note: Microsoft has rebranded Lync as Skype for Business so whenever the term Skype for Business appears in this document; it applies also to Microsoft Lync.

In the Skype for Business environment, given the centralized deployment model, Unified Communication (UC) users in a remote site are dependent on the servers in the enterprise's data center (typically at headquarters) for their communication, and hence are vulnerable to losing communication capabilities when the WAN is unavailable. Given the always-available expectation for voice, it is imperative that the UC solution continues to provide the ability for branch users to make and receive calls when the WAN from the branch to the primary data center is unavailable.

To provide voice services to branch users during a WAN outage, a branch office survivability solution–the Survivable Branch Appliance (SBA) application–is hosted on the OSN Server platform running on AudioCodes Mediant 2600B SBA located at the branch office. During a WAN connectivity failure, Mediant 2600B SBA maintains call connectivity among Microsoft users located at the branch office–Skype for Business clients (for example, Skype for Business clients) and devices (for example, IP phones)–and between these users and an E-SBC SIP trunk.

Note: The new SBA image includes the Fax Server and Auto-Attendant IVR applications with full functionality including a ninety day trial license period for each application. For information on how to install these applications and how to activate the license, refer to the document Fax Server and Auto Attendant IVR Installation Guide (click the link on the SBA Home Page to open this document. For full purchase information, contact your AudioCodes representative.

Figure 1-1: SBA Home Page (Additional AudioCodes Applications Link) New SBA Image



Central Management

Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

Lync Services

Front-End Server	Running	✓
Mediation Server	Running	✓
Replica Replicator Agent	Running	✓
Logging Service Agent	Running	✓
Replica Status	UpToDate : True	✓

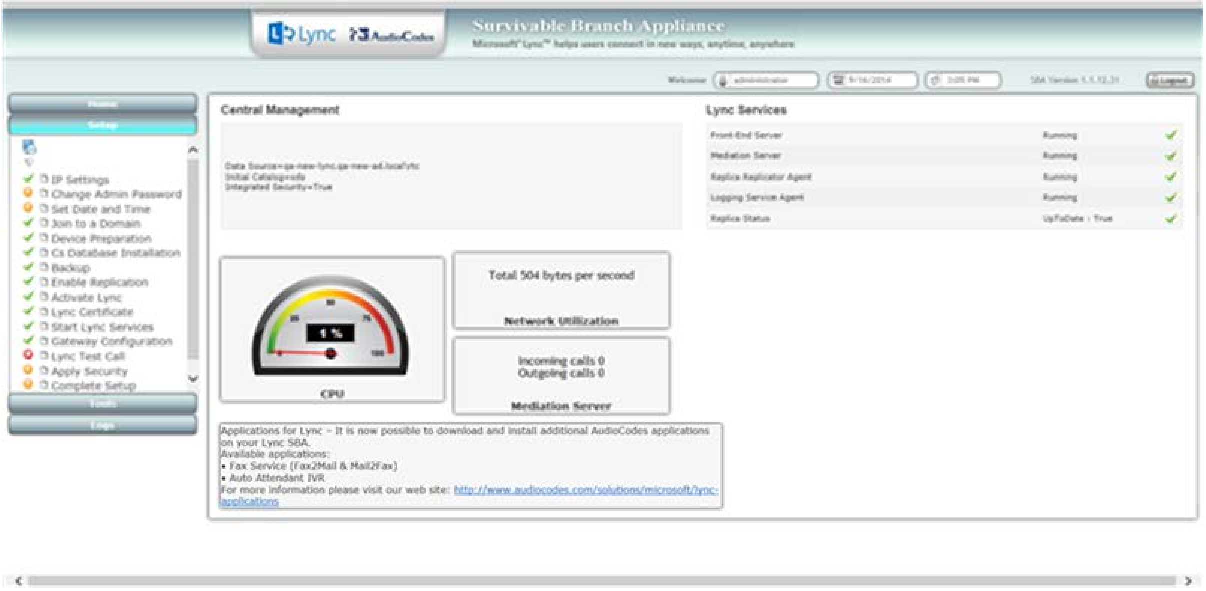
Total 504 bytes per second

Incoming calls 0
Outgoing calls 0

Applications for Lync – Please try AudioCodes additional applications for Lync on your SBA.
Available applications:
- Fax Service (Fax2Mail & Mail2Fax)
- Auto Attendant IVR

For more instructions how to install and activate an evaluation trial of the applications click here

Figure 1-2: SBA Home Page (Additional AudioCodes Applications Link) SBA Upgrade



Central Management

Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

Lync Services

Front-End Server	Running	✓
Mediation Server	Running	✓
Replica Replicator Agent	Running	✓
Logging Service Agent	Running	✓
Replica Status	UpToDate : True	✓

Total 504 bytes per second

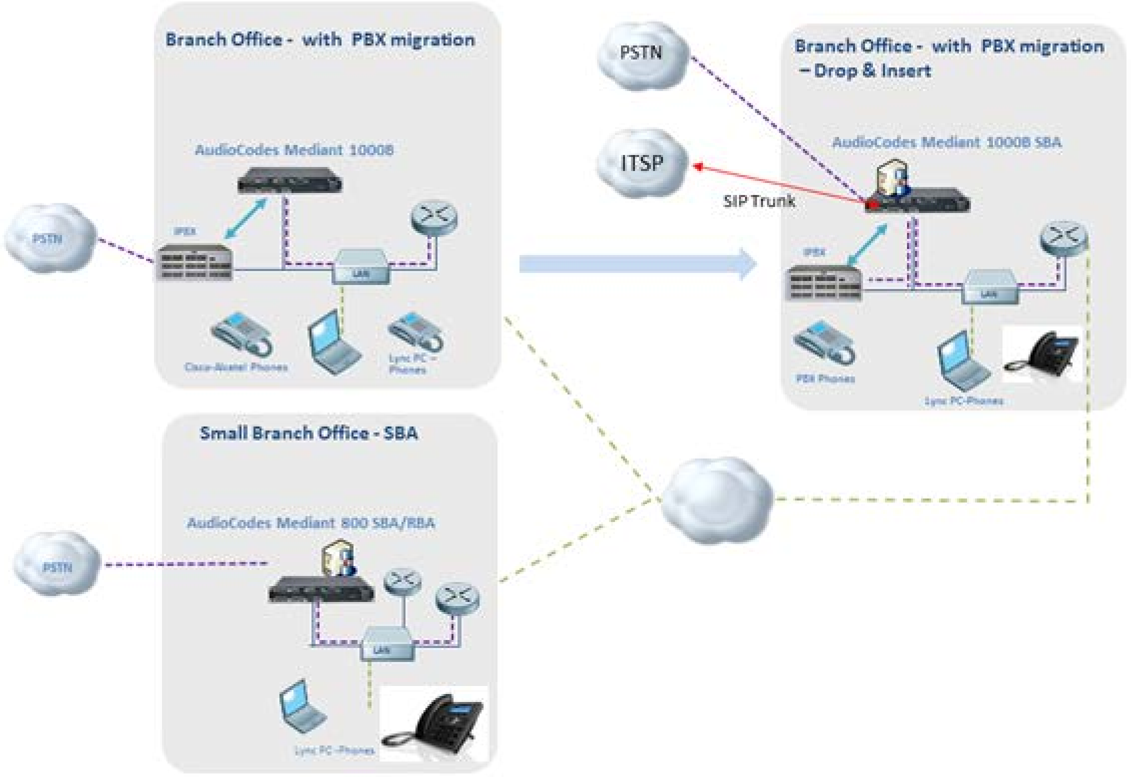
Incoming calls 0
Outgoing calls 0

Applications for Lync – It is now possible to download and install additional AudioCodes applications on your Lync SBA.
Available applications:
- Fax Service (Fax2Mail & Mail2Fax)
- Auto Attendant IVR

For more information please visit our web site: http://www.audiocodes.com/solutions/microsoft/lync-applications

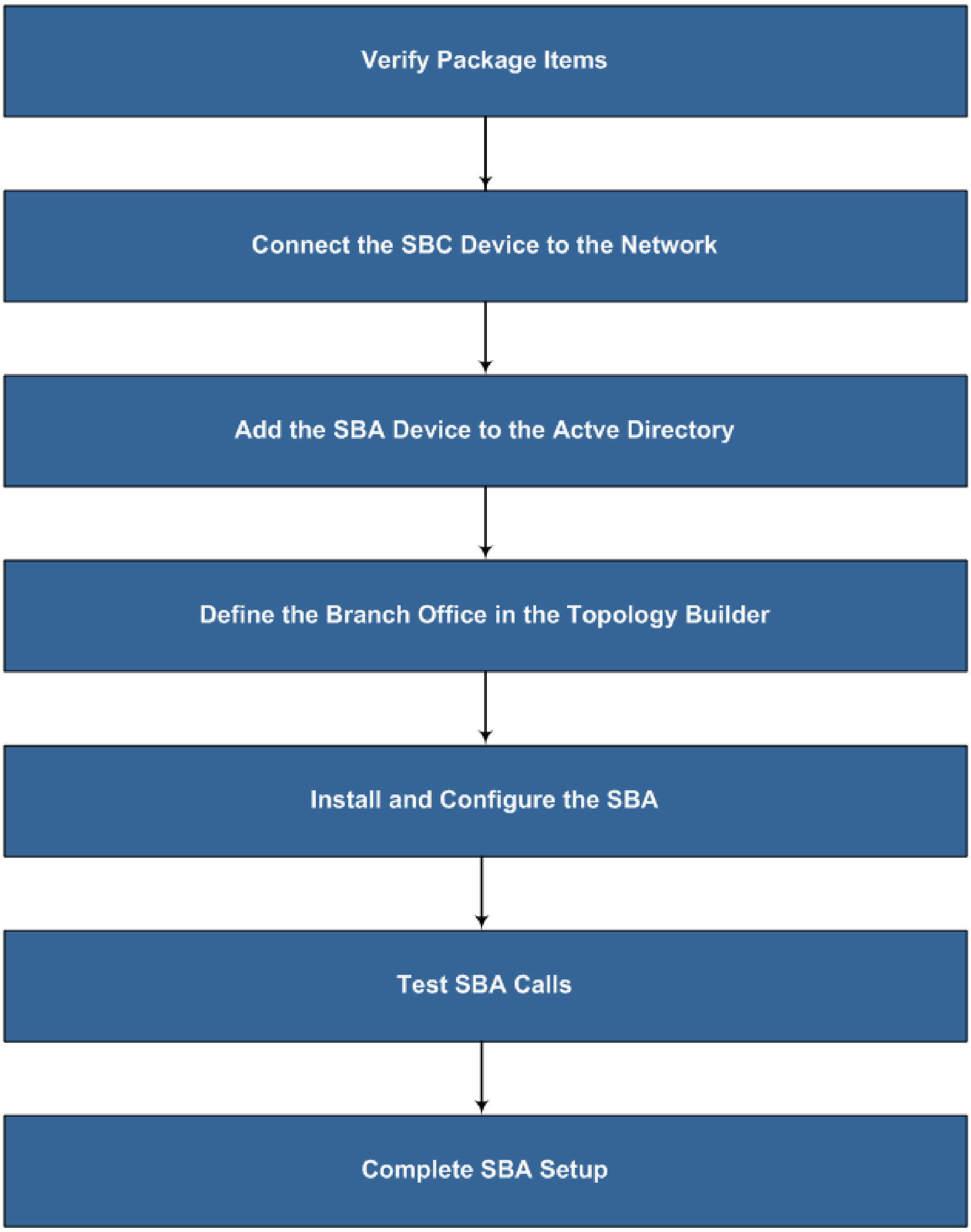
The figure below illustrates typical SBA branch office deployment scenarios.

Figure 1-3: Typical Branch Office Deployments


Branch Office - with PBX migration
AudioCodes Mediant 1000B
PSTN
IPBX
LAN
Cisco-Alcatel Phones
Lync PC - Phones
PSTN
ITSP
SIP Trunk
Branch Office - with PBX migration – Drop & Insert
AudioCodes Mediant 1000B SBA
IPBX
LAN
PBX Phones
Lync PC-Phones
Small Branch Office - SBA
AudioCodes Mediant 800 SBA/RBA
PSTN
LAN
Lync PC -Phones

The summary of the steps required to install the Mediant 2600B SBA is shown in the figure below:

Figure 1-4: Summary of Steps for Installing and Configuring SBA


Verify Package Items
Connect the SBC Device to the Network
Add the SBA Device to the Actve Directory
Define the Branch Office in the Topology Builder
Install and Configure the SBA
Test SBA Calls
Complete SBA Setup

2 Verifying Package Contents

Ensure that your Mediant 2600B SBA package is shipped with the following items:

- Two adjustable rear-rack mounting bracket kits (60 cm and 80 cm) for 19-inch rack mounting
- Four anti-slide bumpers for desktop mounting
- Serial interface cable adaptor
- Cable mini HDMI to HDMI 1.5m for monitor connections
- Cable micro USB to USB 1.5m for serial connections
- USB dongle for SBA software upgrade and recovery procedure
- Microsoft Windows 2012 R2 license document (envelope)
- Two AC power cables

Check, retain and process any documents. If any items are missing or damaged, please contact your AudioCodes sales representative.

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Part I

Hardware Description

This part provides a hardware description overview of the Mediant 2600B SBA device.

The Mediant 2600B SBA is resident on the Mediant 2600B SBA Gateway and E-SBC chassis.

The chassis' panels are described as follows:

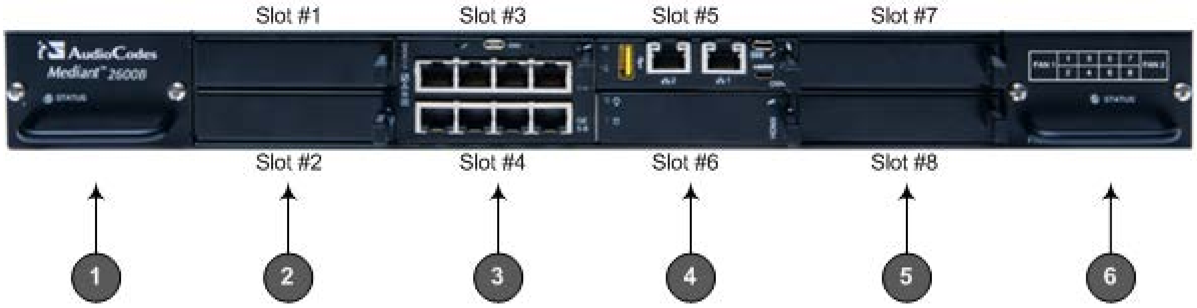
- Front Panel - see Section 'Front Panel' on page 29
- Rear Panel - see Section 'Rear Panel' on page 29

The AudioCodes SBA is installed on the HDMX disk module and runs on the OSN processor module. These modules are described in Section 'OSN Server Modules' on page 18.

3 Front Panel

The device's front panel is shown in the figure below and described in the subsequent table.

Figure 3-1: Front Panel



> **Note:** The figure above provides only an example of the Mediant 2600B. The modules housed in your Mediant 2600B may be slightly different, depending on the ordered hardware configuration (e.g., Media Processing Module / MPM and OSN server modules).

Table 3-1: Front-Panel Description

Item #	Component Description
1	Fan Tray module #1. For more information on the module, refer to the *Mediant 2600B Hardware Manual.*
2	(Slots 1-2) Unused slots shown with two blank slot covers. The slots can house an optional, Media Processing Module (MPM). The MPM module occupies two slots. Note: The MPM is a customer-ordered item.
3	(Slots 3-4) E-SBC CPU AMC module (hereafter referred to as E-SBC). The E-SBC module occupies two slots. The module provides the central processing unit (CPU), serial interface, and Ethernet port interface functionalities. For more information, refer to the *Mediant 2600B Hardware Manual.*
4	(Slots 5-6) OSN server modules (OSN4 and HDMX). The OSN4 module is housed in Slot 5 and the HDMX module in Slot 6.
5	(Slots 7-8) Unused slots shown covered with two blank slot covers. The slots can house one of the following optional modules: ▪ MPM module, on condition that MPM modules are also housed in the slots described in Item #2 and Item #4 (if not occupied by OSN modules). The MPM module occupies two slots. ▪ Secondary HDMX module for the OSN server (see Item #4). The module is installed in Slot 7. This module is installed when configuring the SBA in a RAID configuration. For more information see, 'Part VI: Appendices' on page 246.

Item #	Component Description
	Note: The MPM is a customer-ordered item.
6	Fan Tray module #2 with a schematic displayed on its front panel showing the chassis' slot numbers. For more information on the module, refer to the *Mediant 2600B Hardware Manual.*

3.1 OSN Server Modules

The OSN4 server modules are customer-ordered items. The OSN server consists of two modules:

- OSN4 - central processing unit (CPU), RAM, and port interfaces (see Section 3.1.1).
- HDMX - hard-disk drive (HDD or SSD) providing storage capacity (see Section 3.1.4).

The specifications of the OSN server are listed in the following table:

Table 3-2: OSN4 Server Specifications

CPU	Memory	Storage	Interfaces
Intel® Core™ i7 3rd Generation Dual Core 2.5 GHz	8 GB DDR3 with ECC	Up to 2 hard drives: HDD or SSD	▪ Two external Gigabit Ethernet ▪ USB 2.0 ▪ RS-232 COM ▪ HDMI Graphic

3.1.1 OSN4 Module

This section describes the ports and LEDs on the OSN4 module.

Warning: The OSN4 module contains a non-rechargeable Lithium-ion (LI-ion) battery. If required, replace the Lithium battery only with the following battery type:

- Manufacturer: Hitachi Maxell Energy Ltd.
- Battery Type: CR2032M1SB-LF; Li/MnO2, 3V 210mAh

3.1.1.1 LEDs Description

The OSN4 module LEDs are shown in the figure below and described in the subsequent table.

Figure 3-2: OSN4 Module LEDs

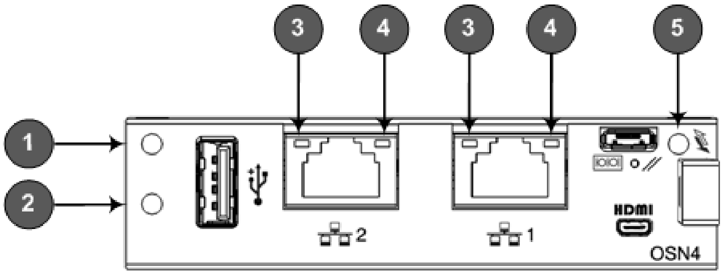


Table 3-3: OSN4 Module LEDs Description

Item	Color	State	Description
1	**Green**	**Flashing**	Firmware (BIOS) application active, payload (x86) in sleep.
		Solid	Firmware (BIOS) application active, payload (x86) active.
2	**Red**	On	Out-of-service indicator due to hardware failure.
	-	Off	Normal operation.
3	**Green**	Solid	Valid Ethernet link (cable connection) established.
		Flashing	Activity in the link.
	-	Off	The LED goes temporarily off if network packets are sent or received. When this LED remains off, a valid link has not been established due to a missing or a faulty cable connection.
4	**Orange**	On	2600Base-TX connection.
	Green	On	100Base-T connection.
	-	Off	10Base-T connection if LED #3 is active.
5	**Blue**	Flashing	Module undergoing shutdown sequence when handle is pulled out to first extraction position, or module had been inserted and handle is still in first extraction position
		On	Module shutdown sequence complete and the module can be extracted from the chassis slot.
		Off	Module correctly inserted in chassis slot.

3.1.1.2 Ports Description

The OSN4 module is shown below and described in the subsequent table.

Figure 3-3: OSN4 Module Ports

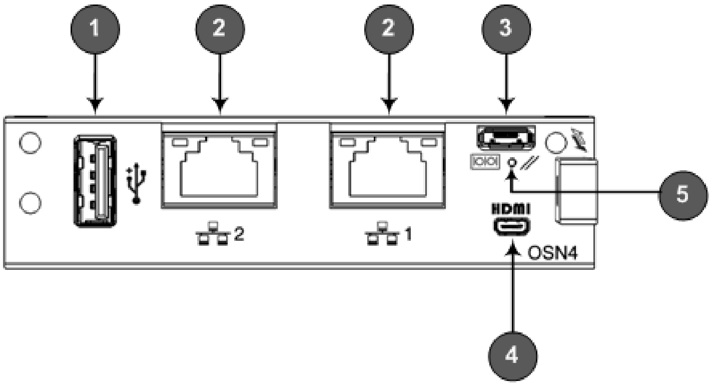


Table 3-4: OSN4 Module Port Description

Item #	Label	Description
1	🔌	USB 2.0 port.
2	🖧	2 RJ-45 ports for Gigabit Ethernet. The interface provides automatic detection and switching between 10Base-T, 100Base-TX and 2600Base-T data transmission (Auto-Negotiation). Auto-wire switching for crossed cables is also supported (Auto-MDI/X).
3	**HDMI**	Micro HDMI port Type-D male connector (for connecting to a graphic display monitor.
4	IOIOI	Console (serial) port (micro-USB) for serial interface (COM1).

Item #	Label	Description
5	//	Reset pinhole button. ▪ To warm reset the operating system of the OSN server (i.e., power remains on): Press and then immediately release the button (less than five seconds). The LED indications are as follows (see LEDs description for LED locations): -Upon reset: ▪ -LED #1: On (solid green) ▪ -LED #2: On (solid red) ▪ -End of reset: LED #1 remains on (solid green); all other LEDs off. ▪ To cold (hard) reset the OSN server (i.e., powers off and then powers on): Press the button for longer than five seconds and then release. The LED indications are as follows (see LEDs description for LED locations): -Upon reset: ▪ -LED #1: On (solid green) ▪ -LED #2: On (solid red) ▪ -LED #5: On (solid blue) ▪ -End of reset: LED #1 remains on (solid green); all other LEDs off.

3.1.2 RJ-45 Gigabit Ethernet Cable Connector Pinouts

The RJ-45 connector pinouts for the Gigabit Ethernet interface are listed in the table below.

Table 3-5: RJ-45 Connector Pinouts for Gigabit Ethernet Interface

Pin	100Base-Tx		2600Base-T	
	I/O	Signal	Signal	Function
1	O	Tx+	I/O	BI_DA+
2	0	Tx-	I/O	BI_DA-
3	I	Rx+	I/O	BI_DB+
4			I/O	BI_DC+
5			I/O	BI_DC-
6	**I**	Rx-	I/O	BI_DB-
7			I/O	BI_DD+
8			I/O	BI_DD-

3.1.3 HDMI Connector Pinouts

The HDMI connector pinouts for the HDMI interface are described in the table below.

Table 3-6: HDMI Type-D Connector Pinouts

Pin	Signal
3	TMDS Data2+
4	TMDS Data2 Shield
5	TMDS Data2-
6	TMDS Data1+
7	TMDS Data1 Shield
8	TMDS Data1-
9	TMDS Data0+
10	TMDS Data0 Shield
11	TMDS Data0-
12	TMDS Clock+
13	TMDS Clock Shield
14	TMDS Clock-
15	CEC
2	Utility/HEAC+
17	SCL
18	SDA
16	DDC/CEC/HEAC Ground
19	+5 V Power
1	Hot Plug Detect/HEAC

3.1.4 HDMX (Hard-Disk Drive) Module

The HDMX module provides the hard-disk drive functionality for the OSN platform. This module is housed in Slot #1 on the Mediant 2600B SBA rear panel.

Note:

- For additional storage capacity per HDMX module, contact your AudioCodes representative.
- The OSN platform can optionally be ordered with dual hard-disk drives (i.e., two HDMX modules).

The HDMX module is available as either an HDD drive or as an SSD drive.

The HDMX module is shown below and described in the subsequent table.

Figure 3-4: HDMX Module LEDs

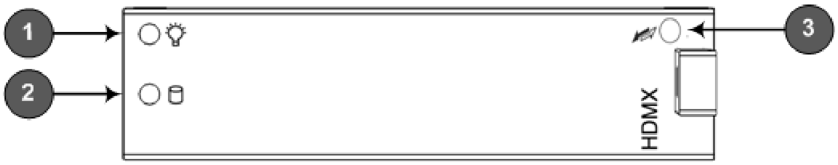


Table 3-7: HDMX Module LED Description

Item #	Label	Color	State	Description
1	💡	Green	On	Power received by module.
		-	Off	No power received by module.
2	🛢	Blue	On	Module can be extracted from chassis slot once dismounted from the OSN operating system.
			Off	Module correctly inserted in chassis slot
1	⚡	Red	On	Hard disk drive in use (active).
		-	Off	Hard disk drive not in use.

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4 E-SBC CPU Ports and LEDs

This section describes the E-SBC CPU Ports and LEDs of the Mediant 2600B device.

4.1 Port Description

The E-SBC CPU module provides various port interfaces as shown in the figure below and described in the subsequent table.

Figure 4-1: E-SBC CPU Module Ports

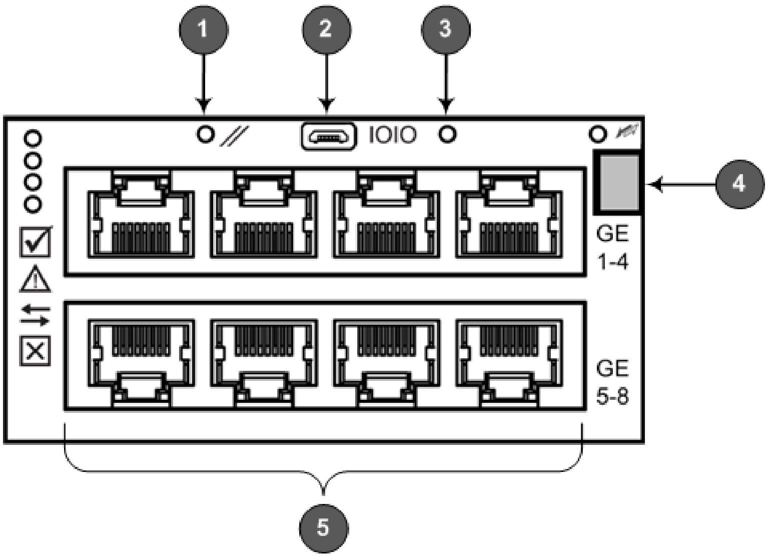

Table 4-1: E-SBC CPU Module Ports Description

Item #	Label	Description
1	//	Reset pinhole button: ▪ To reset the device, press the button for at least 1 second but no longer than 10 seconds. ▪ To reset the device to factory defaults, press the button for at least 12 seconds but no longer than 25 seconds.
2	IOIO	RS-232 port for serial communication with a computer.
3	-	Pinhole button (reserved for future use).
4	-	Handle of module for installing and removing the module.
5	-	Eight 2600Base-T Gigabit Ethernet ports for connecting to the IP network. The Ethernet ports operate in pairs, where one port is active and the other standby, providing 1+1 Ethernet redundancy. The ports support half- and full-duplex modes, auto-negotiation, straight-through and crossover cable detection.

4.2 LED Description

The E-SBC CPU module provides LEDs for indicating various operating status, as described in the table below.

Figure 4-2: E-SBC CPU Module LEDs

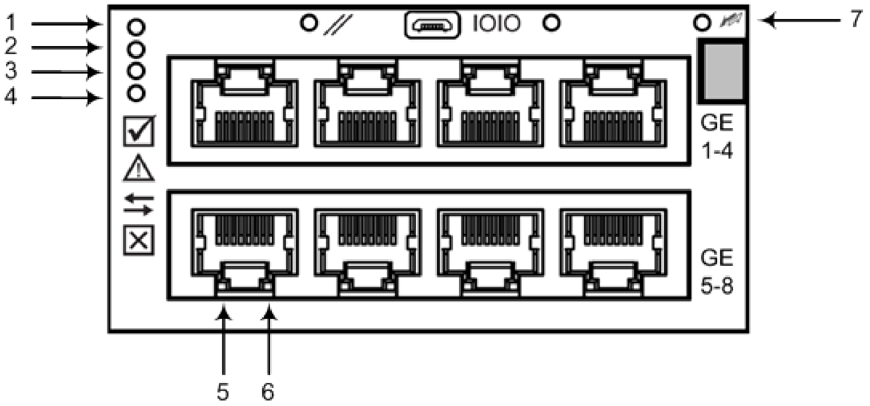

Table 4-2: E-SBC CPU Module LEDs Description

Item #	LED	Color	State	Description
1	☑	**Green**	On	Module in service.
		-	Off	Module out of service.
2	⚠	**-**	Off	During booting up state.
		Red	On	Booting up phase / fault detected in module.
		Green	On	Normal operation.
3	⇆	**-**	Off	During booting up state.
		Green	On	Application running in Standalone state.
			Flashing	Application running in High Availability (HA) Active state.
		Yellow	On	Application is starting Boot / synchronizing HA.
			Flashing	Application is running in HA Redundant state.
4	☒	**Red**	On	Out of service.
		-	Off	Normal operation.
5	Left Ethernet Port LED	Green	On	Ethernet link established.
			Flashing	Data is being received or transmitted (activity) on the Ethernet port.
		-	Off	No Ethernet link.
6	Right Ethernet Port LED	Orange	On	2600Base-T (Gigabit) Ethernet link established.
		-	Off	No Ethernet link or 100Base-Tx link established.

Item #	LED	Color	State	Description
7		**Blue**	On	Blue hot-swap LED indicating that the AMC module can be fully removed or inserted. **Note:** Do not remove the module before this LED turns blue.
		-	Off	Module insertion process is complete.

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5 Rear Panel

The chassis rear panel is displayed in the figure below and described in the subsequent table.

Figure 5-1: Rear Panel

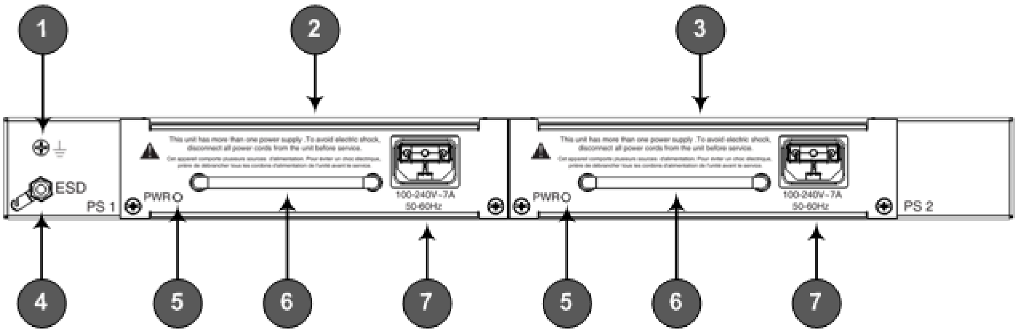
1
2
3
ESD
PS 1
This unit has more than one power supply. To avoid electric shock, disconnect all power cords from the unit before service.
PWR
100-240V~7A
50-60Hz
PWR
100-240V~7A
50-60Hz
PS 2
4
5
6
7
5
6
7

Table 5-1: Rear-Panel Description

Item #	Label	Description
1	Earthing	Protective earthing (grounding) screw.
2	PS 1	Power Supply module No. 1. For more information, see ??
3	PS 2	Power Supply module No. 2. For more information, see ??
4	ESD	Electrostatic Discharge (ESD) lug.
5	PWR	Power status LED for indicating the status of the Power Supply module. For more information, see ???
6	-	Extraction-handle for removing the Power Supply module.
7	100-240V~7A	50-60Hz AC power supply inlet (100-240V~7A, 50-60 Hz) of Power Supply module.

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Part II

Setting up the E-SBC Device

6 Connecting to Power

The procedure below describes how to connect the device to the power supply.

Table 6-1: Power Specifications

Item	Description
Power Supply	Two hot swappable, power supply modules for power load sharing and AC power redundancy in case of failure of one of the modules.
Input Ratings	Single universal power supply 100-240 VAC, 50-60 Hz, 7A max.
Output Ratings	▪ Output 1: 12 VDC / 40A max ▪ Output 2: 12 VDC / 9A ▪ Output 3: 3.3 VDC / 2A
Connection to Electrical Outlet	AC power supply inlet.

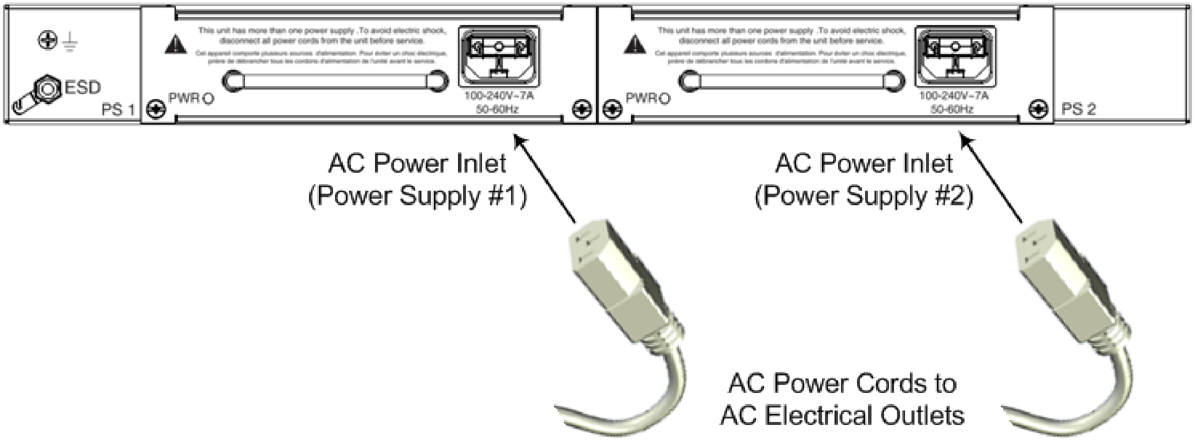
Warnings:

- Both Power Supply modules (1 and 2) must be connected. Ensure that you connect each one to a different AC power supply source. Two Power Supplies provide 1+1 power load-sharing and redundancy. The AC power sockets are located on the device's rear panel.
- The two AC power sources must have the same ground potential.
- The device must be connected (by service personnel) to a socket-outlet with a protective earthing connection.
- Use only a certified 3-conductor power cord, utilizing 18 AWG or 1 mm^2 wires, and no longer than 4.5 meters (14.8 ft).
- If a failure occurs in any one of the Power Supply modules, replace the module immediately.

➢ To connect the device to the power supply:

1. Connect the AC power cord (supplied) to one of the power sockets located on the rear panel.

Figure 6-1: Connecting to Power


ESD
PS 1
This unit has more than one power supply .To avoid electric shock, disconnect all power cords from the unit before service.
Cet appareil comporte plusieurs sources d'alimentation. Pour éviter un choc électrique, prière de débrancher tous les cordons d'alimentation de l'unité avant le service.
PWR
100-240V~7A
50-60Hz
This unit has more than one power supply .To avoid electric shock, disconnect all power cords from the unit before service.
Cet appareil comporte plusieurs sources d'alimentation. Pour éviter un choc électrique, prière de débrancher tous les cordons d'alimentation de l'unité avant le service.
PWR
100-240V~7A
50-60Hz
PS 2
AC Power Inlet
(Power Supply #1)
AC Power Inlet
(Power Supply #2)
AC Power Cords to
AC Electrical Outlets

2. Connect the other end of the power cord to a standard AC electrical outlet (100-240V~50-60 Hz).
3. Repeat steps 1 through 2 for connecting the second Power Supply module, but using the power socket associated with the second Power Supply module and connecting this to a different supply circuit.
4. Turn on the power at the power source (if required).
5. Check that the **POWER** LED on each Power Supply module (front panel) is lit green, indicating that the device is receiving power.

7 Initial Access to the E-SBC Device

Before you can configure the E-SBC device, you need to access its Web interface using the default VoIP / Management LAN IP address, as described in below.

The cabling specifications and procedure for connecting the device to the LAN is as follows:

- **Cable:** Straight-through, Category (Cat) 5, 5e or 6 cable
- **Connector:** Standard RJ-45
- **Connector Pinouts:**

Table 7-1: RJ-45 Connector Pinouts

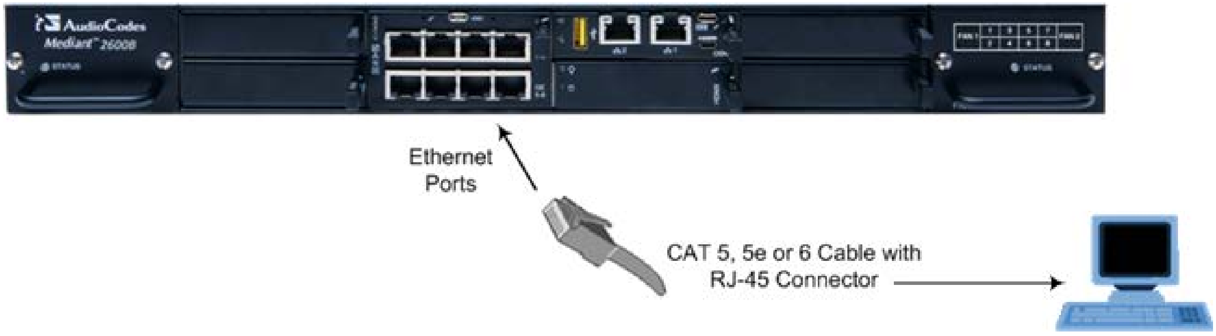
Pin	Name	Description
1	BI_DA+	Bi-directional pair A+
2	BI_DA-	Bi-directional pair A-
3	BI_DB+	Bi-directional pair B+
4	BI_DC+	Bi-directional pair C+
5	BI_DC-	Bi-directional pair C-
6	BI_DB-	Bi-directional pair B-
7	BI_DD+	Bi-directional pair D+
8	BI_DD-	Bi-directional pair D-

The following procedure describes how to change the IP address of the OAMP on the VoIP-LAN interface, using the Web-based management tool (Web interface). The default IP address is used to initially access the device.

➢ **To configure the VoIP-LAN IP Address for OAMP, using the Web interface:**

1. Connect the first Ethernet port group (top-left ports 1 and 2) located on the front panel directly to the LAN network interface of your computer, using a straight-through Ethernet cable.

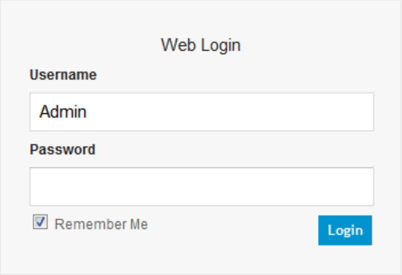
Figure 7-1: Connecting to the LAN Interface



> **Note:** For initial network connectivity to the device, use ports **GE 1** or **GE 2** to connect to the LAN. These ports (or this Ethernet Group) are assigned to the OAMP interface (192.168.0.2) by default. For port names as well as Ethernet port groups (for 1+1 redundancy), see Chapter 8.

2. Change the IP address and subnet mask of your computer to correspond with the default OAMP IP address and subnet mask of the device.
3. Access the Web interface:
   a. On your computer, start a Web browser and in the URL address field, enter the default IP address of the device; the Web interface's Web Login screen appears:

Figure 7-2: Web Login Screen


Web Login

Username

Admin

Password

☑ Remember Me

   b. In the 'Username' and 'Password' fields, enter the case-sensitive, default login username ("Admin") and password ("Admin").
   c. Click **Login**.
4. Change your OAMP interface as described in the next chapter.

8 Changing OAMP Interface

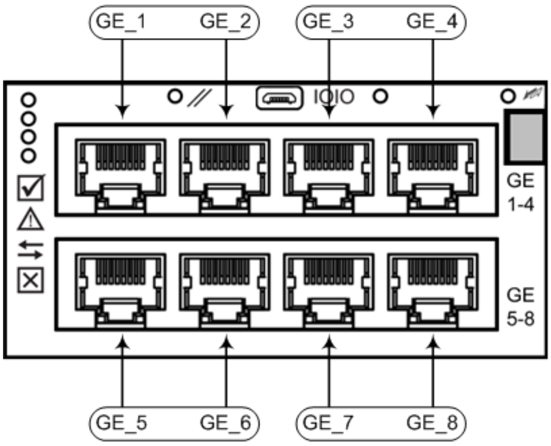
Once you have accessed your device using the default IP address, you can change your management interface (OAMP) to suit your network environment. Maintain the same cable connection that you used when you initially accessed the device.

➢ To change OAMP IP address:

1. Assign the physical Ethernet ports that you wish to user for OAMP to an Ethernet Group in the Ethernet Groups table (**Configuration** tab > **VoIP** menu > **Network** > **Ethernet Groups Table**).

   The table uses special string names to represent the physical ports (refer to the figure below):

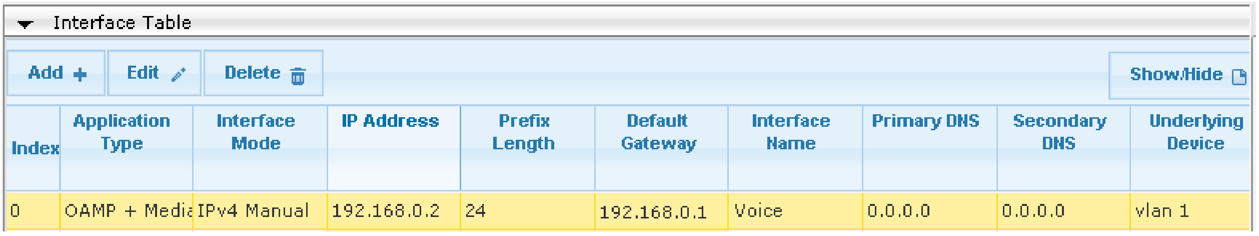
Figure 8-1: Ethernet Group String Names



2. Configure settings (for example, port speed) for your Ethernet ports in the Ethernet Group in the Physical Ports Table (**Configuration** tab > **VoIP** menu > **Network** > **Physical Ports Table**).
3. Configure the VLAN ID (Ethernet Device) for the Ethernet Group in the Ethernet Device Table (**Configuration** tab > **VoIP** menu > **Network** > **Ethernet Device Table**).

4. Change the IP address of the OAMP interface and assign the Ethernet Device (Ethernet Group) in the IP Interfaces Table (**Configuration** tab > **VoIP** menu > **Network** > **IP Interfaces Table**):

8-2: Interface Table



Index	Application Type	Interface Mode	IP Address	Prefix Length	Default Gateway	Interface Name	Primary DNS	Secondary DNS	Underlying Device
0	OAMP + Medi	IPv4 Manual	192.168.0.2	24	192.168.0.1	Voice	0.0.0.0	0.0.0.0	vlan 1

a. Select the row corresponding to the **OAMP + Media + Control** application type, and then click **Edit**.

b. Change the IP address to correspond with your network IP addressing scheme, for example:
   - IP Address: 10.8.6.86
   - Prefix Length: 24 (for 255.255.255.0)
   - Gateway: 10.8.6.85
   - Underlying Device: Select the Ethernet Device (VLAN and associated Ethernet Group) that you configured in Step 3.

c. Click **Add**.

5. Save your settings by resetting the device with a flash burn.

6. Disconnect the PC from the device and re-cable the device to your network. You can now access the management interface using the new OAMP IP address.

Note: For more information on the above procedures, refer to the *Mediant 2600 E-SBC User's Manual*.

Part III

Preparing SBA at the DataCenter

Prior to installing and configuring the SBA at the branch office (see 'Installing and Configuring the SBA' on page 79) you must perform the following actions at the datacenter (typically, located at headquarters):

- Add the SBA Device to the Active Directory (AD). See Chapter 'Adding the SBA Device to the Active Directory' on page 41
- Create a user account on the AD belonging to the RTCUniversalSBATechnicians group. This user performs the SBA deployment (Domain Admin account can also perform SBA deployment, by default). See 'Adding the SBA Device to the Active Directory' on page 41
- Add (publish) the SBA Device to your topology. See Chapter 'Defining the Branch Office Topology using Topology Builder' on page 45

Once these actions have been performed, you can join the SBA in the branch site to the Active Directory domain and activate the Lync services.

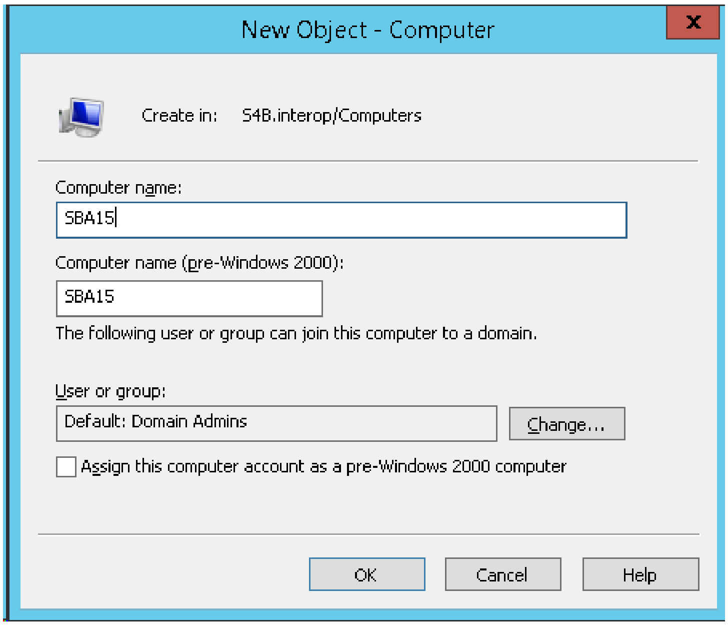
9 Adding the SBA Device to the Active Directory

The procure below describes how to add the SBA device to the AD.

➢ To add the SBA device to the Active Directory:

1. Add the planned Survivable Branch Appliance device name to the Active Directory Domain Services:
   a. Start the Active Directory Users and Computers program (**Start** > **Active Directory Users and Computers**).
   b. Add the Survivable Branch Appliance device name to the domain computers (right-click Computers, choose **New**, and then click **Computer**).

Figure 9-1: New Object Computer Dialog Box



Create in: S4B.interop/Computers

Computer name: SBA15

Computer name (pre-Windows 2000): SBA15

The following user or group can join this computer to a domain.

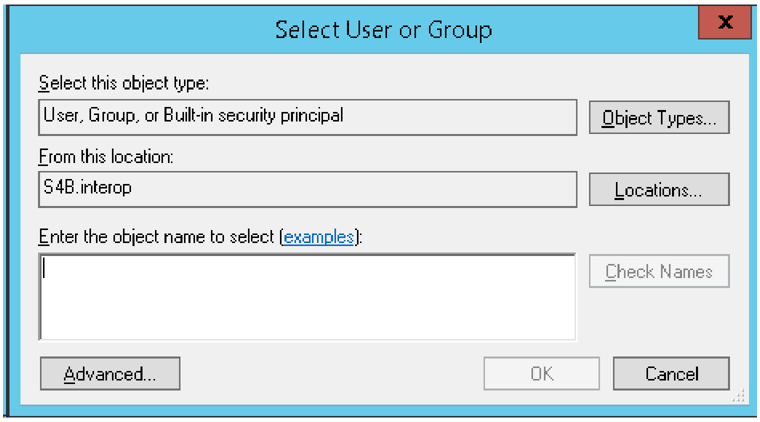
User or group: Default: Domain Admins

□ Assign this computer account as a pre-Windows 2000 computer

   c. Click **Change** to add a user or group that can join this specific SBA server to the domain.

      If you are working with the Domain Administrator, do not change the "Domain Admin" group. If you are working with another user, specify the name of a user or group that is allowed to join this computer to the domain:

Figure 9-2: Select User or Group to Change



Select User or Group

Select this object type: User, Group, or Built-in security principal

From this location: S4B.interop

Enter the object name to select (examples):

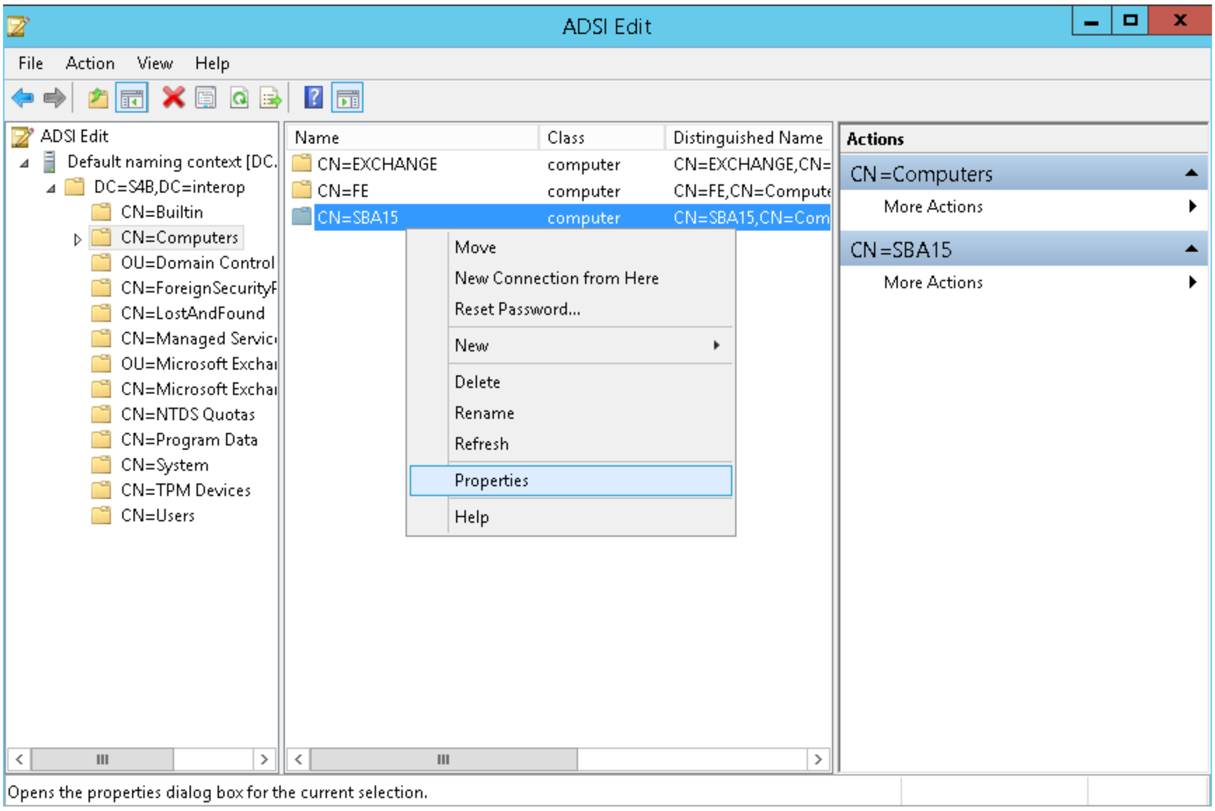
d. In the "Enter the object name" text box, enter **RTCUniversalSBATechnicians** and click **Check Names**.

e. Click **OK**.

f. Start the ADSI Edit program (**Start** > **Administrative Tools** > **ADSI Edit**).

g. Right-click the Survivable Branch Appliance computer name that you just created, and then choose **Properties**.

Figure 9-3: ADSI Edit



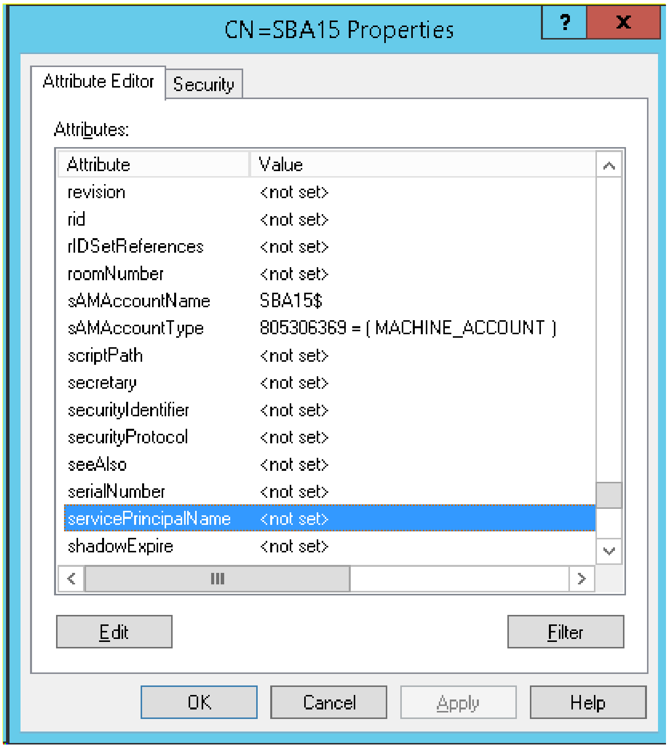
ADSI Edit

Name	Class	Distinguished Name
CN=EXCHANGE	computer	CN=EXCHANGE,CN=
CN=FE	computer	CN=FE,CN=Compute
CN=SBA15	computer	CN=SBA15,CN=Com

Opens the properties dialog box for the current selection.

h. In the Attributes Editor list, select **servicePrincipalName**.

Figure 9-4: Attribute Editor



Attributes:

Attribute	Value
revision	<not set>
rid	<not set>
rIDSetReferences	<not set>
roomNumber	<not set>
sAMAccountName	SBA15$
sAMAccountType	805306369 = (MACHINE_ACCOUNT)
scriptPath	<not set>
secretary	<not set>
securityIdentifier	<not set>
securityProtocol	<not set>
seeAlso	<not set>
serialNumber	<not set>
servicePrincipalName	<not set>
shadowExpire	<not set>

i. Click **Edit** and enter the value "HOST/<SBA FQDN>", where SBA FQDN is the FQDN of your Survivable Branch Appliance (e.g., HOST/SBA15.iSFB15.local).

2. In the Active Directory Users and Computers Users folder, add the new SBA computer to the **RTCUniversalReadOnlyAdmins** attribute.

3. In Active Directory Users and Computers, create a user account belonging to the **RTCUniversalSBATechnicians** group. This user performs the Survivable Branch Appliance deployment.

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10 Defining Branch Office Topology-Skype for Business Server 2015

This section describes how to add the Survivable Branch Appliance to your topology, using Skype for Business Topology Builder. This configuration includes the following main steps:

- Defining the branch office SBA and its associated E-SBC device – see below.
- Configure a "Route" on the Skype for Business Server 2015 and associate it with the E-SBC device (see Section 10.2 on page 59).

Note: References in this section to PSTN Gateway in the Skype for Business Topology Builder and in these procedures refers to the AudioCodes E-SBC device.

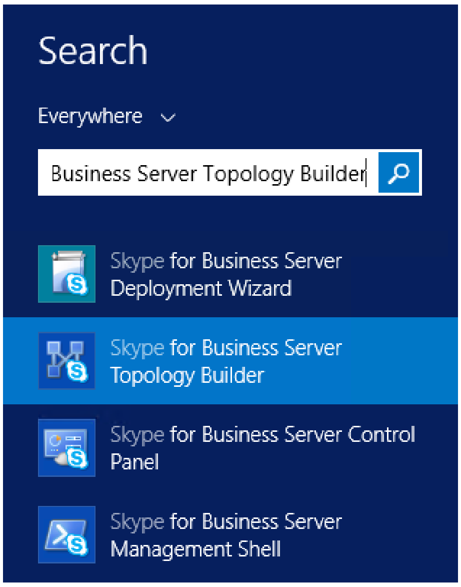
10.1 Defining the SBA Branch Office and Associated E-SBC Device

The procedure below describes how to define the branch office with the SBA and its associated E-SBC device.

➢ **To define the branch office and associate it with Mediation Server:**

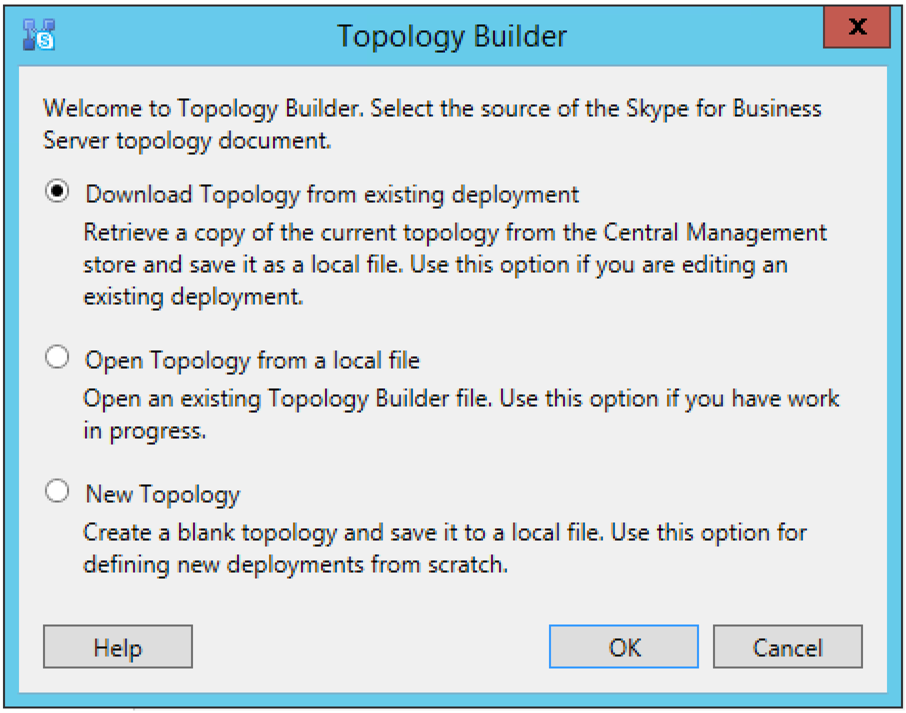
1. On the server where the Topology Builder is installed, start the Skype for Business Server 2015 Topology Builder (Windows **Start** menu > search for **Skype for Business Server Topology Builder**), as shown below:

Figure 10-1: Starting the Skype for Business Server Topology Builder


Search
Everywhere
Business Server Topology Builder
Skype for Business Server Deployment Wizard
Skype for Business Server Topology Builder
Skype for Business Server Control Panel
Skype for Business Server Management Shell

The following is displayed:

Figure 10-2: Topology Builder Dialog Box



Topology Builder

Welcome to Topology Builder. Select the source of the Skype for Business Server topology document.

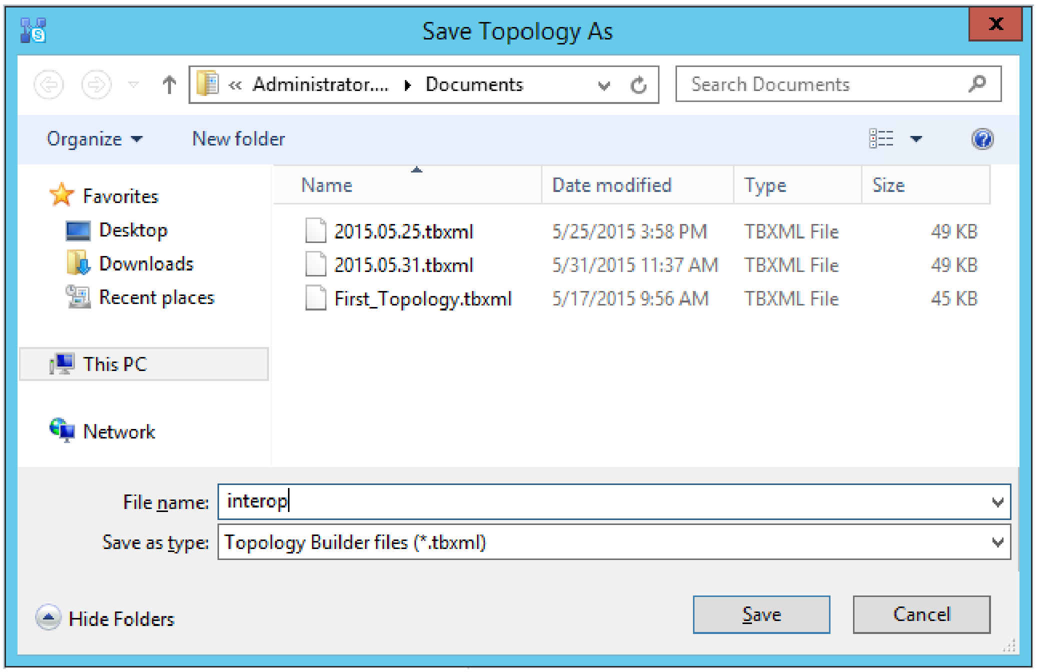
● Download Topology from existing deployment
Retrieve a copy of the current topology from the Central Management store and save it as a local file. Use this option if you are editing an existing deployment.

○ Open Topology from a local file
Open an existing Topology Builder file. Use this option if you have work in progress.

○ New Topology
Create a blank topology and save it to a local file. Use this option for defining new deployments from scratch.

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

Figure 10-3: Save Topology As



Save Topology As

Name	Date modified	Type	Size
2015.05.25.tbxml	5/25/2015 3:58 PM	TBXML File	49 KB
2015.05.31.tbxml	5/31/2015 11:37 AM	TBXML File	49 KB
First_Topology.tbxml	5/17/2015 9:56 AM	TBXML File	45 KB

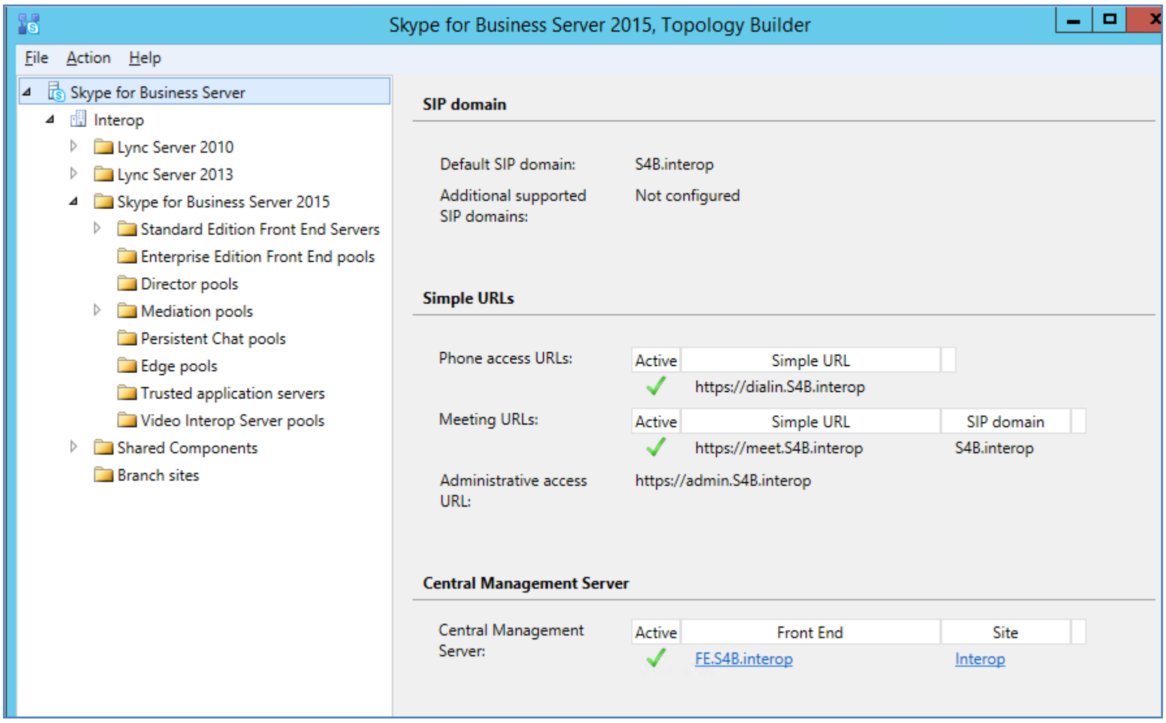
File name: interop

Save as type: Topology Builder files (*.tbxml)

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

The Topology Builder screen with the downloaded Topology is displayed:

Figure 10-4: Downloaded Topology


Skype for Business Server 2015, Topology Builder
File Action Help
Skype for Business Server
Interop
Lync Server 2010
Lync Server 2013
Skype for Business Server 2015
Standard Edition Front End Servers
Enterprise Edition Front End pools
Director pools
Mediation pools
Persistent Chat pools
Edge pools
Trusted application servers
Video Interop Server pools
Shared Components
Branch sites

SIP domain

Default SIP domain: S4B.interop

Additional supported SIP domains: Not configured

Simple URLs

Phone access URLs:

Active	Simple URL
✓	https://dialin.S4B.interop

Meeting URLs:

Active	Simple URL	SIP domain
✓	https://meet.S4B.interop	S4B.interop

Administrative access URL: https://admin.S4B.interop

Central Management Server

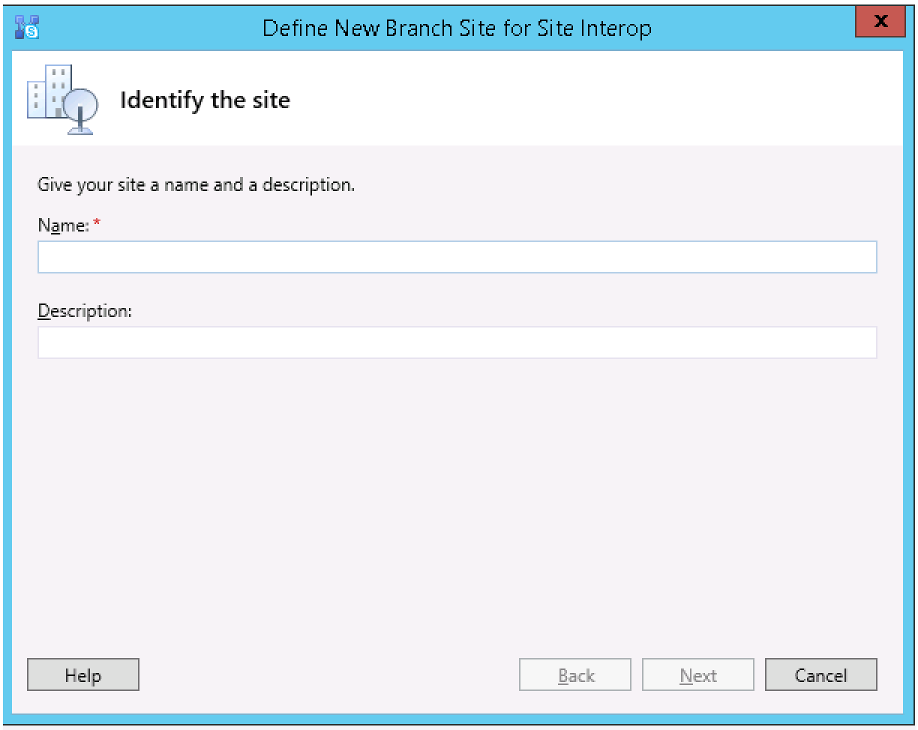
Central Management Server:

Active	Front End	Site
✓	FE.S4B.interop	Interop

4. From the Topology Builder console tree, do one of the following:

   - If you used the Planning tool to design your Enterprise Voice topology, expand the Branch sites node, and then expand the name of the branch site you specified in the tool. To modify each section of the branch office, right-click the branch site, and then from the shortcut menu, choose Edit Properties.
   - If you did not use the Planning tool, right-click the **Branch sites** node, and then from the shortcut menu, choose New Branch Site; the following dialog box appears:

Figure 10-5: Identify the Site



Define New Branch Site for Site Interop

Identify the site

Give your site a name and a description.

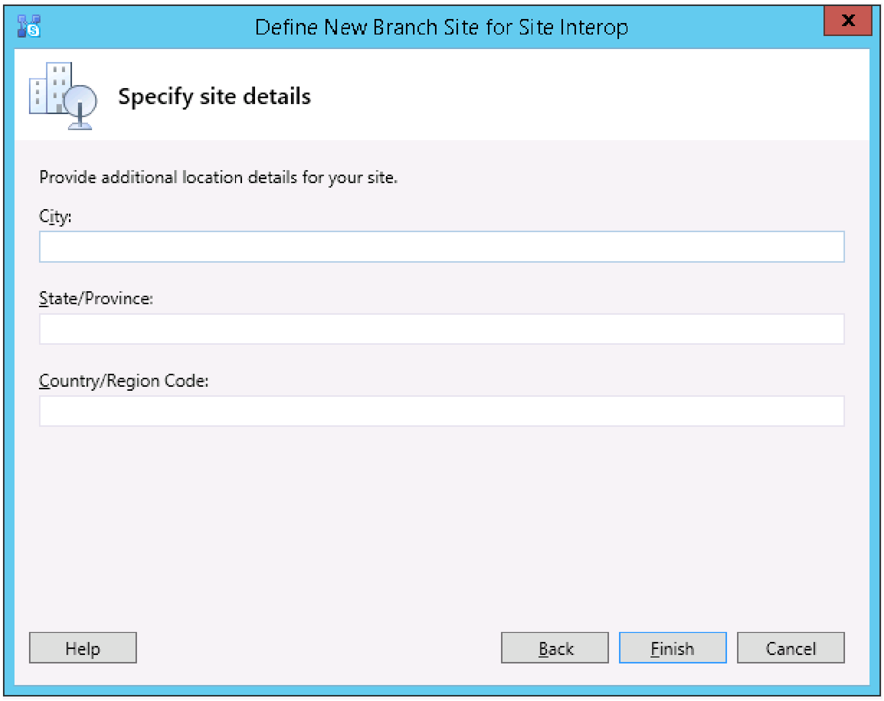
Name: *

Description:

5. In the dialog box, do the following:
   a. In the ‘Name’ field, type the name of the branch site. Only this field is required, the other fields are optional.
   b. In the ‘Description’ field, type a meaningful description of the branch site.

c. Click **Next**; the following dialog box appears:

Figure 10-6: Specify Site Details



Define New Branch Site for Site Interop

Specify site details

Provide additional location details for your site.

City:

State/Province:

Country/Region Code:

6. In the dialog box, do the following:

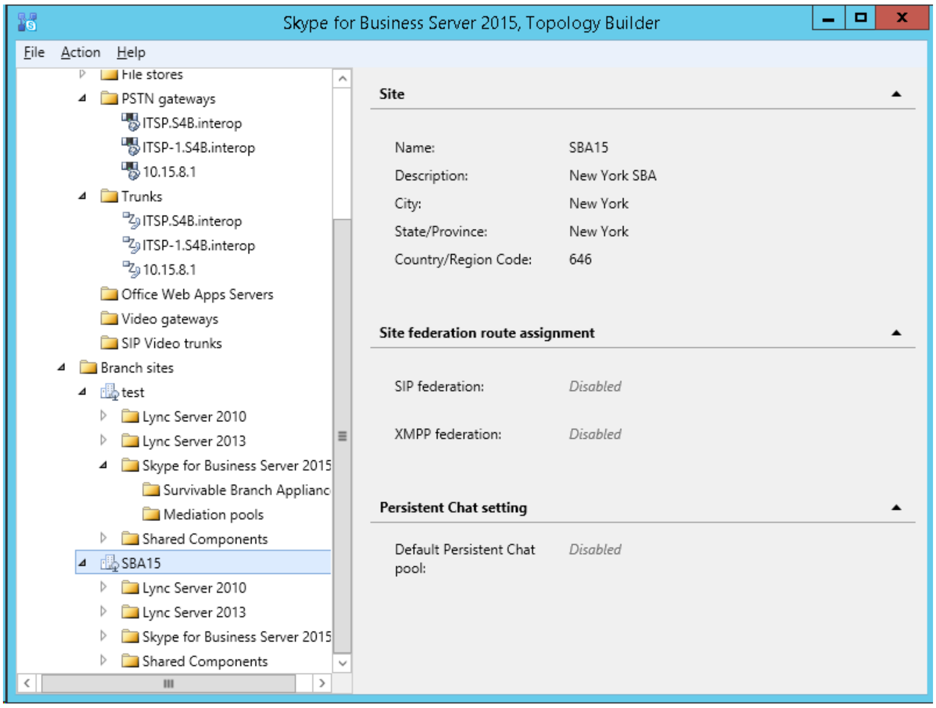
   a. In the ‘City’ field, type the name of the city in which the branch site is located.

   b. In the ‘State/Province’ field, type the name of the state or region in which the branch site is located.

   c. In the ‘Country/Region Code’ field, type the two-digit calling code for the country in which the branch site is located.

d. Click **Next**; the following dialog box appears:

Figure 10-7: New Branch Site Successfully Defined



Site

Name: SBA15
Description: New York SBA
City: New York
State/Province: New York
Country/Region Code: 646

Site federation route assignment

SIP federation: *Disabled*

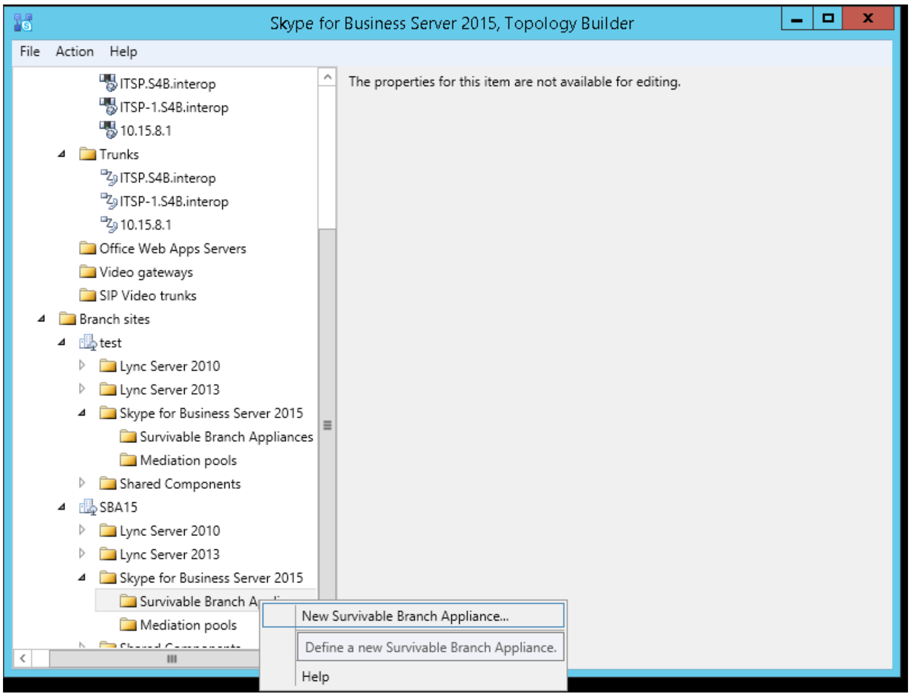
XMPP federation: *Disabled*

Persistent Chat setting

Default Persistent Chat pool: *Disabled*

7. Under the new SBA folder, select the respective folder of the Microsoft platform to which you wish to add the SBA e.g. **Skype for Business Server 2015**, and then click **Finish**; the following dialog box appears:

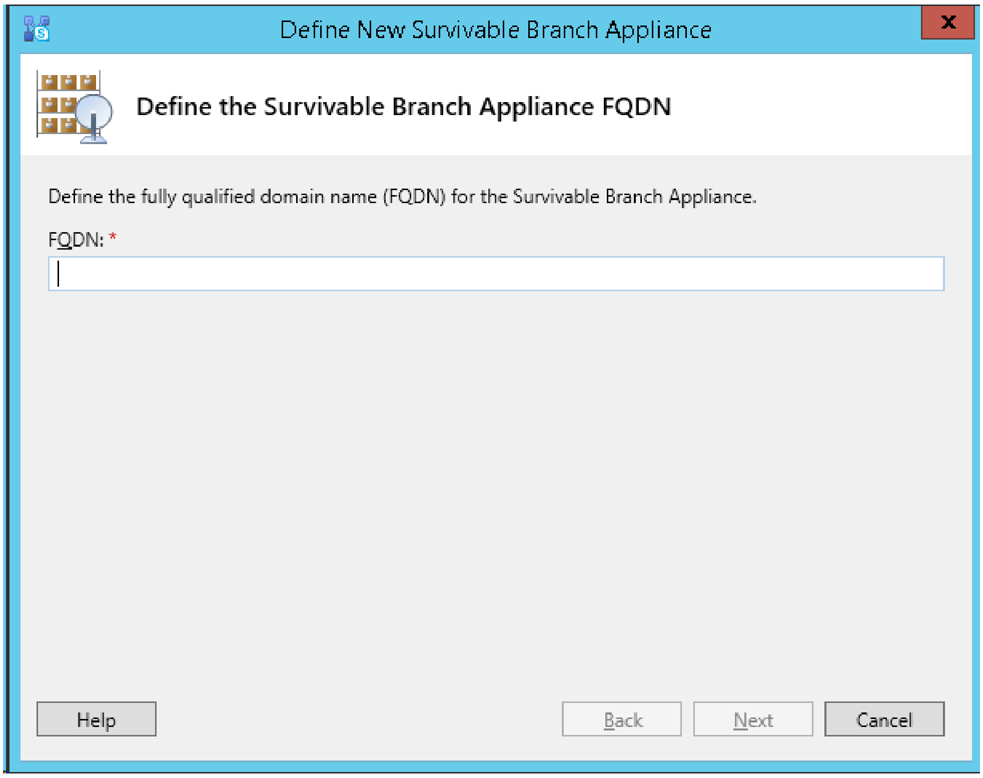
Figure 10-8: Define the Survivable Branch Appliance FQDN



The properties for this item are not available for editing.

8. In the ‘FQDN’ field, type the FQDN of the SBA, and then click **Next.**

Figure 10-9: SBA FQDN



Define the Survivable Branch Appliance FQDN

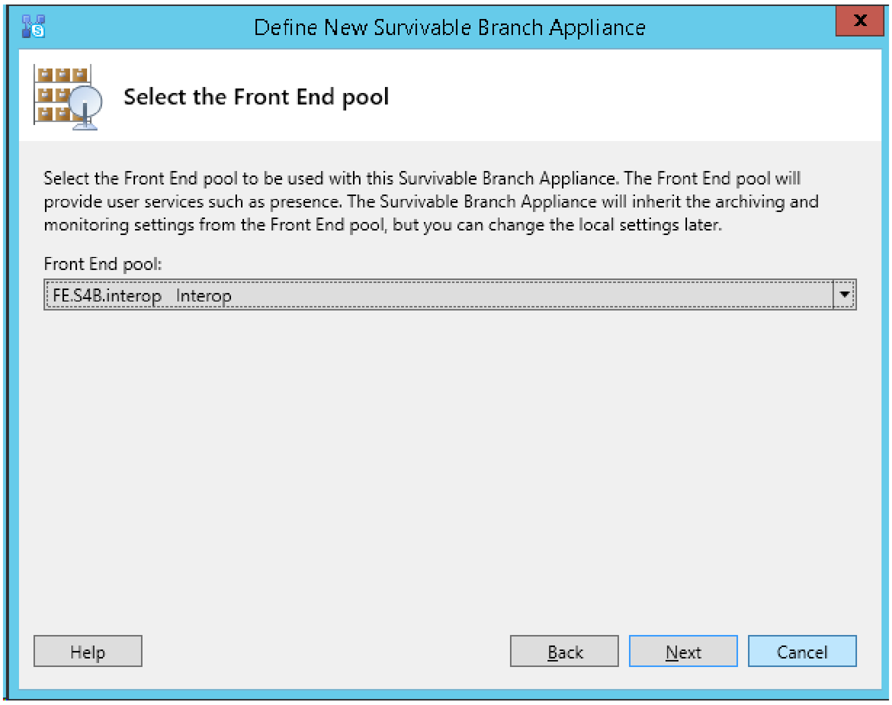
Define the fully qualified domain name (FQDN) for the Survivable Branch Appliance.

FQDN: *

Note: The Survivable Branch Appliance FQDN parameter above should be identically configured in the E-SBC Proxy Set for Skype for Business 2015 (see Section 13.5 on page 156).

The following dialog box appears:

Figure 10-10: Select the Front End Pool



Define New Survivable Branch Appliance

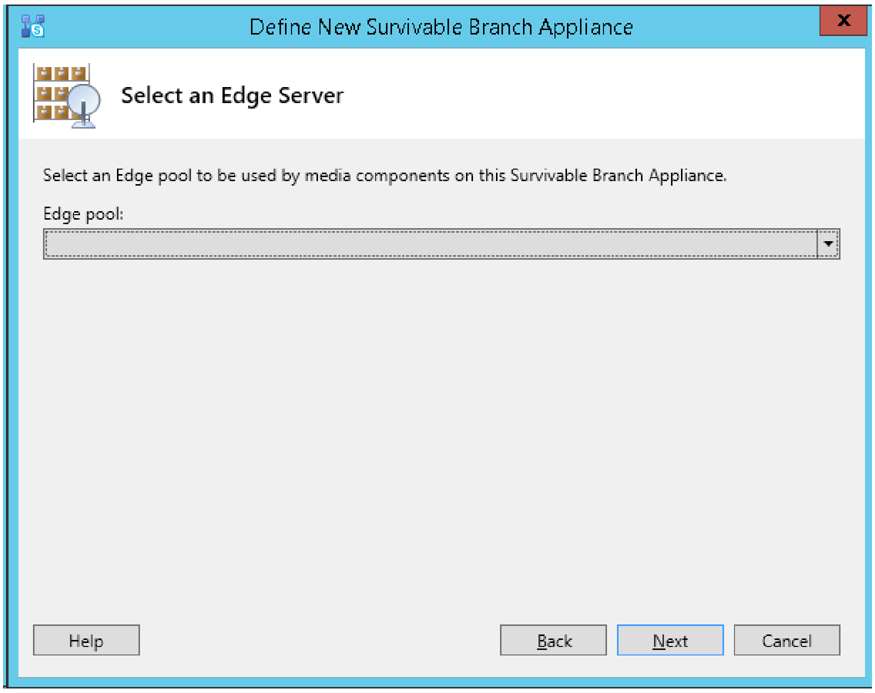
Select the Front End pool

Select the Front End pool to be used with this Survivable Branch Appliance. The Front End pool will provide user services such as presence. The Survivable Branch Appliance will inherit the archiving and monitoring settings from the Front End pool, but you can change the local settings later.

Front End pool: FE.S4B.interop   Interop

9. From the ‘Front End pool’ drop-down list, select the Front End pool to be used with this SBA, and then click **Next**; the following dialog box appears:

Figure 10-11: Select an Edge Server



Define New Survivable Branch Appliance

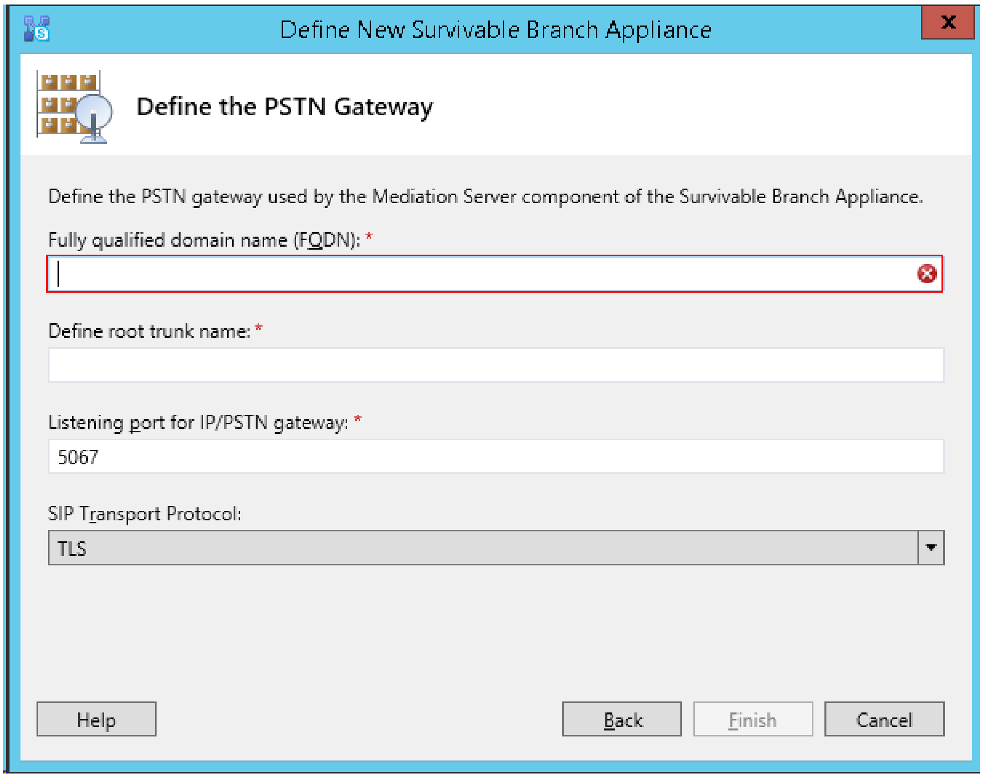
Select an Edge Server

Select an Edge pool to be used by media components on this Survivable Branch Appliance.

Edge pool:

10. From the ‘Edge pool’ drop-down list, select the Edge pool to be used with this SBA (optional), and then click **Next**; the following dialog box example screens appear:

Figure 10-12: Define PSTN Gateway (E-SBC Device)



Define New Survivable Branch Appliance

Define the PSTN Gateway

Define the PSTN gateway used by the Mediation Server component of the Survivable Branch Appliance.

Fully qualified domain name (FQDN): *

Define root trunk name: *

Listening port for IP/PSTN gateway: * 5067

SIP Transport Protocol: TLS

11. Enter the Fully Qualified Domain Name (FQDN) of the E-SBC (e.g., **ITSP.S4B.interop**). This FQDN should be identically configured the Subject Name (CN) in the TLS Certificate Context (see Section 13.9.3 on page 173).

    The subsequent field "Define root trunk name" is automatically filled when you enter the FQDN. The definition of the trunk is a logical connection between the Mediation Server and an E-SBC uniquely identified by the following combination: Mediation Server FQDN, Mediation Server listening port (TLS or TCP), E-SBC IP and FQDN, and gateway listening port.

Note:

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

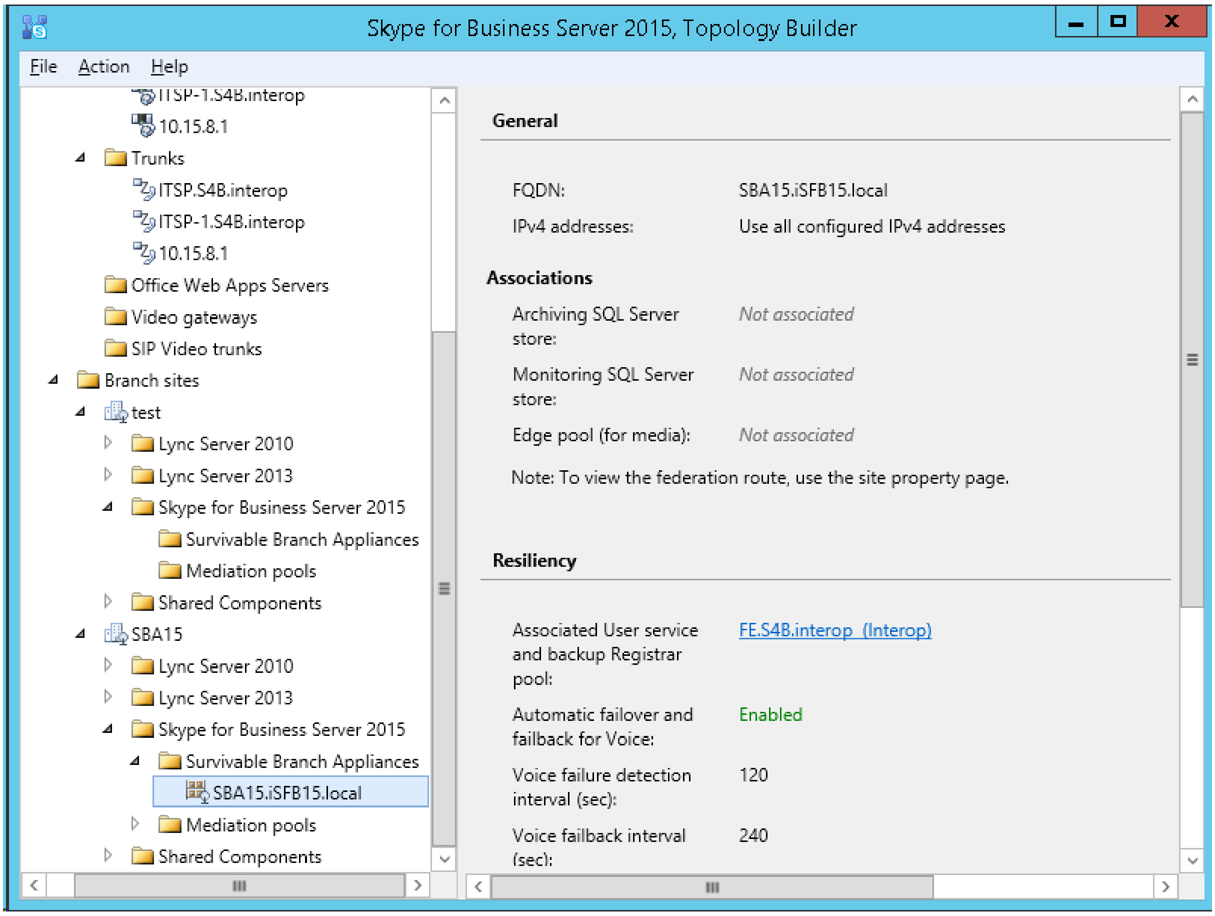
12. In the 'Listening Port for IP/PSTN Gateway' field, enter the listening port that the E-SBC will use for SIP messages from the Mediation Server that will be associated with the root trunk of the PSTN gateway (e.g., **5067**). This parameter should be identically configured in the SIP Interface table (see Section 13.4 on page 154).

13. In the 'SIP Transport Protocol' field, select the transport type (e.g., **TLS**) that the trunk uses. This parameter should be identically configured in the SIP Interface table (see Section 13.4 on page 154).

14. Click **Finish**.

15. The new SBA is added under the Survivable Branch Appliances folder as shown below:

Figure 10-13: SBA Branch Successfully Created



General

FQDN: SBA15.iSFB15.local

IPv4 addresses: Use all configured IPv4 addresses

Associations

Archiving SQL Server store: *Not associated*

Monitoring SQL Server store: *Not associated*

Edge pool (for media): *Not associated*

Note: To view the federation route, use the site property page.

Resiliency

Associated User service and backup Registrar pool: FE.S4B.interop (Interop)

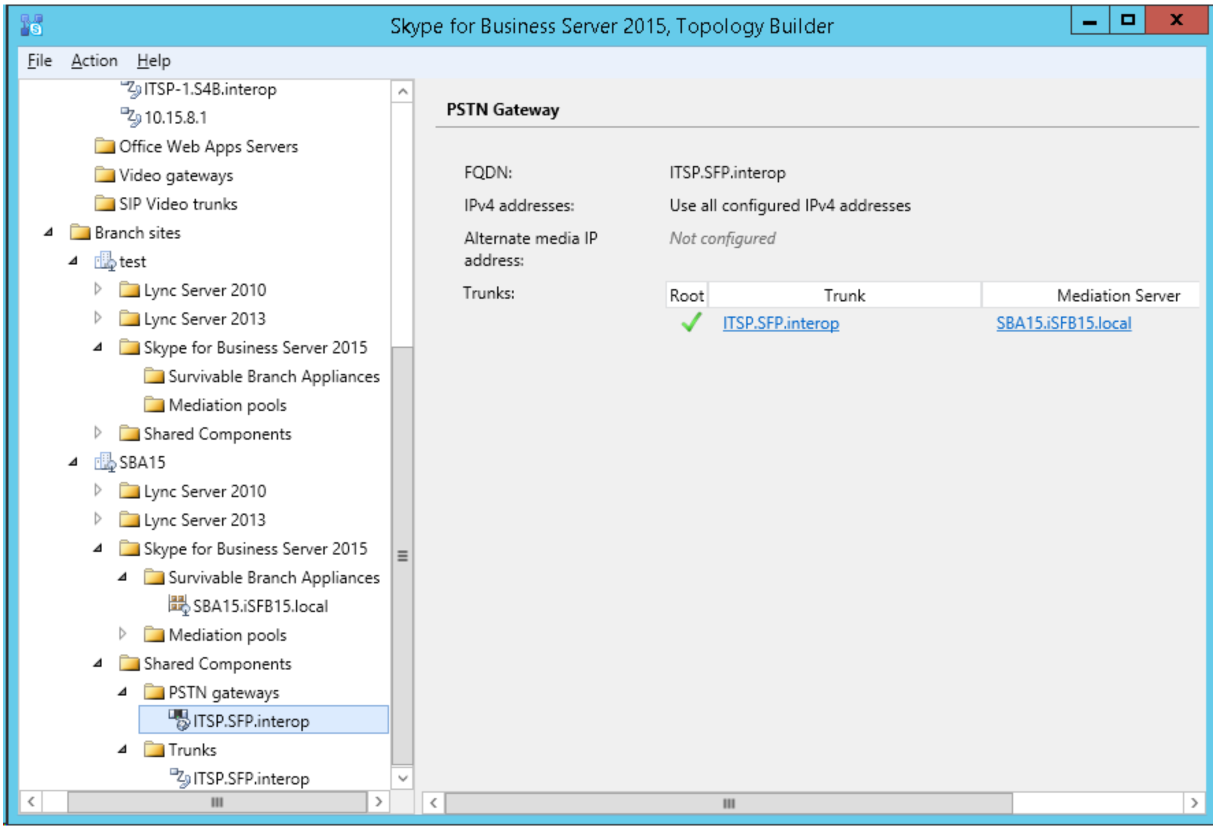
Automatic failover and failback for Voice: Enabled

Voice failure detection interval (sec): 120

Voice failback interval (sec): 240

16. Open the SBA branch Shared Components folder and you notice that the PSTN Gateway (E-SBC device) and trunk objects have been added in the respective folders as shown in the example figure below:

Figure 10-14: SBA Shared Components



PSTN Gateway

FQDN: ITSP.SFP.interop

IPv4 addresses: Use all configured IPv4 addresses

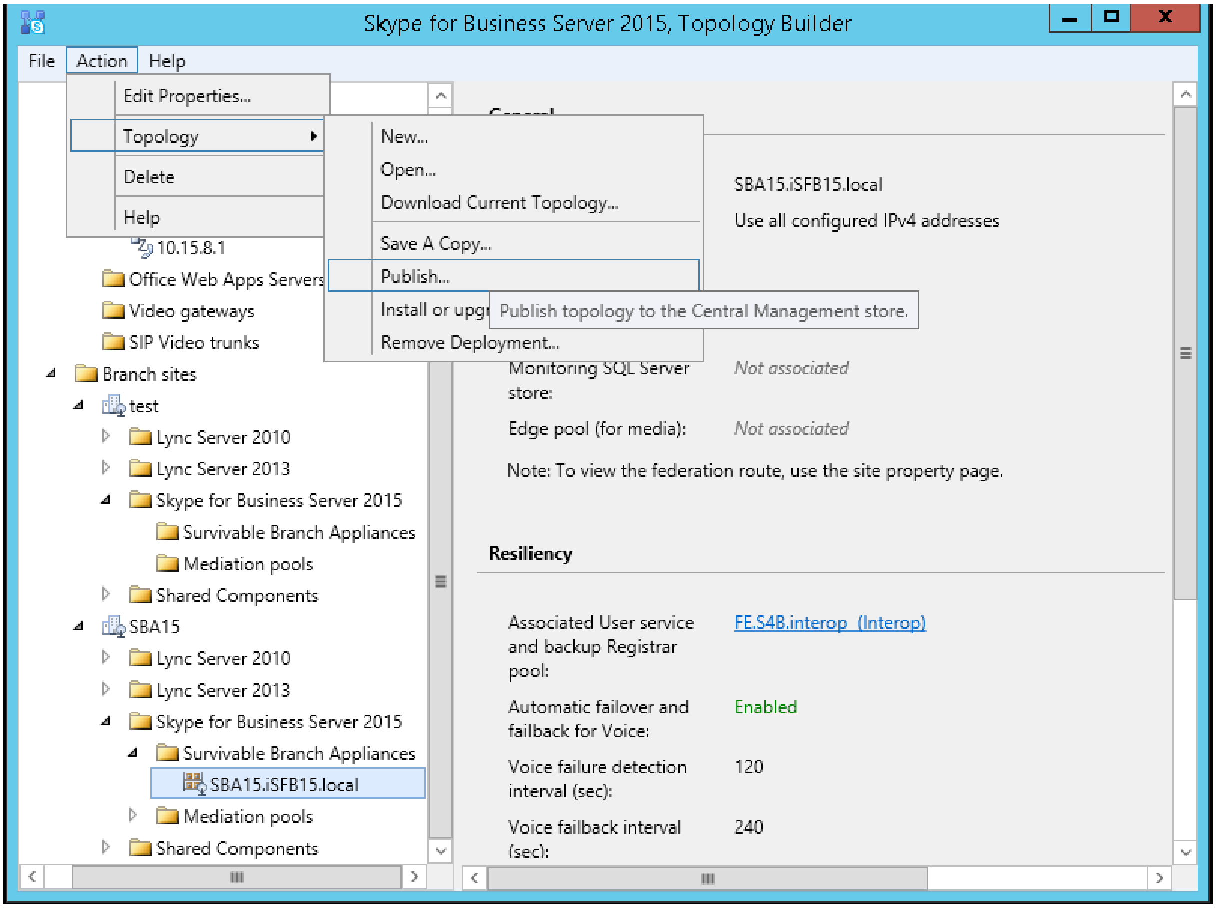
Alternate media IP address: *Not configured*

Trunks:

Root	Trunk	Mediation Server
✓	ITSP.SFP.interop	SBA15.iSFB15.local

17. Publish the Topology: In the main tree, select the root node **Skype for Business Server**, and then from the **Action** menu, choose **Publish Topology**, as shown below:

Figure 10-15: Choosing Publish Topology



SBA15.iSFB15.local

Use all configured IPv4 addresses

Monitoring SQL Server store: *Not associated*

Edge pool (for media): *Not associated*

Note: To view the federation route, use the site property page.

Associated User service and backup Registrar pool: FE.S4B.interop (Interop)

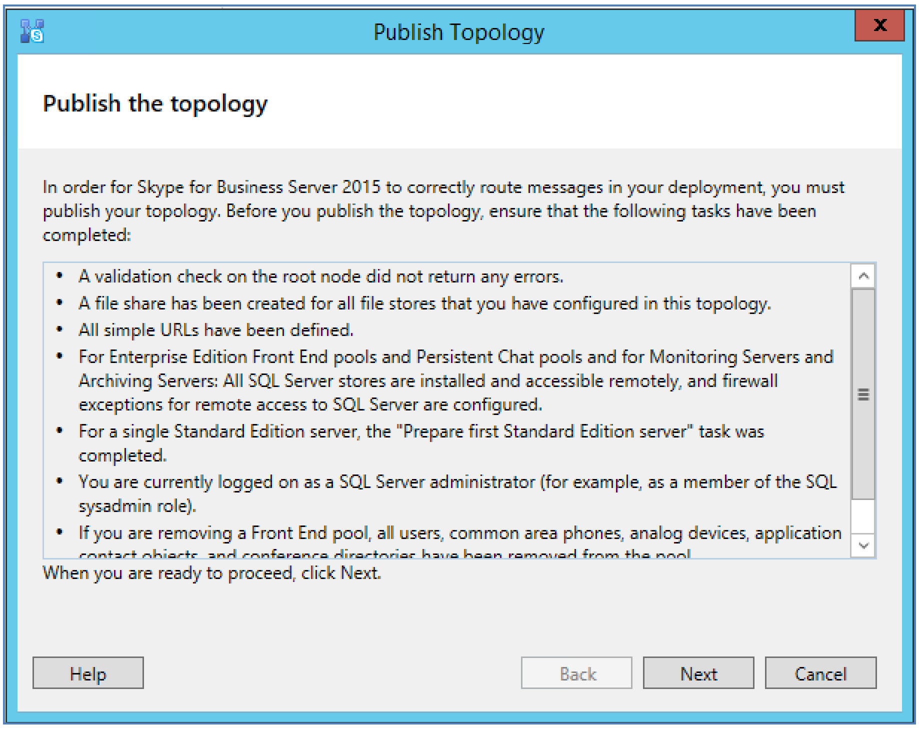
Automatic failover and failback for Voice: Enabled

Voice failure detection interval (sec): 120

Voice failback interval (sec): 240

The following is displayed:

Figure 10-16: Publish the Topology



Publish the topology

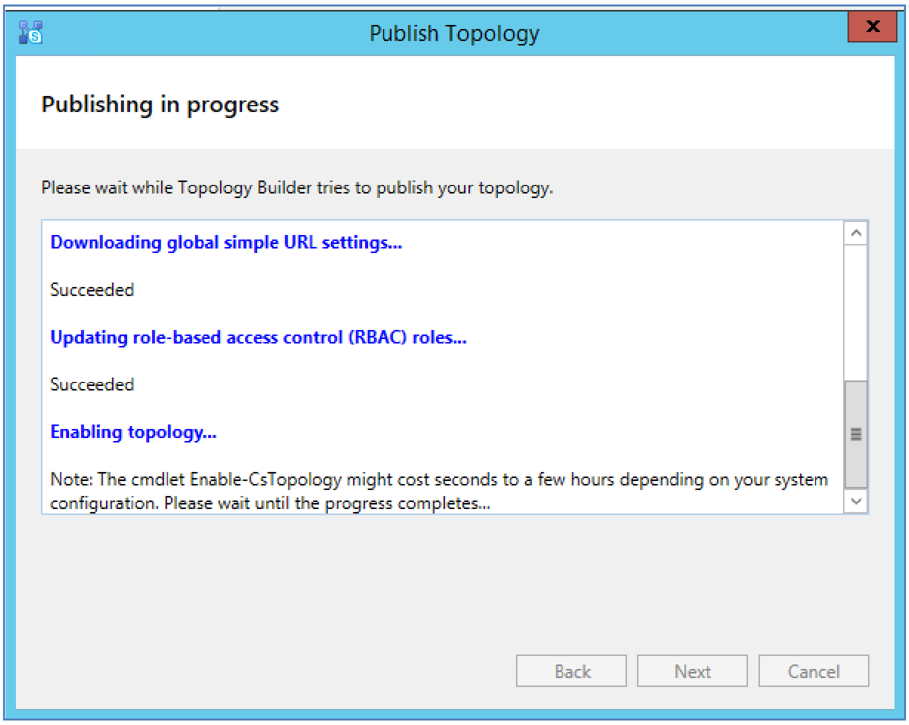
In order for Skype for Business Server 2015 to correctly route messages in your deployment, you must publish your topology. Before you publish the topology, ensure that the following tasks have been completed:

- A validation check on the root node did not return any errors.
- A file share has been created for all file stores that you have configured in this topology.
- All simple URLs have been defined.
- For Enterprise Edition Front End pools and Persistent Chat pools and for Monitoring Servers and Archiving Servers: All SQL Server stores are installed and accessible remotely, and firewall exceptions for remote access to SQL Server are configured.
- For a single Standard Edition server, the "Prepare first Standard Edition server" task was completed.
- You are currently logged on as a SQL Server administrator (for example, as a member of the SQL sysadmin role).
- If you are removing a Front End pool, all users, common area phones, analog devices, application contact objects, and conference directories have been removed from the pool.

When you are ready to proceed, click Next.

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

Figure 10-17: Publishing in Progress



Publishing in progress

Please wait while Topology Builder tries to publish your topology.

Downloading global simple URL settings...

Succeeded

Updating role-based access control (RBAC) roles...

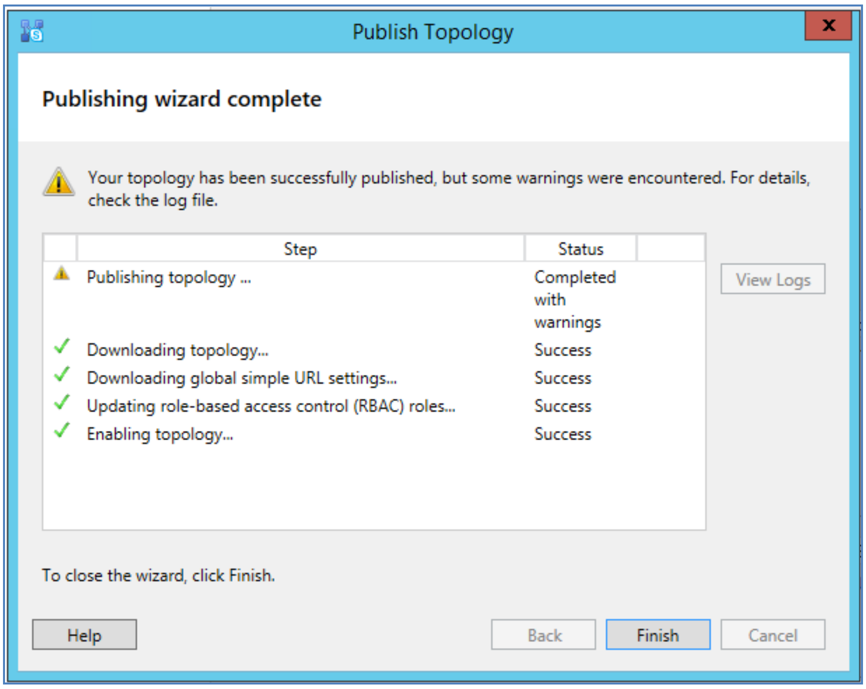
Succeeded

Enabling topology...

Note: The cmdlet Enable-CsTopology might cost seconds to a few hours depending on your system configuration. Please wait until the progress completes...

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

Figure 10-18: Publishing Wizard Complete



Publishing wizard complete

Your topology has been successfully published, but some warnings were encountered. For details, check the log file.

	Step	Status
⚠	Publishing topology ...	Completed with warnings
✓	Downloading topology...	Success
✓	Downloading global simple URL settings...	Success
✓	Updating role-based access control (RBAC) roles...	Success
✓	Enabling topology...	Success

To close the wizard, click Finish.

20. Click **Finish**.

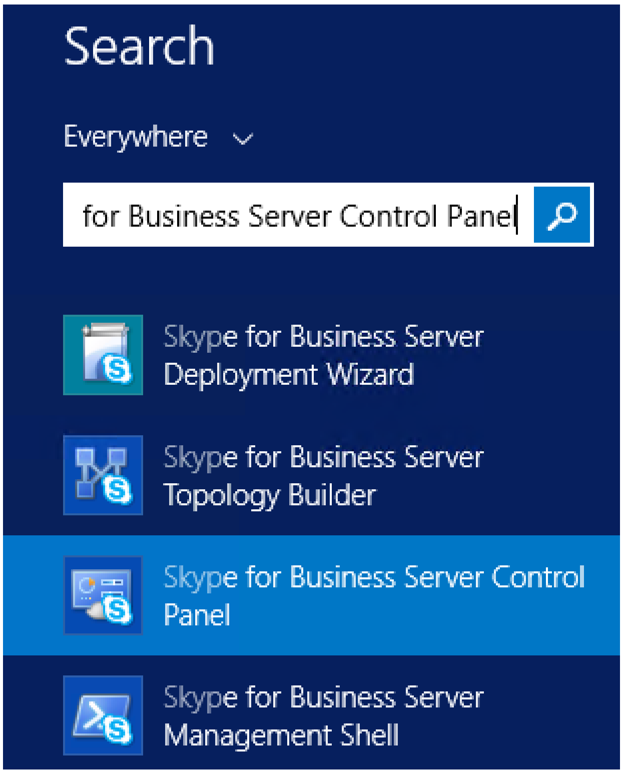
10.2 Configuring the "Route" on Skype for Business Server 2015

The procedure below describes how to configure a "Route" on the Skype for Business Server 2015 and to associate it with the E-SBC PSTN gateway.

➢ **To configure the "route" on Skype for Business Server 2015:**

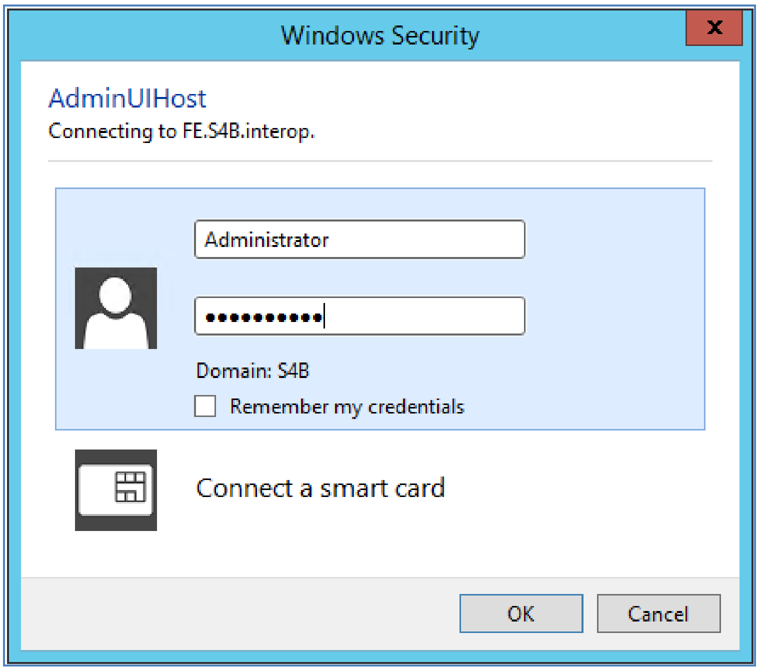
1. Start the Microsoft Skype for Business Server 2015 Control Panel (**Start** > search for **Microsoft Skype for Business Server Control Panel**), as shown below:

Figure 10-19: Opening the Skype for Business Server Control Panel


Search
Everywhere
for Business Server Control Panel
Skype for Business Server Deployment Wizard
Skype for Business Server Topology Builder
Skype for Business Server Control Panel
Skype for Business Server Management Shell

2. You are prompted to enter your login credentials:

Figure 10-20: Skype for Business Server Credentials



Windows Security

AdminUIHost

Connecting to FE.S4B.interop.

Administrator

••••••••••

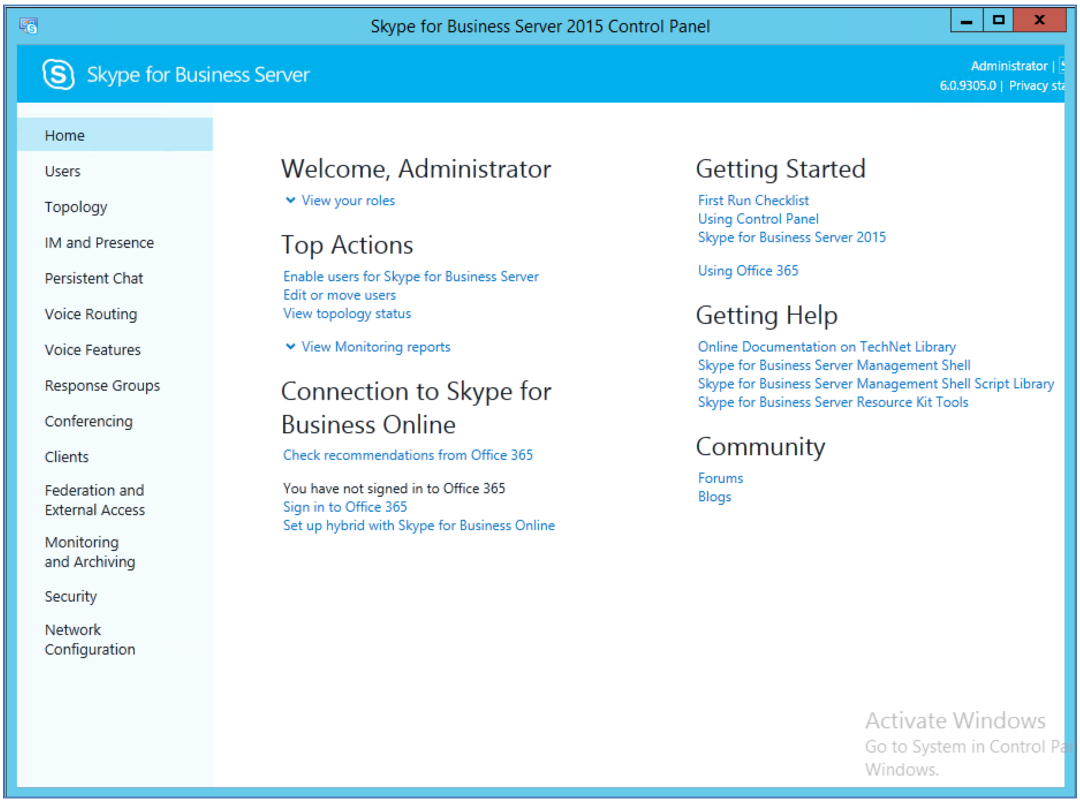
Domain: S4B

□ Remember my credentials

Connect a smart card

3. Enter your domain username and password, and then click **OK**; the Microsoft Skype for Business Server 2015 Control Panel is displayed:

Figure 10-21: Microsoft Skype for Business Server 2015 Control Panel



Skype for Business Server 2015 Control Panel

Skype for Business Server

Administrator | S
6.0.9305.0 | Privacy sta

- Home
- Users
- Topology
- IM and Presence
- Persistent Chat
- Voice Routing
- Voice Features
- Response Groups
- Conferencing
- Clients
- Federation and External Access
- Monitoring and Archiving
- Security
- Network Configuration

Welcome, Administrator

View your roles

Top Actions

Enable users for Skype for Business Server
Edit or move users
View topology status

View Monitoring reports

Connection to Skype for Business Online

Check recommendations from Office 365

You have not signed in to Office 365
Sign in to Office 365
Set up hybrid with Skype for Business Online

Getting Started

First Run Checklist
Using Control Panel
Skype for Business Server 2015

Using Office 365

Getting Help

Online Documentation on TechNet Library
Skype for Business Server Management Shell
Skype for Business Server Management Shell Script Library
Skype for Business Server Resource Kit Tools

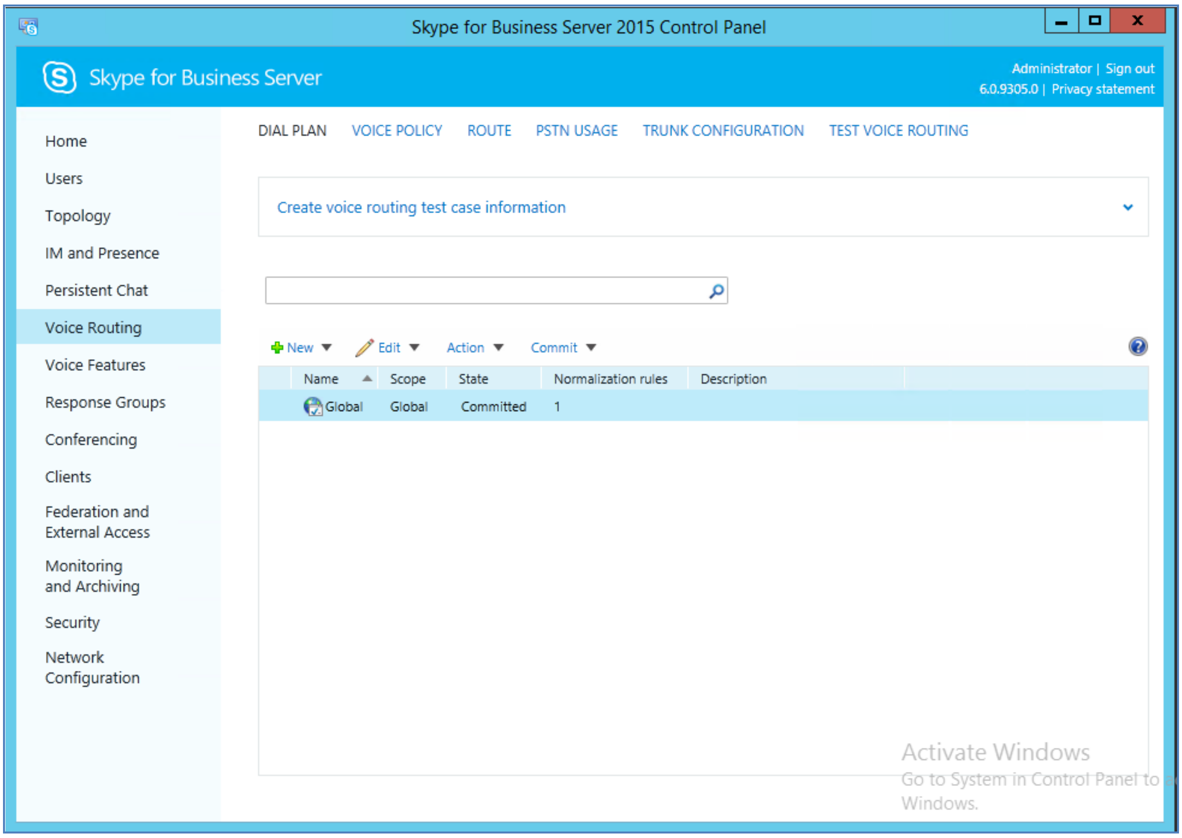
Community

Forums
Blogs

Activate Windows
Go to System in Control Pa
Windows.

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

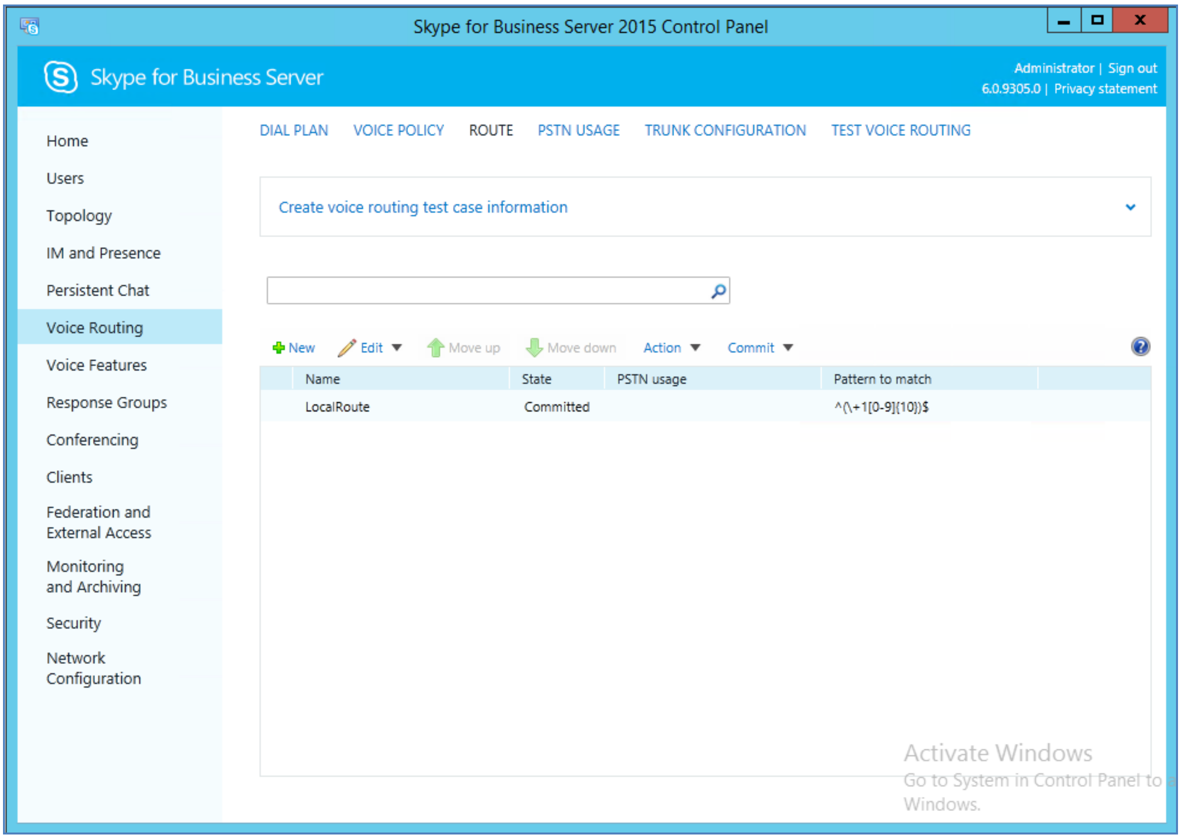
Figure 10-22**: Voice Routing Page**



Name	Scope	State	Normalization rules	Description
Global	Global	Committed	1	

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

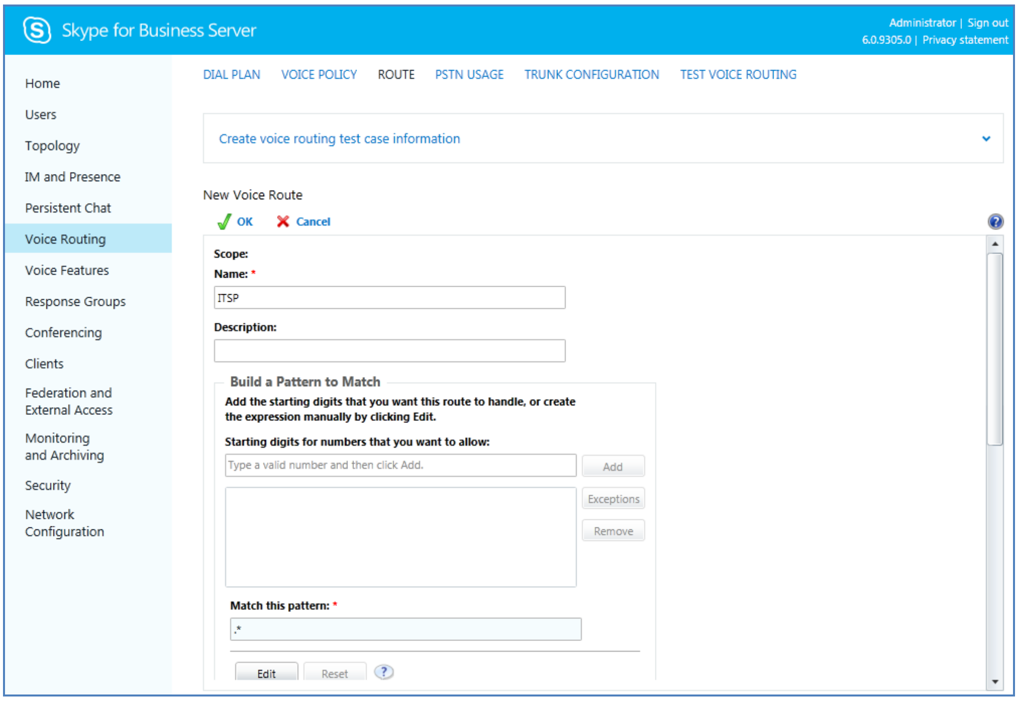
Figure 10-23: Route Tab



Name	State	PSTN usage	Pattern to match
LocalRoute	Committed		^(\+1[0-9]{10})$

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

Figure 10-24: Adding New Voice Route



New Voice Route

Scope:

Name: * ITSP

Description:

Build a Pattern to Match

Add the starting digits that you want this route to handle, or create the expression manually by clicking Edit.

Starting digits for numbers that you want to allow: Type a valid number and then click Add.

Match this pattern: * .*

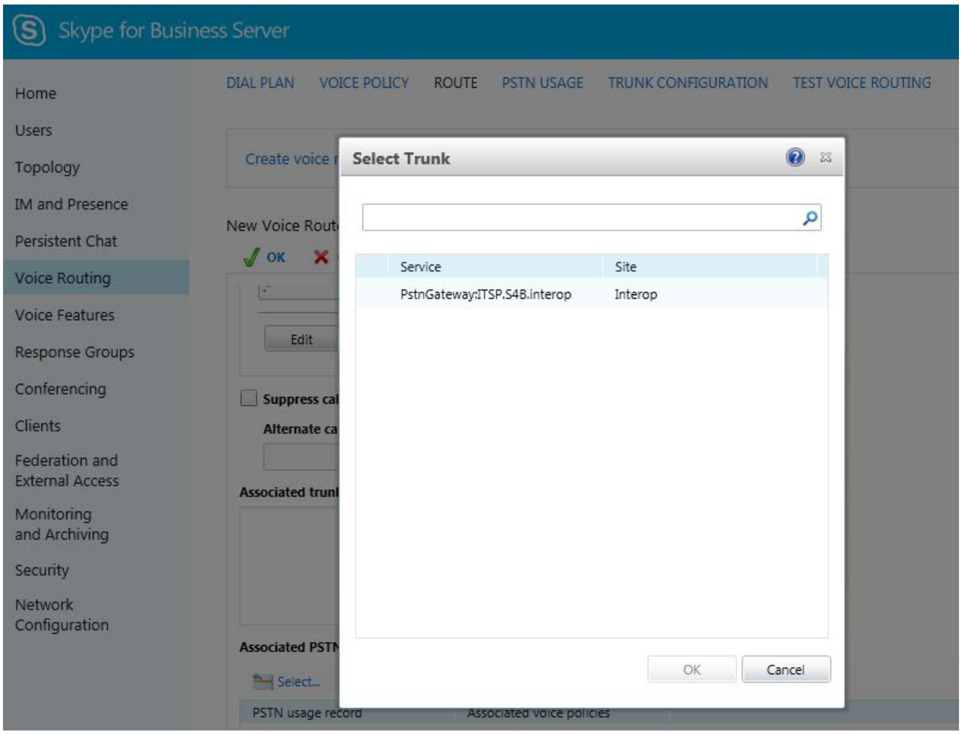
7. In the 'Name' field, enter a name for this route (e.g., **ITSP**).

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

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

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

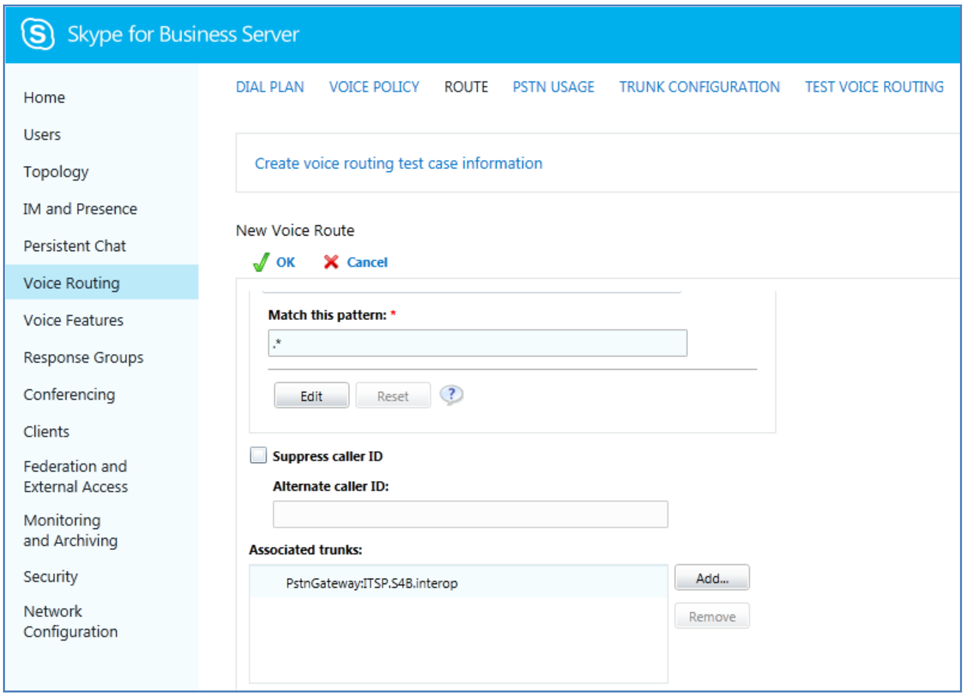
Figure 10-25: List of Deployed Trunks



Service	Site
PstnGateway:ITSP.S4B.interop	Interop

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

Figure 10-26: Selected E-SBC Trunk



Match this pattern: * .*

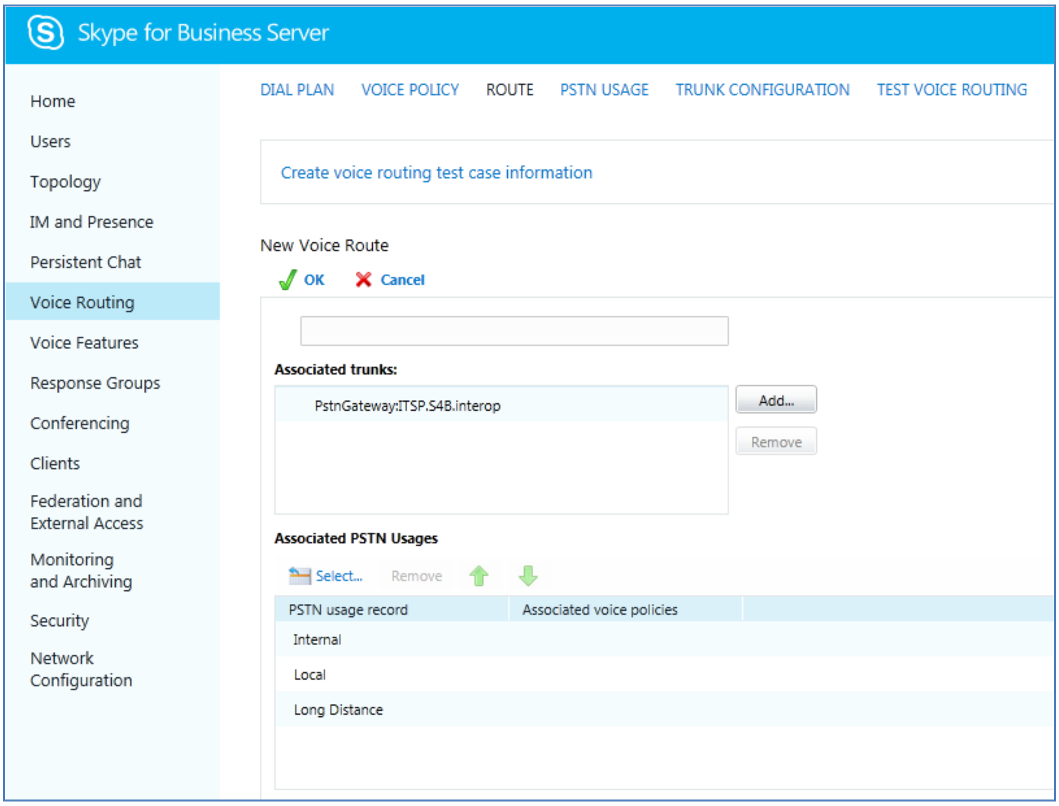
☐ Suppress caller ID

Alternate caller ID:

Associated trunks: PstnGateway:ITSP.S4B.interop

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

Figure 10-27: Associating PSTN Usage to Route



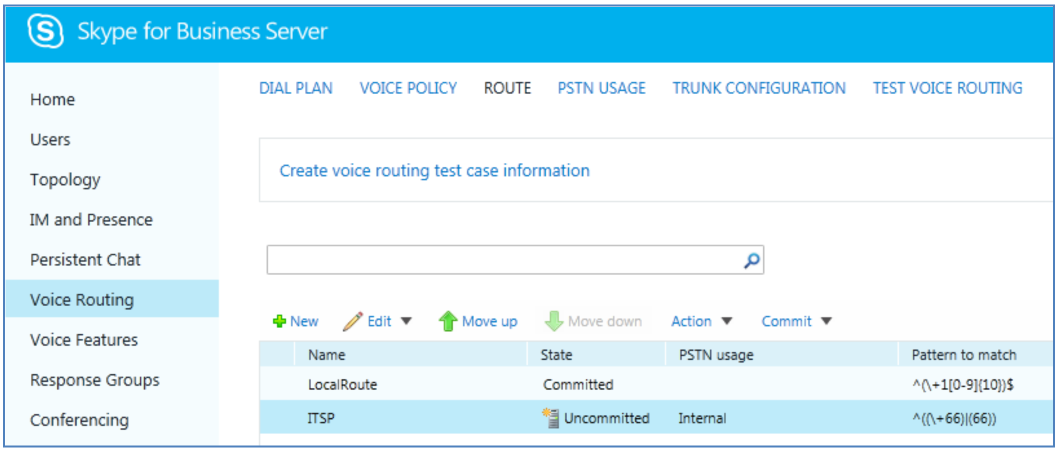
Associated trunks: PstnGateway:ITSP.S4B.interop

Associated PSTN Usages

PSTN usage record	Associated voice policies
Internal	
Local	
Long Distance	

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

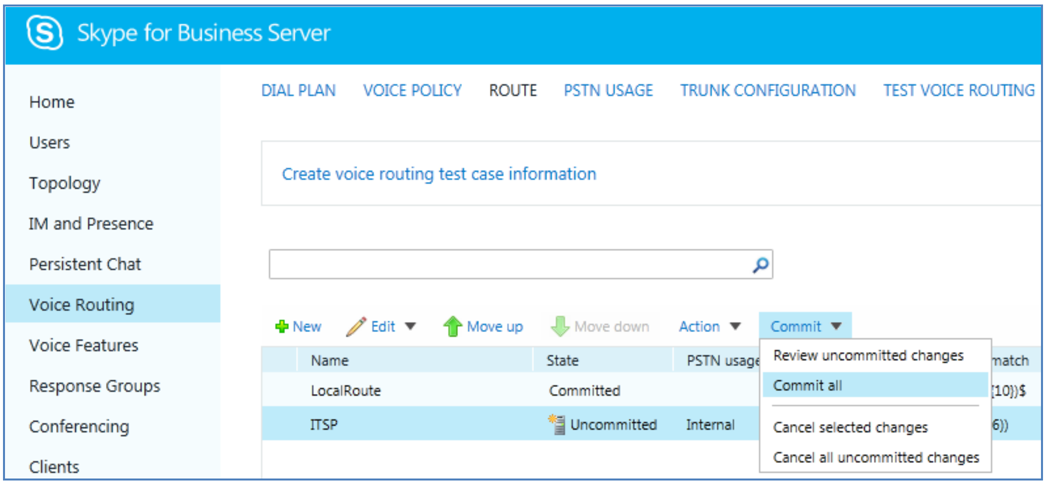
Figure 10-28: Confirmation of New Voice Route



Name	State	PSTN usage	Pattern to match
LocalRoute	Committed		^(\+1[0-9]{10})$
ITSP	Uncommitted	Internal	^((\+66)|(66))

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

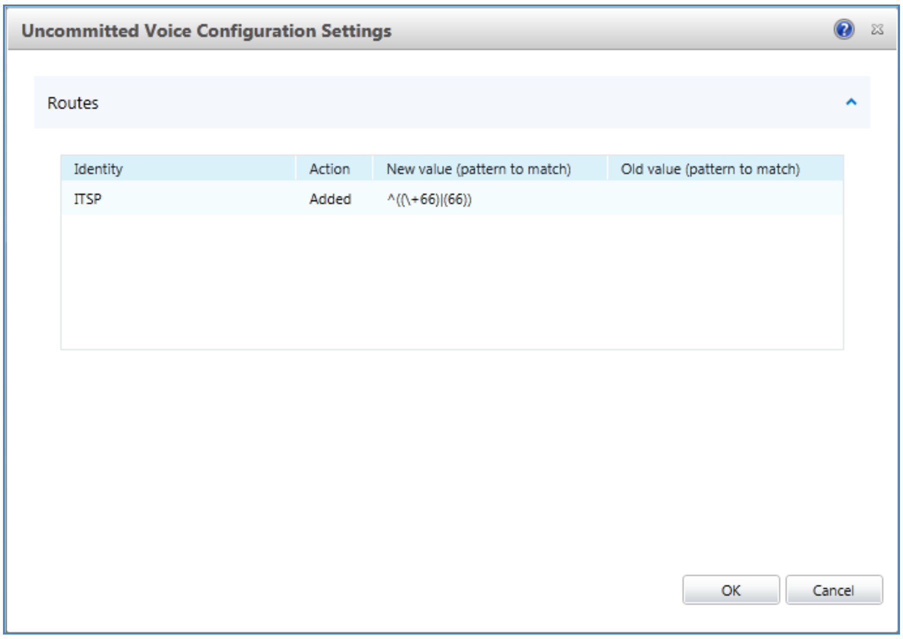
Figure 10-29: Committing Voice Routes



Name	State	PSTN usage	match
LocalRoute	Committed		[10])$
ITSP	Uncommitted	Internal	6))

The Uncommitted Voice Configuration Settings page appears:

Figure 10-30: Uncommitted Voice Configuration Settings



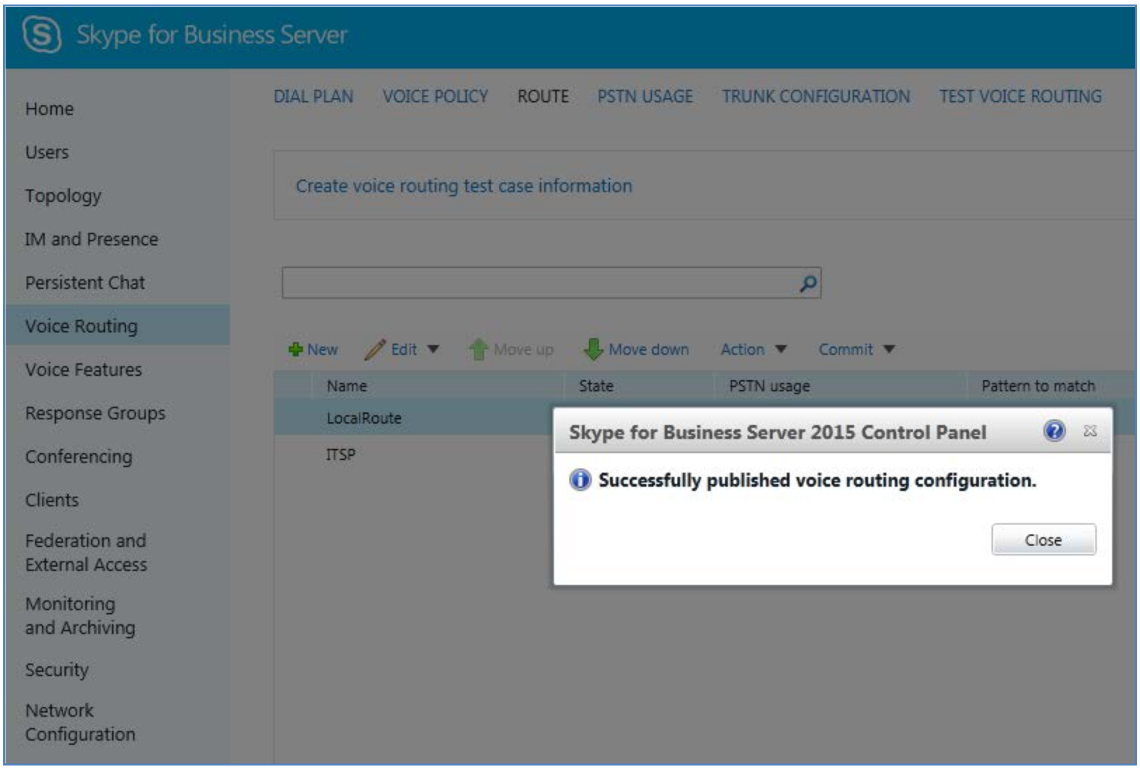
Uncommitted Voice Configuration Settings

Routes

Identity	Action	New value (pattern to match)	Old value (pattern to match)
ITSP	Added	^((\+66)|(66))	

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

Figure 10-31: Confirmation of Successful Voice Routing Configuration

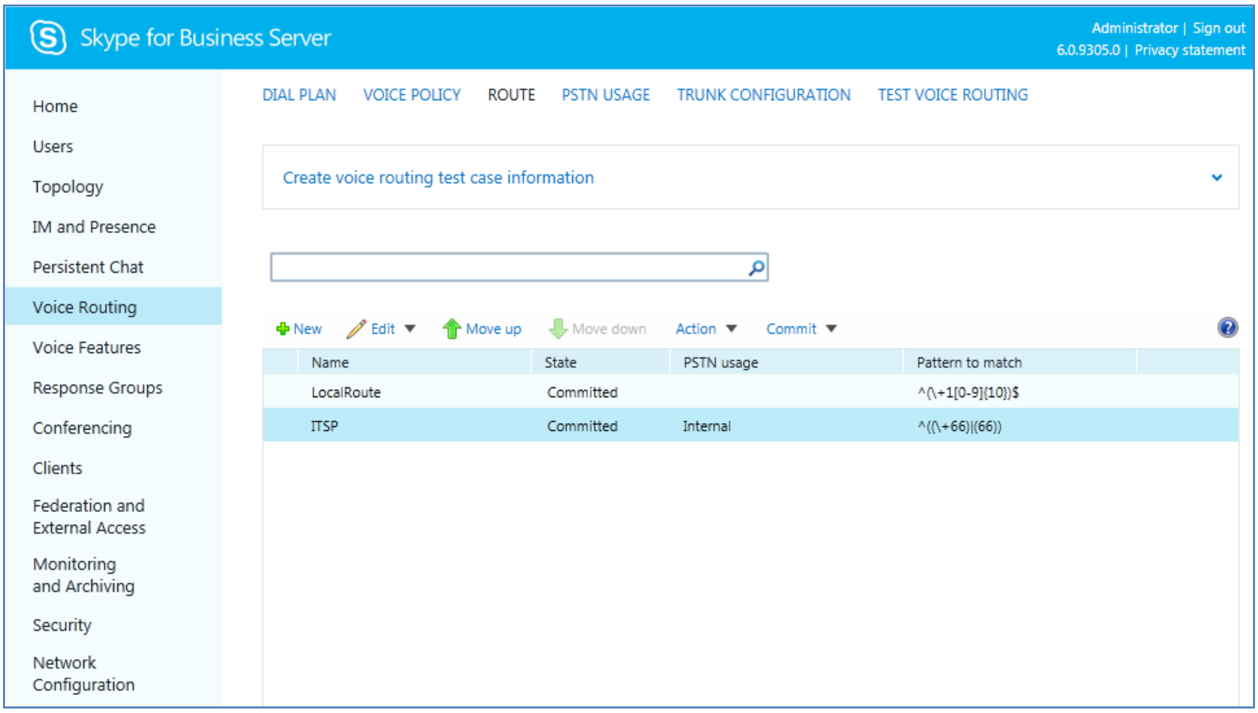


Skype for Business Server 2015 Control Panel

Successfully published voice routing configuration.

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

Figure 10-32: Voice Routing Screen Displaying Committed Routes



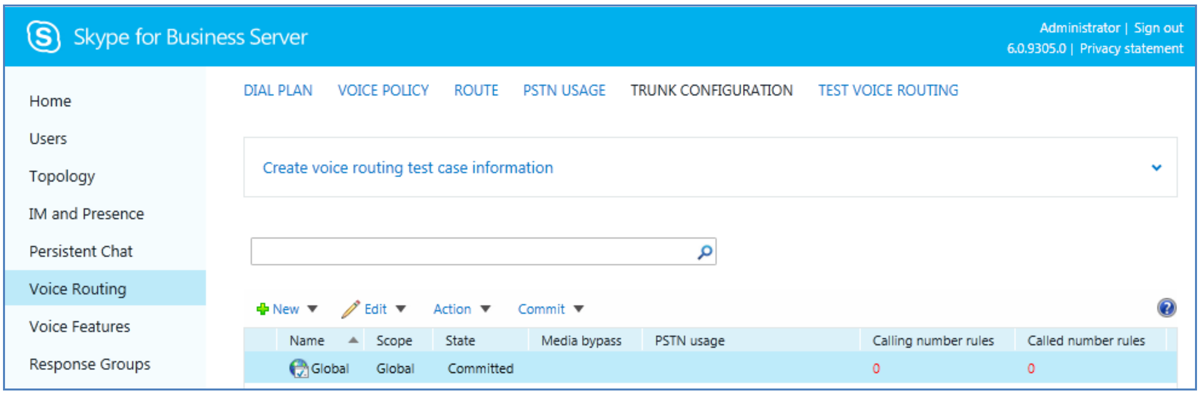
Name	State	PSTN usage	Pattern to match
LocalRoute	Committed		^(\+1[0-9]{10})$
ITSP	Committed	Internal	^((\+66)|(66))

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

Note: The SIP History-Info header provides a method to verify the identity (ID) of the call forwarder (i.e., the Skype for Business user number). This ID is required by Vendor SIP Trunk in the P-Asserted-Identity header. The device adds this ID to the P-Asserted-Identity header in the sent INVITE message using the IP Profile (later configured in Section 13.6 on page 160).

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

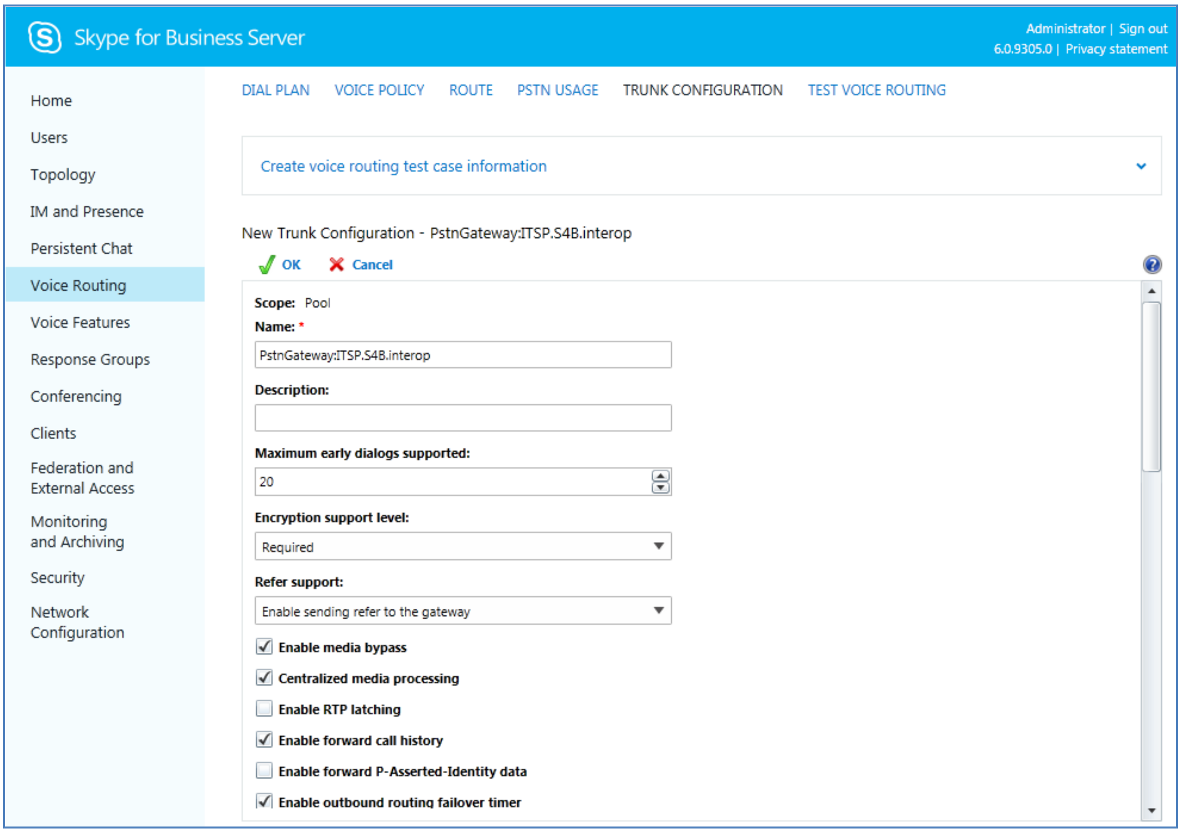
Figure 10-33: Voice Routing Screen – Trunk Configuration Tab



Name	Scope	State	Media bypass	PSTN usage	Calling number rules	Called number rules
Global	Global	Committed			0	0

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

Figure 10-34: Edit Trunk Configuration



New Trunk Configuration - PstnGateway:ITSP.S4B.interop

Scope: Pool

Name: * PstnGateway:ITSP.S4B.interop

Description:

Maximum early dialogs supported: 20

Encryption support level: Required

Refer support: Enable sending refer to the gateway

☑ Enable media bypass
☑ Centralized media processing
□ Enable RTP latching
☑ Enable forward call history
□ Enable forward P-Asserted-Identity data
☑ Enable outbound routing failover timer

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

16. Repeat Steps 11 through 13 to commit your settings.

Part IV

Setting up the SBA with Management Interface

This part describes how to initially connect to the SBA's management interface and to install and configure it in the branch site.

11 Connecting to the SBA Management Interface

The SBA Web-based, graphical user interface (GUI) tool is used for installing and configuring the SBA application running on the Mediant 2600B SBA OSN server.

Note: The SBA Management Interface is supported from Internet Explorer 9 and later (Compatibility disabled), Firefox, and Google Chrome.

You can initially connect the SBA to the network using one of the following methods:

- **Using the internal NIC:** the SBA is connected to the network through the E-SBC Ethernet port and the devices internal switch. See below.

  If this option is used, only a single network cable is required (for connecting to the E-SBC Ethernet port).

- **Using the external NIC:** the SBA is connected to the network through the GE port on the OSN server. See Section 11.2.

  If this option is used, two network cables are required; one for connecting to the OSN server GE port and the other for connecting to the E-SBC application GE port.

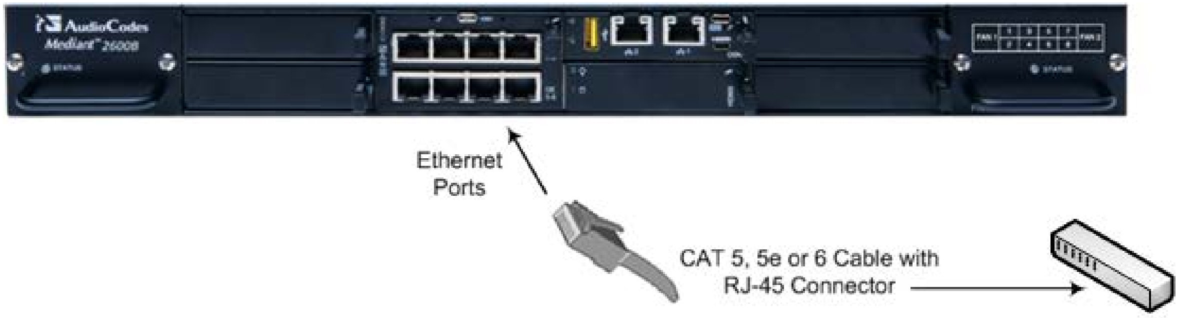
11.1 Connecting to SBA Using the Internal NIC

When you initially connect to the SBA using the internal NIC, the network cable should be connected to one of the E-SBC Ethernet ports on the device's front panel; this port connects to the device's internal switch, which then connects to the OSN module. When this option is used, there is no pre-configured factory default IP address, and therefore the network address must be acquired using DHCP or assigned with a static IP address.

➢ To initially connect to the SBA using the internal NIC:

1. Connect the first Ethernet port on the SBC module on the front panel of the device directly to the network using a straight-through Ethernet cable.

Figure 11-1: Connecting Mediant 2600B SBA LAN Port (Front Panel)



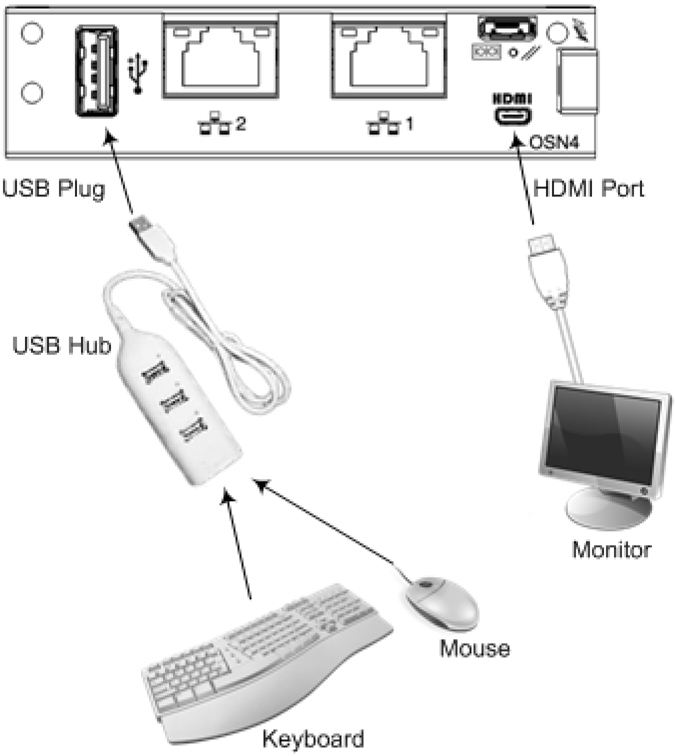
2. If you wish to monitor the connection process via an HDMI monitor, do the following (otherwise skip to Step 3):

   a. Connect a USB hub to the USB port located on the OSN4 module, and then connect the USB hub to the following computer peripherals:

      - Mouse
      - Keyboard

   b. Using the supplied MINI HDMI TO HDMI 1.5m cable, connect the Micro HDMI port on the OSN4 module using a Mini HDMI connector and connect the other end to the HDMI port on the monitor using a Type-D male connector. For HDMI connector cable pinouts (see Section 3.1.3 for HDMI cable connector pinouts).

Figure 11-2: Cabling OSN4 Module with HDMI Monitor



   c. Determine the NIC used for the Ethernet port, by removing the network cable from the Ethernet port and viewing on the monitor that the NIC (ID) has changed to "Disconnected". This is the NIC corresponding to the Ethernet LAN port.

   d. Reconnect the network cable and then do one of the following:

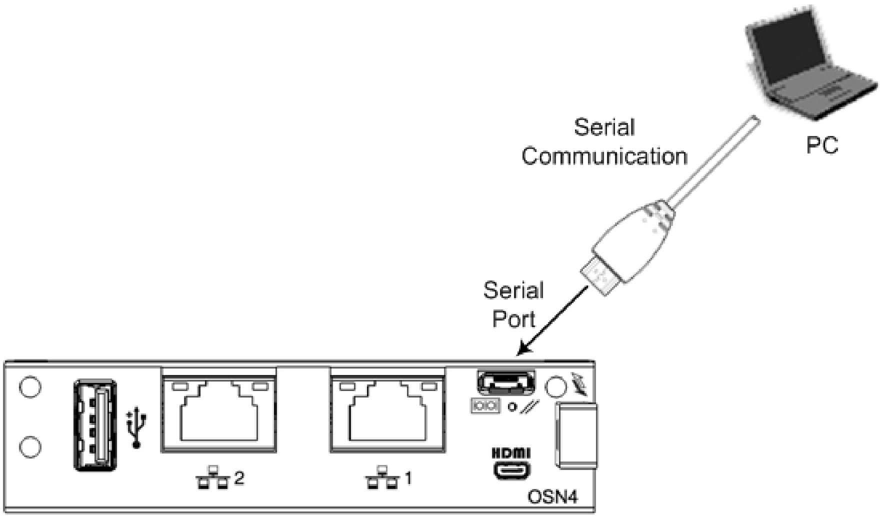
      - If you have a DHCP server in your network, note the IP address assigned to the Ethernet LAN port.
      - If you are not using a DHCP server, then assign a static IP address to the NIC of the Ethernet LAN port.

   e. Proceed to Step 10.

3. Connect a serial cable with a micro-USB connector on one end to the serial port (labeled **IOIOI**) on the OSN4 module.

4. Connect the other end of the cable to the COM port on your computer.

Figure 11-3: Cabling OSN4 Module for Serial Communication



Note: For the Mediant 2600B SBA OSN serial interface port (micro-USB) to be operational, you must download a special USB driver from the Internet. Download this driver at:

- http://www.silabs.com/products/mcu/pages/usbtouartbridgevcpdrivers.aspx
- http:/www.silabs.com/products/mcu/pages/usbtouartbridgevcpdrivers.aspx

5. Establish serial communication with the OSN server through a terminal emulation program (such as HyperTerminal) using the following serial communication settings:
   - Baud Rate: 115200 (bits per second)
   - Data Bits: 8
   - Parity: None
   - Stop Bits: 1
   - Flow Control: None
6. Press Enter; the Serial Console prompt is displayed:

```
SAC>
```

7. Type the following to view all the NIC addresses:

```
SAC>i
```

8. Do one of the following:
   - If you have a DHCP server in your network, the internal NIC should be identified by a displayed IP address (the two external Ethernet LAN ports should be displayed as "Disconnected").

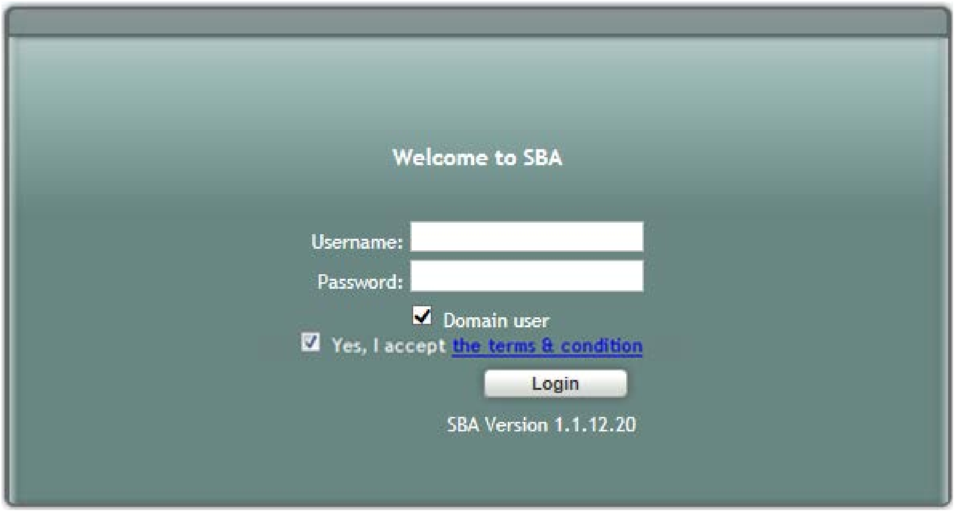
- If you are not using a DHCP server, assign a static IP address to the NIC of the internal Ethernet LAN port using the following command and then press **Enter** to apply your settings:

```
i <NIC ID> <IP address> <subnet> <default gateway>
```

9. Disconnect the serial cable from the OSN server.
10. Open a standard Web browser (Firefox, Google Chrome, or Internet Explorer 9 and later is recommended), and then in the URL address field, enter the IP address that you determined above.

    The Survivable Branch Appliance Management Interface opens:

Figure 11-4: Welcome to SBA



Welcome to SBA

Username:

Password:

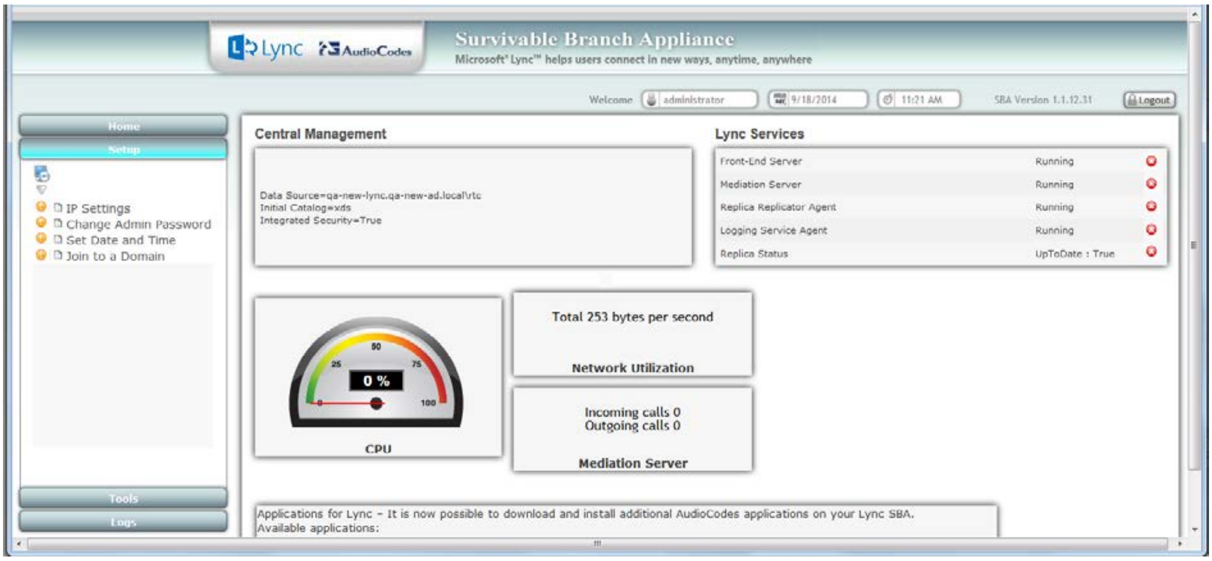
☑ Domain user

☑ Yes, I accept the terms & condition

SBA Version 1.1.12.20

11. Log in with the default username ("Administrator") and password ("Pass123"), Select the "Yes, I accept the term and condition" checkbox, and then click **Login**; the Home screen appears:

Figure 11-5: SBA Home Screen



Welcome administrator 9/18/2014 11:21 AM SBA Version 1.1.12.31

Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

Front-End Server	Running
Mediation Server	Running
Replica Replicator Agent	Running
Logging Service Agent	Running
Replica Status	UpToDate : True

0 %

Total 253 bytes per second

Incoming calls 0
Outgoing calls 0

Applications for Lync - It is now possible to download and install additional AudioCodes applications on your Lync SBA.
Available applications:

12. Change the default IP address of the SBA Management Interface to suit your network environment (see page 81).

11.2 Connecting to the SBA Using the External NIC

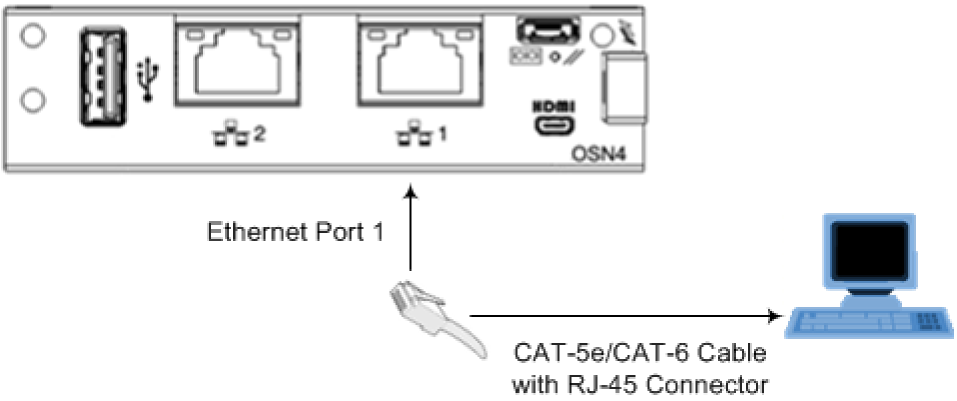
When you initially connect to the SBA using the external NIC, the network cable should be connected to Ethernet port **1** on the OSN module.

The SBA Management Interface is initially accessed using the pre-configured factory default IP address of the OSN server (**192.168.0.20/16**). You can then use the SBA Management interface to change this default IP address to suit your network environment.

➢ To initially connect to the SBA using the external NIC:

1. Connect an RJ-45 connector, on one end of a CAT 5 (5e or 6) cable to Ethernet port **1** on the OSN4 module. Connect the other end of the cable to your PC .

Figure 11-6: Cabling OSN4 Module to Network



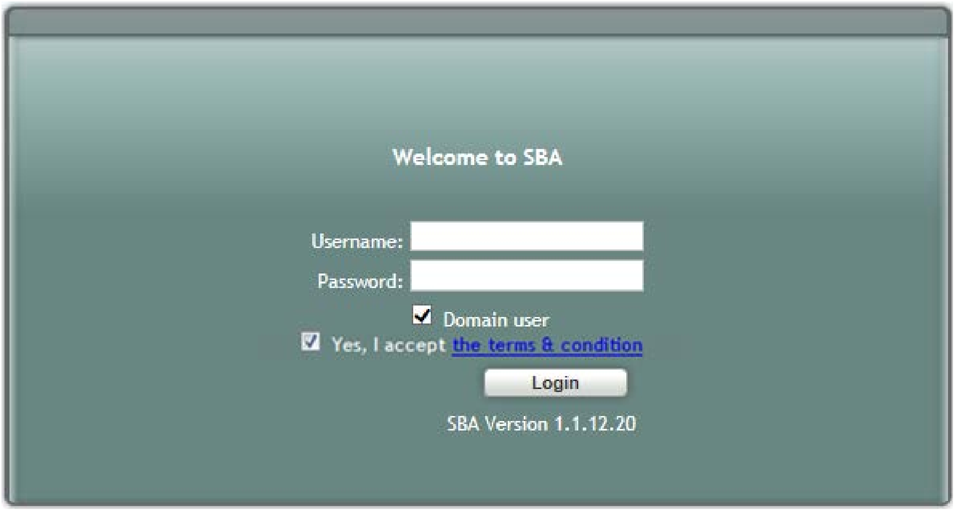
For RJ-45 connector pinouts for the Gigabit Ethernet interface, see Section 3.1.2.

2. Change your computer's IP address so that it is in the same subnet as the default IP address of the OSN server hosting the SBA.

3. Open a standard Web browser (Firefox, Google Chrome, or Internet Explorer 9 and later is recommended), and then in the URL address field, enter the OSN server default IP address (**192.168.0.20/16**).

   The Survivable Branch Appliance Management Interface opens:

Figure 11-7: Welcome to SBA



Welcome to SBA

Username:

Password:

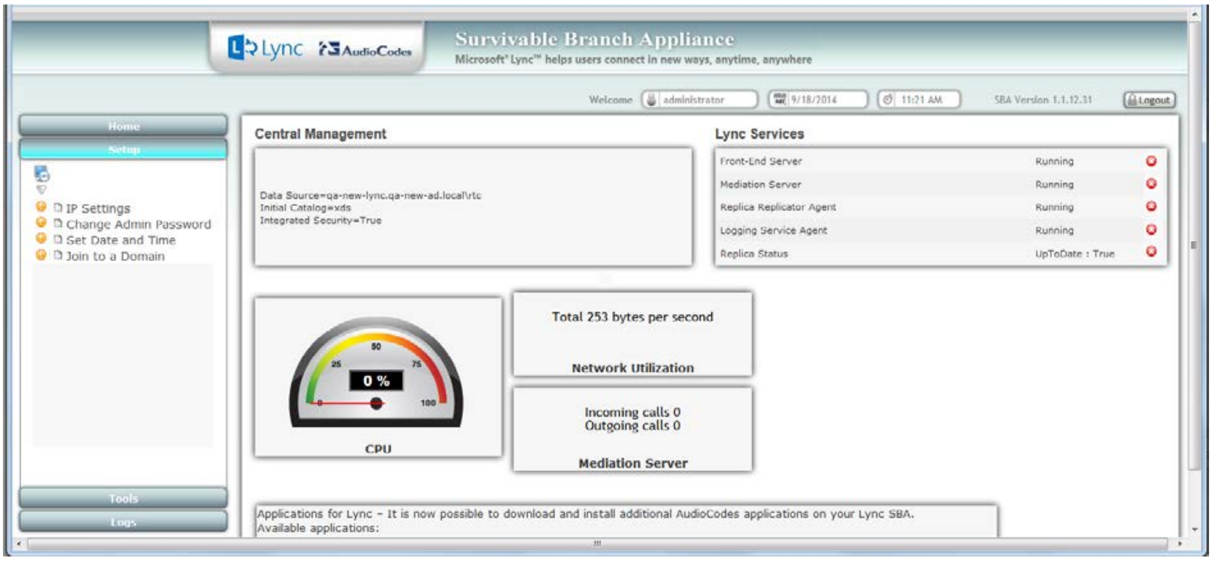
☑ Domain user

☑ Yes, I accept the terms & condition

SBA Version 1.1.12.20

4. Log in with the default username ("Administrator") and password ("Pass123"), Select the "Yes, I accept the term and condition" checkbox and then click **Login**; the Home screen appears:

Figure 11-8: SBA Home Screen



Survivable Branch Appliance

Microsoft® Lync™ helps users connect in new ways, anytime, anywhere

Welcome administrator 9/18/2014 11:21 AM SBA Version 1.1.12.31

- IP Settings
- Change Admin Password
- Set Date and Time
- Join to a Domain

Central Management

```
Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True
```

Lync Services

Front-End Server	Running
Mediation Server	Running
Replica Replicator Agent	Running
Logging Service Agent	Running
Replica Status	UpToDate : True

Total 253 bytes per second

Network Utilization

Incoming calls 0
Outgoing calls 0

Mediation Server

Applications for Lync – It is now possible to download and install additional AudioCodes applications on your Lync SBA.
Available applications:

5. Change the default IP address of the SBA Management Interface to suit your network environment (see Section 'Step 1: Define IP Settings' on page 80).

12 Installing and Configuring the SBA

Once you are logged in to the SBA Management Interface, you can start configuring SBA, as described in this section.

Note: Before you perform the procedures described below ensure that you have prepared the SBA in the Data Center as described in Chapter 9 on page 41 and Chapter 10 on page 45.

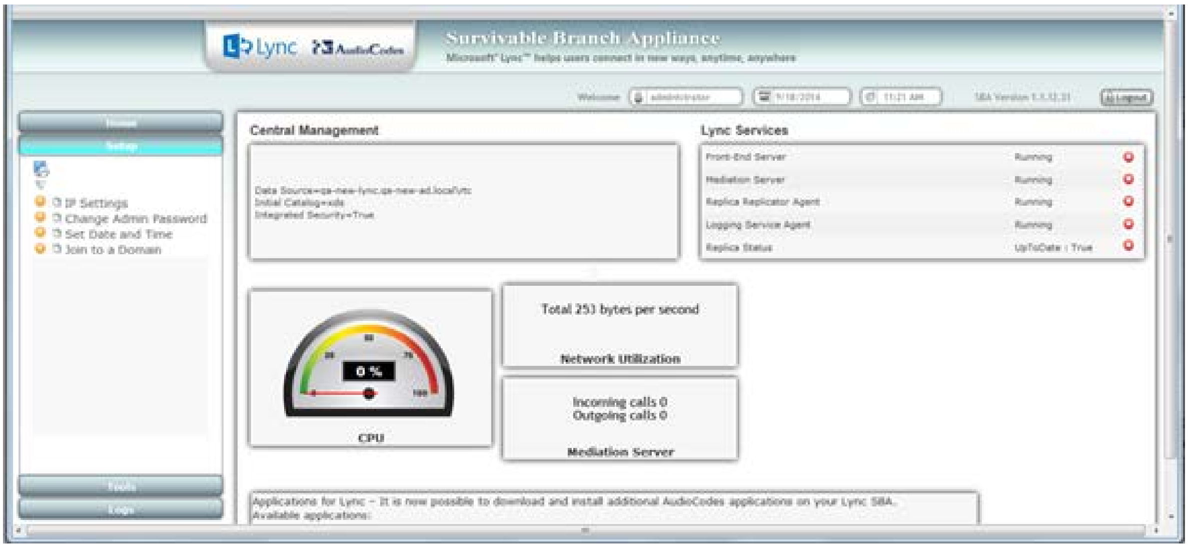
The SBA configuration is done in the Setup tab. For the configuration to be successful, it is imperative that all Setup options are performed correctly and in sequence (according to their order of appearance in the graphical user interface / GUI):

1. Define IP Settings - See 'Step 1: Define IP Settings' on page 80
2. Change Computer Name - See 'Step 2: Change Computer Name' on page 84
3. Change Admin Password - See 'Step 3: Change Admin Password' on page 87
4. Set Date and Time - See 'Step 4: Set Date and Time' on page 89
5. Join to a Domain - See 'Step 5: Join to a Domain' on page 93
6. Device Preparation - See 'Step 6: Device Preparation' on page 97
7. Cs Database Installation - See 'Step 7: Cs Database Installation' on page 99
8. Backup –See 'Step 8: Backup' on page 101
9. Enable Replication - See 'Step 9: Enable Replication' on page 103
10. Activate Lync - See 'Step 10: Activate Lync' on page 106
11. Lync Certificate - See 'Step 11: Lync Certificate' on page 107
12. Start Lync Services - See 'Step 12: Start Lync Services' on page 115
13. Configure Gateway and Test Calls - See 'Step 13: Configure Gateway and Test Calls' on page 117
14. Test Lync Calls – See 'Step 14: Test Lync Calls' on page 120
15. Apply Security – See 'Step 15: Apply Security' on page 123
16. (Optional) Remote Control. See 'Step 16: (Optional) Remote Control' on page 130
17. (Optional) SNMP. See 'Step 17 (Optional) SNMP Setup' on page 132
18. Complete SBA Setup. See 'Step 18: Completing SBA Setup' on page 139

If a task fails, ensure you correct it before performing additional tasks. When a task is configured successfully, a check mark (green) appears alongside the option.

Note: Initially, the Setup menu displays only the first few options (until you Join to a Domain). The remaining options appear only after you successfully Join to the Active Directory Domain.

Figure 12-1: Setup Tab Displaying Tasks



- IP Settings
- Change Admin Password
- Set Date and Time
- Join to a Domain

Central Management

Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

Lync Services

Front-End Server	Running	●
Mediation Server	Running	●
Replica Replicator Agent	Running	●
Logging Service Agent	Running	●
Replica Status	UpToDate : True	●

Total 253 bytes per second

Incoming calls 0
Outgoing calls 0

Applications for Lync – It is now possible to download and install additional AudioCodes applications on your Lync SBA.
Available applications:

In each of the configuration menu screens, the current CPU of the OSN module is displayed in the background. In the Setup pane, a list of all the configurable items is displayed.

Table 12-1: Setup Pane Icon

Setup Pane Icon	Description
✓	Indicates a successfully configured item.
●	Indicates an item that has not yet been configured.
●	Indicates an item whose configuration has failed.

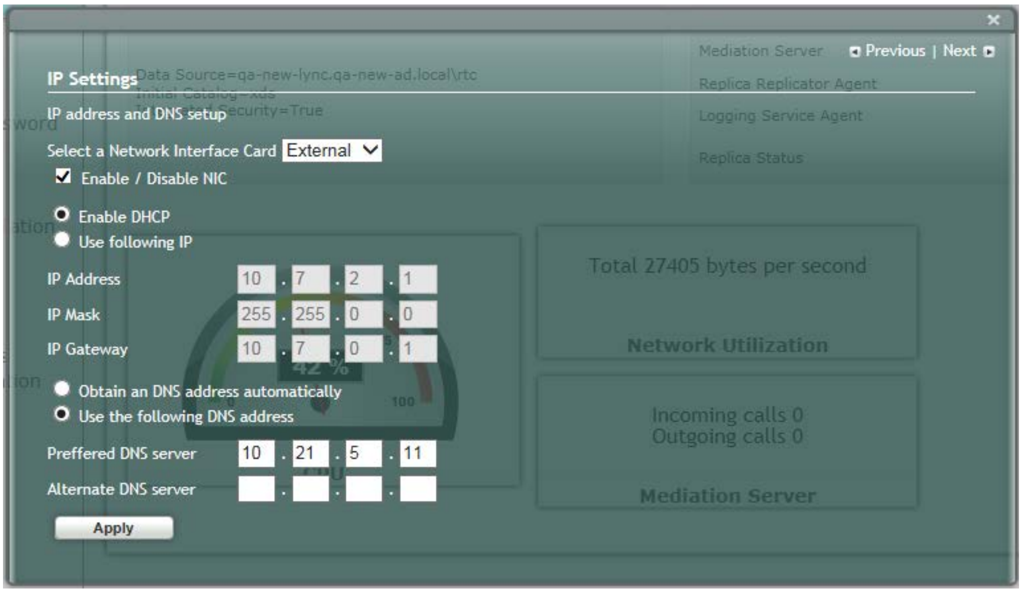
12.1 Step 1: Define IP Settings

The IP Settings option defines the IP address and domain name server (DNS).

➢ To set the IP address and DNS:

1. Select the **Setup** tab, and then select the 'IP Settings' check box; the following screen is displayed:

Figure 12-2: Set IP Configuration Page



IP Settings

IP address and DNS setup

Select a Network Interface Card External

☑ Enable / Disable NIC

● Enable DHCP

○ Use following IP

IP Address 10 . 7 . 2 . 1

IP Mask 255 . 255 . 0 . 0

IP Gateway 10 . 7 . 0 . 1

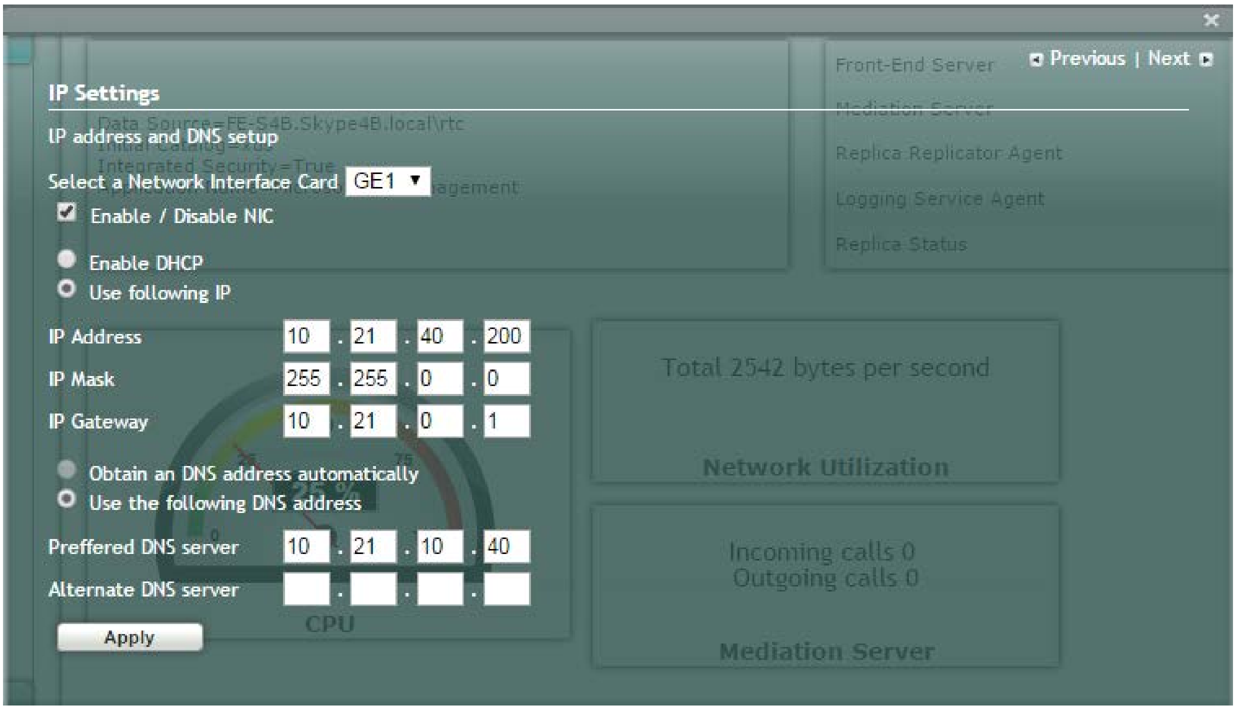
○ Obtain an DNS address automatically

● Use the following DNS address

Preffered DNS server 10 . 21 . 5 . 11

Alternate DNS server . . .

Figure 12-3: IP Settings



IP Settings

IP address and DNS setup

Select a Network Interface Card GE1

☑ Enable / Disable NIC

○ Enable DHCP

● Use following IP

IP Address 10 . 21 . 40 . 200

IP Mask 255 . 255 . 0 . 0

IP Gateway 10 . 21 . 0 . 1

○ Obtain an DNS address automatically

● Use the following DNS address

Preffered DNS server 10 . 21 . 10 . 40

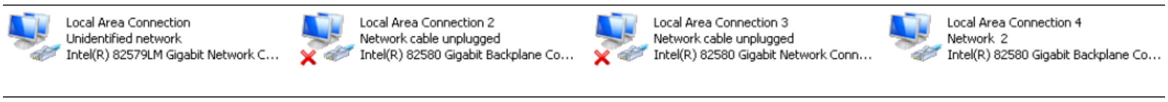
Alternate DNS server . . .

2. Clear the 'Enable / Disable NIC' check box for those interfaces that you are not using.
3. From the drop-down list, select one of the following NIC interface options:
   - **External1** – Corresponds to one of the physical Ethernet ports on the Mediant 2600B rear panel.
   - **External2** – Corresponds to one of the physical Ethernet ports on the Mediant 2600B rear panel.
   - **Internal1** – Internal port that connects the OSN server to the gateway's SBC module.
   - **Internal2** – Internal port that is not in use.

Note: The assignment of the physical ports (Port 1 and Port 2) to the **External1** and **External2** NICs is random.

The following screen shows an example of the configured Ethernet ports on the OSN Windows server. In this example, the disabled internal NIC is labeled "Local Area Connection", the disconnected external NIC is labeled "Local Area Connection 2", the disconnected internal NIC is labeled "Local Area Connection 3" and the connected external NIC is labeled "Local Area Connection 4". Note that whenever you connect or disconnect a network cable from one of the interfaces, the status changes.

Figure 12-4: OSN Windows Status



Local Area Connection
Unidentified network
Intel(R) 82579LM Gigabit Network C...

Local Area Connection 2
Network cable unplugged
Intel(R) 82580 Gigabit Backplane Co...

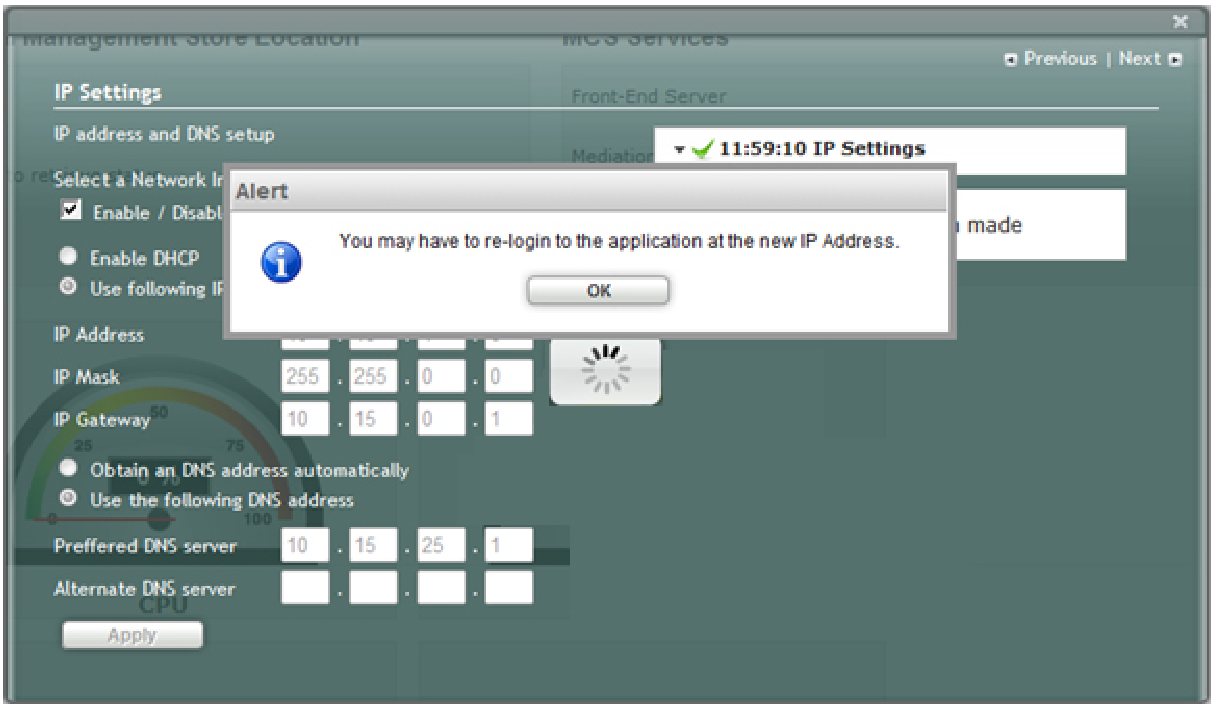
Local Area Connection 3
Network cable unplugged
Intel(R) 82580 Gigabit Network Conn...

Local Area Connection 4
Network 2
Intel(R) 82580 Gigabit Backplane Co...

Note: Whenever you connect or disconnect a network cable from one of the interfaces, the status icons displayed in the example screens above change.

4. Select the "Use following IP" option.
5. Confirm/change the IP address.
6. Confirm/change the IP mask.
7. Confirm/change the default IP gateway.
8. Select the "Use the following DNS address" option.
9. Enter the details of the DNS server.
10. Click **Apply**. If the IP address has changed, you will be required to login again.

Figure 12-5: IP Settings - Login Again



▾ ✓ 11:59:10 IP Settings

IP Settings

IP address and DNS setup

Select a Network Ir

☑ Enable / Disabl

○ Enable DHCP

● Use following IF

IP Address

IP Mask 255 . 255 . 0 . 0

IP Gateway 10 . 15 . 0 . 1

○ Obtain an DNS address automatically

● Use the following DNS address

Preffered DNS server 10 . 15 . 25 . 1

Alternate DNS server

Alert

You may have to re-login to the application at the new IP Address.

OK

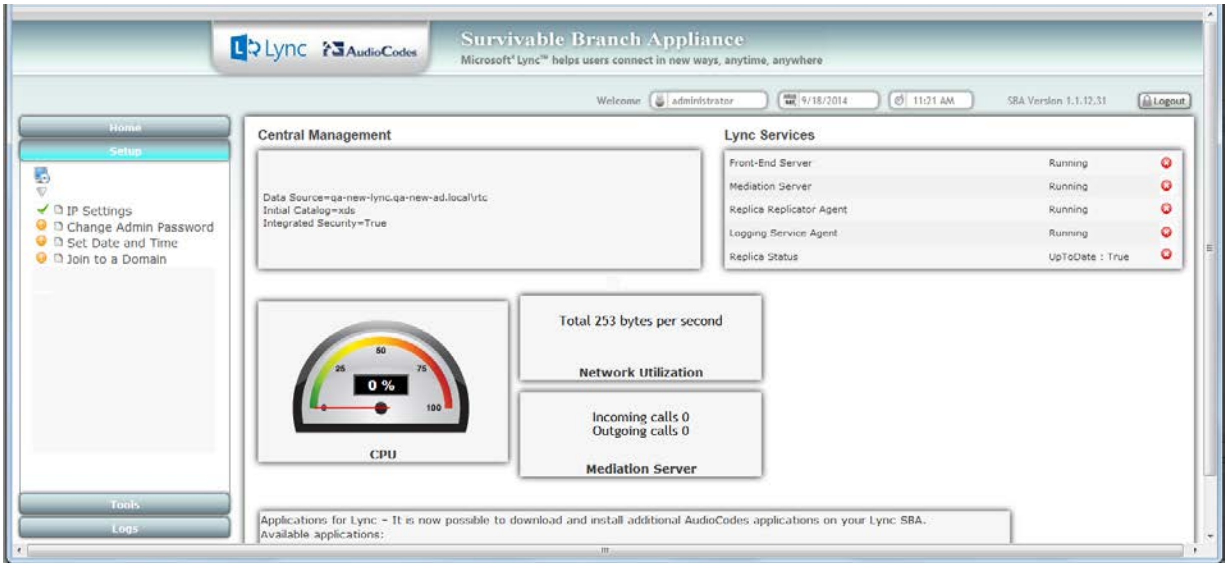
11. Click **OK**. A new login screen appears.
12. Enter the Username, Password and then click **Login**.

Notes:

- The system logs in with the new IP address.
- Every time you change the NIC interface option, click Apply for the change to take effect.

A green check mark is displayed next to the 'IP Settings' option under the **Setup** tab, as shown in the figure below.

Figure 12-6: IP Settings Complete



Welcome administrator 9/18/2014 11:21 AM SBA Version 1.1.12.31

Central Management

Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

Lync Services

Front-End Server	Running
Mediation Server	Running
Replica Replicator Agent	Running
Logging Service Agent	Running
Replica Status	UpToDate : True

Total 253 bytes per second

Network Utilization

Incoming calls 0
Outgoing calls 0

Mediation Server

Applications for Lync - It is now possible to download and install additional AudioCodes applications on your Lync SBA.
Available applications:

12.2 Step 2: Change Computer Name

The Change Computer Name option defines the computer name of the SBA.

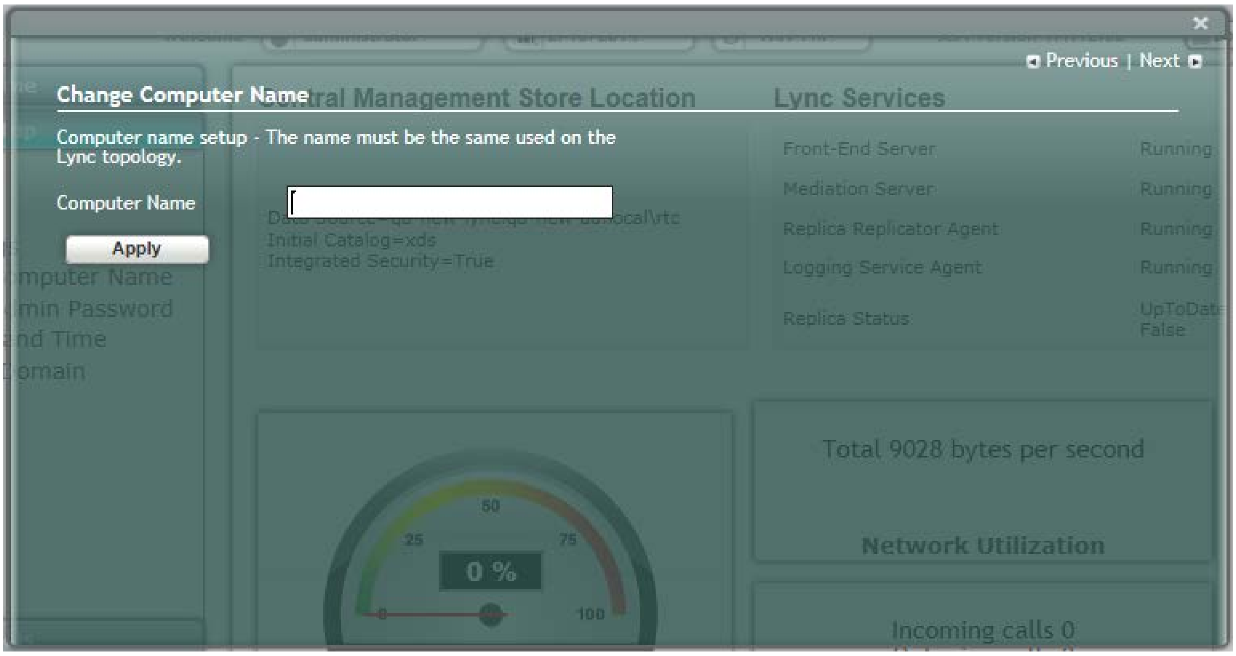
Note:

- This procedure requires you to reboot the SBA server to successfully apply the configuration. However, if you forget to do so, the server automatically reboots after a session timeout. When this occurs, the login screen appears with the following popup message: "The SBA server needs to be rebooted. Please insert your credentials and click Login. The server will then be rebooted". After the server reboots, the following message appears: "The SBA server has been rebooted automatically". You can then login to the SBA Management Interface.
- Once you join to the Domain, this configuration option is only available when you login as a local user (not a Domain user).

➢ To change the computer name of the SBA server:

1. Select the **Setup** tab, and then select the 'Change Computer Name' check box; the following screen appears:

Figure 12-7: Change Computer Name Screen



Change Computer Name

Computer name setup - The name must be the same used on the Lync topology.

Computer Name

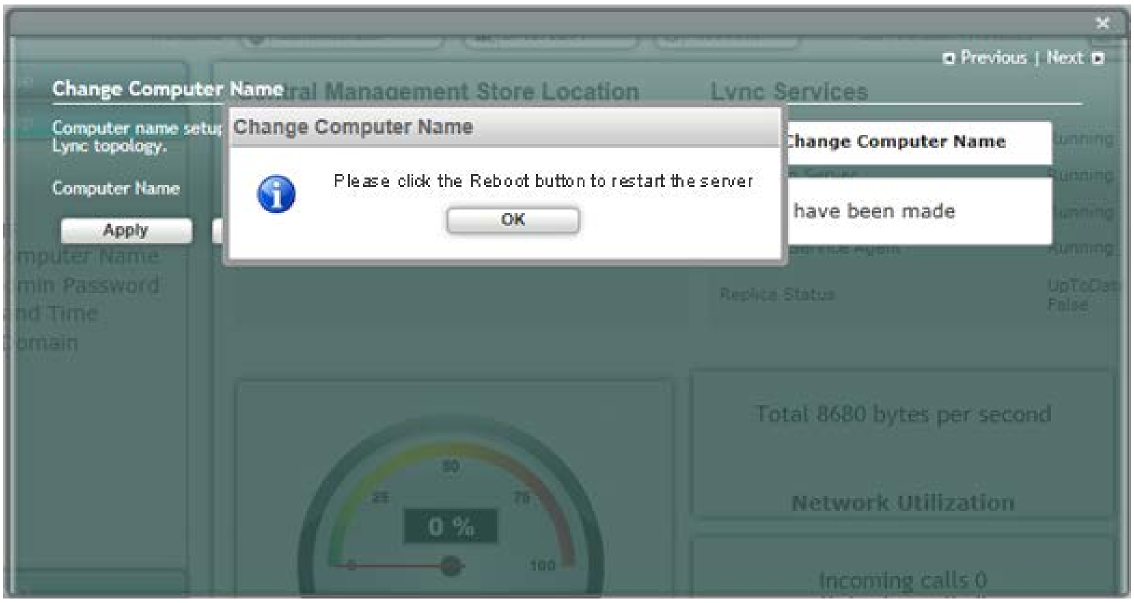
Apply

2. In the 'Computer Name' field, enter the computer name.

Note: The Computer Name must be the same as that used for the SBA in the Microsoft Active Directory (AD) and Topology during the pre-configuration steps performed at the datacenter (see Chapter '1' on page 41 and Chapter '1' on page 45).

3. Click **Apply**; the "Operation Completed Successfully"message appears on the bottom of the screen. A message also appears to advise that a re-boot is necessary for the setting to take effect:

Figure 12-8: Reboot Computer after Computer Name Change

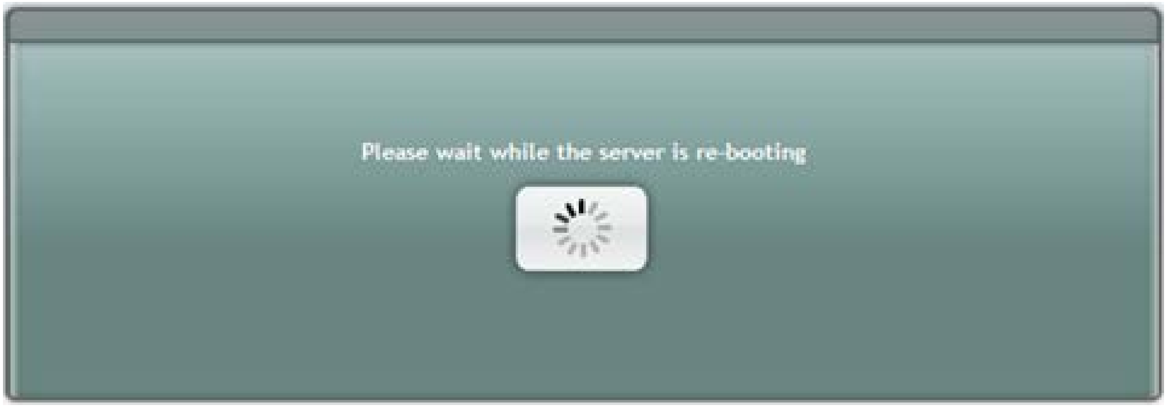


Change Computer Name

Please click the Reboot button to restart the server

4. Click **Reboot**; the SBA server reboots and the following screen is displayed:

Figure 12-9: Server Re-booting

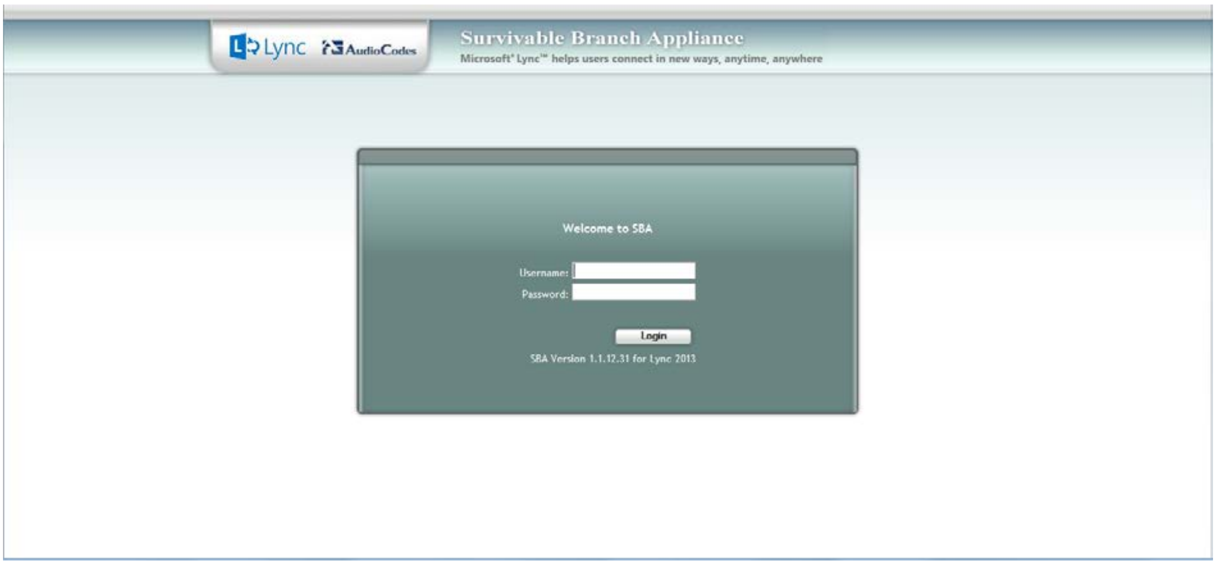


Please wait while the server is re-booting

Note: The re-boot process takes approximately five minutes.

When the SBA completes its reboot, the Welcome to SBA screen appears again.

Figure 12-10: Login Screen



Survivable Branch Appliance
Microsoft® Lync™ helps users connect in new ways, anytime, anywhere

Welcome to SBA

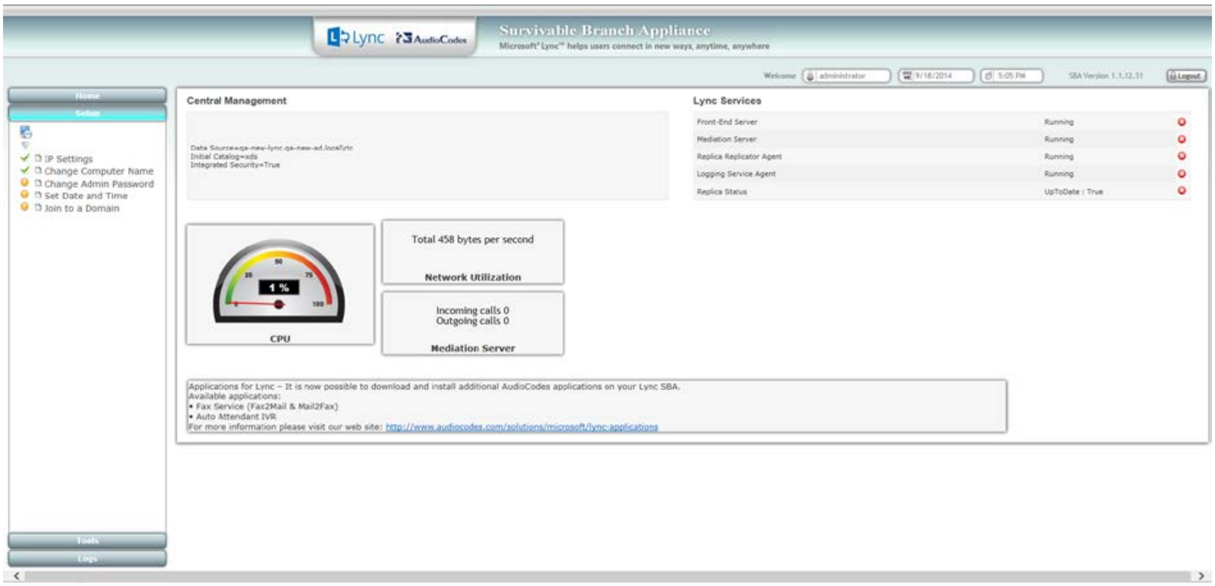
Username:

Password:

SBA Version 1.1.12.31 for Lync 2013

5. Enter your username and password and then click **Login** to log in once again to the SBA Management Interface; the Setup tab appears, displaying a green check mark next to the 'Change Computer Name' option, as shown in the figure below.

Figure 12-11: Change Computer Name – Completed Successfully



Survivable Branch Appliance
Microsoft® Lync™ helps users connect in new ways, anytime, anywhere

Welcome administrator 9/18/2014 5:05 PM SBA Version 1.1.12.31

- ✓ IP Settings
- ✓ Change Computer Name
- ● Change Admin Password
- ● Set Date and Time
- ● Join to a Domain

Central Management

```
Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True
```

Lync Services

Front-End Server	Running	●
Mediation Server	Running	●
Replica Replicator Agent	Running	●
Logging Service Agent	Running	●
Replica Status	UpToDate : True	●

Total 458 bytes per second

Network Utilization

Incoming calls 0
Outgoing calls 0

Mediation Server

Applications for Lync – It is now possible to download and install additional AudioCodes applications on your Lync SBA.
Available applications:
• Fax Service (Fax2Mail & Mail2Fax)
• Auto Attendant IVR
For more information please visit our web site: http://www.audiocodes.com/solutions/microsoft/lync-applications

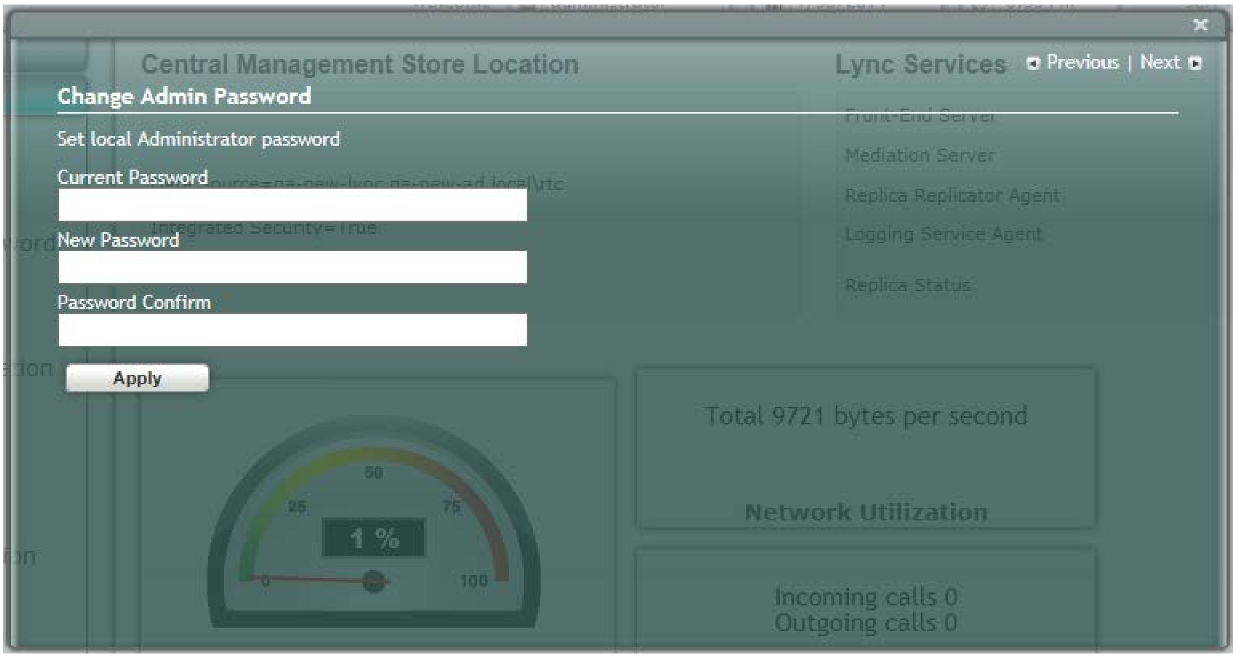
12.3 Step 3: Change Admin Password

The Change Admin Password option resets the local Administrator password.

➢ To change the Administrator password:

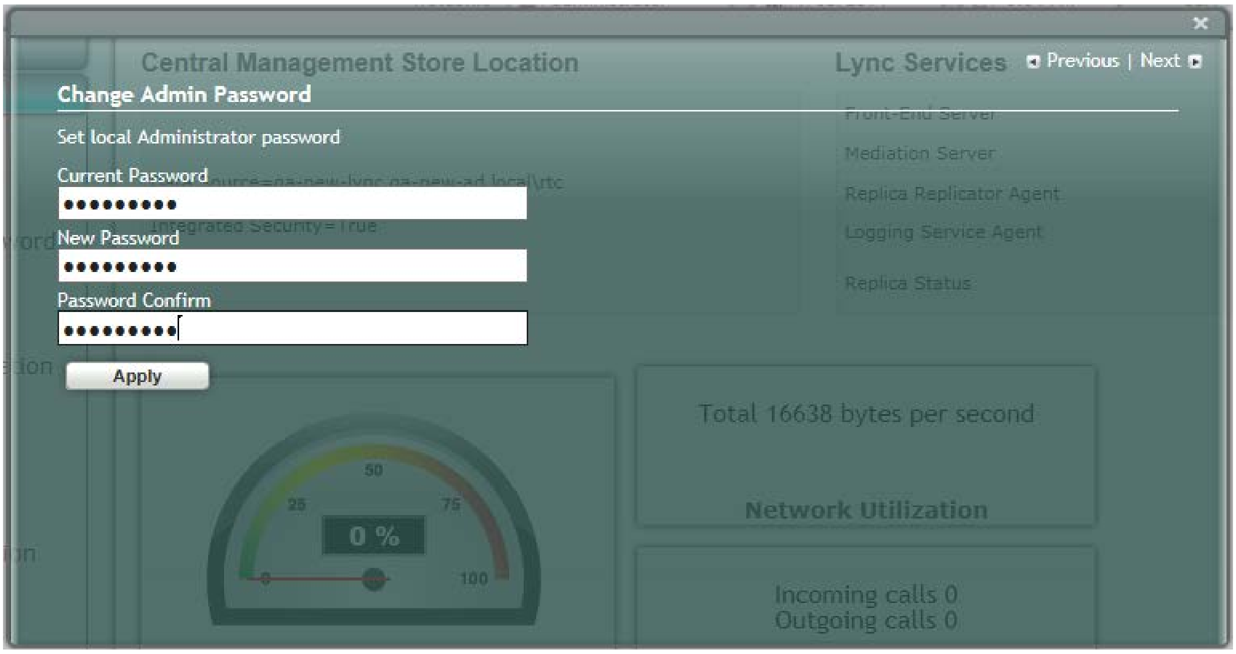
1. Select the **Setup** tab, and then select the 'Change Admin Password' check box; the following screen is displayed:

Figure 12-12: Change Admin Password Screen



2. In the 'Current Password' field, enter the current password.
3. In the 'New Password' field', enter a new password, and then in the 'Password Confirm' field, enter the new password again.
4. Click **Apply**; the following screen appears:

Figure 12-13: Change Admin Password



Change Admin Password

Set local Administrator password

Current Password
●●●●●●●●●

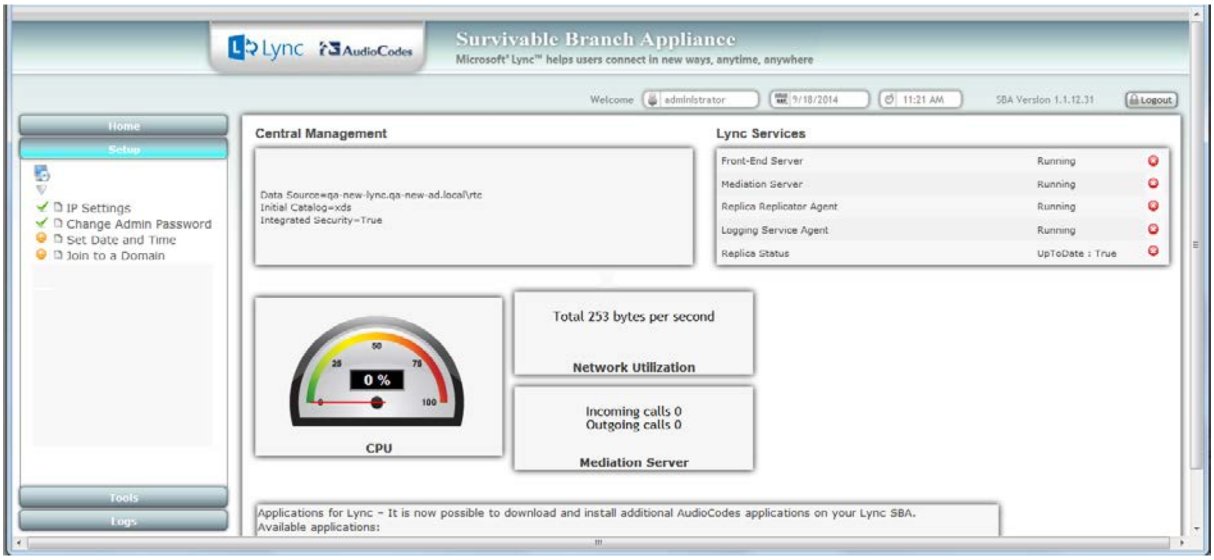
New Password
●●●●●●●●●

Password Confirm
●●●●●●●●●

Apply

5. Click **Next** to proceed to the next setup task; a green check mark appears next to the 'Change Admin Password' option under the Setup tab, as shown in the figure below.

Figure 12-14: Change Admin Password – Completed Successfully


Lync
AudioCodes
Survivable Branch Appliance
Microsoft® Lync™ helps users connect in new ways, anytime, anywhere
Home
Setup
Tools
Logs
50
25
75
0 %
0
100
CPU
Logout

Welcome administrator 9/18/2014 11:21 AM SBA Version 1.1.12.31

- ✓ IP Settings
- ✓ Change Admin Password
- ● Set Date and Time
- ● Join to a Domain

Central Management

Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

Lync Services

Front-End Server	Running
Mediation Server	Running
Replica Replicator Agent	Running
Logging Service Agent	Running
Replica Status	UpToDate : True

Total 253 bytes per second

Network Utilization

Incoming calls 0
Outgoing calls 0

Mediation Server

Applications for Lync – It is now possible to download and install additional AudioCodes applications on your Lync SBA.
Available applications:

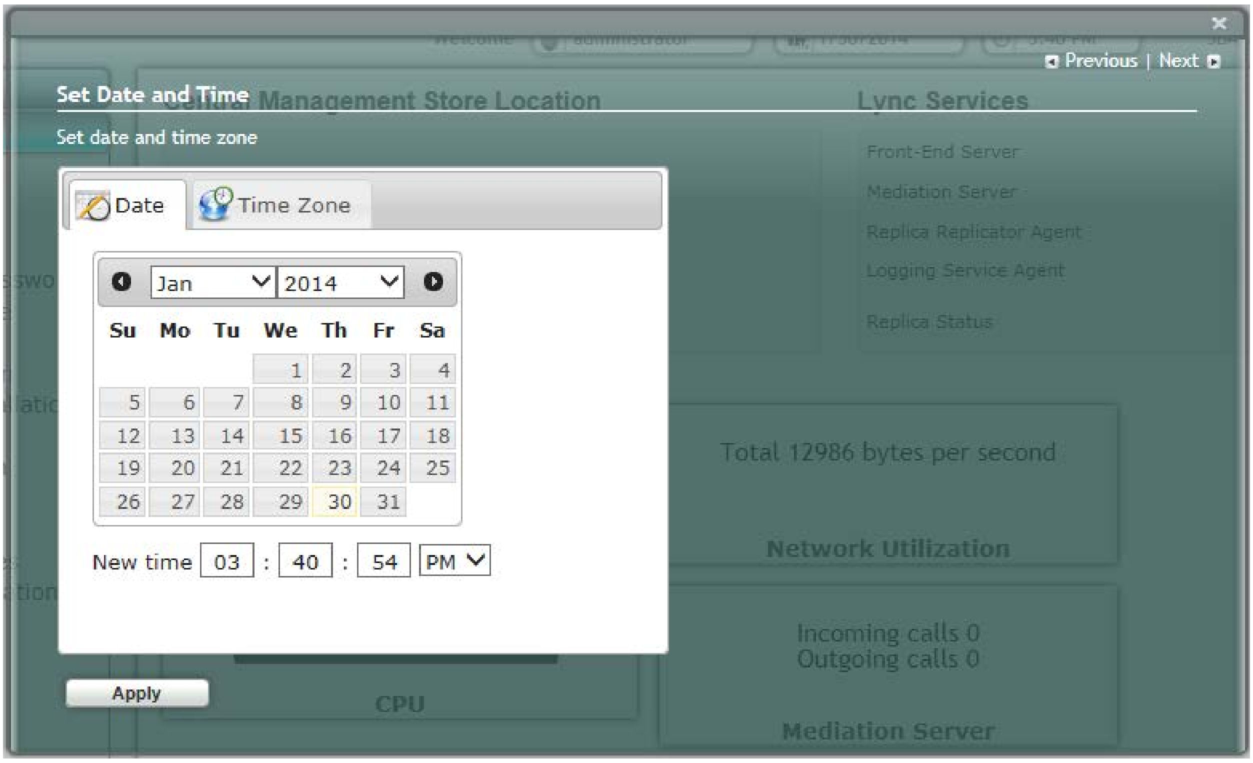
12.4 Step 4: Set Date and Time

The Set Date and Time option resets the date and time zone.

➢ **To set the date and time:**

1. Select the **Setup** tab, and then select the 'Set Date and Time' check box; the following screen is displayed:

Figure 12-15: Set Date and Time Screen



Set Date and Time

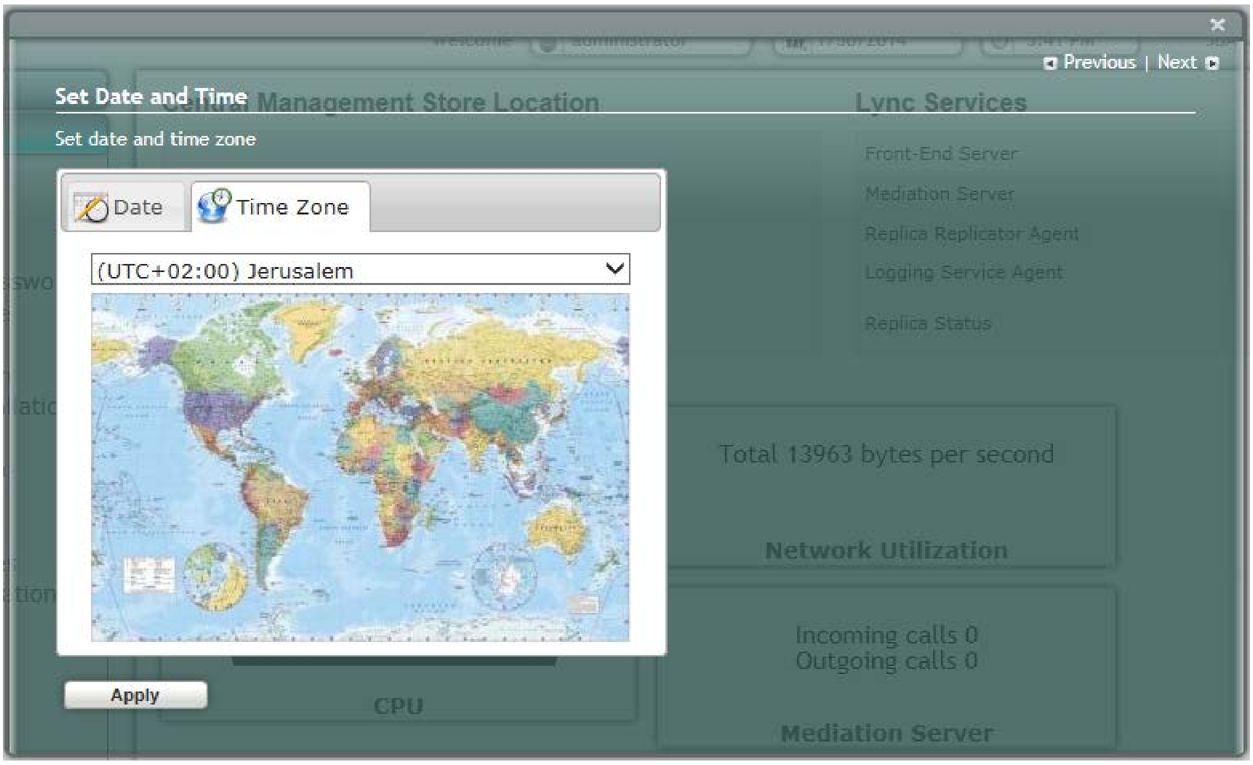
Set date and time zone

Jan 2014

New time 03 : 40 : 54 PM

2. Select the **Time Zone** tab; the following screen appears:

Figure 12-16: Set Date and Time - Time Zone

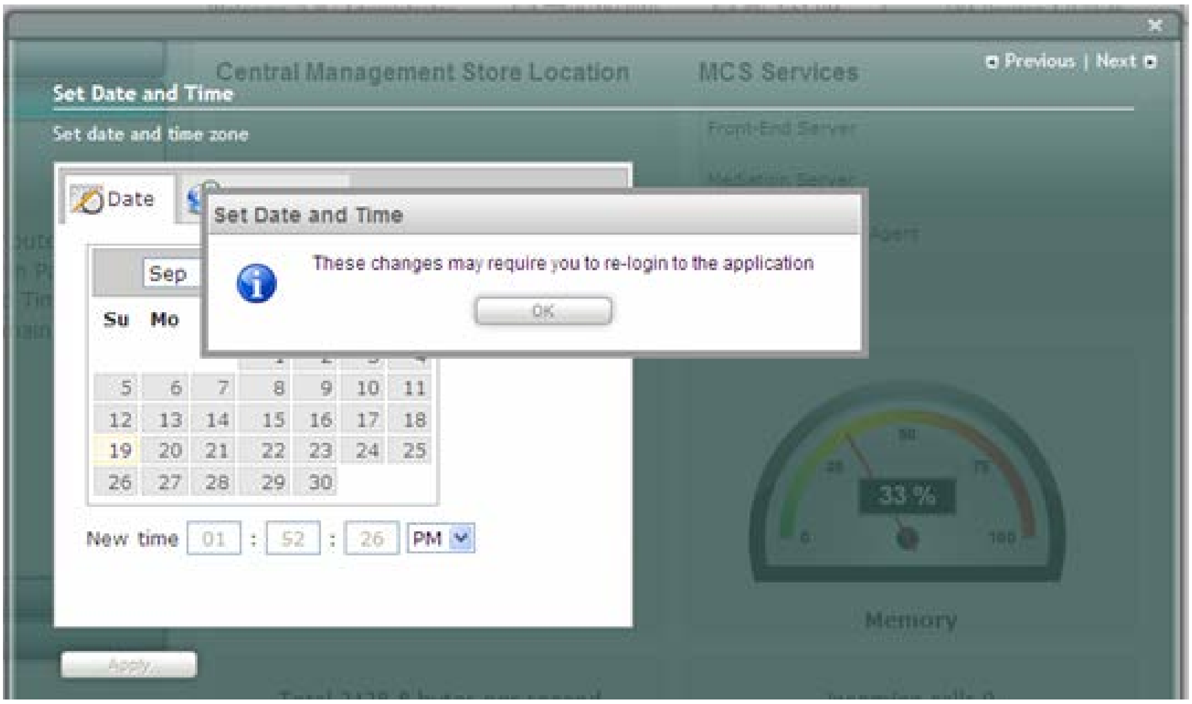


(UTC+02:00) Jerusalem

3. From the drop-down list, select the appropriate time zone.
4. Select the **Date** tab, and then define the date and time.
5. Click **Apply**; the "Operation Completed Successfully" message appears on the bottom of the screen.

6. Click **Apply**; a notification message box appears:

Figure 12-17: Set Date and Time- Notification Message

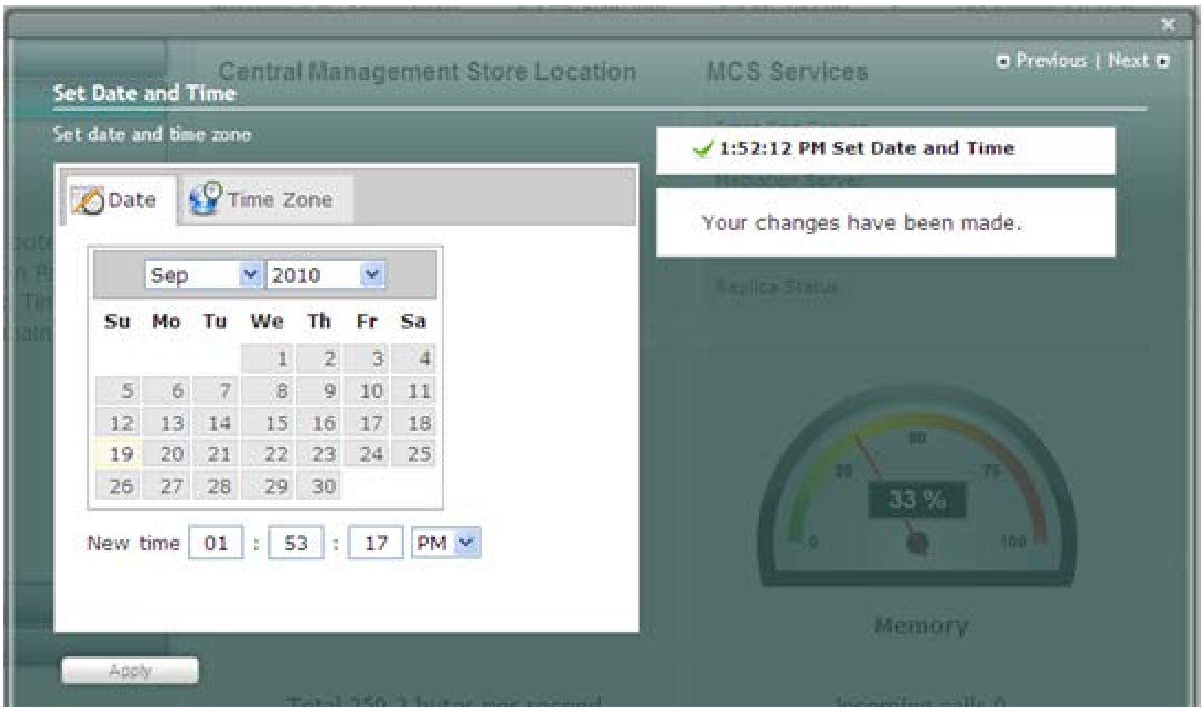


Set Date and Time

These changes may require you to re-login to the application

New time 01 : 52 : 26 PM

7. Click **OK**; the following confirmation screen appears:



1:52:12 PM Set Date and Time

Your changes have been made.

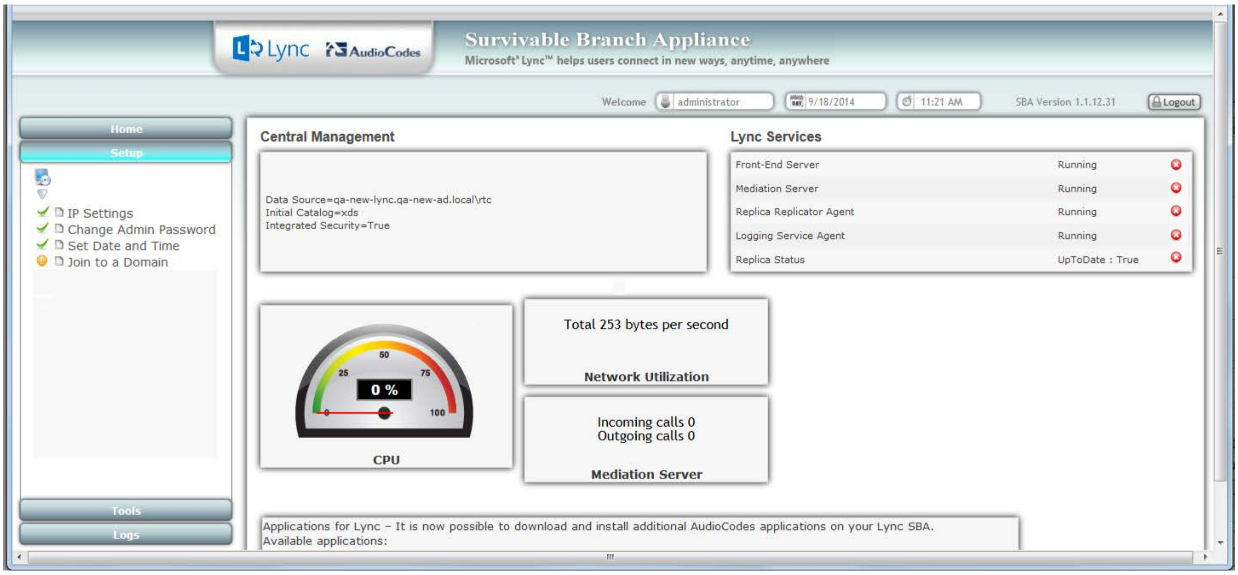
Sep 2010

New time 01 : 53 : 17 PM

8. Click **Next** to proceed to the next setup task.

A green check mark appears next to to the 'Set Date and Time' option under the Setup tab, as shown in the figure below.

Figure 12-18: Set Date and Time - Completed Successfully



Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

Front-End Server	Running
Mediation Server	Running
Replica Replicator Agent	Running
Logging Service Agent	Running
Replica Status	UpToDate : True

Total 253 bytes per second

Incoming calls 0
Outgoing calls 0

Applications for Lync - It is now possible to download and install additional AudioCodes applications on your Lync SBA.
Available applications:

12.5 Step 5: Join to a Domain

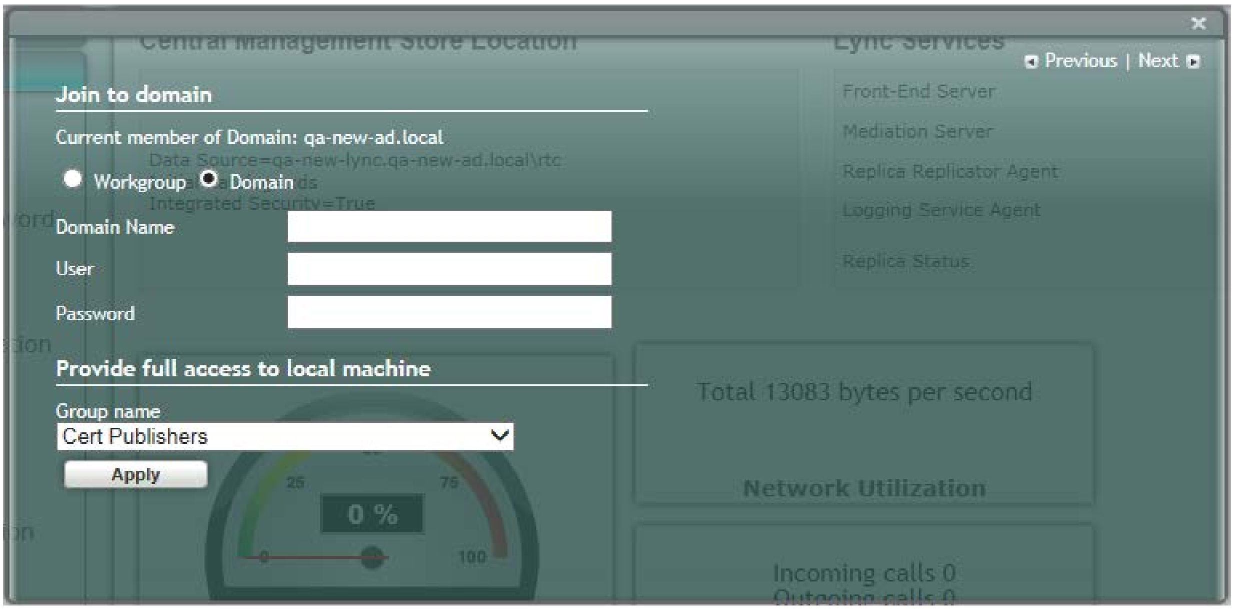
The Join to Domain option enables you to join the SBA application to a domain.

Note: This procedure requires you to reboot the SBA server to successfully apply the configuration. However, if you forget to do so, the server automatically reboots after a session timeout. When this occurs, the login screen appears with the following popup message: "The SBA server needs to be rebooted. Please insert your credentials and click on Login.The server will then be rebooted". After the server reboots, the following message appears: "The SBA server has been rebooted automatically". You can then login to the SBA Management Interface.

➢ To join the SBA application to a domain:

1. Select the **Setup** tab, and then select the 'Join to a Domain' check box; the following screen appears:

Figure 12-19: Join to a Domain Screen



Join to domain

Current member of Domain: qa-new-ad.local

○ Workgroup ● Domain

Domain Name

User

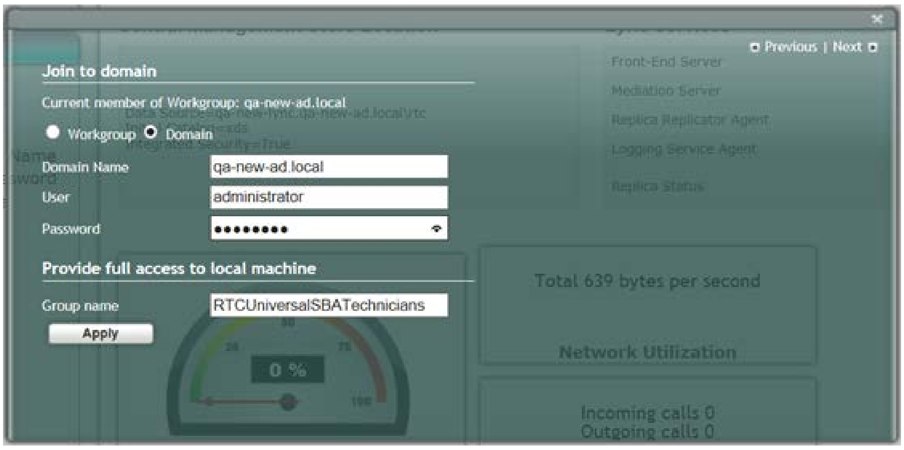
Password

Provide full access to local machine

Group name

Cert Publishers

Figure 12-20: Domain Details



Join to domain

Current member of Workgroup: qa-new-ad.local

○ Workgroup ● Domain

Domain Name qa-new-ad.local

User administrator

Password ••••••••

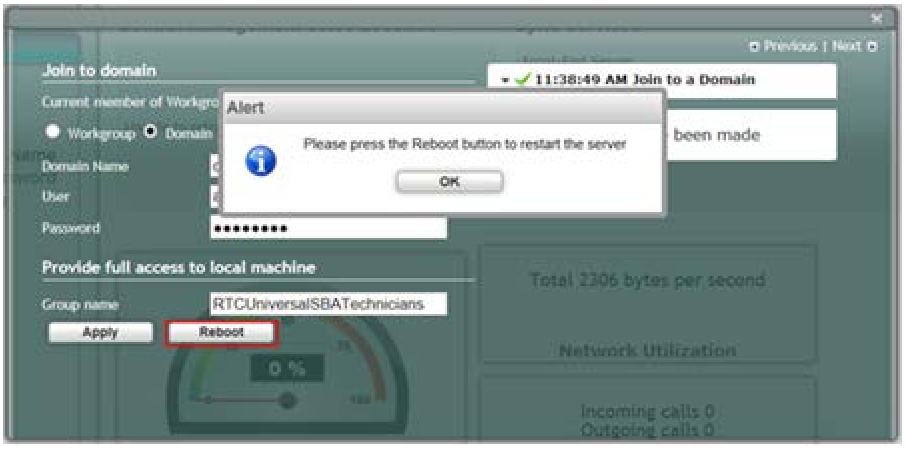
Provide full access to local machine

Group name RTCUniversalSBATechnicians

2. In the ‘Domain Name’ field, enter the domain name.
3. In the ‘User’ and ‘Password’ fields, enter the user and password of an account that has permission to join the SBA to the domain as configured on page 41.
4. In the ‘Group name’ field, ensure that the **RTCUniversalSBATechnicians** value is selected.

5. Click **Apply**; a message box appears requesting you to confirm reboot:

Figure 12-21: Join to a Domain – Reboot Message Box



Join to domain

Current member of Workgro

○ Workgroup ● Domain

Domain Name

User

Password ●●●●●●●●●

Provide full access to local machine

Group name RTCUniversalSBATechnicians

✓ 11:38:49 AM Join to a Domain

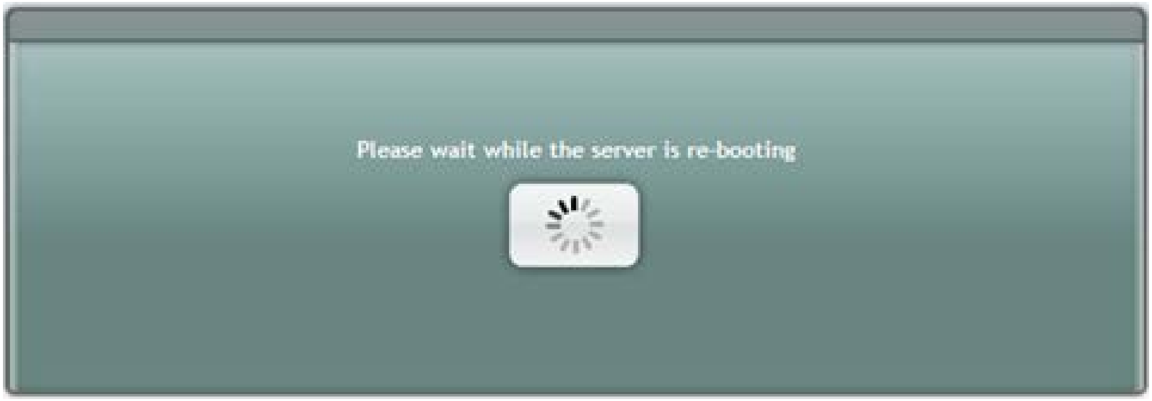
been made

Alert

Please press the Reboot button to restart the server

6. Click **OK** and then click **Reboot** to reboot the OSN server.

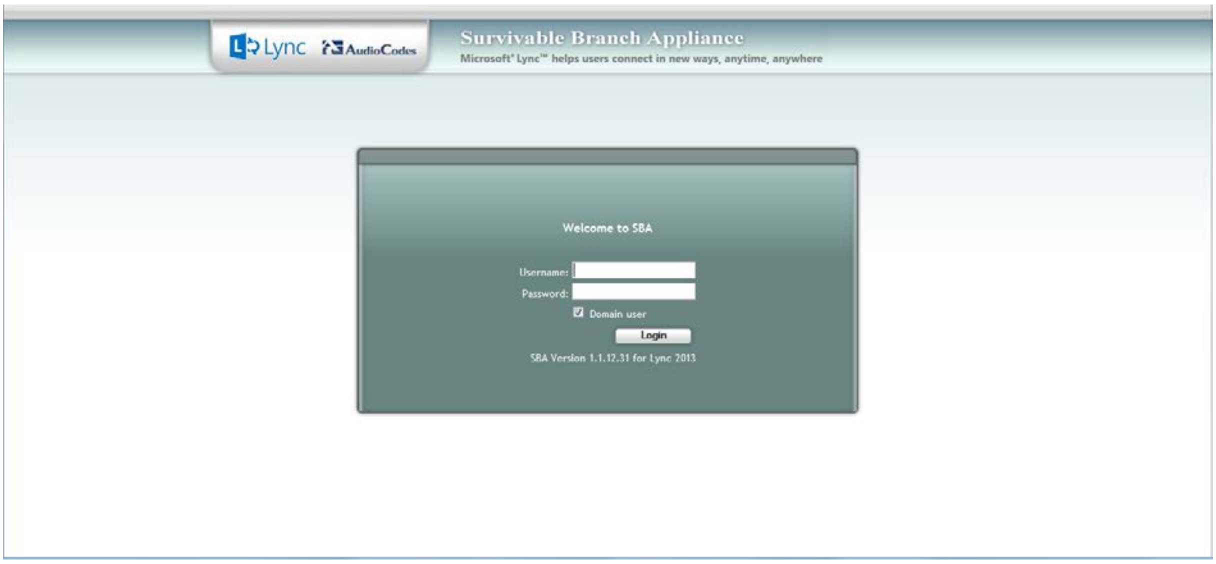
Figure 12-22: Server Re-booting



Please wait while the server is re-booting

7. When the reboot completes, the Welcome to SBA login screen appears, now displaying a Domain user check box (which is selected by default):

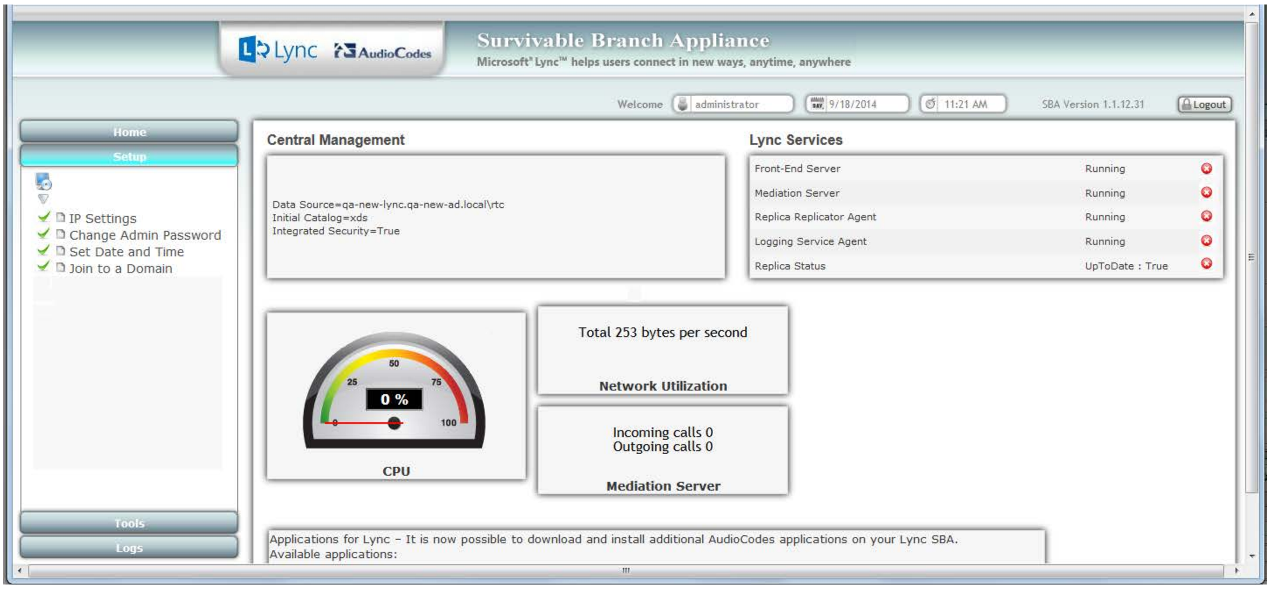
Figure 12-23: Welcome to SBA - Domain User


Lync
AudioCodes
Survivable Branch Appliance
Microsoft® Lync™ helps users connect in new ways, anytime, anywhere
Welcome to SBA
Username:
Password:
☑ Domain user
Login

SBA Version 1.1.12.31 for Lync 2013

8. Log in with the Domain user username and password, and then click **Login**; a green check mark is displayed next to the 'Join to a Domain' option under the Setup tab, as shown in the figure below. In addition, the Setup tab now displays the remaining menu configuration options.

Figure 12-24: Join to a Domain - Completed Successfully



Welcome administrator 9/18/2014 11:21 AM SBA Version 1.1.12.31

Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

Front-End Server	Running
Mediation Server	Running
Replica Replicator Agent	Running
Logging Service Agent	Running
Replica Status	UpToDate : True

Total 253 bytes per second

Incoming calls 0
Outgoing calls 0

Applications for Lync – It is now possible to download and install additional AudioCodes applications on your Lync SBA.
Available applications:

12.6 Step 6: Device Preparation

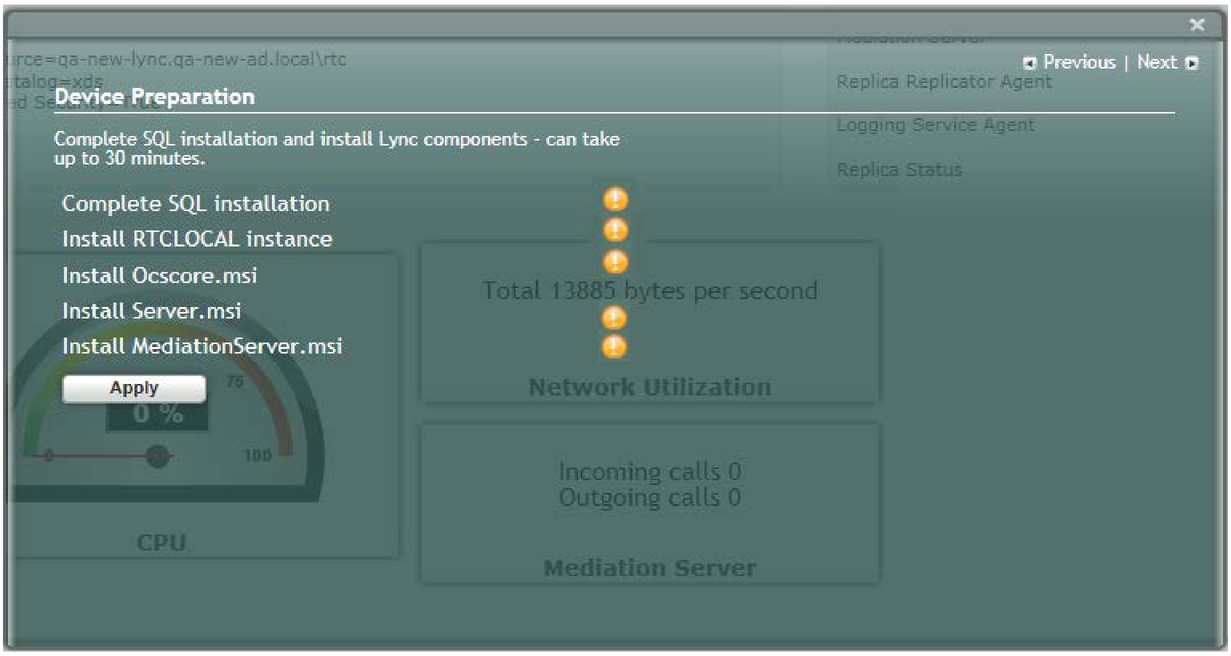
The Device Preparation menu option completes the SQL preparation and installs the Skype for Business components.

Note: This procedure requires you to reboot the SBA server to successfully apply the configuration. However, if you forget to do so, the server automatically reboots after a session timeout. When this occurs, the login screen appears with the following popup message: "The SBA server needs to be rebooted. Please insert your credentials and click on Login.The server will then be rebooted". After the server reboots, the following message appears: "The SBA server has been rebooted automatically". You can then login to the SBA Management Interface.

➢ To prepare the device:

1. Select the **Setup** tab, and then select the 'Device Preparation' check box; the following screen appears:

Figure 12-25: Device Preparation



Device Preparation

Complete SQL installation and install Lync components - can take up to 30 minutes.

Complete SQL installation

Install RTCLOCAL instance

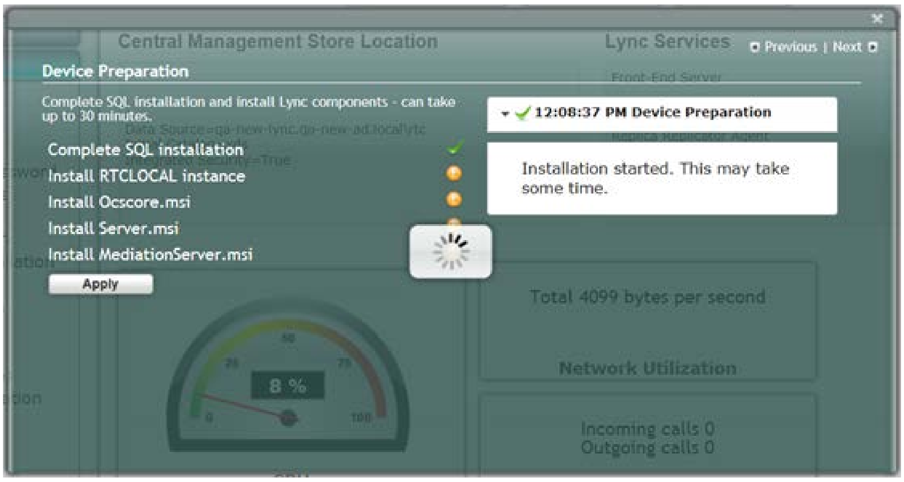
Install Ocscore.msi

Install Server.msi

Install MediationServer.msi

2. Click **Apply**; the SQL installation begins, and the following screens appear in sequence as the SQL installation progresses. You can view a detailed log after each installation phase, by clicking the Detailed Log link.

Figure 12-26: Device Preparation Started



Device Preparation

Complete SQL installation and install Lync components - can take up to 30 minutes.

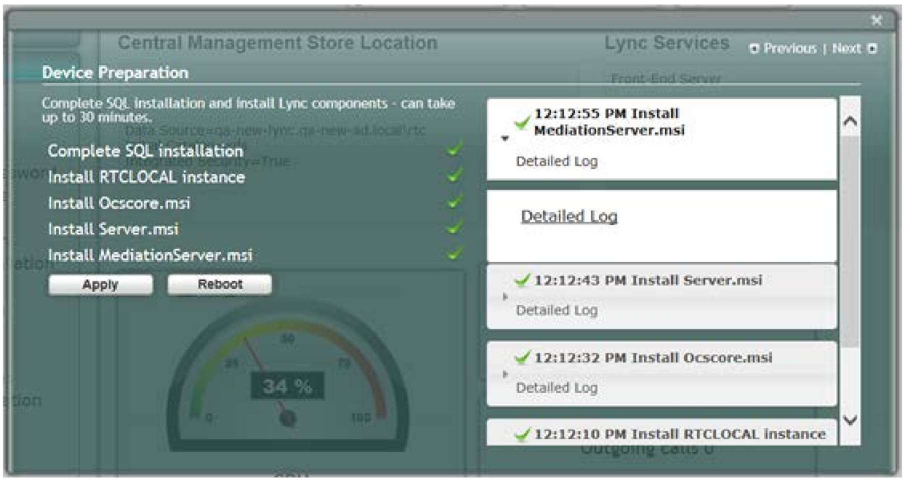
Complete SQL installation ✓
Install RTCLOCAL instance ●
Install Ocscore.msi ●
Install Server.msi
Install MediationServer.msi

Apply

✓ 12:08:37 PM Device Preparation

Installation started. This may take some time.

Figure 12-27: Device Preparation – All Components Installed



Device Preparation

Complete SQL installation and install Lync components - can take up to 30 minutes.

Complete SQL installation ✓
Install RTCLOCAL instance ✓
Install Ocscore.msi ✓
Install Server.msi ✓
Install MediationServer.msi ✓

Apply
Reboot

✓ 12:12:55 PM Install MediationServer.msi
Detailed Log

Detailed Log

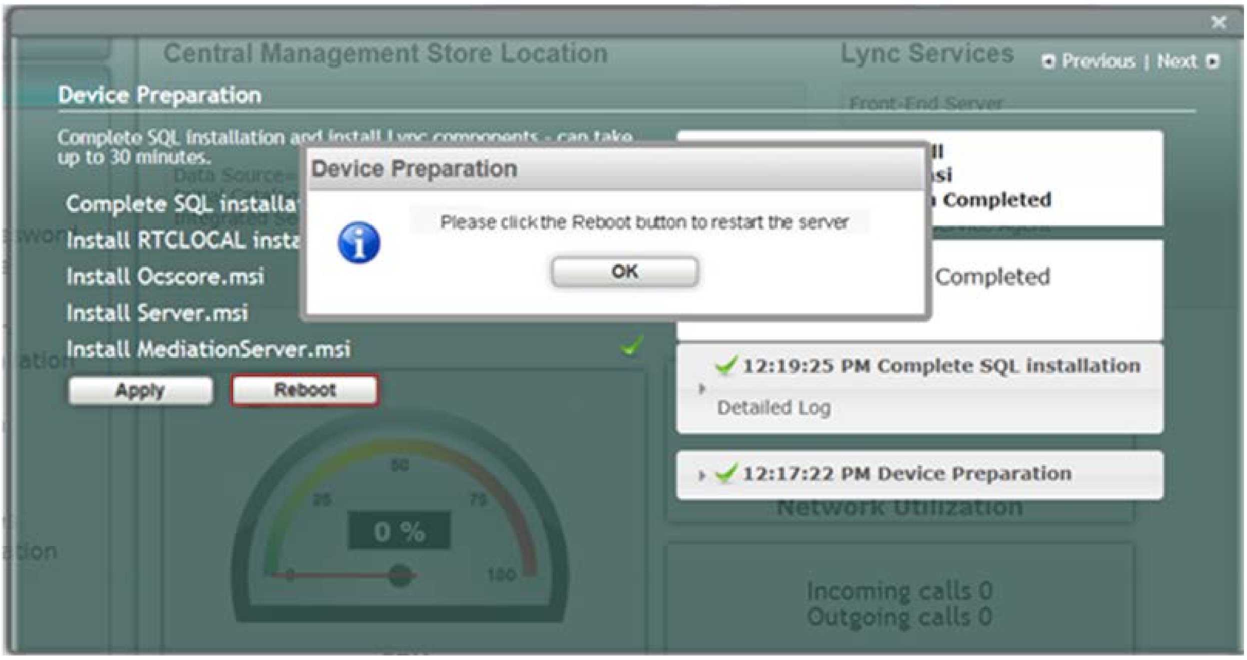
✓ 12:12:43 PM Install Server.msi
Detailed Log

✓ 12:12:32 PM Install Ocscore.msi
Detailed Log

✓ 12:12:10 PM Install RTCLOCAL instance

3. When the installation completes, you are prompted to reboot the SBA server.

Figure 12-28: Device Preparation Reboot



Device Preparation

Complete SQL installation and install Lync components - can take up to 30 minutes.

Complete SQL installa

Install RTCLOCAL insta

Install Ocscore.msi

Install Server.msi

Install MediationServer.msi

Device Preparation

Please click the Reboot button to restart the server

Completed

Completed

12:19:25 PM Complete SQL installation

Detailed Log

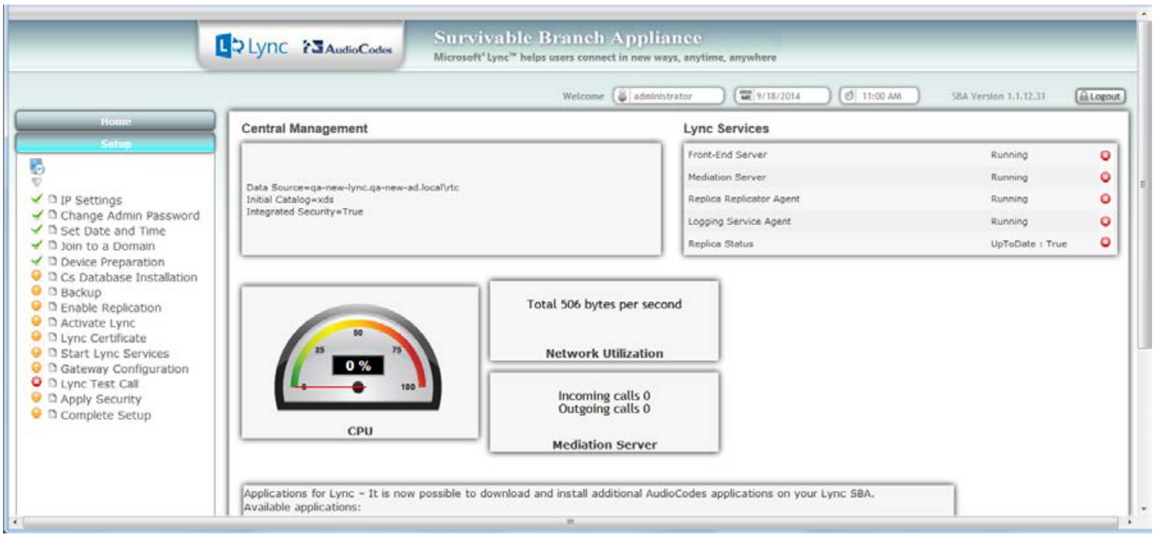
12:17:22 PM Device Preparation

4. Click **OK**, and then do one of the following:

- If all steps have been completed successfully, click **Reboot**.
- If you wish to review some of the steps, refer to the Detailed Log for corrective information, rectify the problem, and then click **Apply** to install the remaining components.

When you relogin to the SBA, a green check mark appears next to the 'Device Preparation' option under the Setup tab, as shown in the figure below.

Figure 12-29: Device Preparation Complete



Lync
AudioCodes
Survivable Branch Appliance
Microsoft® Lync™ helps users connect in new ways, anytime, anywhere
Welcome
Logout
Home
Setup
25
50
75
100
0 %
CPU
Network Utilization
Mediation Server

administrator 9/18/2014 11:00 AM SBA Version 1.1.12.31

- ✓ IP Settings
- ✓ Change Admin Password
- ✓ Set Date and Time
- ✓ Join to a Domain
- ✓ Device Preparation
- ● Cs Database Installation
- ● Backup
- ● Enable Replication
- ● Activate Lync
- ● Lync Certificate
- ● Start Lync Services
- ● Gateway Configuration
- ● Lync Test Call
- ● Apply Security
- ● Complete Setup

Central Management

Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

Lync Services

Front-End Server	Running	●
Mediation Server	Running	●
Replica Replicator Agent	Running	●
Logging Service Agent	Running	●
Replica Status	UpToDate : True	●

Total 506 bytes per second

Incoming calls 0
Outgoing calls 0

Applications for Lync - It is now possible to download and install additional AudioCodes applications on your Lync SBA.
Available applications:

12.7 Step 7: Cs Database Installation

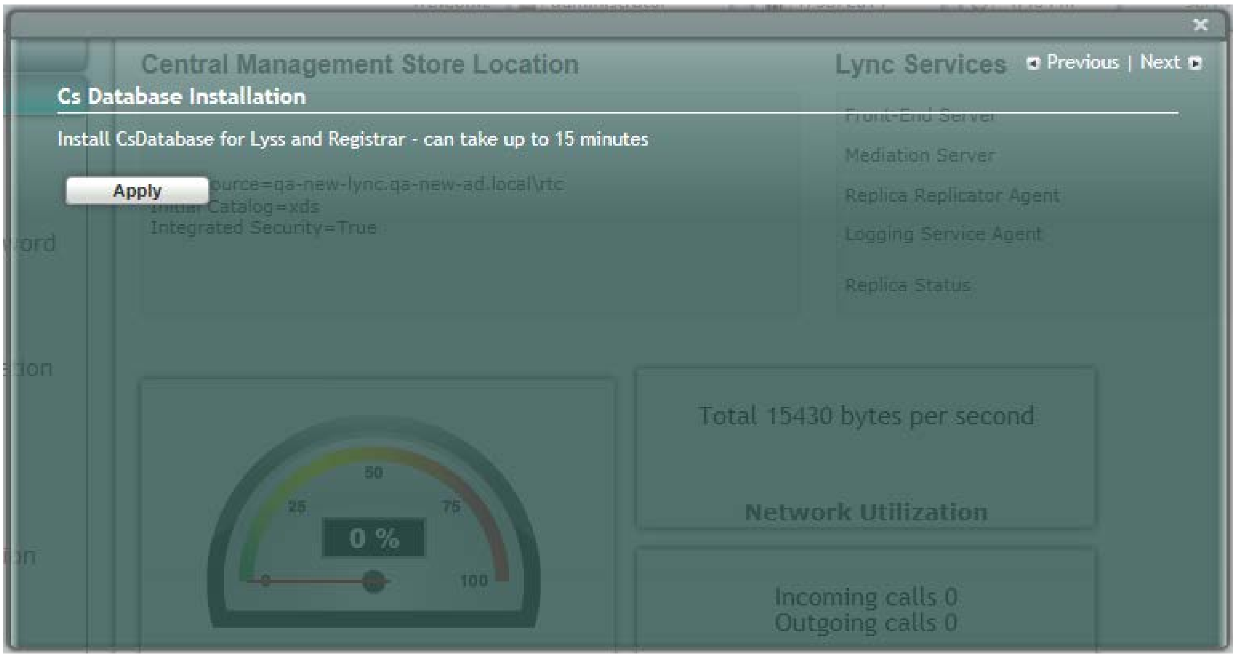
The Cs Database installation option installs CsDatabase for Lyss and registrar.

Note: This step is not relevant for Microsoft Lync Server 2010 deployments.

➢ To install the CsDatabase:

1. Select the **Setup** tab, and then select the 'Cs Database installation' check box; the following screen appears:

Figure 12-30: Cs Database Installation Screen

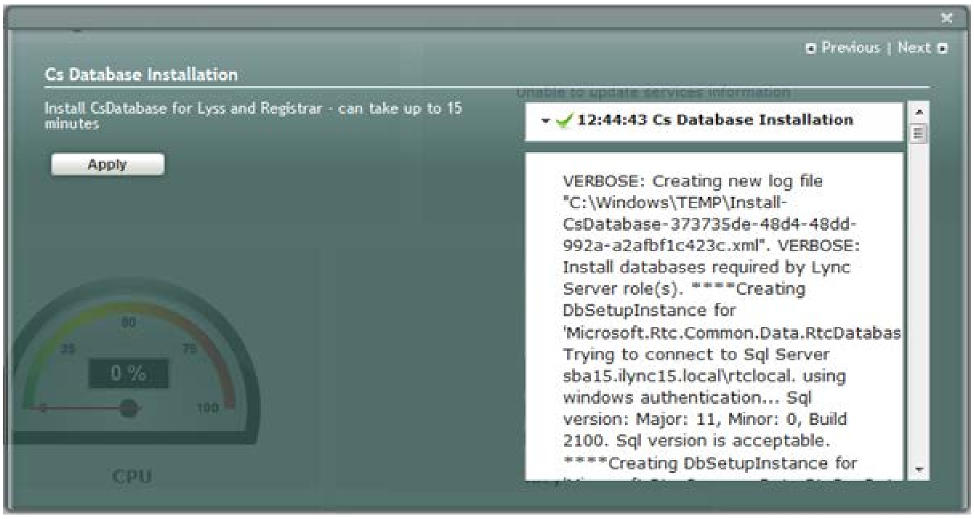


Cs Database Installation

Install CsDatabase for Lyss and Registrar - can take up to 15 minutes

2. Click **Apply**; the following screen appears:

Figure 12-31: Cs Database Installation – Applied Successfully



Cs Database Installation

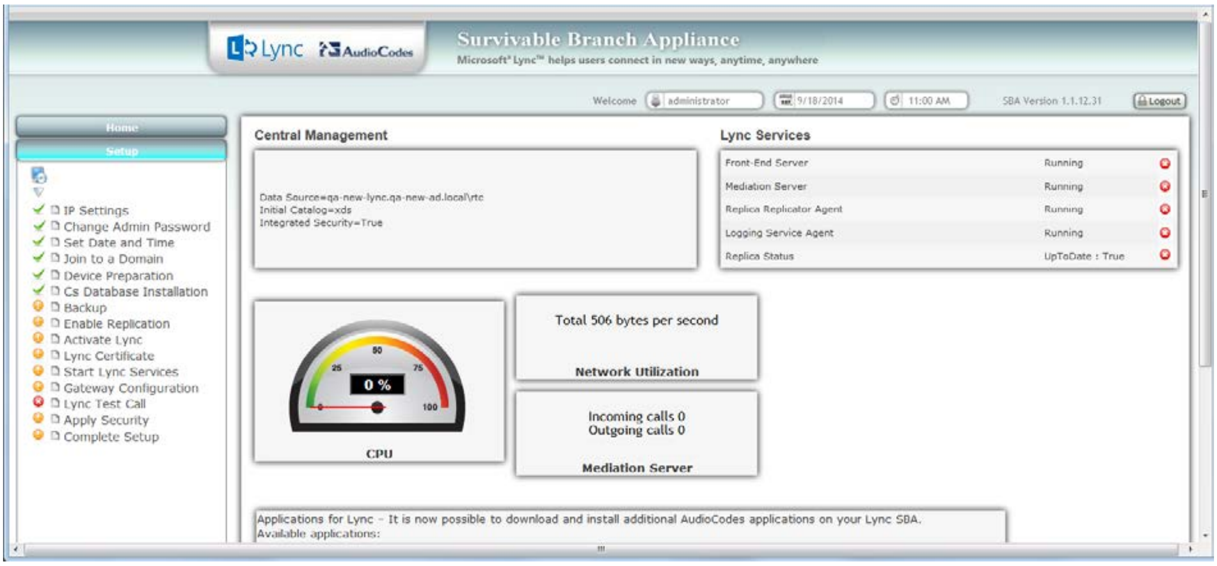
Install CsDatabase for Lyss and Registrar - can take up to 15 minutes

12:44:43 Cs Database Installation

```
VERBOSE: Creating new log file
"C:\Windows\TEMP\Install-
CsDatabase-373735de-48d4-48dd-
992a-a2afbf1c423c.xml". VERBOSE:
Install databases required by Lync
Server role(s). ****Creating
DbSetupInstance for
'Microsoft.Rtc.Common.Data.RtcDatabas
Trying to connect to Sql Server
sba15.ilync15.local\rtclocal. using
windows authentication... Sql
version: Major: 11, Minor: 0, Build
2100. Sql version is acceptable.
****Creating DbSetupInstance for
```

A green check mark appears next to the 'Cs Database' option under the Setup tab, as shown in the figure below.

Figure 12-32: Successful Cs Database



- ✓ IP Settings
- ✓ Change Admin Password
- ✓ Set Date and Time
- ✓ Join to a Domain
- ✓ Device Preparation
- ✓ Cs Database Installation
- ● Backup
- ● Enable Replication
- ● Activate Lync
- ● Lync Certificate
- ● Start Lync Services
- ● Gateway Configuration
- ● Lync Test Call
- ● Apply Security
- ● Complete Setup

Central Management

Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

Lync Services

Front-End Server	Running	●
Mediation Server	Running	●
Replica Replicator Agent	Running	●
Logging Service Agent	Running	●
Replica Status	UpToDate : True	●

Total 506 bytes per second

Incoming calls 0
Outgoing calls 0

Applications for Lync - It is now possible to download and install additional AudioCodes applications on your Lync SBA.
Available applications:

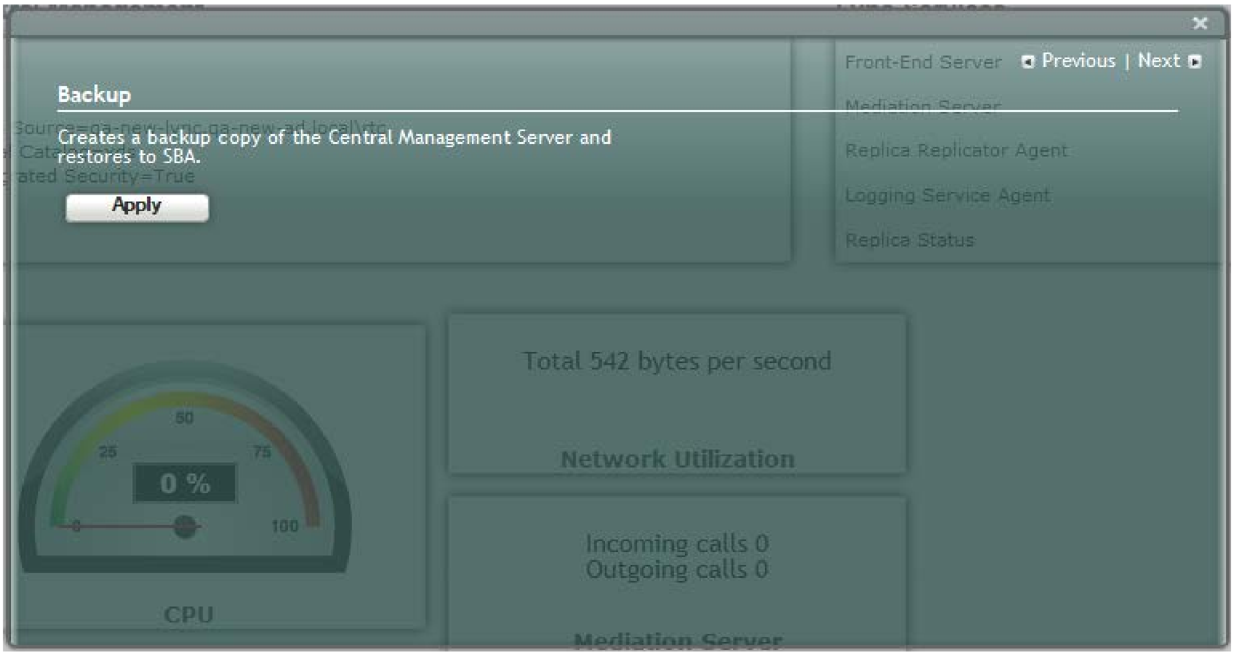
12.8 Step 8: Backup

The Backup option creates a backup copy of the Central Management Server on the SBA server.

➢ **To create a backup of the Central Management Server:**

1. Select the **Setup** tab, and then select the 'Backup' check box; the following screen appears:

Figure 12-33: Backup screen

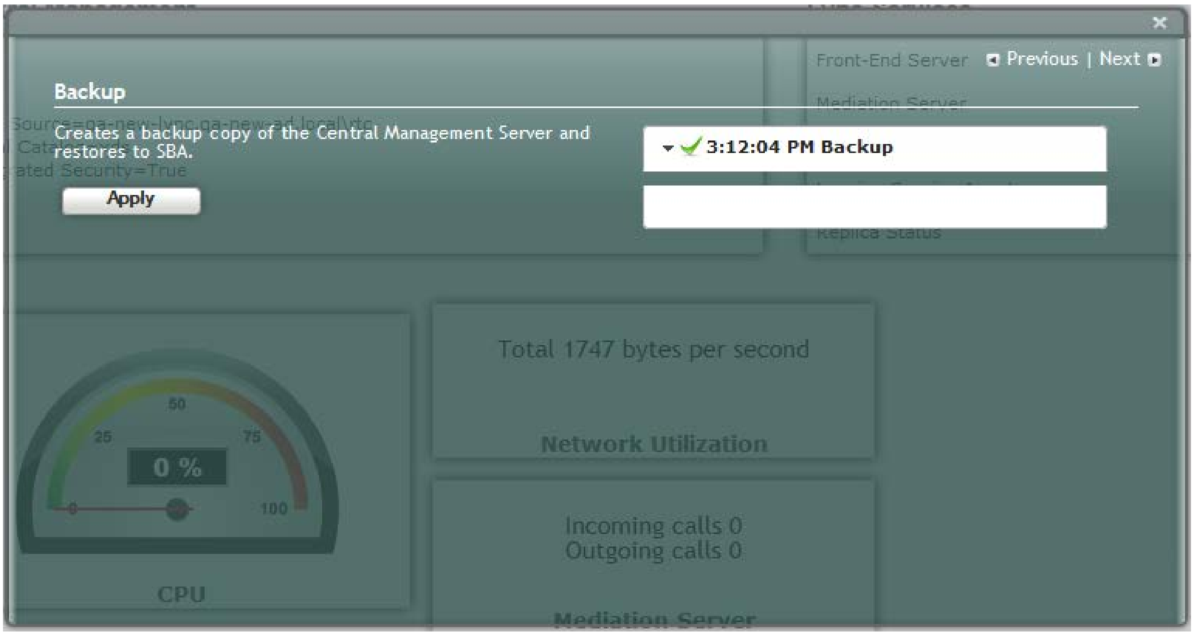


Backup

Creates a backup copy of the Central Management Server and restores to SBA.

2. Click **Apply**; the following screen appears:

Figure 12-34: Backup Confirm



Backup

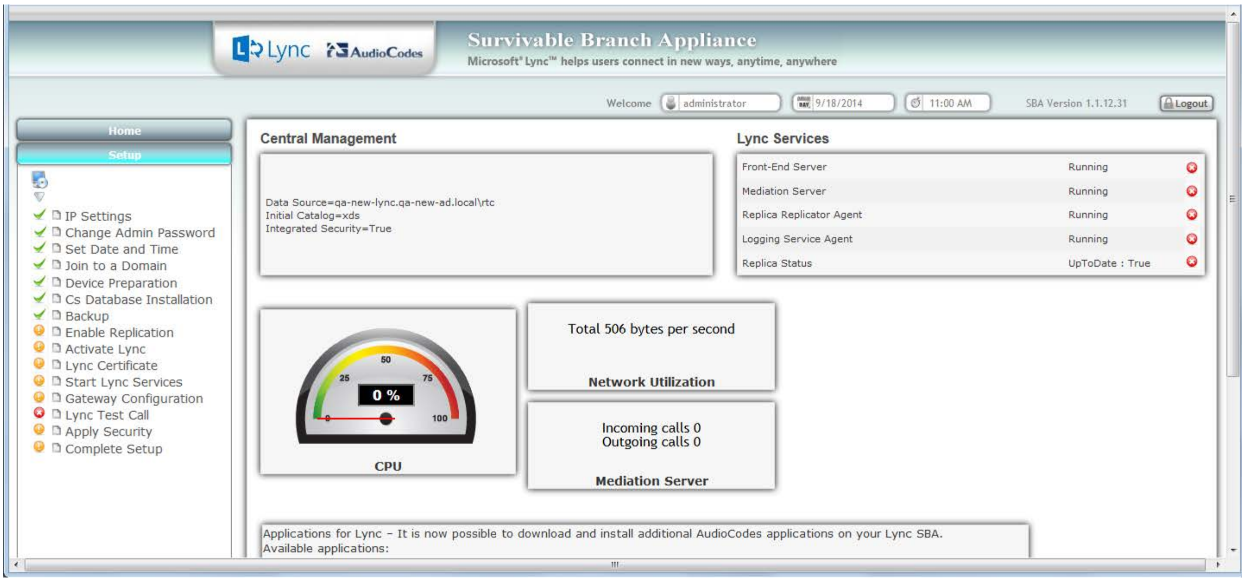
Creates a backup copy of the Central Management Server and restores to SBA.

Apply

✓ 3:12:04 PM Backup

A green check mark appears next to the 'Backup' option under the Setup tab, as shown in the figure below.

Figure 12-35: Backup – Completed Successfully



Lync AudioCodes
Survivable Branch Appliance
Microsoft® Lync™ helps users connect in new ways, anytime, anywhere
Welcome administrator 9/18/2014 11:00 AM SBA Version 1.1.12.31 Logout
Home
Setup
0 %
CPU
Total 506 bytes per second
Network Utilization
Incoming calls 0
Outgoing calls 0
Mediation Server

- ✓ IP Settings
- ✓ Change Admin Password
- ✓ Set Date and Time
- ✓ Join to a Domain
- ✓ Device Preparation
- ✓ Cs Database Installation
- ✓ Backup
- Enable Replication
- Activate Lync
- Lync Certificate
- Start Lync Services
- Gateway Configuration
- Lync Test Call
- Apply Security
- Complete Setup

Central Management

Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

Lync Services

Front-End Server	Running
Mediation Server	Running
Replica Replicator Agent	Running
Logging Service Agent	Running
Replica Status	UpToDate : True

Applications for Lync - It is now possible to download and install additional AudioCodes applications on your Lync SBA.
Available applications:

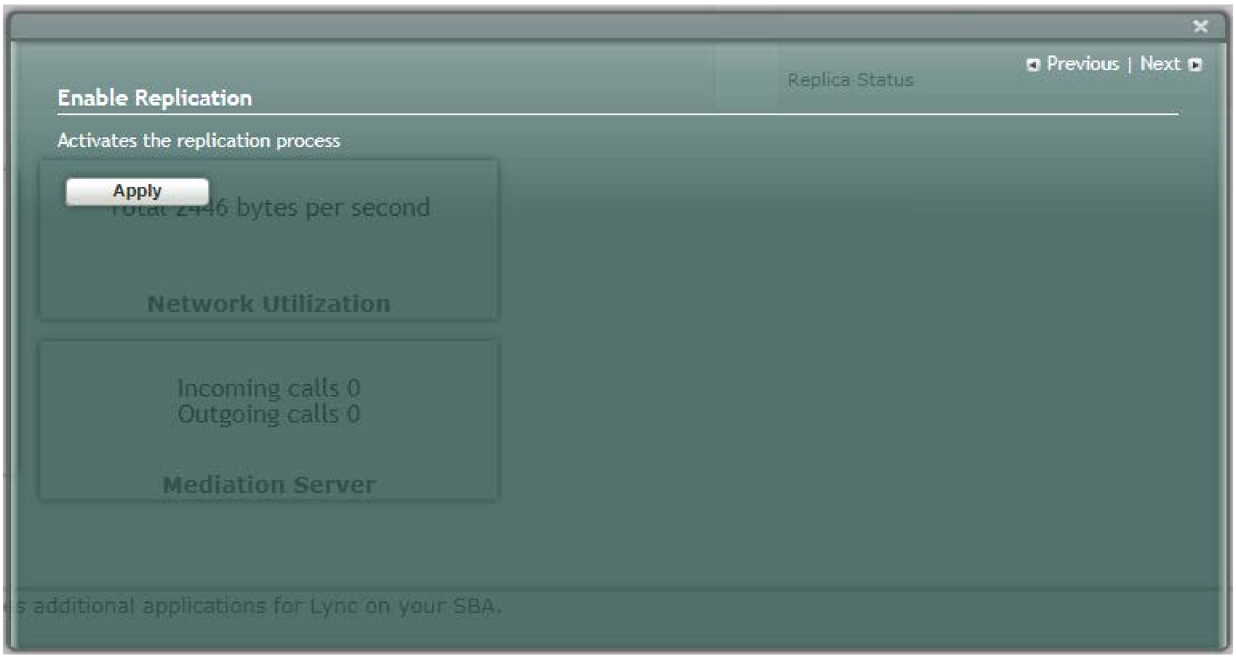
12.9 Step 9: Enable Replication

The 'Enable Replication' option enables the replication process with the Central Management Server. The actual replication is executed after all Lync services have been enabled.

➢ To enable replication:

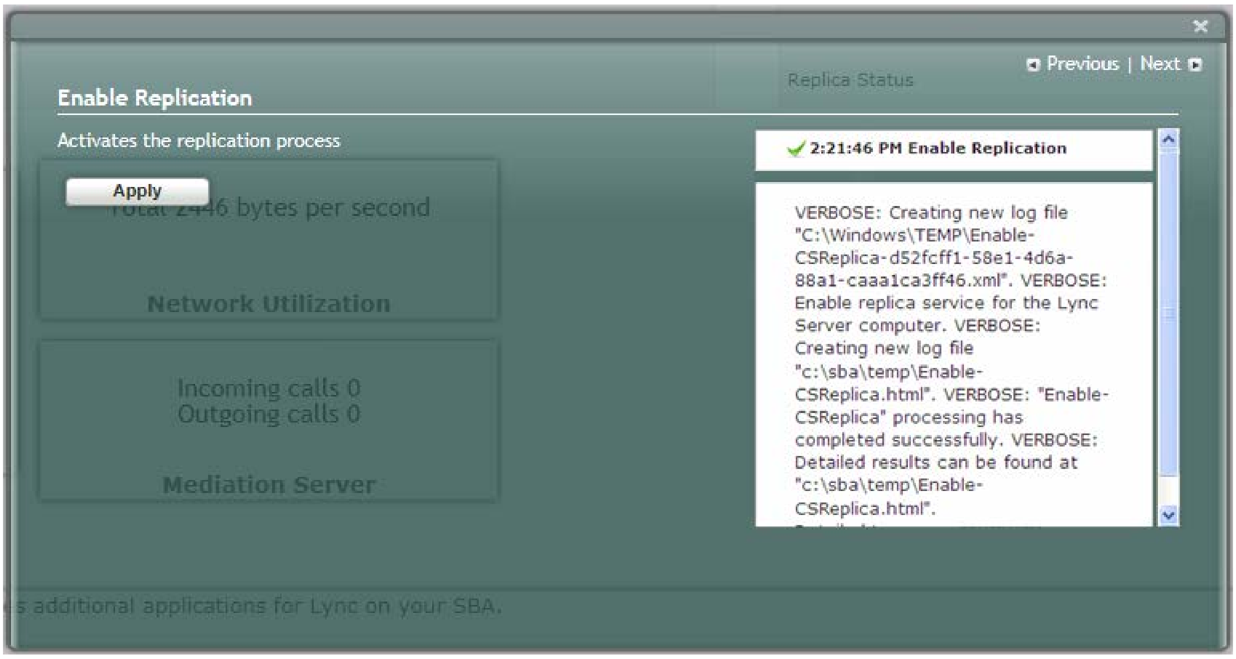
1. Select the **Setup** tab, and then select the 'Enable Replication' check box; the following screen appears:

Figure 12-36: Enable Replication



2. Click **Apply**; the following screen appears:

Figure 12-37: Enable Replication – Applied Successfully

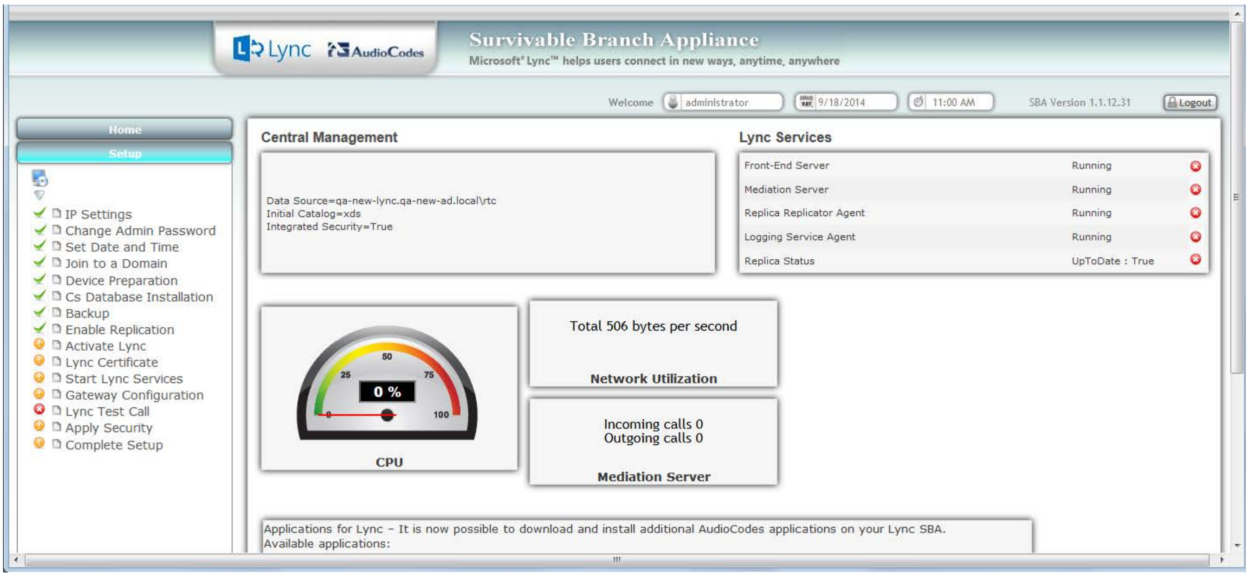


✓ 2:21:46 PM Enable Replication

```
VERBOSE: Creating new log file
"C:\Windows\TEMP\Enable-
CSReplica-d52fcff1-58e1-4d6a-
88a1-caaa1ca3ff46.xml". VERBOSE:
Enable replica service for the Lync
Server computer. VERBOSE:
Creating new log file
"c:\sba\temp\Enable-
CSReplica.html". VERBOSE: "Enable-
CSReplica" processing has
completed successfully. VERBOSE:
Detailed results can be found at
"c:\sba\temp\Enable-
CSReplica.html".
```

A green check mark appears next to the 'Enable Replication' option under the Setup tab, as shown in the figure below.

Figure 12-38: Enable Replication – Applied Successfully



Lync AudioCodes
Survivable Branch Appliance
Microsoft® Lync™ helps users connect in new ways, anytime, anywhere
Welcome administrator 9/18/2014 11:00 AM SBA Version 1.1.12.31 Logout
Home
Setup
Total 506 bytes per second
Network Utilization
Incoming calls 0
Outgoing calls 0
Mediation Server
50
25
75
0 %
0
100
CPU

- ✓ IP Settings
- ✓ Change Admin Password
- ✓ Set Date and Time
- ✓ Join to a Domain
- ✓ Device Preparation
- ✓ Cs Database Installation
- ✓ Backup
- ✓ Enable Replication
- ● Activate Lync
- ● Lync Certificate
- ● Start Lync Services
- ● Gateway Configuration
- ☒ Lync Test Call
- ● Apply Security
- ● Complete Setup

Central Management

Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

Lync Services

Front-End Server	Running	☒
Mediation Server	Running	☒
Replica Replicator Agent	Running	☒
Logging Service Agent	Running	☒
Replica Status	UpToDate : True	☒

Applications for Lync – It is now possible to download and install additional AudioCodes applications on your Lync SBA.
Available applications:

Note: The replication status may not immiediately display the status "Up to Date-True or "Up to Date-False. These statuses should be displayed at a later stage in the configuration process.

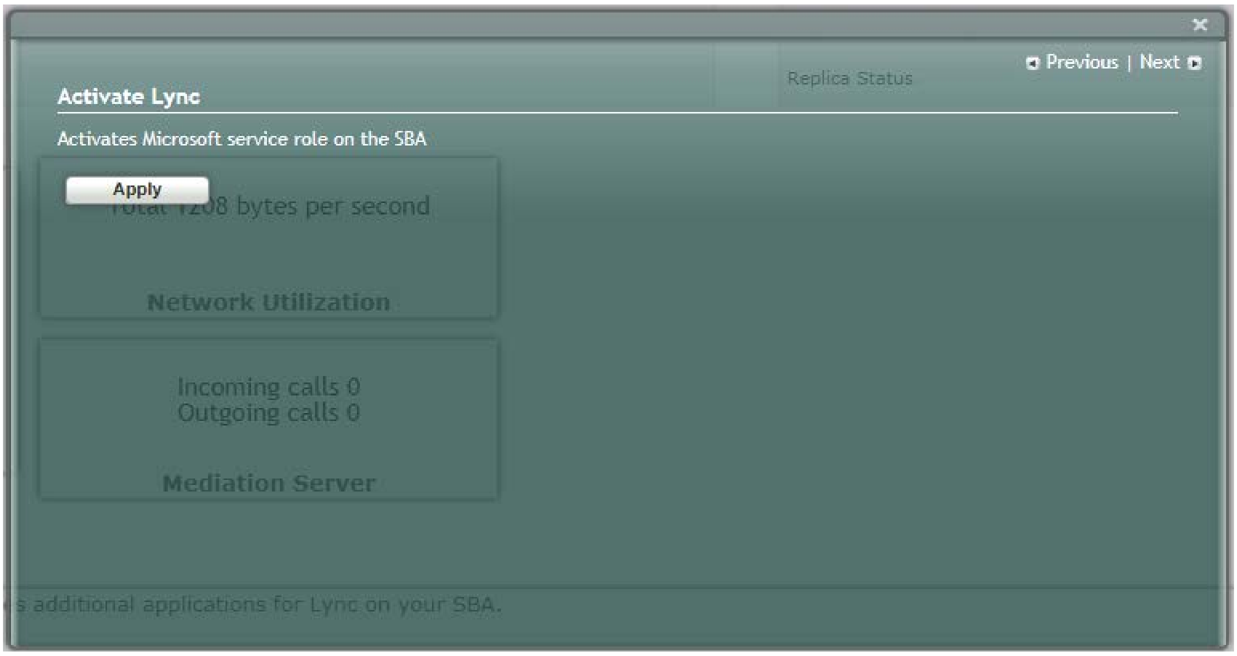
12.10 Step 10: Activate Lync

The Activate Lync option activates the SBA server machine to run a Lync server 2013 service role. Installing the required software does not automatically cause the SBA server machine to adopt a new service role; instead, it must be activated before it actually begins to function in its new role.

➢ To activate Lync:

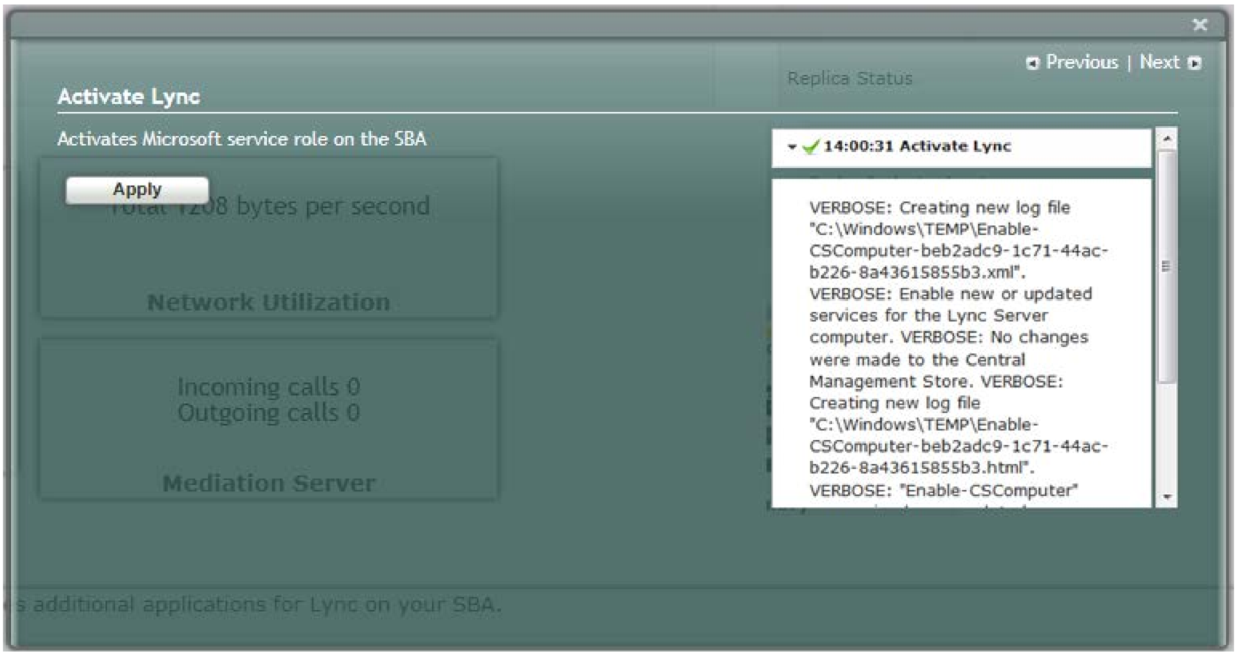
1. Select the **Setup** tab, and then select the 'Activate Lync' check box; the following screen appears:

Figure 12-39: Activate Lync


×
Replica Status
Previous | Next
Activate Lync
Activates Microsoft service role on the SBA
Apply
Total 1208 bytes per second
Network Utilization
Incoming calls 0
Outgoing calls 0
Mediation Server
s additional applications for Lync on your SBA.

2. Click **Apply**; the following screen appears:

Figure 12-40: Activate Lync Applied

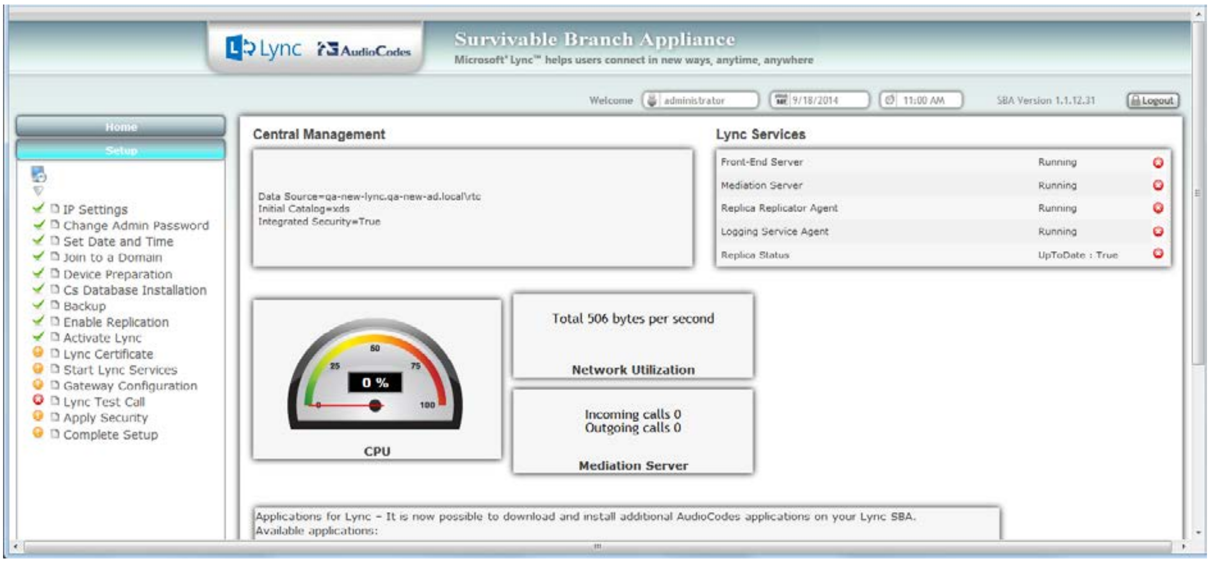

Previous | Next
Replica Status
Activate Lync
Activates Microsoft service role on the SBA
Apply
Total 1208 bytes per second
Network Utilization
Incoming calls 0
Outgoing calls 0
Mediation Server
s additional applications for Lync on your SBA.

```
14:00:31 Activate Lync

VERBOSE: Creating new log file
"C:\Windows\TEMP\Enable-
CSComputer-beb2adc9-1c71-44ac-
b226-8a43615855b3.xml".
VERBOSE: Enable new or updated
services for the Lync Server
computer. VERBOSE: No changes
were made to the Central
Management Store. VERBOSE:
Creating new log file
"C:\Windows\TEMP\Enable-
CSComputer-beb2adc9-1c71-44ac-
b226-8a43615855b3.html".
VERBOSE: "Enable-CSComputer"
```

A green check mark appears next to the 'Activate Lync' option under the Setup tab, as shown in the figure below.

Figure 12-41: Activate Lync – Completed Successfully



Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

Front-End Server	Running
Mediation Server	Running
Replica Replicator Agent	Running
Logging Service Agent	Running
Replica Status	UpToDate : True

Applications for Lync - It is now possible to download and install additional AudioCodes applications on your Lync SBA.
Available applications:

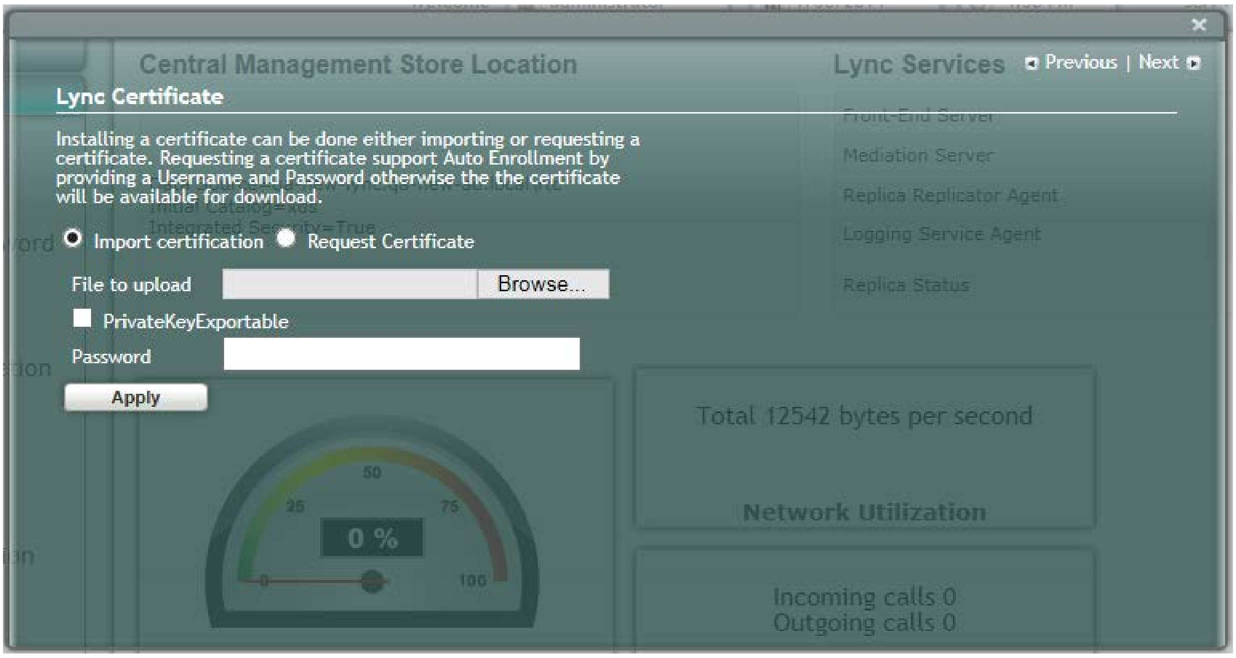
12.11 Step 11: Lync Certificate

The 'Lync Certificate' option installs a certificate from the domain’s certificate authority. This certificate is used to secure the connection between the SBA server and the Central Management Server.

➢ To install a Certificate:

- Select the **Setup** tab, and then select the 'Lync Certificate' check box; the following screen appears:

Figure 12-42: Lync Certificate



Lync Certificate

Installing a certificate can be done either importing or requesting a certificate. Requesting a certificate support Auto Enrollment by providing a Username and Password otherwise the the certificate will be available for download.

● Import certification ○ Request Certificate

File to upload [ ] Browse...

□ PrivateKeyExportable

Password [ ]

Certificates can be installed either by importing an existing certificate or requesting a new certificate.

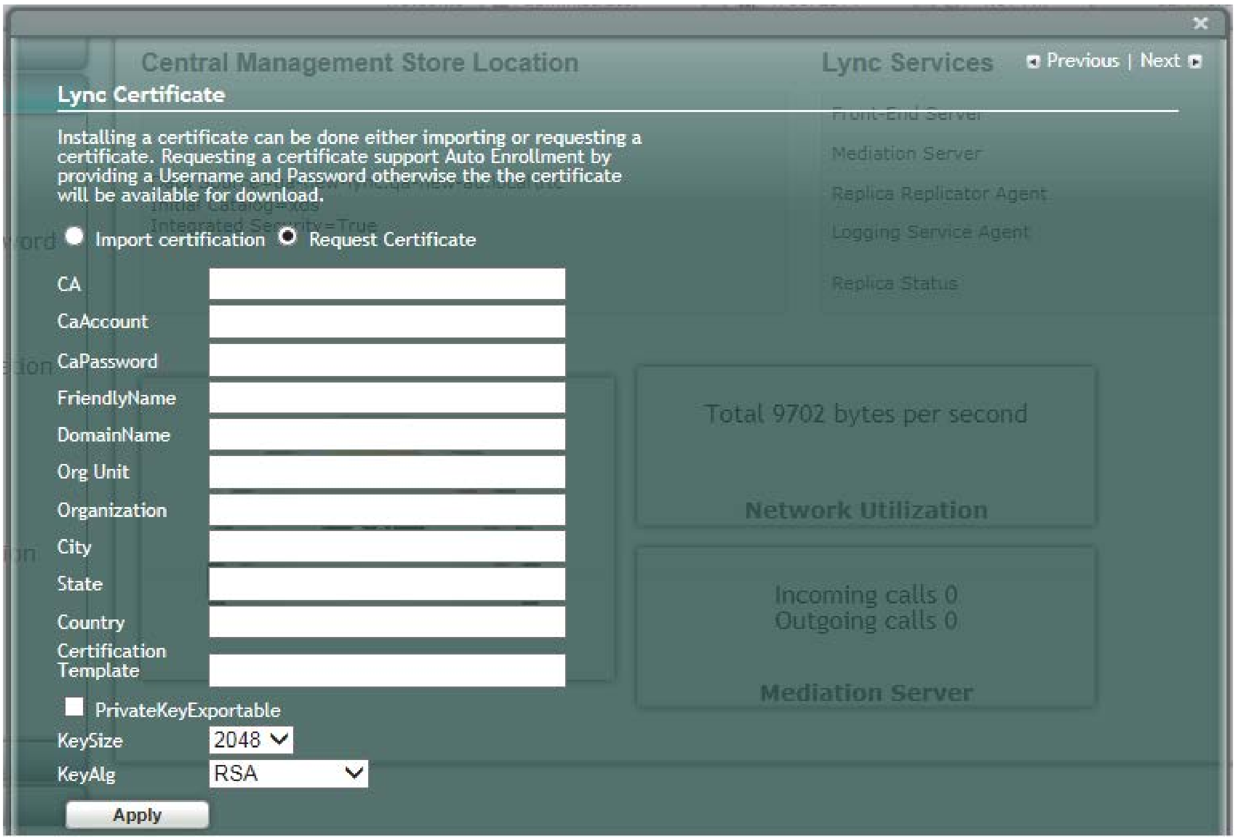
➢ To import an existing certificate:

1. Select the **Import Certification** radio button.
2. Click **Browse** to select the File to Upload.
3. Enter the Password (optional) of the certificates.
4. Click **Apply**.

➢ To request a new certificate:

1. Select the **Request Certificate** radio button.

Figure 12-43: Request Certificate



Lync Certificate

Installing a certificate can be done either importing or requesting a certificate. Requesting a certificate support Auto Enrollment by providing a Username and Password otherwise the the certificate will be available for download.

○ Import certification ● Request Certificate

CA

CaAccount

CaPassword

FriendlyName

DomainName

Org Unit

Organization

City

State

Country

Certification Template

□ PrivateKeyExportable

KeySize 2048

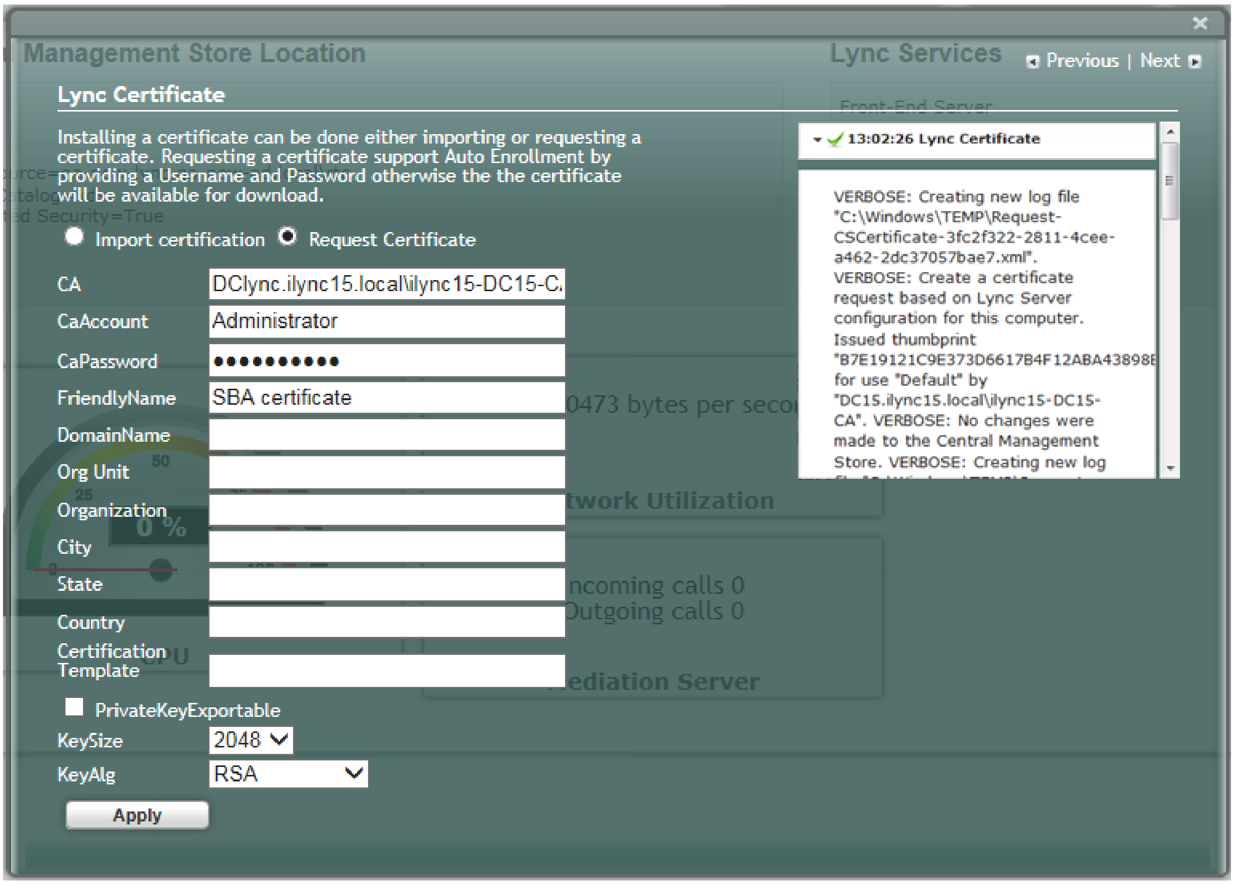
KeyAlg RSA

Apply

2. Requesting a certificate supports Auto-enrollment. Enter all fields. Those fields beginning with a CA prefix are mandatory. The correct Certificate Authority (CA), User and Password must also be supplied.

The CA field contains the <CA FQDN>\<CA Name> (e.g., CA.Lync.local\CA-DC-Lync-CA).

Figure 12-44: Request Certificate Detailed Log



Lync Certificate

Installing a certificate can be done either importing or requesting a certificate. Requesting a certificate support Auto Enrollment by providing a Username and Password otherwise the the certificate will be available for download.

○ Import certification ● Request Certificate

CA	DClync.ilync15.local\ilync15-DC15-C,
CaAccount	Administrator
CaPassword	••••••••••
FriendlyName	SBA certificate
DomainName	
Org Unit	
Organization	
City	
State	
Country	
Certification Template	

□ PrivateKeyExportable

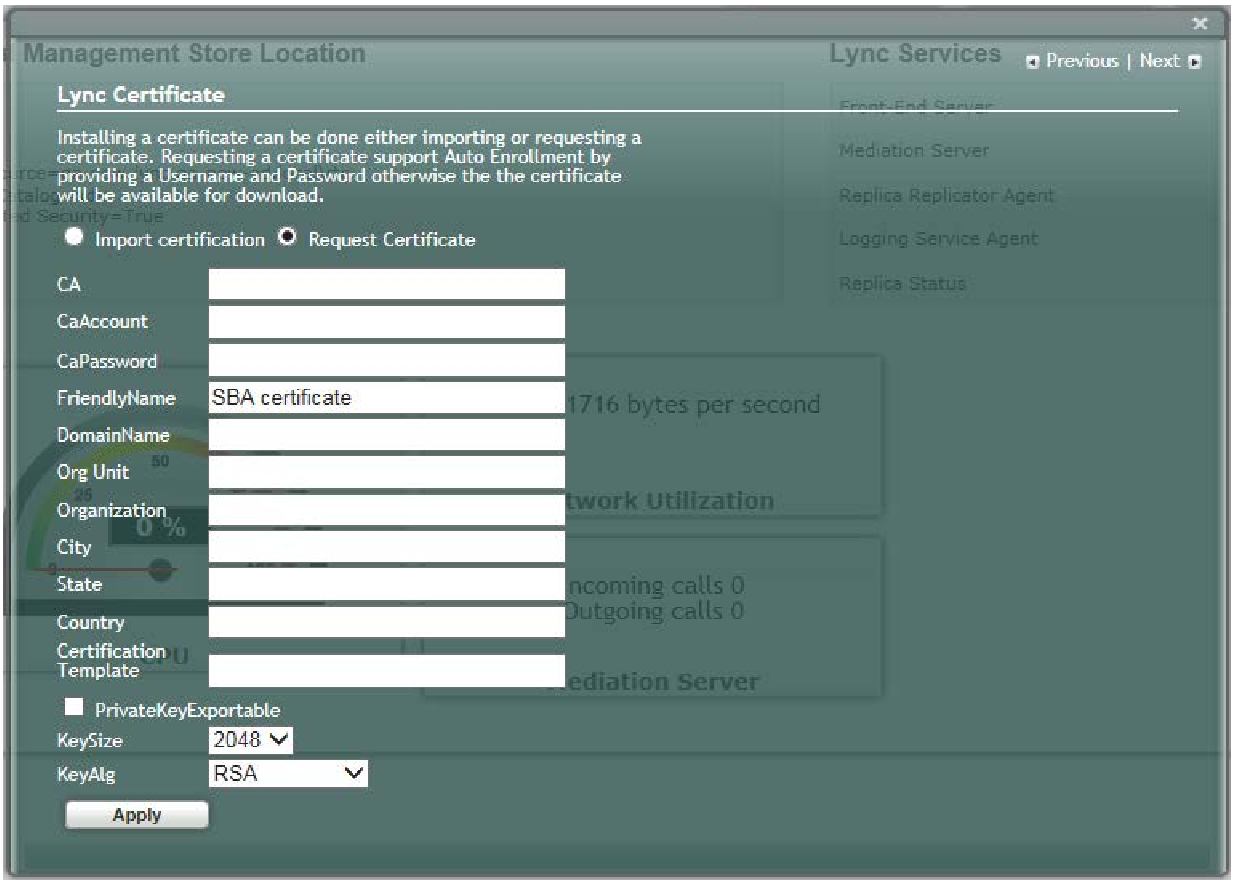
KeySize	2048
KeyAlg	RSA

✓ 13:02:26 Lync Certificate

```
VERBOSE: Creating new log file
"C:\Windows\TEMP\Request-
CSCertificate-3fc2f322-2811-4cee-
a462-2dc37057bae7.xml".
VERBOSE: Create a certificate
request based on Lync Server
configuration for this computer.
Issued thumbprint
"B7E19121C9E373D6617B4F12ABA43898E
for use "Default" by
"DC15.ilync15.local\ilync15-DC15-
CA". VERBOSE: No changes were
made to the Central Management
Store. VERBOSE: Creating new log
```

3. If the CA field is not entered, the system creates an enrollment certificate, which can be downloaded.

Figure 12-45: Lync Certificate SBA Certificate



Lync Certificate

Installing a certificate can be done either importing or requesting a certificate. Requesting a certificate support Auto Enrollment by providing a Username and Password otherwise the the certificate will be available for download.

○ Import certification ● Request Certificate

CA	
CaAccount	
CaPassword	
FriendlyName	SBA certificate
DomainName	
Org Unit	
Organization	
City	
State	
Country	
Certification Template	

□ PrivateKeyExportable

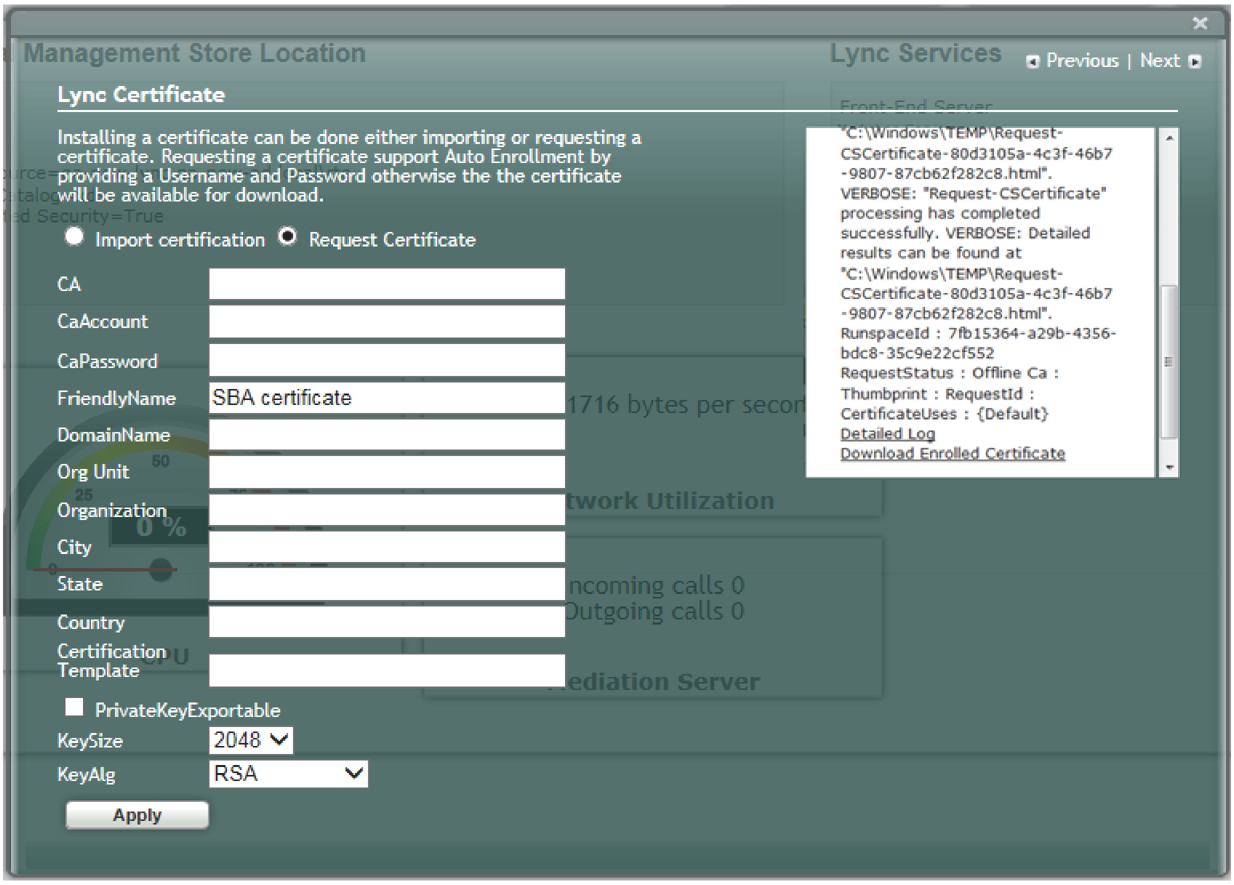
KeySize 2048

KeyAlg RSA

Apply

4. Click **Apply**; the following screen appears.

Figure 12-46: Lync Certificate – Download Enrolled Certificate01



Lync Certificate

Installing a certificate can be done either importing or requesting a certificate. Requesting a certificate support Auto Enrollment by providing a Username and Password otherwise the the certificate will be available for download.

○ Import certification ● Request Certificate

CA	
CaAccount	
CaPassword	
FriendlyName	SBA certificate
DomainName	
Org Unit	
Organization	
City	
State	
Country	
Certification Template	

□ PrivateKeyExportable

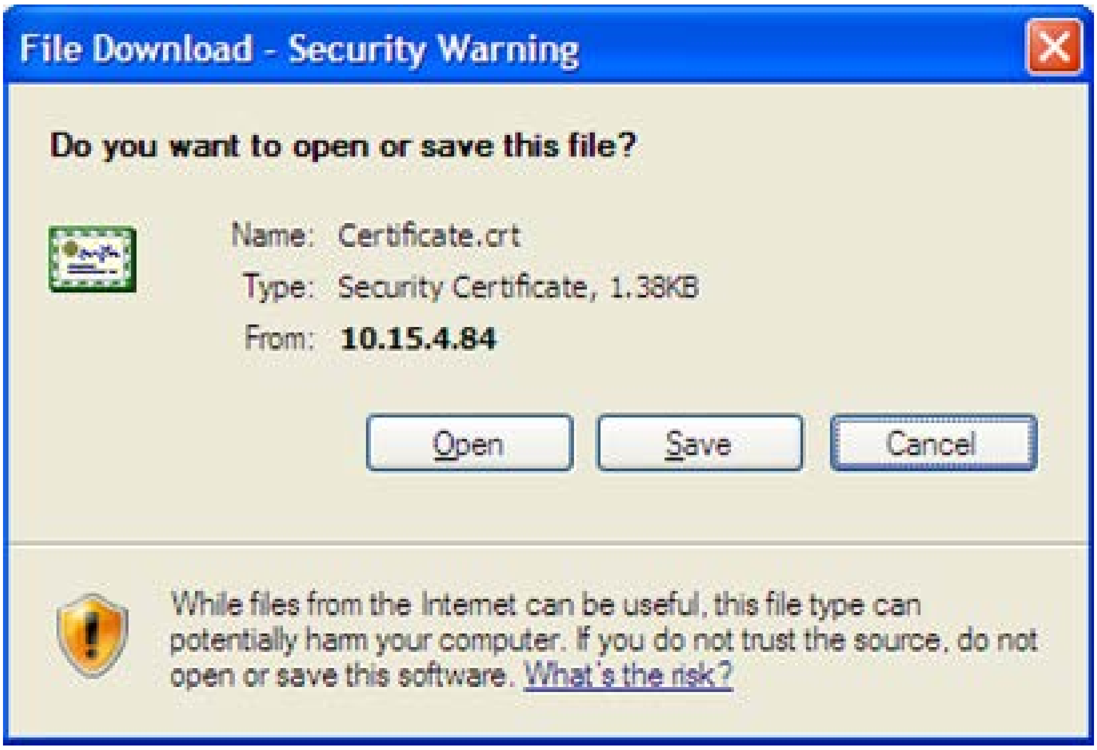
KeySize: 2048

KeyAlg: RSA

Apply

```
"C:\Windows\TEMP\Request-
CSCertificate-80d3105a-4c3f-46b7
-9807-87cb62f282c8.html".
VERBOSE: "Request-CSCertificate"
processing has completed
successfully. VERBOSE: Detailed
results can be found at
"C:\Windows\TEMP\Request-
CSCertificate-80d3105a-4c3f-46b7
-9807-87cb62f282c8.html".
RunspaceId : 7fb15364-a29b-4356-
bdc8-35c9e22cf552
RequestStatus : Offline Ca :
Thumbprint : RequestId :
CertificateUses : {Default}
Detailed Log
Download Enrolled Certificate
```

5. Click the **Download Enrolled Certificate** link; the following screen appears.



File Download - Security Warning

Do you want to open or save this file?

Name: Certificate.crt

Type: Security Certificate, 1.38KB

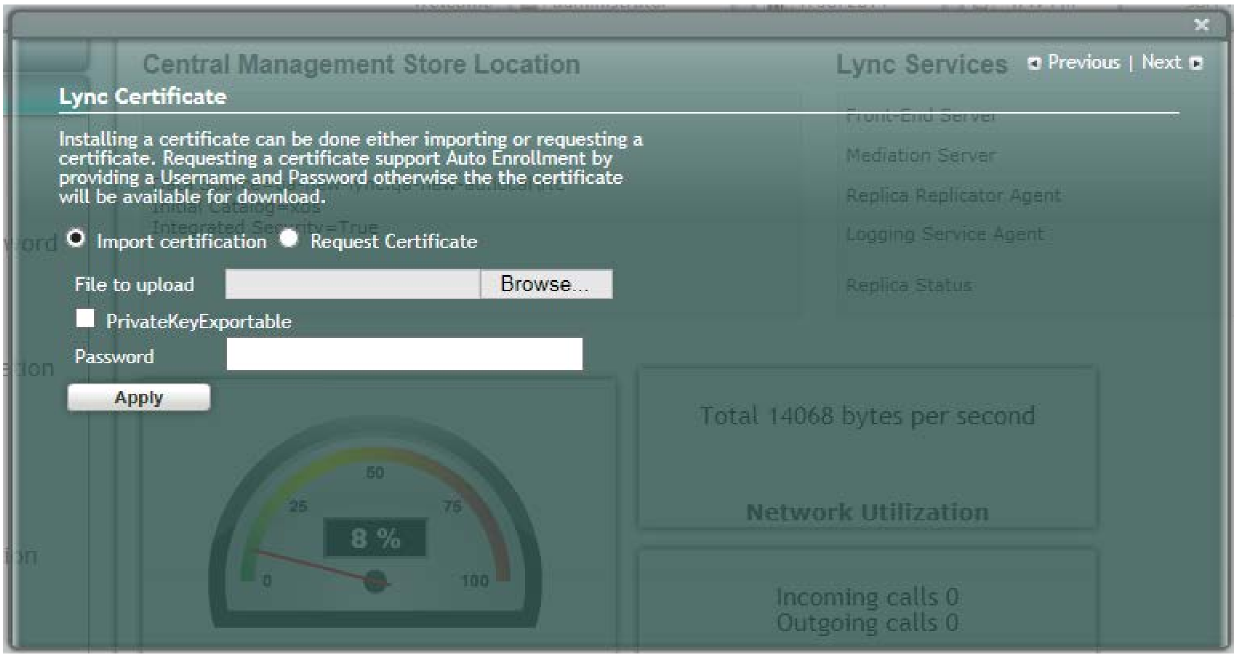
From: **10.15.4.84**

While files from the Internet can be useful, this file type can potentially harm your computer. If you do not trust the source, do not open or save this software. What's the risk?

6. Click **Save**.

7. Once the Enrollment Certificate has been signed, select the Import Certification radio button as shown below and upload the signed certificate to be uploaded by using the Browse and File to Upload fields.

Figure 12-47: Lync Certificate – File Upload



Lync Certificate

Installing a certificate can be done either importing or requesting a certificate. Requesting a certificate support Auto Enrollment by providing a Username and Password otherwise the the certificate will be available for download.

● Import certification ○ Request Certificate

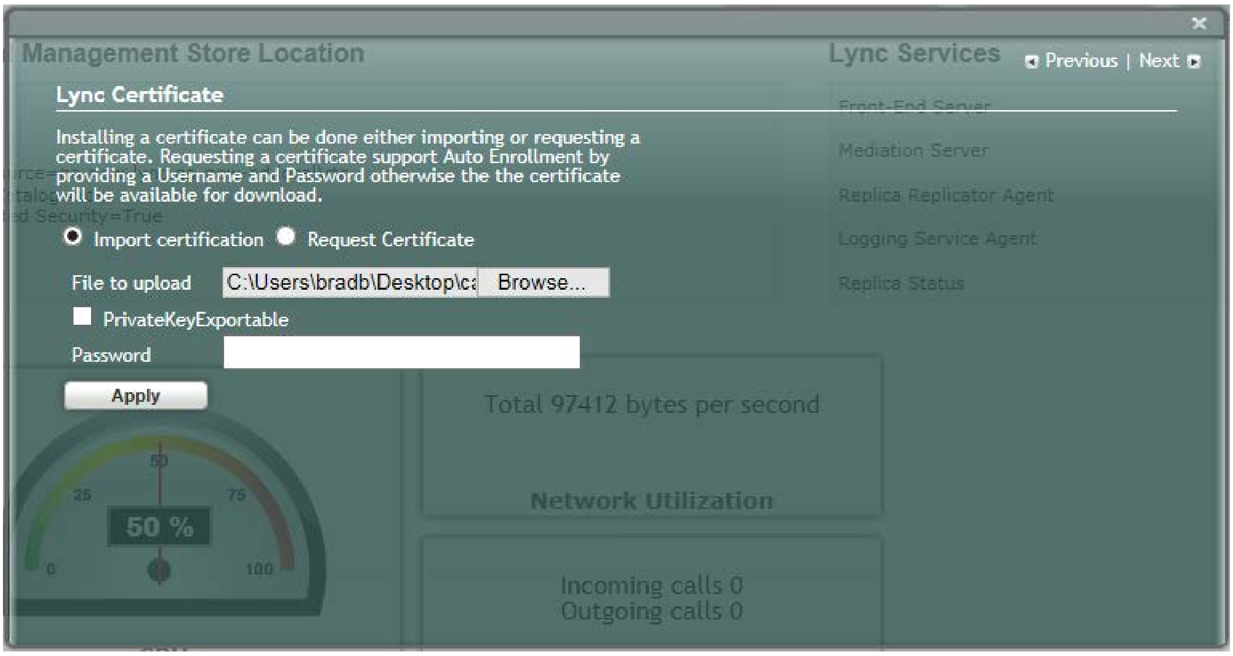
File to upload

□ PrivateKeyExportable

Password

8. Click **Apply**; the following screen appears:

Figure 12-48: Lync Certificate – Detail Log



Lync Certificate

Installing a certificate can be done either importing or requesting a certificate. Requesting a certificate support Auto Enrollment by providing a Username and Password otherwise the the certificate will be available for download.

● Import certification ○ Request Certificate

File to upload C:\Users\bradb\Desktop\c: Browse...

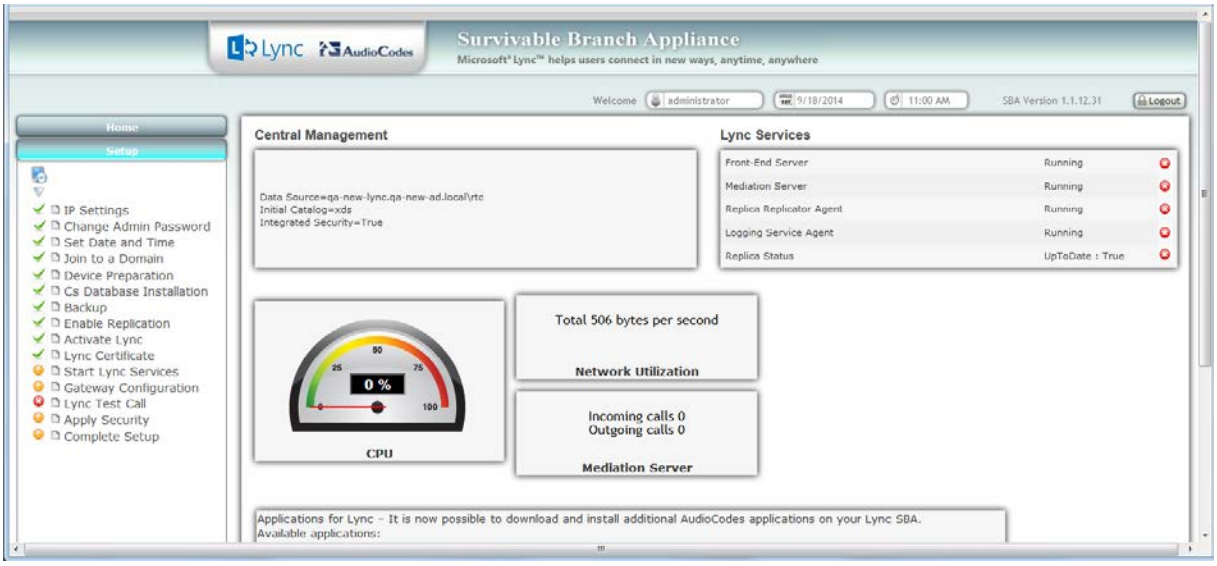
□ PrivateKeyExportable

Password

Apply

A green check mark appears next to the 'Lync Certificate' option under the Setup tab, as shown in the figure below.

Figure 12-49: Lync Certificate Complete


Lync
AudioCodes
Survivable Branch Appliance
Microsoft® Lync™ helps users connect in new ways, anytime, anywhere
Welcome
Logout
Home
Setup
0 %
25
50
75
0
100
CPU

administrator 9/18/2014 11:00 AM SBA Version 1.1.12.31

- ✓ IP Settings
- ✓ Change Admin Password
- ✓ Set Date and Time
- ✓ Join to a Domain
- ✓ Device Preparation
- ✓ Cs Database Installation
- ✓ Backup
- ✓ Enable Replication
- ✓ Activate Lync
- ✓ Lync Certificate
- ● Start Lync Services
- ● Gateway Configuration
- ● Lync Test Call
- ● Apply Security
- ● Complete Setup

Central Management

Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

Lync Services

Front-End Server	Running	●
Mediation Server	Running	●
Replica Replicator Agent	Running	●
Logging Service Agent	Running	●
Replica Status	UpToDate : True	●

Total 506 bytes per second

Network Utilization

Incoming calls 0
Outgoing calls 0

Mediation Server

Applications for Lync – It is now possible to download and install additional AudioCodes applications on your Lync SBA.
Available applications:

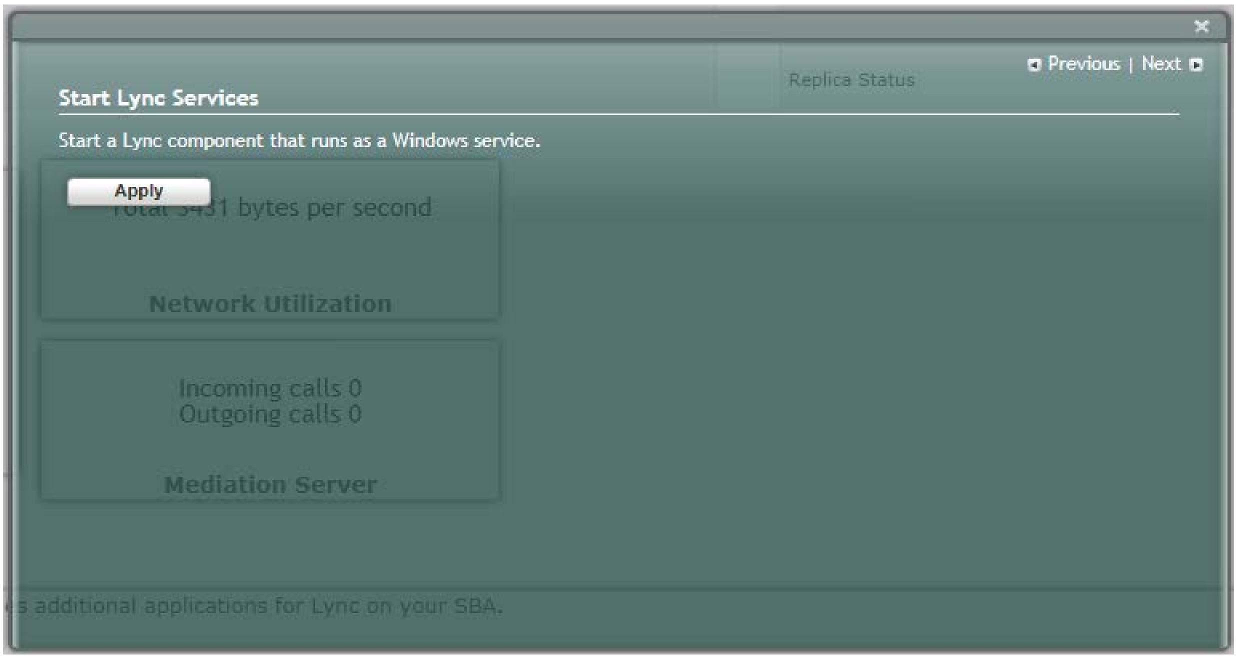
12.12 Step 12: Start Lync Services

The Start Lync Services option enables you to start a Skype for Business component that runs as a Windows service.

➢ To start Lync services:

1. Select the **Setup** tab and then select the Start Lync Services check box; the following screen is displayed:

Figure 12-50: Start Lync Services

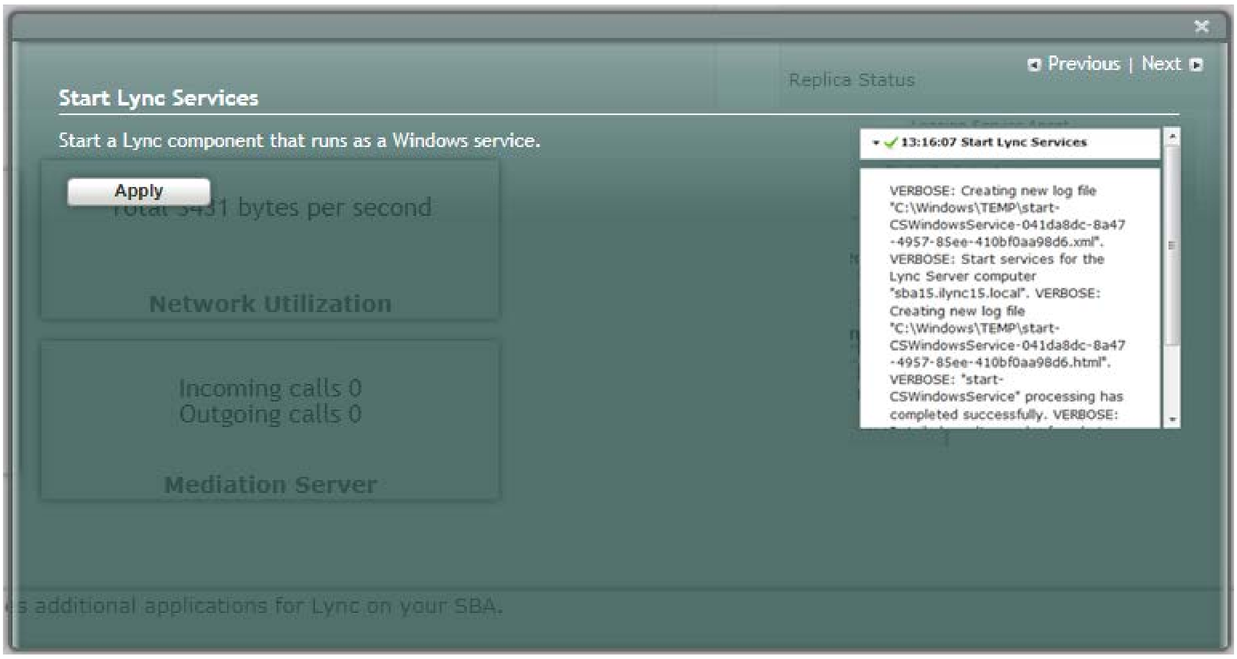


Start Lync Services

Start a Lync component that runs as a Windows service.

2. Click **Apply** to start the services as per the Lync configuration settings; the following screen is displayed:

Figure 12-51: Start Lync Services



Start Lync Services

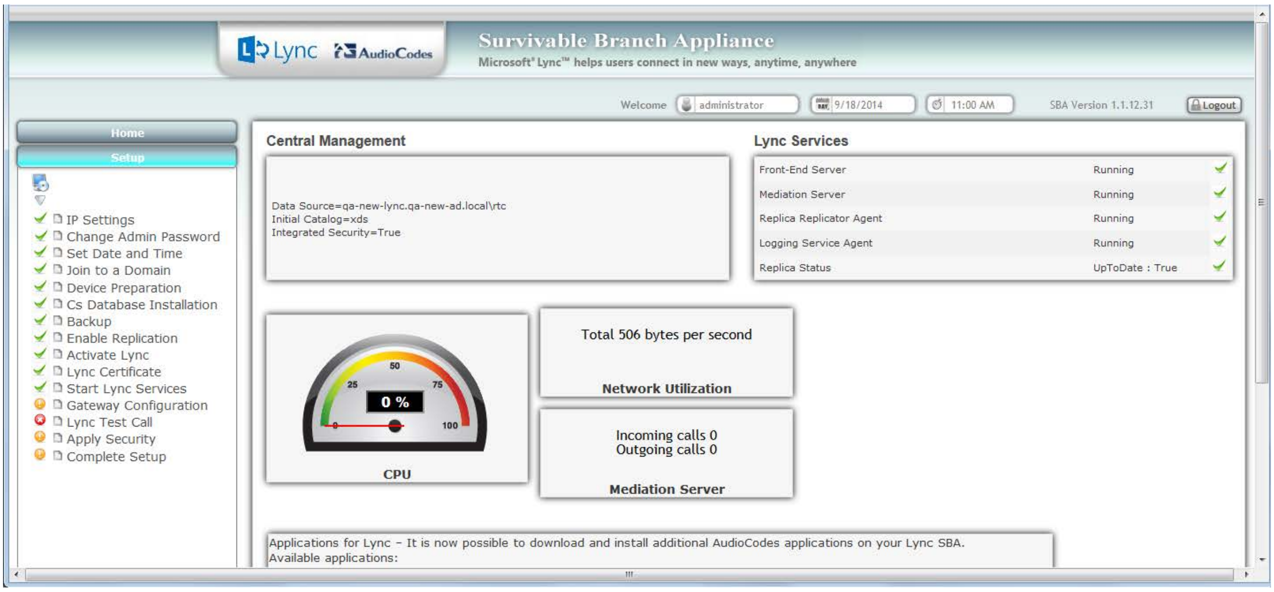
Start a Lync component that runs as a Windows service.

```
✓ 13:16:07 Start Lync Services

VERBOSE: Creating new log file
"C:\Windows\TEMP\start-
CSWindowsService-041da8dc-8a47
-4957-85ee-410bf0aa98d6.xml".
VERBOSE: Start services for the
Lync Server computer
"sba15.ilync15.local". VERBOSE:
Creating new log file
"C:\Windows\TEMP\start-
CSWindowsService-041da8dc-8a47
-4957-85ee-410bf0aa98d6.html".
VERBOSE: "start-
CSWindowsService" processing has
completed successfully. VERBOSE:
```

A green check mark appears next to the 'Start Lync Services' option under the Setup tab, and in the Lync Services information pane all of the Lync Services are shown as "Running" as shown in the figure below.

Figure 12-52: Start Lync Services -Completed Successfully



✓ IP Settings
✓ Change Admin Password
✓ Set Date and Time
✓ Join to a Domain
✓ Device Preparation
✓ Cs Database Installation
✓ Backup
✓ Enable Replication
✓ Activate Lync
✓ Lync Certificate
✓ Start Lync Services
● Gateway Configuration
● Lync Test Call
● Apply Security
● Complete Setup

Central Management

Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

Lync Services

Front-End Server	Running	✓
Mediation Server	Running	✓
Replica Replicator Agent	Running	✓
Logging Service Agent	Running	✓
Replica Status	UpToDate : True	✓

Total 506 bytes per second

Network Utilization

Incoming calls 0
Outgoing calls 0

Mediation Server

Applications for Lync - It is now possible to download and install additional AudioCodes applications on your Lync SBA.
Available applications:

Note: The Lync Services and Replication Status take time to update and therefore will not immediately be displayed as running**.**

12.13 Step 13: Configure E-SBC Test Calls

The Gateway Configuration option enables you to connect to the Web-based interface of the E-SBC functionality of the Mediant 2600B SBA in order to configure the gateway for testing calls to the SIP trunk.

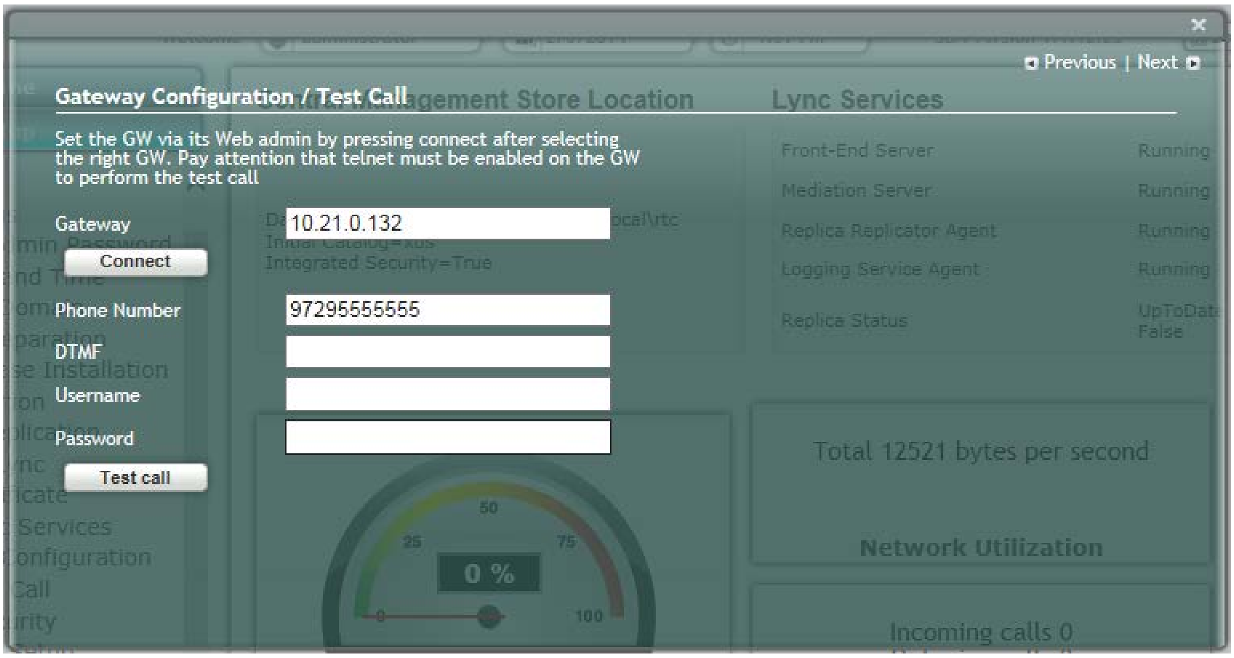
Note: Before testing gateway calls:

- Ensure that you have connected the E-SBC gateway as described in Chapter 7.
- Ensure that you have configured E-SBC call routing (for more information, refer to the *Mediant 2600B SBA MSBR User's Manual*).

➢ To configure the gateway and run test calls:

1. Select the **Setup** tab, and then select the 'Gateway Configuration' check box; the following screen appears:

Figure 12-53: Gateway Test Call



Gateway Configuration / Test Call

Set the GW via its Web admin by pressing connect after selecting the right GW. Pay attention that telnet must be enabled on the GW to perform the test call

Gateway: 10.21.0.132

Phone Number: 97295555555

DTMF:

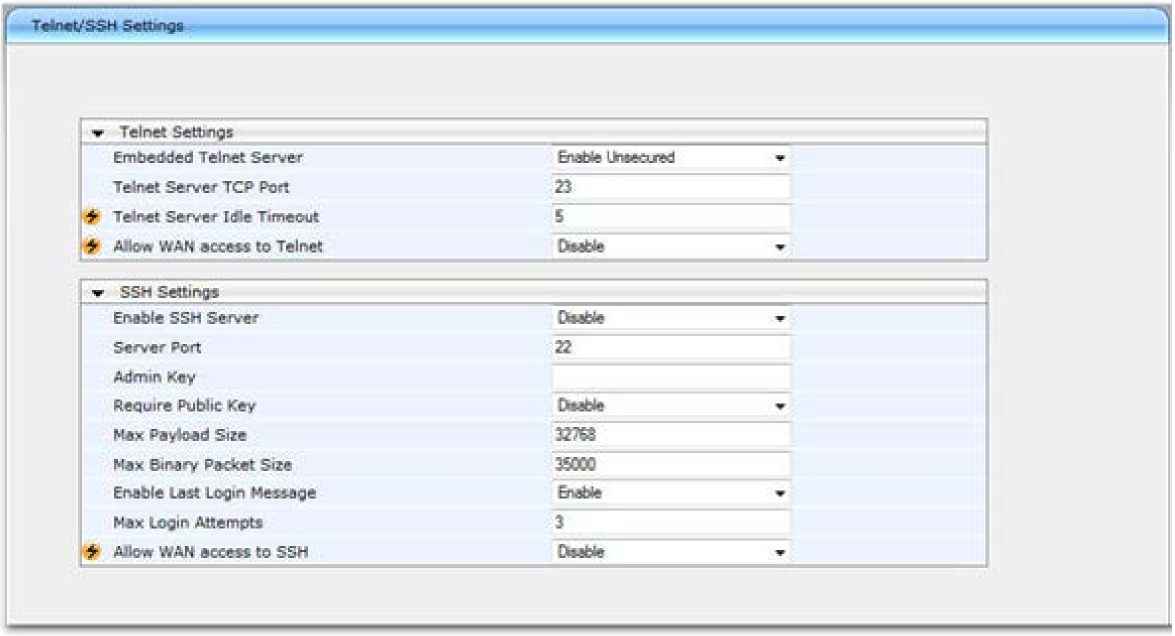
Username:

Password:

2. In the ‘Gateway’ field, enter the IP address or DNS name of the Mediant 2600B SBA.
3. In the 'Phone Number' field, enter the endpoint phone number for which you wish to test the call.

4. In the ‘DTMF’ field, enter any DTMF string. This DTMF string will be heard when the user picks up the phone handset (optional).
5. If you changed the Web/Telnet login username and password of the Gateway, then enter their values in the ‘Username’ and ‘Password’ fields respectively; otherwise, leave the fields as is.
6. Click **Connect**; the login screen for the gateway's Embedded HTTP/S-based Web server is displayed.
7. Establish a telnet session (enable Telnet on the Gateway):
   - f. Open the Telnet/SSH Settings page (**Configuration** tab > **System** menu > **Management** > **Telnet/SSH Settings**).
   - g. From the ‘Embedded Telnet Server’ drop-down list, select **Enable Unsecured**.
   - h. In the ‘Telnet Server TCP Port’ field, ensure that the port used for Telnet is '23' (default).

Figure 12-54: Enable Telnet



Telnet/SSH Settings

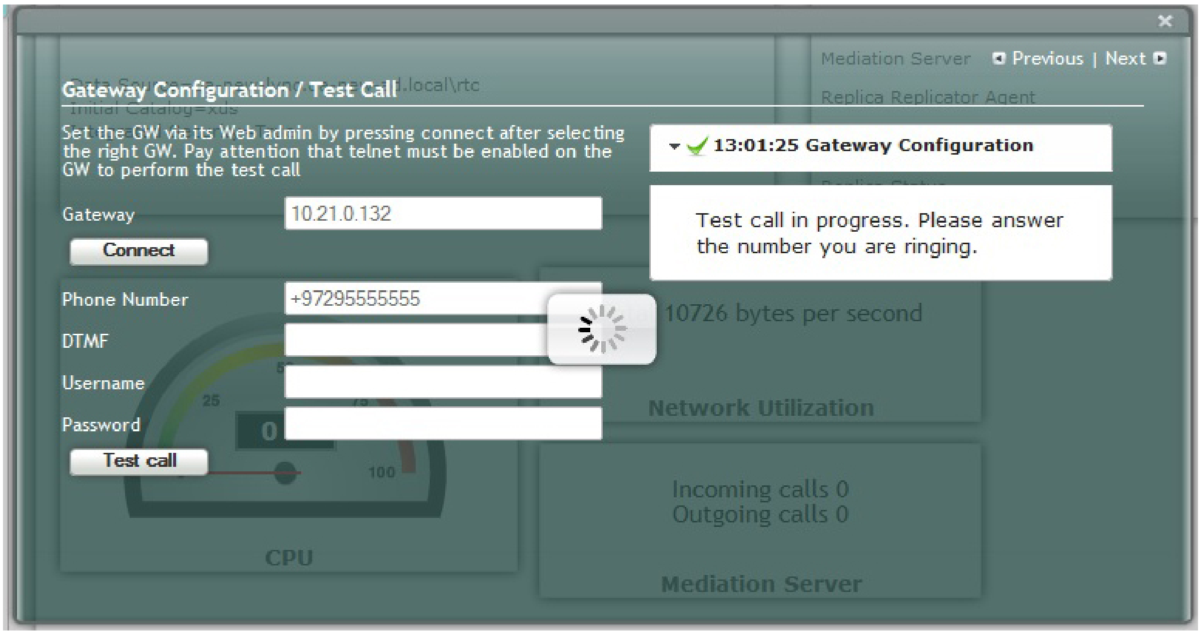
Telnet Settings	
Embedded Telnet Server	Enable Unsecured
Telnet Server TCP Port	23
⚡ Telnet Server Idle Timeout	5
⚡ Allow WAN access to Telnet	Disable

SSH Settings	
Enable SSH Server	Disable
Server Port	22
Admin Key	
Require Public Key	Disable
Max Payload Size	32768
Max Binary Packet Size	35000
Enable Last Login Message	Enable
Max Login Attempts	3
⚡ Allow WAN access to SSH	Disable

8. Configure call routing (for more information, refer to the *Mediant 2600B SBA E-SBC User's Manual*.

9. In the SBA Management Interface, click **Test Call**; the test call in progress is displayed:

Figure 12-55: Test Call in Progress



Gateway Configuration / Test Call

Set the GW via its Web admin by pressing connect after selecting the right GW. Pay attention that telnet must be enabled on the GW to perform the test call

Gateway: 10.21.0.132

Phone Number: +97295555555

DTMF:

Username:

Password:

13:01:25 Gateway Configuration

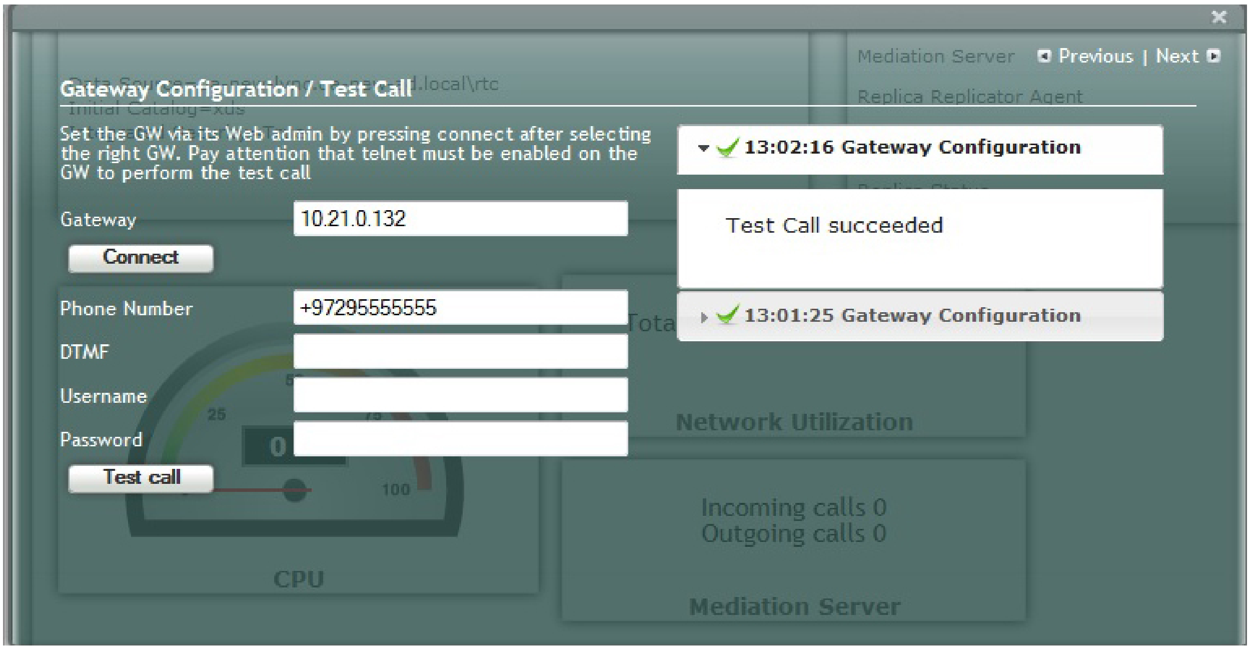
Test call in progress. Please answer the number you are ringing.

10726 bytes per second

Incoming calls 0
Outgoing calls 0

- When the call has been successfully tested.
- If the phone does not ring, an error message is displayed and the call test fails. If the phone rings, lift the handset and confirm that you can hear the DTMFs. The following screen appears when you answer the phone:

Figure 12-56: Test Call Succeeded



Gateway Configuration / Test Call

Set the GW via its Web admin by pressing connect after selecting the right GW. Pay attention that telnet must be enabled on the GW to perform the test call

Gateway: 10.21.0.132

Phone Number: +97295555555

DTMF:

Username:

Password:

13:02:16 Gateway Configuration

Test Call succeeded

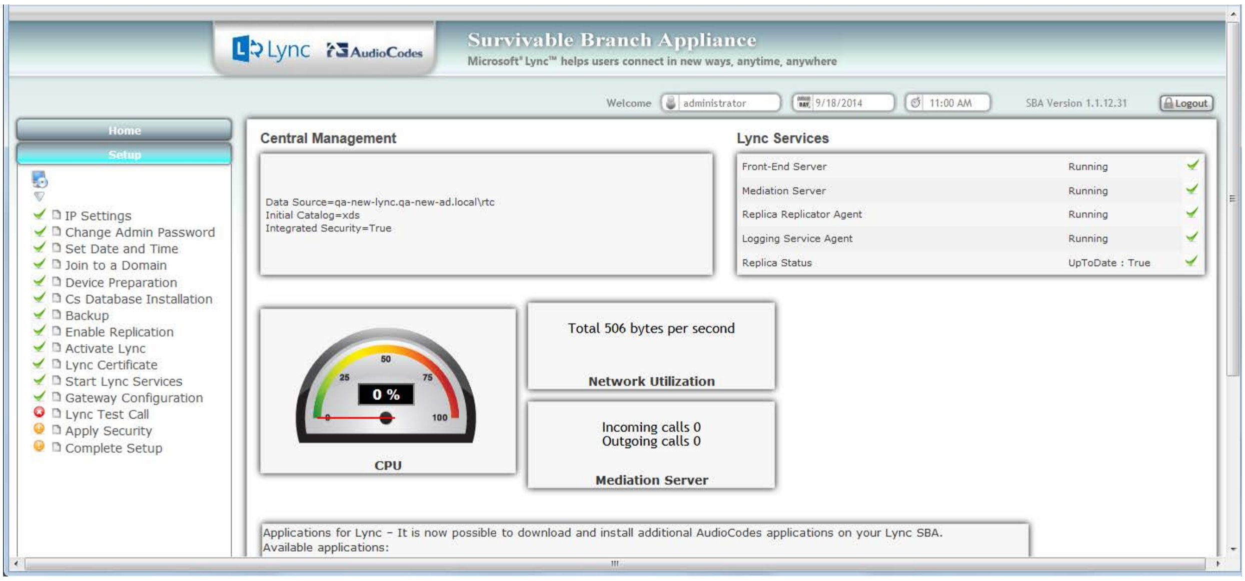
13:01:25 Gateway Configuration

Incoming calls 0
Outgoing calls 0

Note: It is recommended to disable Telnet after making the test call.

A green check marks appear next to the 'Gateway Configuration' (and Gateway test call) option under the Setup tab, as shown in the figure below.

Figure 12-57: Gateway Test Call Successful



Welcome administrator | 9/18/2014 | 11:00 AM | SBA Version 1.1.12.31

Central Management

Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

Lync Services

Front-End Server	Running	✓
Mediation Server	Running	✓
Replica Replicator Agent	Running	✓
Logging Service Agent	Running	✓
Replica Status	UpToDate : True	✓

Total 506 bytes per second

Network Utilization

Incoming calls 0
Outgoing calls 0

Mediation Server

Applications for Lync - It is now possible to download and install additional AudioCodes applications on your Lync SBA.
Available applications:

12.14 Step 14: Test Lync Calls

The Lync Test Call option allows you to test an E-SBC call initiated by the Skype for Business server.

12.14.1 Test Prerequisites

Before running the Skype for Business Test Call, the following prerequisites must be met:

- The gateway call has been successfully tested as described in 'Step 13: Configure Gateway and Test Calls' on page 117
- Test users have been created in the Skype for Business and are voice-enabled.
- VoIP Outbound Routing configuration has been setup and the correct policies assigned to the test users (for more information, refer to the *Mediant 2600B SBA MSBR User's Manual*).
- Built-in-users for Health Monitoring have been configured using the following commands:

```
New-CsHealthMonitoringConfiguration -Identity
<XdsGlobalRelativeIdentity> -FirstTestUserSipUri <String> -
SecondTestUserSipUri <String>
```

Where:

- Identity the FQDN of the pool where the health monitoring configuration settings are to be assigned (i.e., SBA FQDN).
- FirstTestUserSipUri is the SIP address of the first test user to be configured for use by this collection of health monitoring settings. Note that the SIP address must include the sip: prefix, for example:

  -FirstTestUserSipUri sip:kenmyer@litwareinc.com
- SecondTestUserSipUri is the SIP address of the second test user to be configured for use by this collection of health monitoring settings. Note that the SIP address must include the sip: prefix, for example:

  -SecondTestUserSipUri sip:jhaas@litwareinc.com

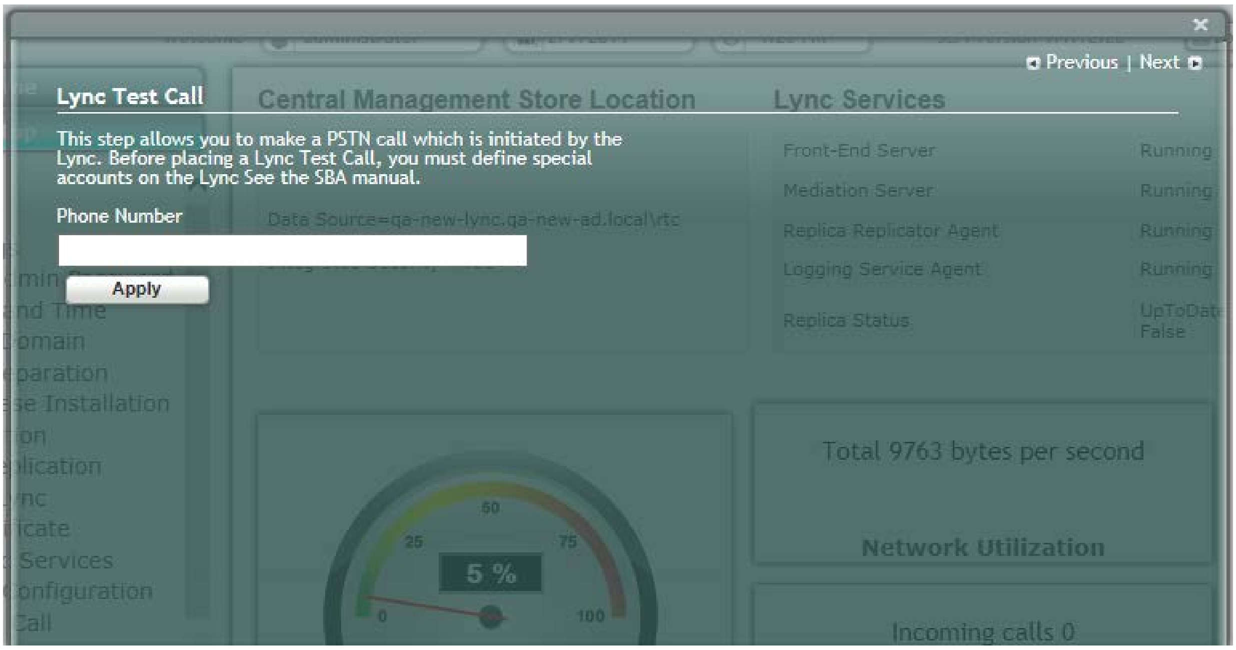
12.14.2 Running the Skype for Business Call Test

The procedure for running the Skype for Business test call is described below.

➢ To run the Skype for Business test call:

1. Select the **Setup** tab, and then select the **Lync Test Call** option; the Lync Test Call screen is displayed:

Figure 12-58: Lync Test Call



Lync Test Call

This step allows you to make a PSTN call which is initiated by the Lync. Before placing a Lync Test Call, you must define special accounts on the Lync See the SBA manual.

Phone Number

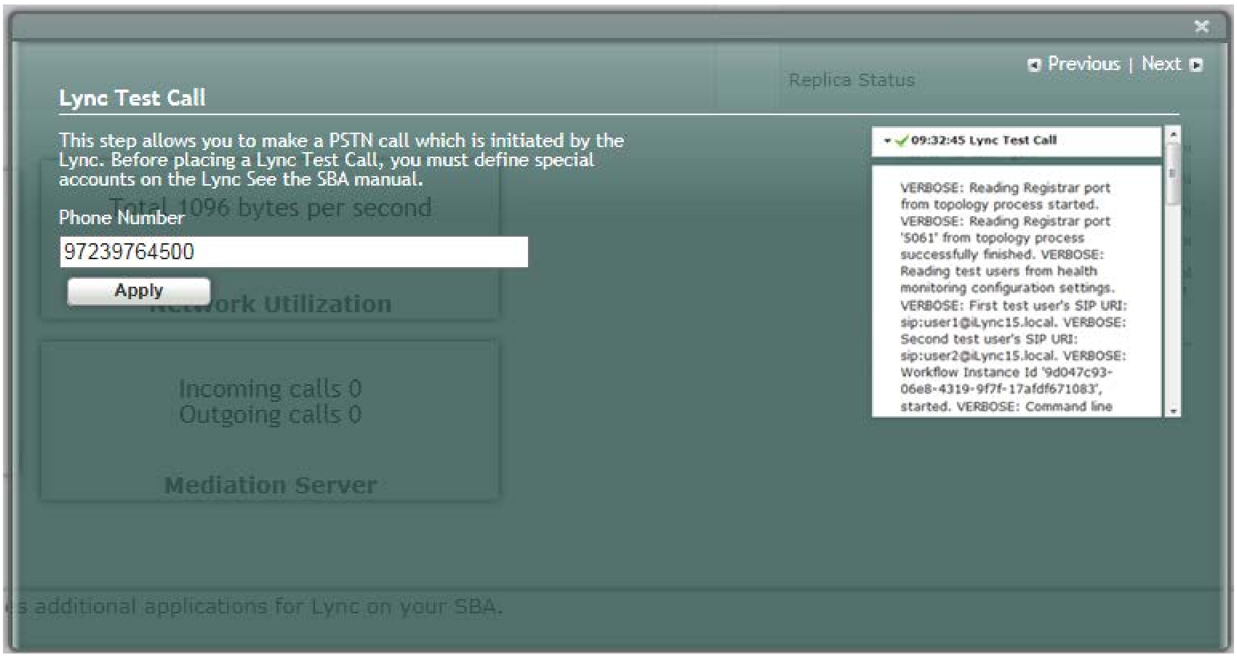
Apply

Previous | Next
Central Management Store Location
Data Source=qa-new-lync.qa-new-ad.local\rtc
Lync Services
Front-End Server Running
Mediation Server Running
Replica Replicator Agent Running
Logging Service Agent Running
Replica Status UpToDat False
Total 9763 bytes per second
Network Utilization
Incoming calls 0
5 %
0
25
50
75
100

2. In the ‘Dial Check Phone Number’ field, enter the E-SBC phone number to dial.
3. Click **Apply** to start the test call.

If the test is successful, the phone of the E-SBC user rings and when the handset is lifted, the DTMF tones are heard. If the phone does not ring, an error message is displayed on the screen. The screen displays logged details of the call:

Figure 12-59: Lync Test Call – Logged Call Test Result



Lync Test Call

This step allows you to make a PSTN call which is initiated by the Lync. Before placing a Lync Test Call, you must define special accounts on the Lync See the SBA manual.

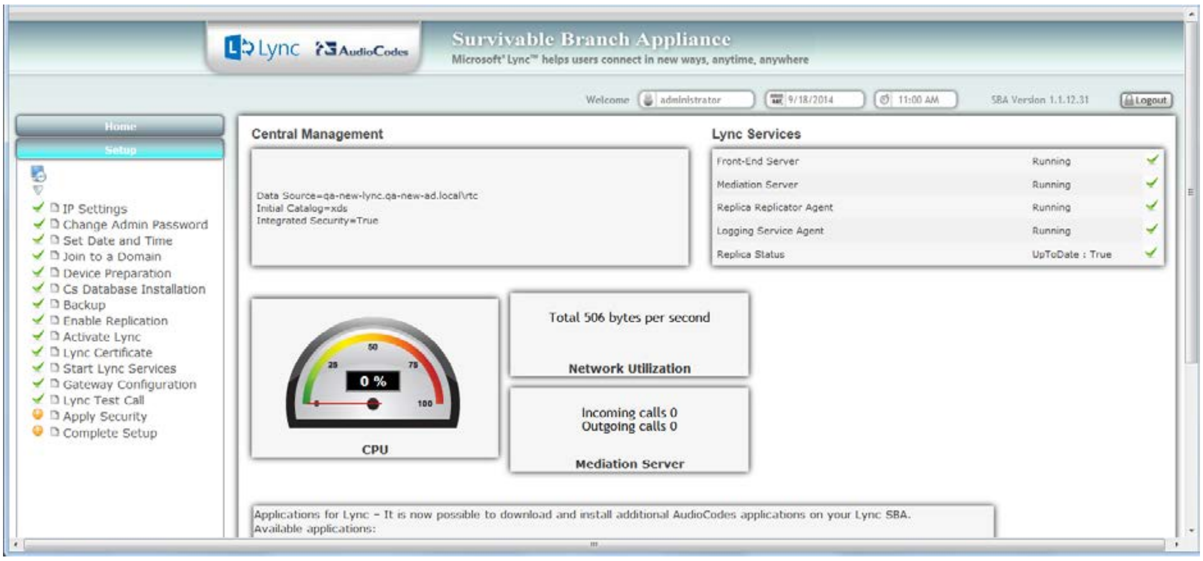
Phone Number: 97239764500

```
✓ 09:32:45 Lync Test Call

VERBOSE: Reading Registrar port from topology process started. VERBOSE: Reading Registrar port '5061' from topology process successfully finished. VERBOSE: Reading test users from health monitoring configuration settings. VERBOSE: First test user's SIP URI: sip:user1@iLync15.local. VERBOSE: Second test user's SIP URI: sip:user2@iLync15.local. VERBOSE: Workflow Instance Id '9d047c93-06e8-4319-9f7f-17afdf671083', started. VERBOSE: Command line
```

A green check mark appears next to the 'Lync Test Call' option under the Setup tab, as shown in the figure below.

Figure 12-60: Lync Test Call Successful



- ✓ IP Settings
- ✓ Change Admin Password
- ✓ Set Date and Time
- ✓ Join to a Domain
- ✓ Device Preparation
- ✓ Cs Database Installation
- ✓ Backup
- ✓ Enable Replication
- ✓ Activate Lync
- ✓ Lync Certificate
- ✓ Start Lync Services
- ✓ Gateway Configuration
- ✓ Lync Test Call
- ● Apply Security
- ● Complete Setup

Central Management

Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

Lync Services

Front-End Server	Running	✓
Mediation Server	Running	✓
Replica Replicator Agent	Running	✓
Logging Service Agent	Running	✓
Replica Status	UpToDate : True	✓

Applications for Lync – It is now possible to download and install additional AudioCodes applications on your Lync SBA.
Available applications:

12.15 Step 15: Apply Security

You can apply a security template to the device. This template configures the security for various SBA services. For example, firewall policy, registeries and OS audit policy. You can apply one of the following security policies:

- No Policy-use a default hardening setup (no security template is loaded to the SBA device) as was the case until this release.
- Use default template-Load an AudioCodes built default security template to the SBA device.
- Upload a security template-Load an administrator-defined template to the SBA device.

Note: Once a template is loaded, you cannot perform rollback using the SBA GUI. To rollback the security settings, refer to the Microsoft document at:

- http://technet.microsoft.com/en-us/library/cc733088.aspx
- http://technet.microsoft.com/en-us/library/cc733088.aspx

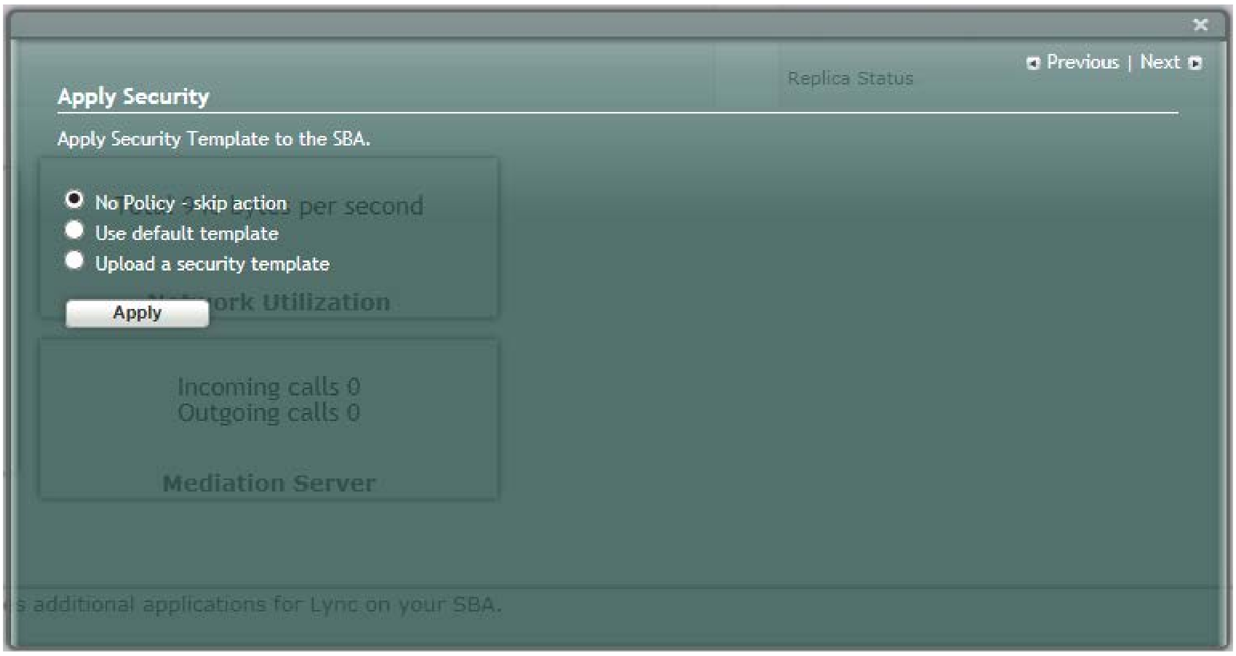
12.15.1 Apply No Policy

This procedure describes how to configure the 'No Policy' security option on the SBA device. When this option is configured, a default hardening setup is implemented and no security template is loaded to the SBA device.

➤ To implement the No Policy option:

1. Select the **Setup** tab, and then click the **Apply Security** option; the following screen is displayed:

Figure 12-61: Apply Security-No Policy



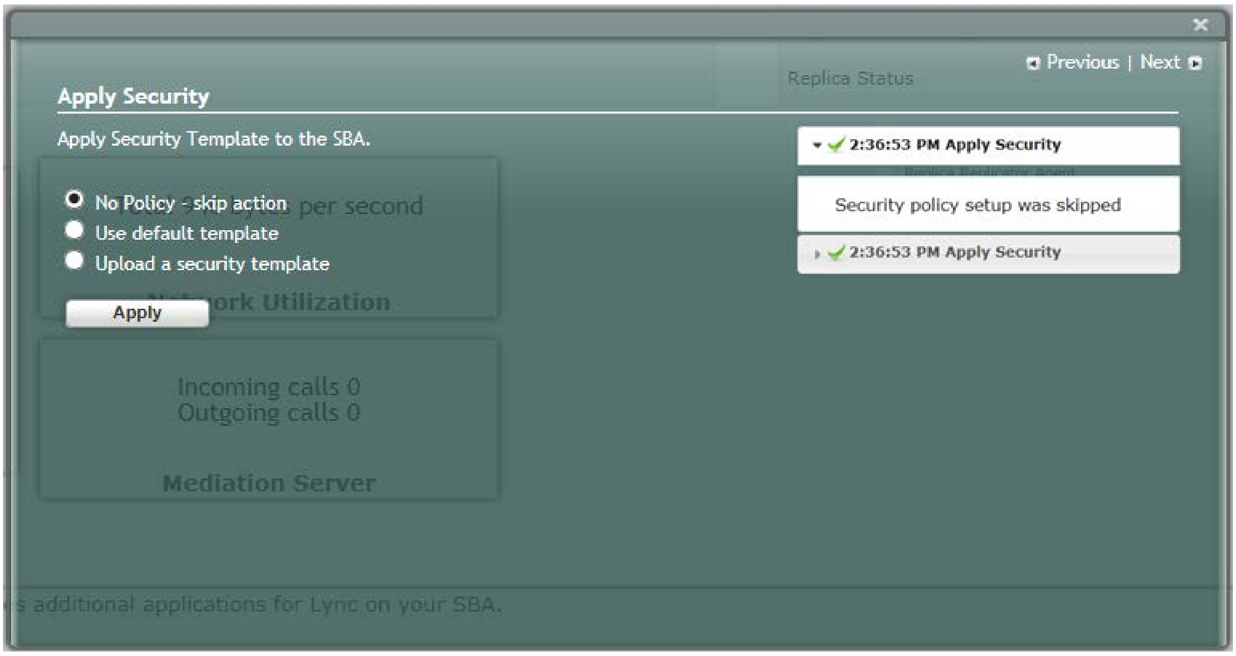
Apply Security

Apply Security Template to the SBA.

● No Policy - skip action
○ Use default template
○ Upload a security template

2. Select the 'No Policy-skip action' check box option, and then click **Apply**; the following screen is displayed:

Figure 12-62: Confirmation-Security Policy Setup Skipped



Apply Security

Apply Security Template to the SBA.

● No Policy - skip action
○ Use default template
○ Upload a security template

2:36:53 PM Apply Security

Security policy setup was skipped

2:36:53 PM Apply Security

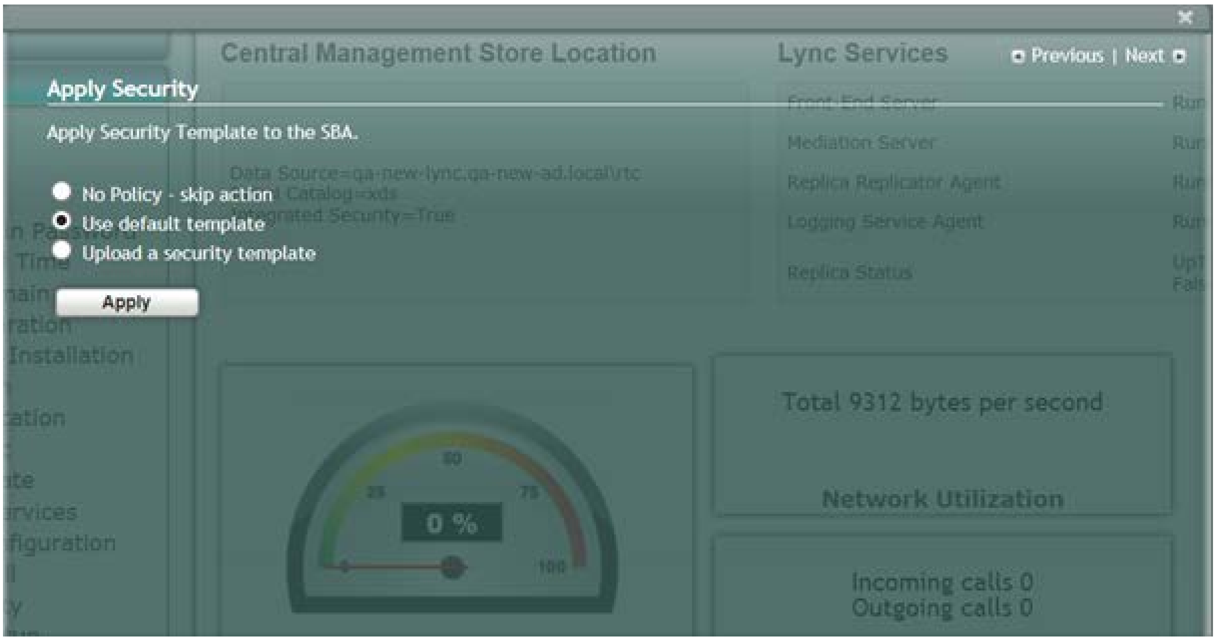
12.15.2 Apply Default Security Template

This procedure describes how to apply the default security template.

➢ To apply the default security template:

1. Select the **Setup** tab, and then click the **Apply Security** option; the following screen is displayed:

Figure 12-63: Apply Security Policy- Use Default Template



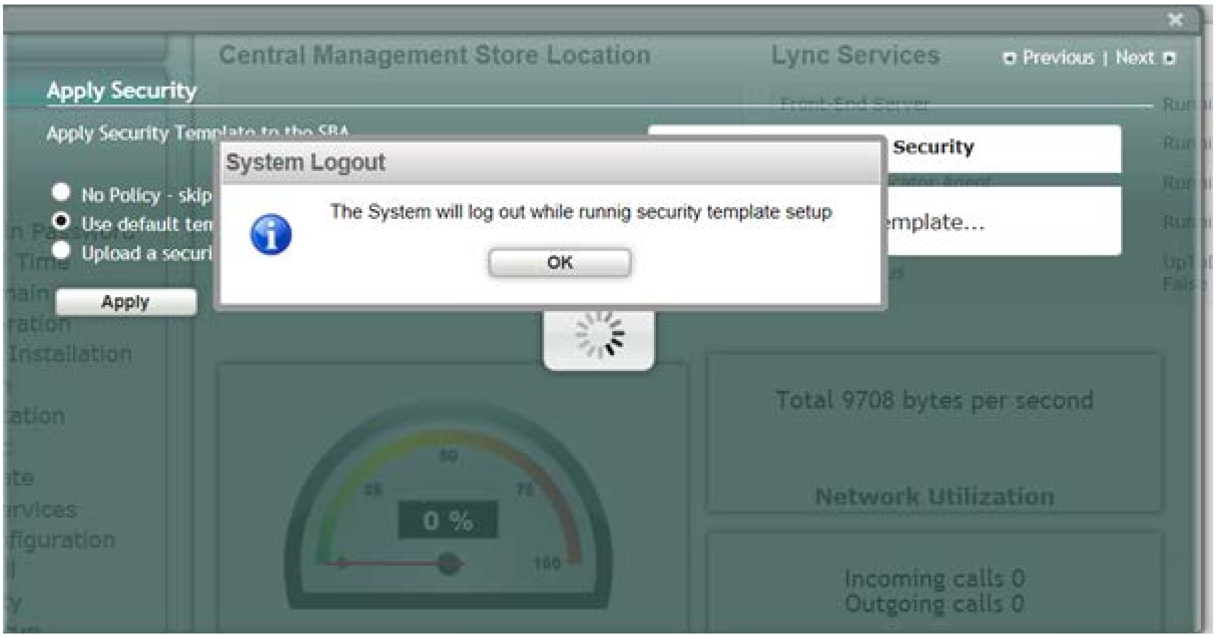
Apply Security

Apply Security Template to the SBA.

○ No Policy - skip action
● Use default template
○ Upload a security template

2. Select the 'Use default template' check box, and then click **Apply**; the SBA automatically logs out:

Figure 12-64: System Logout Default Security Applied



Apply Security

Apply Security Template to the SBA

○ No Policy - skip
● Use default ten
○ Upload a securi

Apply

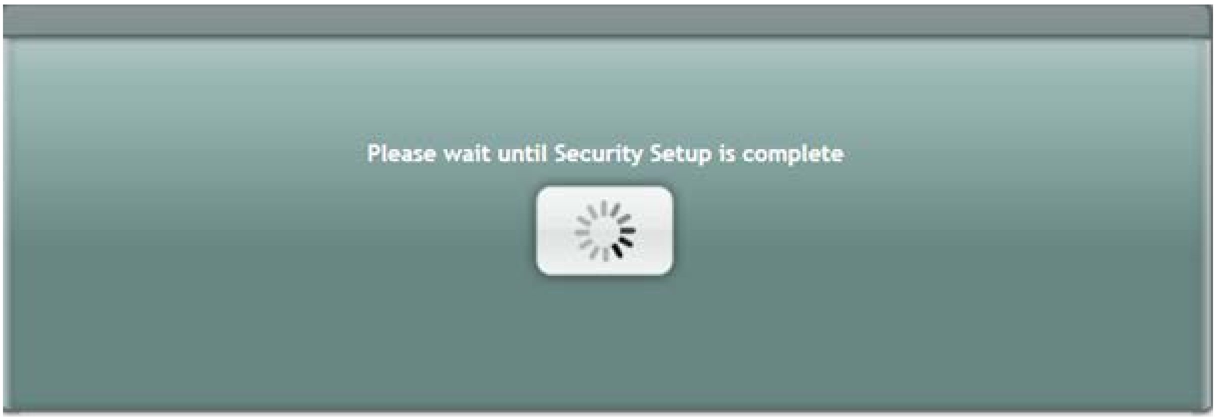
System Logout

The System will log out while runnig security template setup

OK

3. Click **OK** for the system to log out while running the security template;the following screen appears:

Figure 12-65: Security Setup is Complete

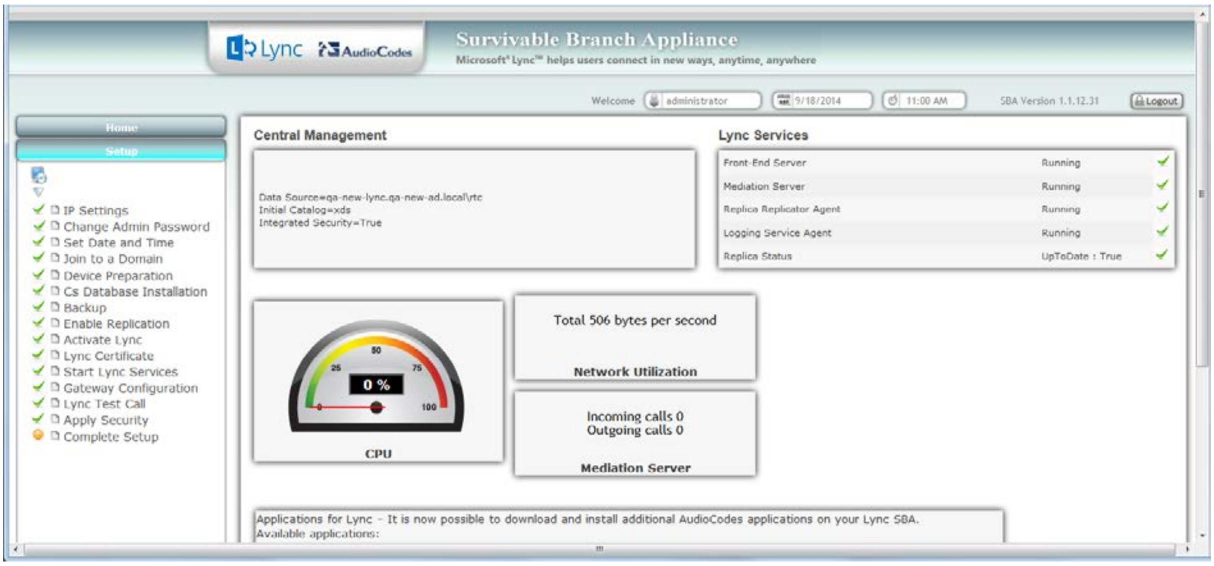


Please wait until Security Setup is complete

4. After a few minutes the security setup completes, and the SBA login screen appears.
5. Login and then select the **Setup** tab.

A green check mark appears next to the 'Apply Security' option, as shown in the figure below.

Figure 12-66: Security Template Successfully Applied



- ✓ IP Settings
- ✓ Change Admin Password
- ✓ Set Date and Time
- ✓ Join to a Domain
- ✓ Device Preparation
- ✓ Cs Database Installation
- ✓ Backup
- ✓ Enable Replication
- ✓ Activate Lync
- ✓ Lync Certificate
- ✓ Start Lync Services
- ✓ Gateway Configuration
- ✓ Lync Test Call
- ✓ Apply Security
- ● Complete Setup

Central Management

Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

Lync Services

Front-End Server	Running	✓
Mediation Server	Running	✓
Replica Replicator Agent	Running	✓
Logging Service Agent	Running	✓
Replica Status	UpToDate : True	✓

Total 506 bytes per second

Network Utilization

Incoming calls 0
Outgoing calls 0

Mediation Server

Applications for Lync - It is now possible to download and install additional AudioCodes applications on your Lync SBA.
Available applications:

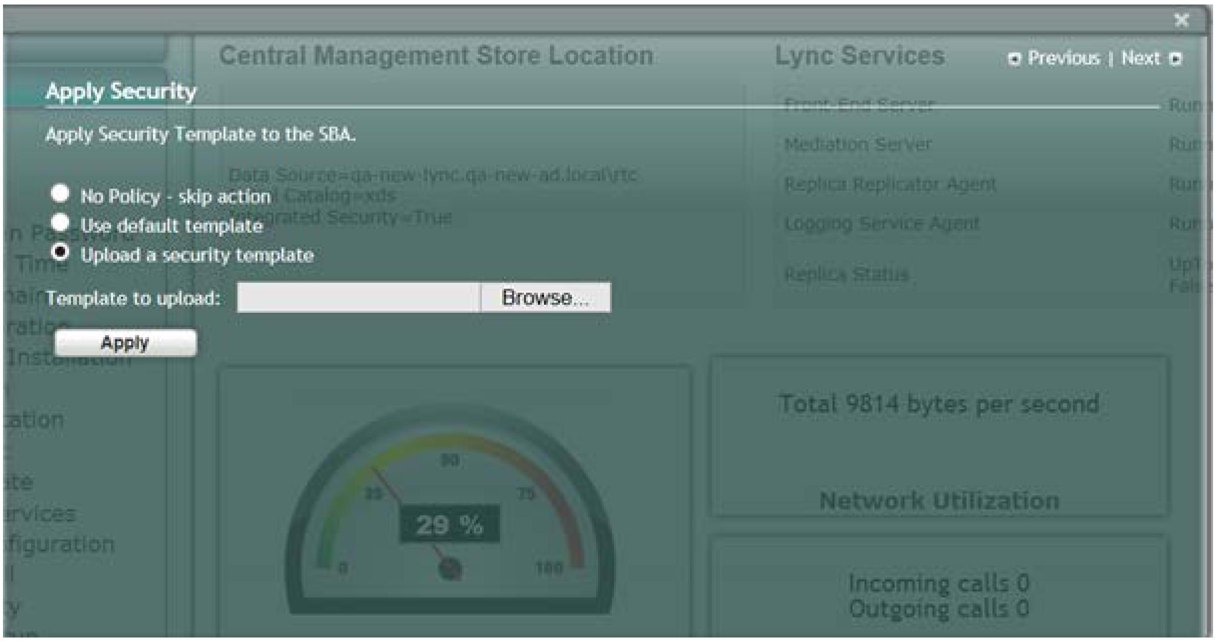
12.15.3 Apply User-Defined Security Template

This procedure describes how to apply a user-defined security template.

➢ **To apply a user-defined security template:**

1. Select the **Setup** tab, and then select the 'Apply Security' check box, the following screen is displayed:

Figure 12-67: Upload a Security Template



Apply Security

Apply Security Template to the SBA.

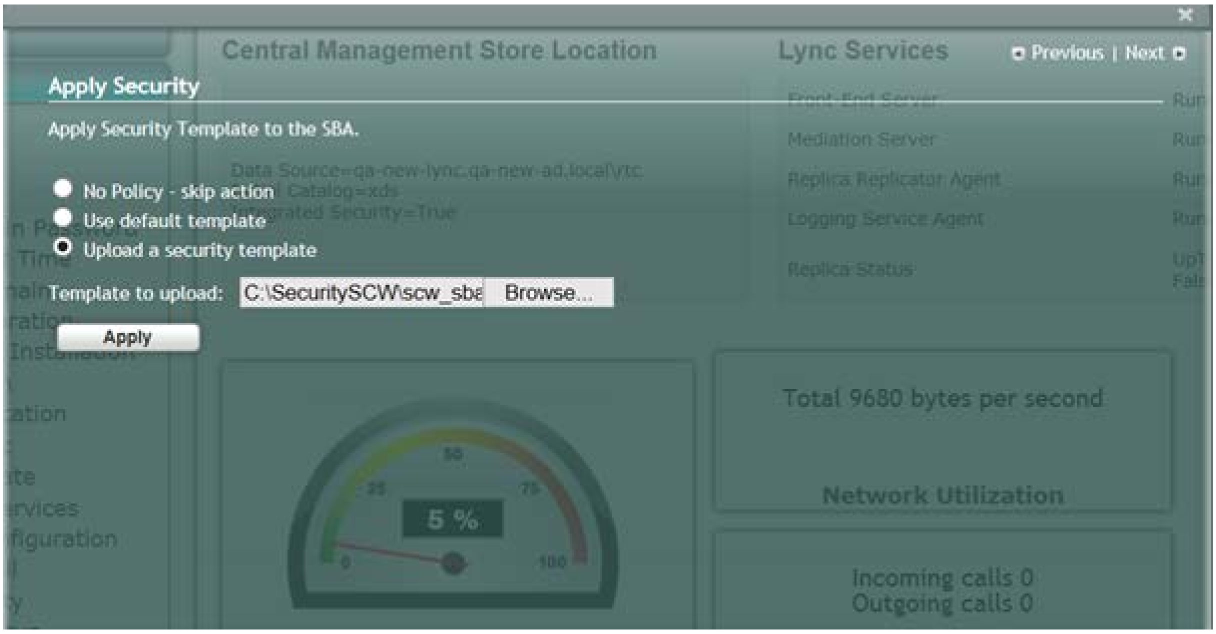
○ No Policy - skip action
○ Use default template
● Upload a security template

Template to upload: [ ] Browse...

Apply

2. Select the 'Upload a security template' check box; the following screen appears:

Figure 12-68: Apply Security Policy- Browse to Security Template



Apply Security

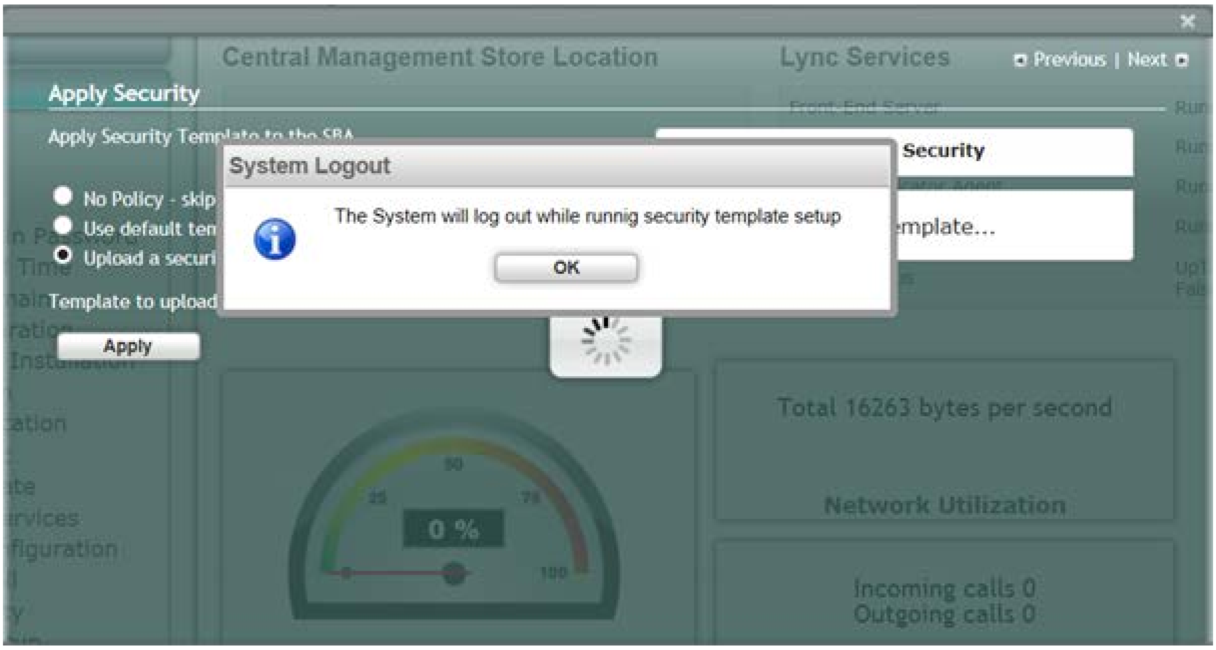
Apply Security Template to the SBA.

○ No Policy - skip action
○ Use default template
● Upload a security template

Template to upload: C:\SecuritySCW\scw_sba Browse...

3. Browse to a custom security template to upload and run, and then click **Apply**; the SBA automatically logs out:

Figure 12-69: Security Template Automatic System Logout

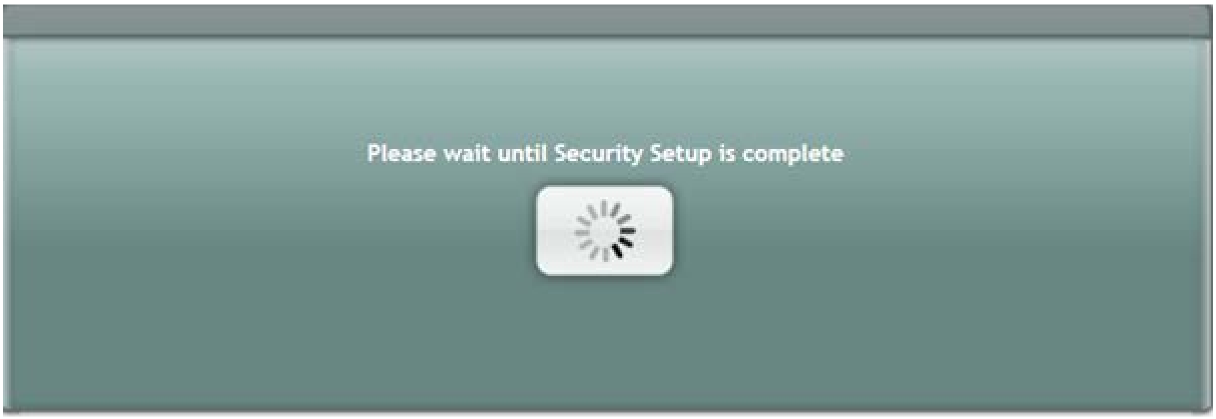


System Logout

The System will log out while runnig security template setup

4. Click **OK** for the system to log out while running security template; the following screen appears:

   After a few minutes the security setup completes, and the SBA login screen appears.

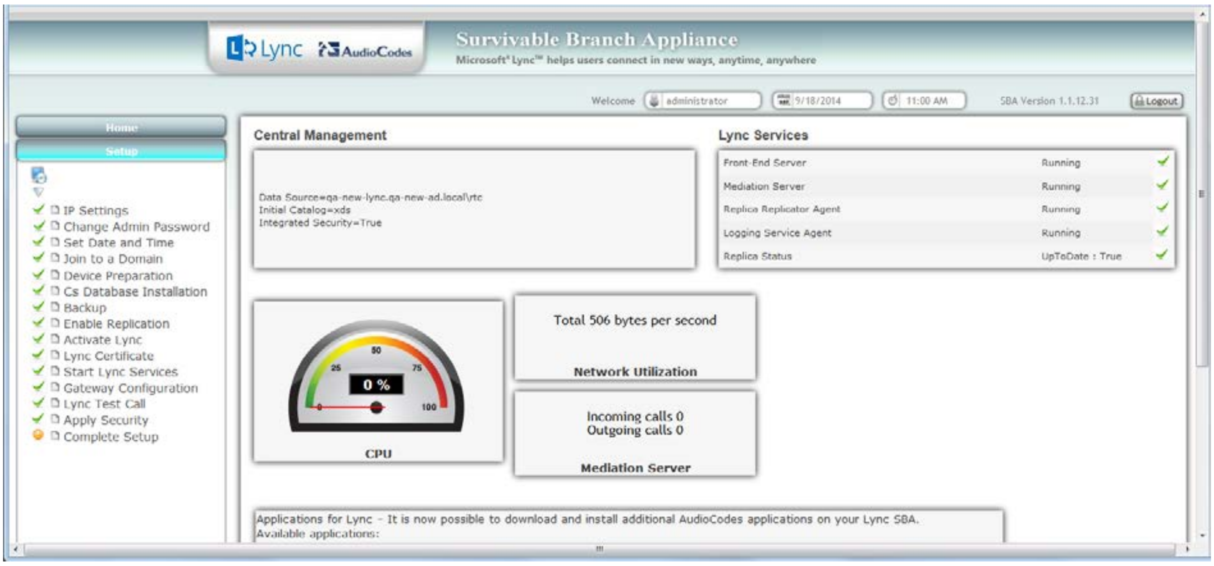


Please wait until Security Setup is complete

5. Login and then select the **Setup** tab.

   A green check mark appears next to the 'Apply Security' option, as shown in the figure below.

Figure 12-70: Security Template Successfully Applied



Survivable Branch Appliance

Microsoft® Lync™ helps users connect in new ways, anytime, anywhere

Welcome administrator 9/18/2014 11:00 AM SBA Version 1.1.12.31 Logout

- ✓ IP Settings
- ✓ Change Admin Password
- ✓ Set Date and Time
- ✓ Join to a Domain
- ✓ Device Preparation
- ✓ Cs Database Installation
- ✓ Backup
- ✓ Enable Replication
- ✓ Activate Lync
- ✓ Lync Certificate
- ✓ Start Lync Services
- ✓ Gateway Configuration
- ✓ Lync Test Call
- ✓ Apply Security
- ● Complete Setup

Central Management

Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

Lync Services

Front-End Server	Running	✓
Mediation Server	Running	✓
Replica Replicator Agent	Running	✓
Logging Service Agent	Running	✓
Replica Status	UpToDate : True	✓

Total 506 bytes per second

Network Utilization

Incoming calls 0
Outgoing calls 0

Mediation Server

Applications for Lync - It is now possible to download and install additional AudioCodes applications on your Lync SBA.
Available applications:

12.16 Step 16: (Optional) Remote Control

This section describes how to enable or disable the RDP (Remote Desktop Protocol) and the Remote Windows Powershell on the SBA device.

Remote Power Shell - The Remote PowerShell is by default enabled. Note that for previous versions (prior to version 1.1.12.0), the Remote PowerShell was by default disabled, and could only be enabled by configuring the parameter 'PSRemoting = Force' in the PowerShell.

RDP (Remote Desktop Protocol): The RDP is enabled by default for all SBA versions.

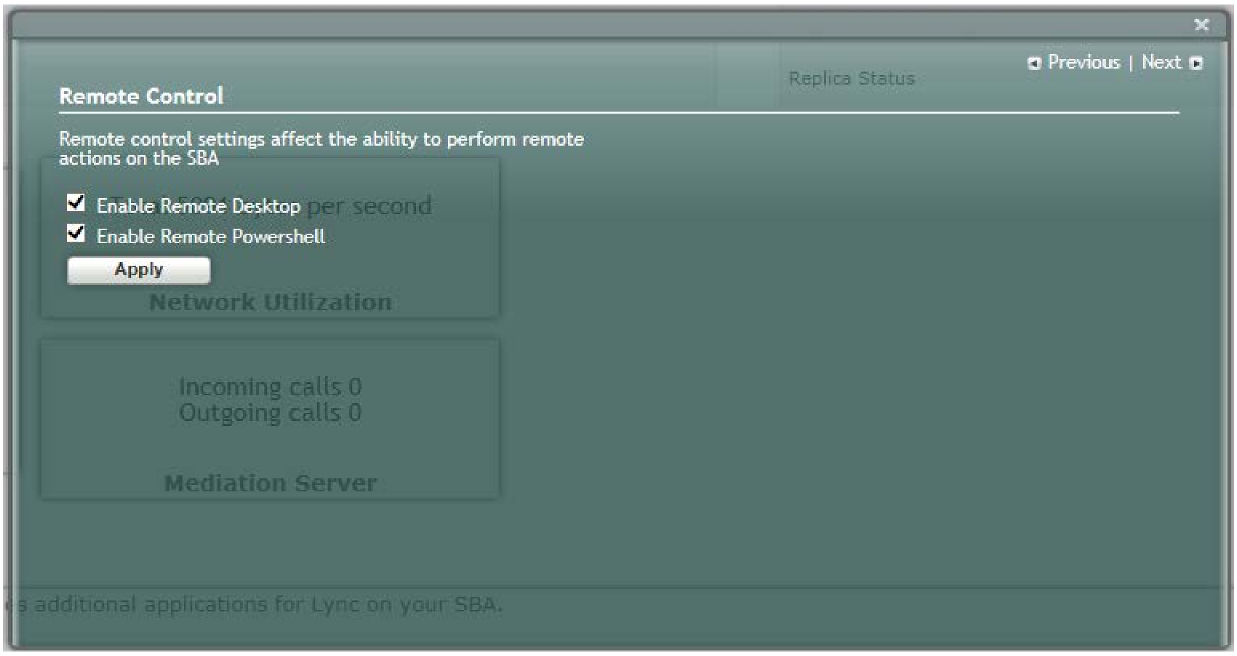
Note: If you are using the SBA Pro to upgrade the SBA, then you must enable the Remote Windows Powershell.

➢ To enable/disable remote controls:

1. Select the **Tools** tab, and then select the 'Remote Control' checkbox.

   The Remote Control screen is displayed:

Figure 12-71: Remote Control



Remote Control

Remote control settings affect the ability to perform remote actions on the SBA

☑ Enable Remote Desktop

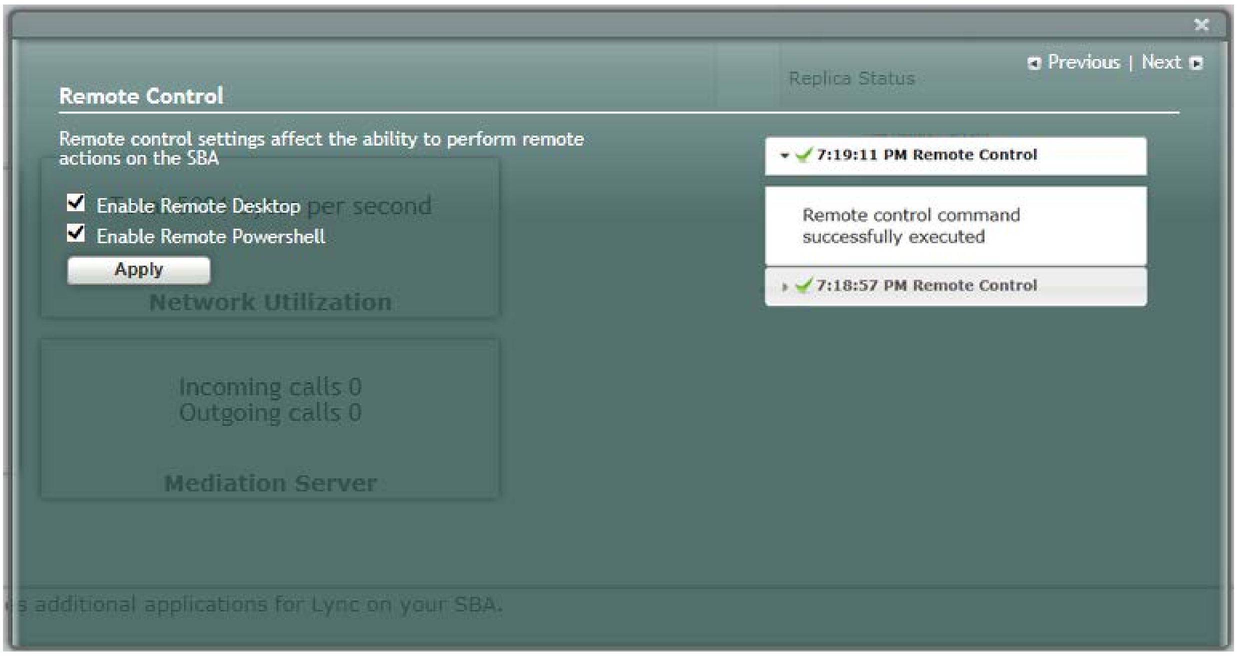
☑ Enable Remote Powershell

Apply

2. Select the 'Enable Remote Desktop' check box to enable the Remote Desktop on the SBA.
3. Select the 'Enable Remote Powershell' check box to enable the Remote Powershell on the SBA.
4. Click **Apply**.

The following screen is displayed after disabling the Remote Desktop and enabling the Remote Powershell:

Figure 12-72: Remote Desktop Disabled and Remote Powershell Enabled



Remote Control

Remote control settings affect the ability to perform remote actions on the SBA

☑ Enable Remote Desktop

☑ Enable Remote Powershell

Apply

7:19:11 PM Remote Control

Remote control command successfully executed

7:18:57 PM Remote Control

12.17 Step 17 (Optional) SNMP Setup

The AudioCodes SBA device can be configured to report SNMP info and traps to an external SNMP Trap Manager, such as the AudioCodes Element Management System (EMS). You can configure the following:

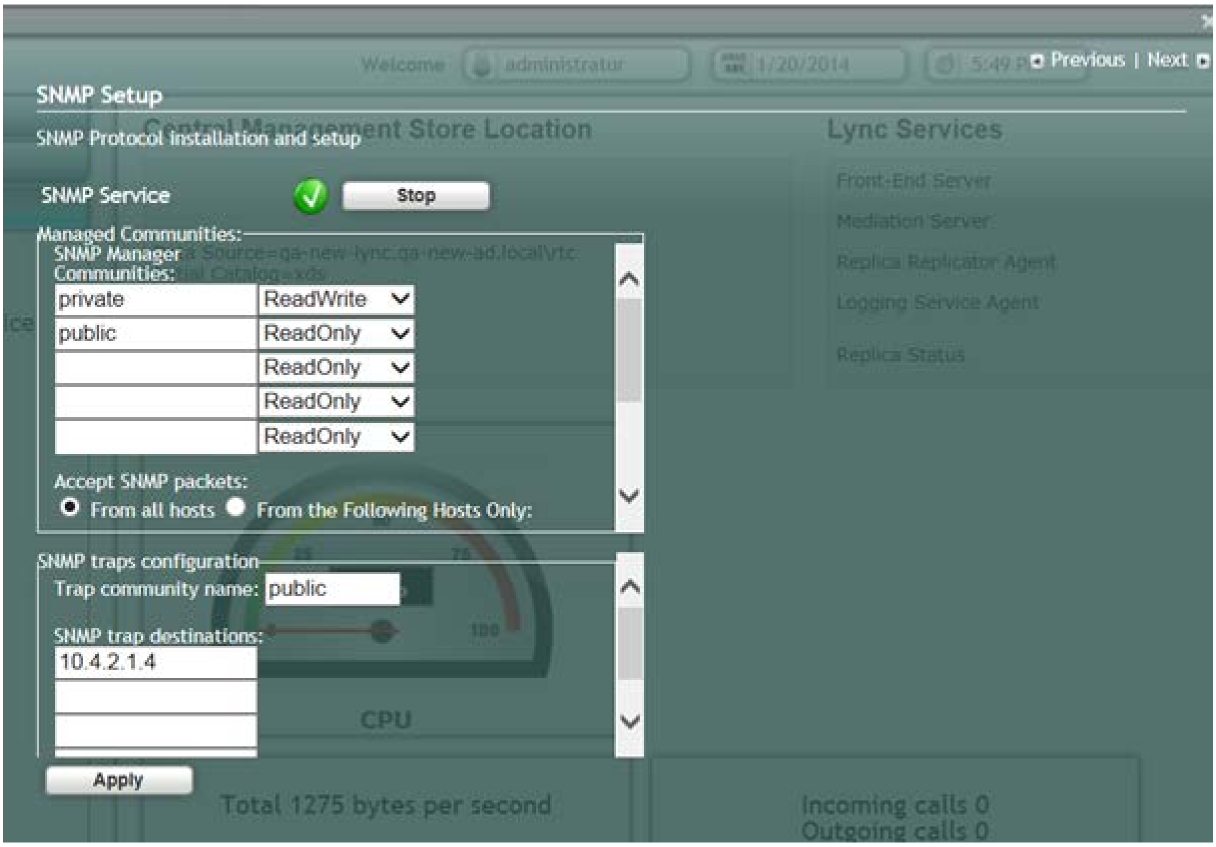
- Stop and start the SNMP service.
- Private and public community strings.
- SNMP trusted hosts
- SNMP Trap Destination i.e. the IP address of the SNMP trap destination. For example, EMS.

➢ To setup SNMP:

1. Select the **Tools** tab, and then select the 'SNMP Setup' check box.

   The SNMP Setup screen is displayed:

Figure 12-73: SNMP Setup Screen



SNMP Service ✓

Managed Communities:

SNMP Manager Communities:

private	ReadWrite
public	ReadOnly
	ReadOnly
	ReadOnly
	ReadOnly

Accept SNMP packets:

● From all hosts ○ From the Following Hosts Only:

SNMP traps configuration

Trap community name: public

SNMP trap destinations:

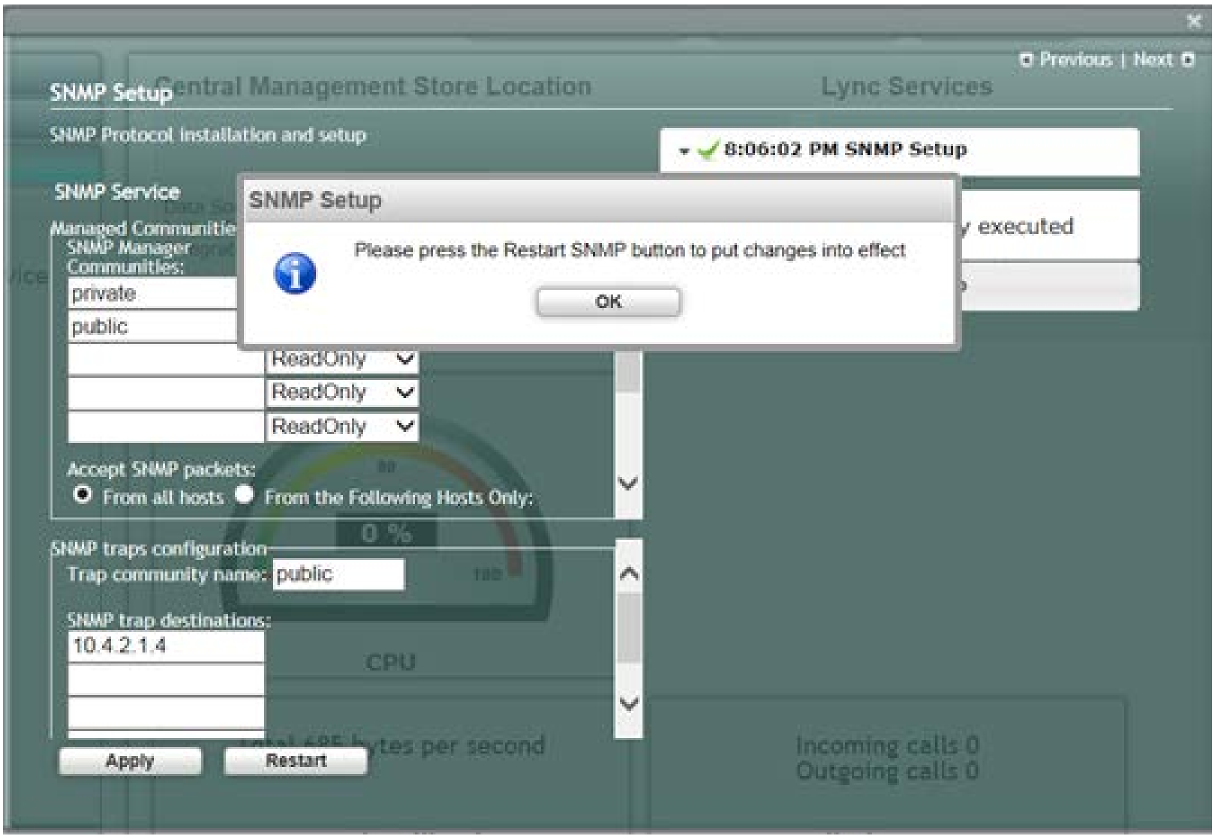
10.4.2.1.4

If the SNMP Service is running, an adjacent green sign is indicated.

2. In the SNMP Manager Communities pane, configure the public and private community strings.
3. If you wish to configure trusted hosts, select the 'From the Following Hosts Only' check box, and then in the 'SNMP Trusted Hosts' field, enter the names of the SNMP Trusted Hosts.
4. In the 'Trap Community Name' field, enter the name of the SNMPv2 community (user) name.
5. In the 'SNMP Trap Destination' field, enter the IP address of the destination trap manager e.g. EMS. You can enter up to five SNMP trap destinations.
6. Click **Apply**.

The following screen is displayed:

Figure 12-74: SNMP Restart Confirmation



SNMP Setup

SNMP Protocol installation and setup

SNMP Service

Managed Communities

SNMP Manager Communities:

private	
public	
	ReadOnly
	ReadOnly
	ReadOnly

Accept SNMP packets: ● From all hosts ○ From the Following Hosts Only:

SNMP traps configuration

Trap community name: public

SNMP trap destinations: 10.4.2.1.4

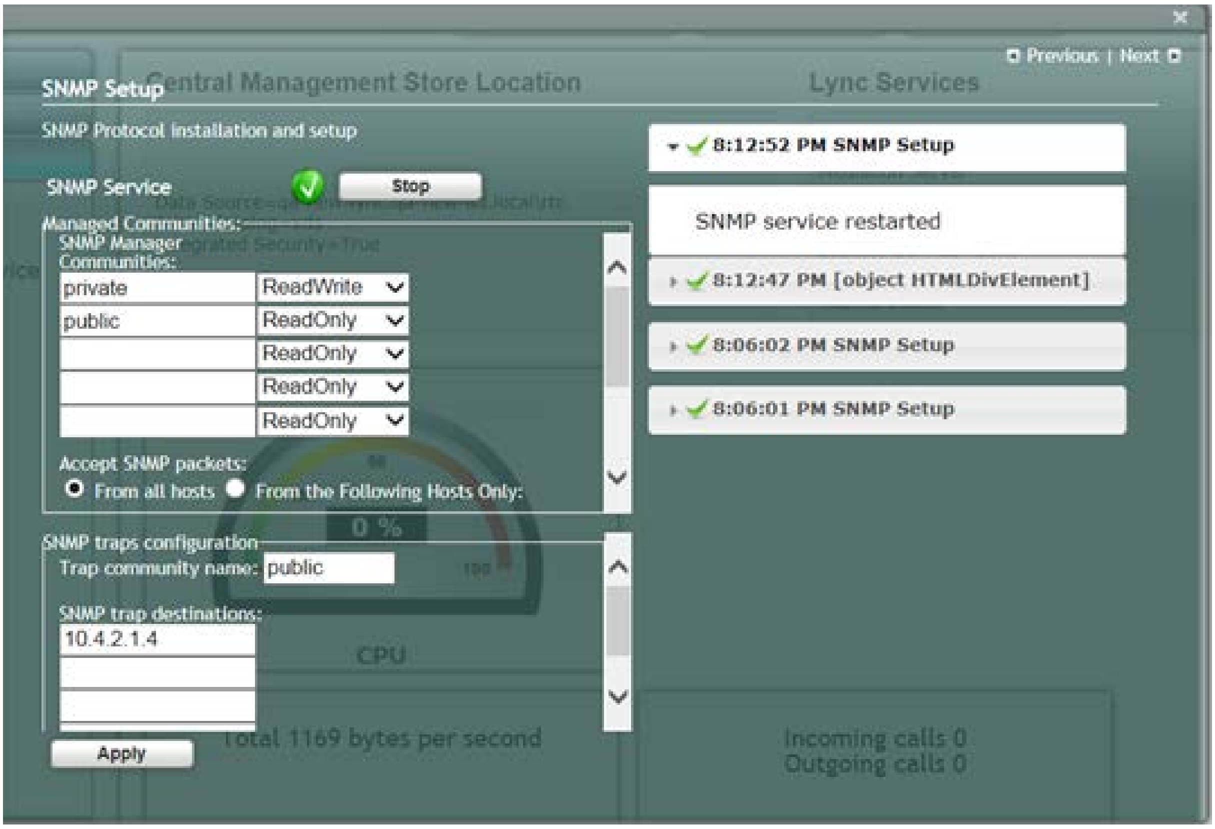
SNMP Setup

Please press the Restart SNMP button to put changes into effect

7. Click **OK**, and then click **Restart**.

The following screen is displayed:

Figure 12-75: SNMP Setup After Restart



SNMP Setup

SNMP Protocol installation and setup

SNMP Service ✓

Managed Communities:

SNMP Manager Communities:

private	ReadWrite
public	ReadOnly
	ReadOnly
	ReadOnly
	ReadOnly

Accept SNMP packets:
● From all hosts ○ From the Following Hosts Only:

SNMP traps configuration

Trap community name: public

SNMP trap destinations:
10.4.2.1.4

✓ 8:12:52 PM SNMP Setup

SNMP service restarted

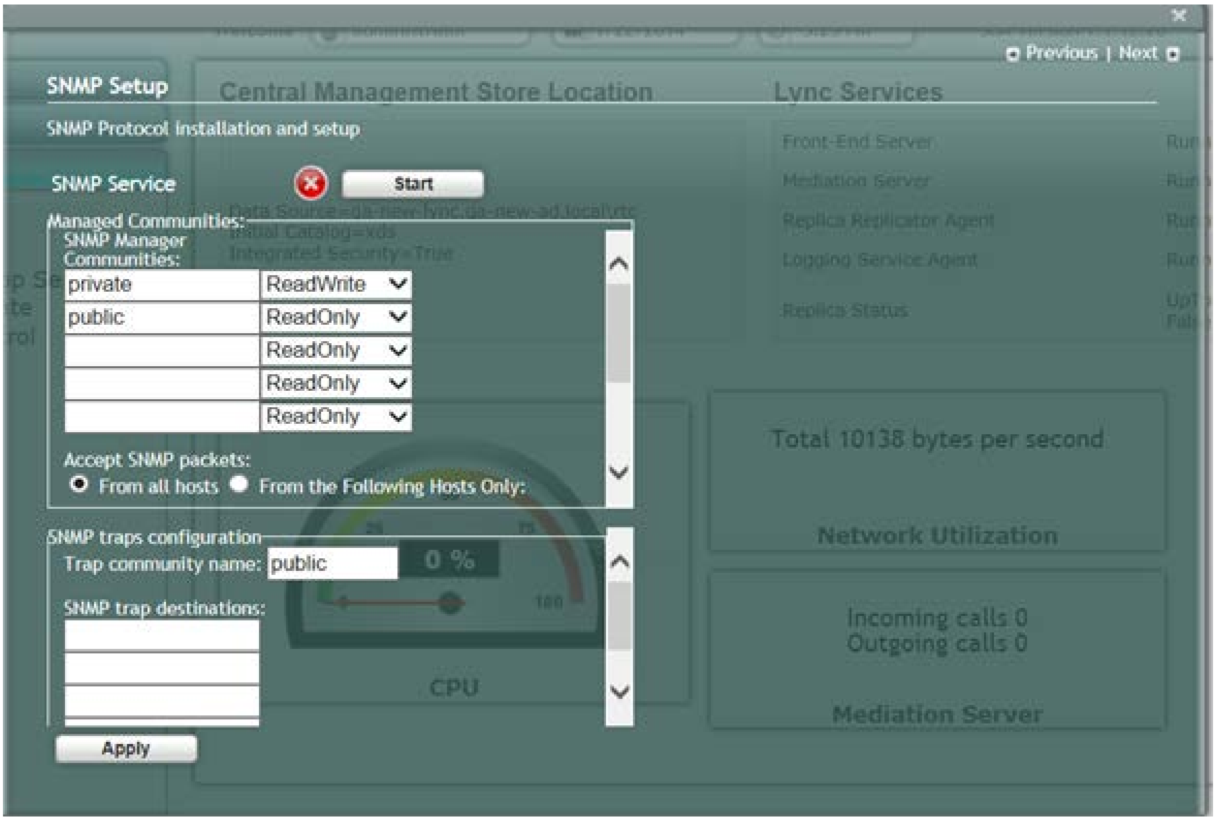
✓ 8:12:47 PM [object HTMLDivElement]

✓ 8:06:02 PM SNMP Setup

✓ 8:06:01 PM SNMP Setup

If the SNMP service is stopped, the following screen is displayed:

Figure 12-76: SNMP Service Started



SNMP Setup

SNMP Protocol installation and setup

SNMP Service ☒ Start

Managed Communities:

SNMP Manager Communities:

private	ReadWrite
public	ReadOnly
	ReadOnly
	ReadOnly
	ReadOnly

Accept SNMP packets:

● From all hosts ○ From the Following Hosts Only:

SNMP traps configuration

Trap community name: public

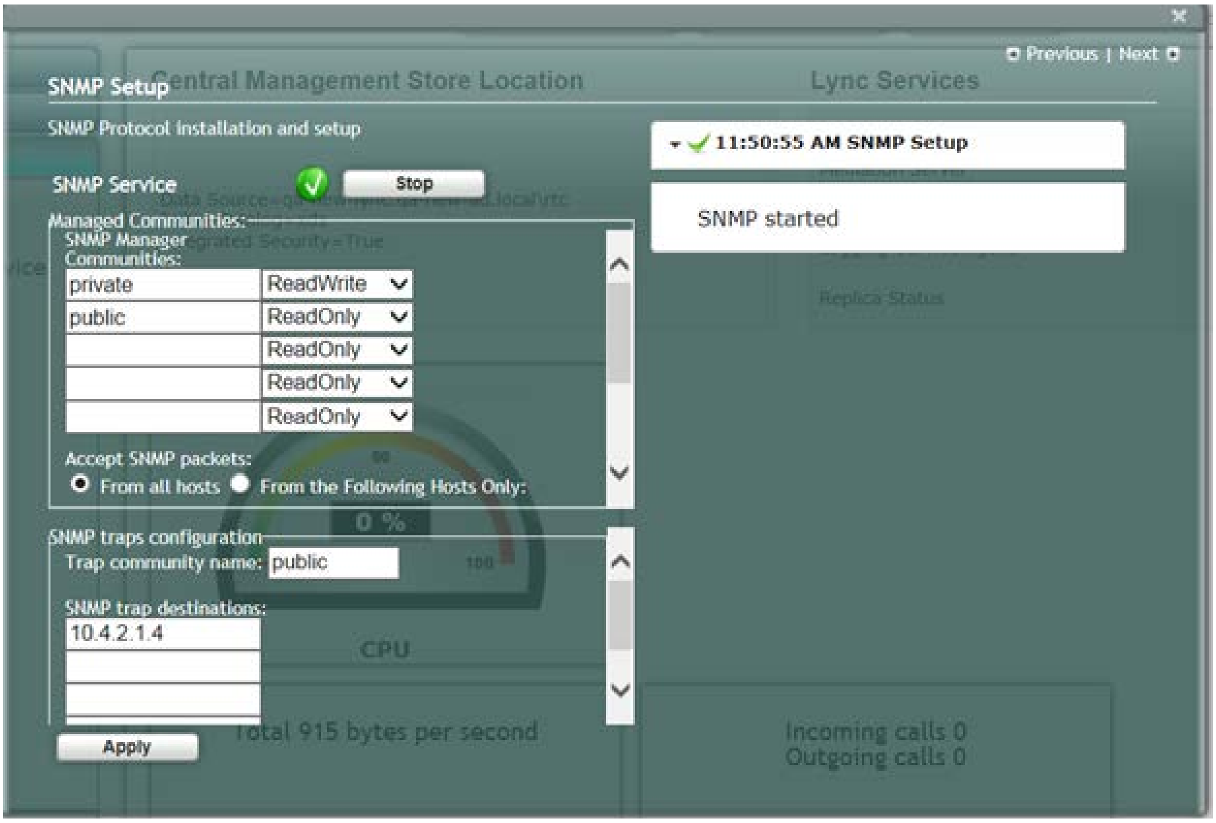
SNMP trap destinations:

Apply

8. Click **Start** to start the SNMP service.

The following screen is displayed:

Figure 12-77: SNMP Service Confirmation



SNMP Setup

SNMP Protocol installation and setup

SNMP Service

Managed Communities:

SNMP Manager Communities:

private	ReadWrite
public	ReadOnly
	ReadOnly
	ReadOnly
	ReadOnly

Accept SNMP packets: ● From all hosts ○ From the Following Hosts Only:

SNMP traps configuration

Trap community name: public

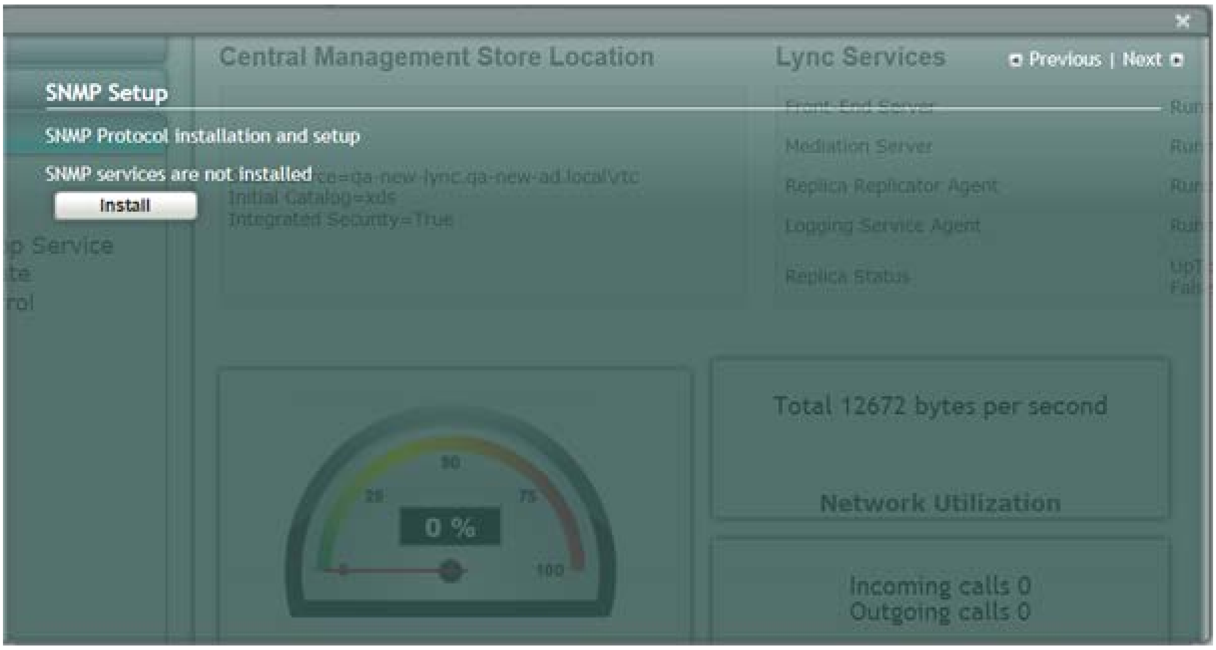
SNMP trap destinations: 10.4.2.1.4

11:50:55 AM SNMP Setup

SNMP started

If SNMP service is not installed, the following screen is displayed:

Figure 12-78: SNMP Service is not Installed



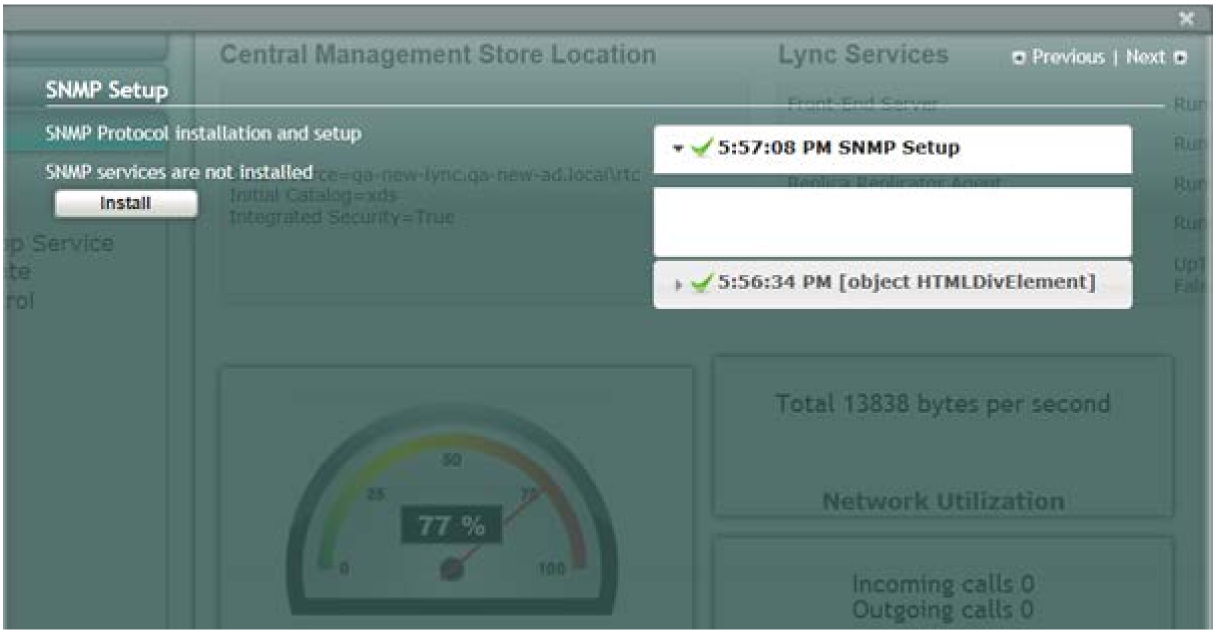
SNMP Setup

SNMP Protocol installation and setup

SNMP services are not installed

9. Click **Install** to install the SNMP service; the following screen is displayed:

Figure 12-79: SNMP Service Install Confirmation



SNMP Setup

SNMP Protocol installation and setup

SNMP services are not installed

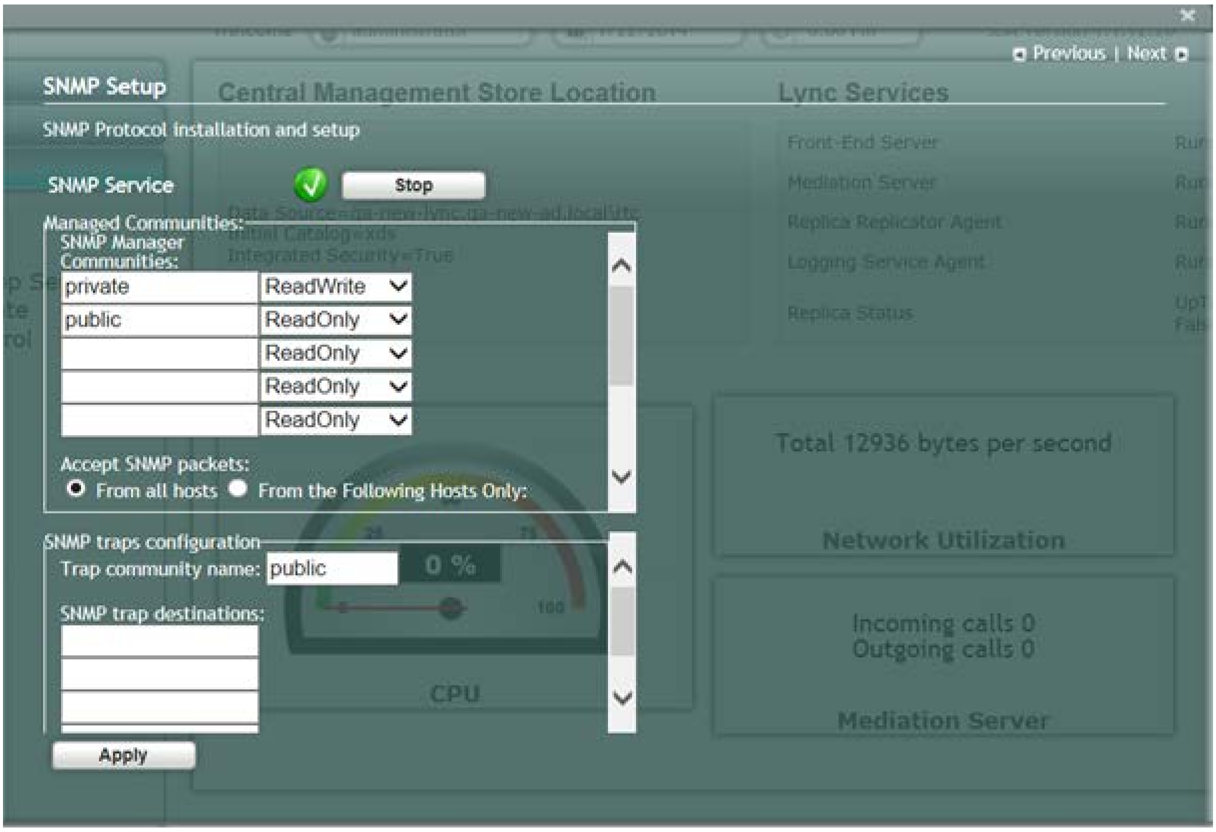
Install

5:57:08 PM SNMP Setup

5:56:34 PM [object HTMLDivElement]

10. Click the **Tools** tab, and then select the 'SNMP Setup' check box ;the following screen is displayed:

Figure 12-80: SNMP Setup-Final



SNMP Setup

SNMP Protocol installation and setup

SNMP Service ✓ Stop

Managed Communities:

SNMP Manager Communities:

private	ReadWrite
public	ReadOnly
	ReadOnly
	ReadOnly
	ReadOnly

Accept SNMP packets:

● From all hosts ○ From the Following Hosts Only:

SNMP traps configuration

Trap community name: public

SNMP trap destinations:

Apply

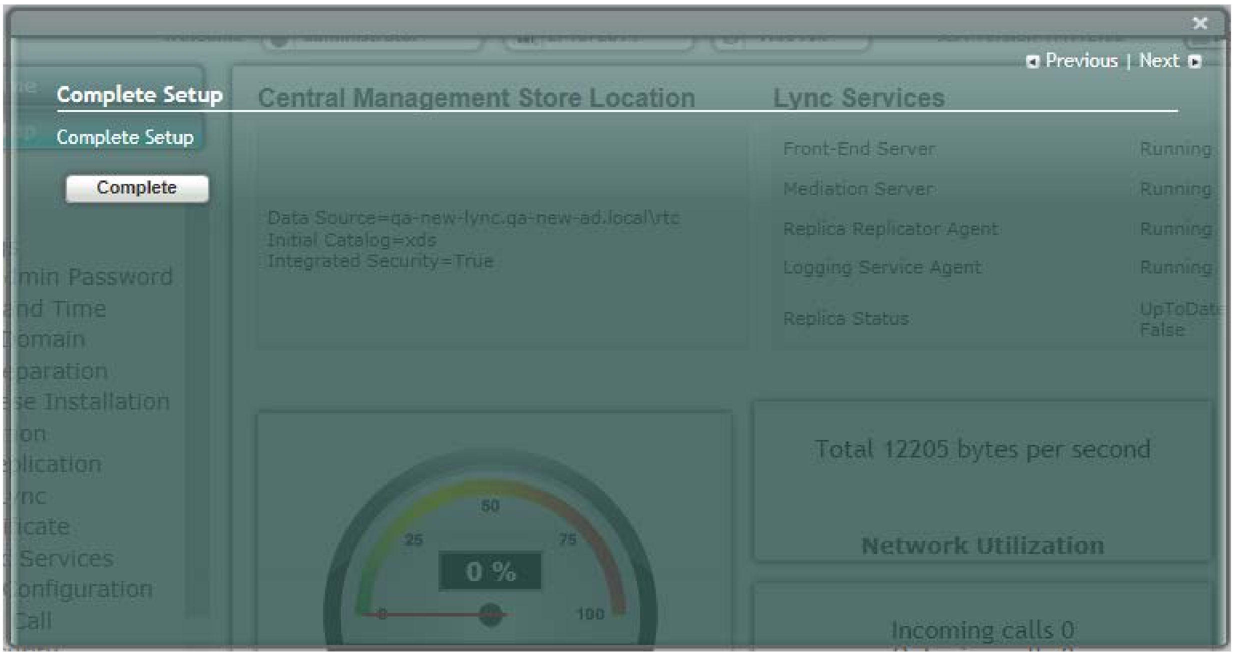
12.18 Step 18: Completing SBA Setup

Once you have completed all configurations as described in the previous sections, you need to perform the procedure described below to complete the SBA setup.

➢ To complete SBA setup:

1. Log in to the SBA Web wizard (if not logged in already).
2. Select the **Setup** tab, and then select the 'Complete Setup' checkbox; the Complete Setup screen appears:

Figure 12-81: Complete SBA Setup Screen



Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

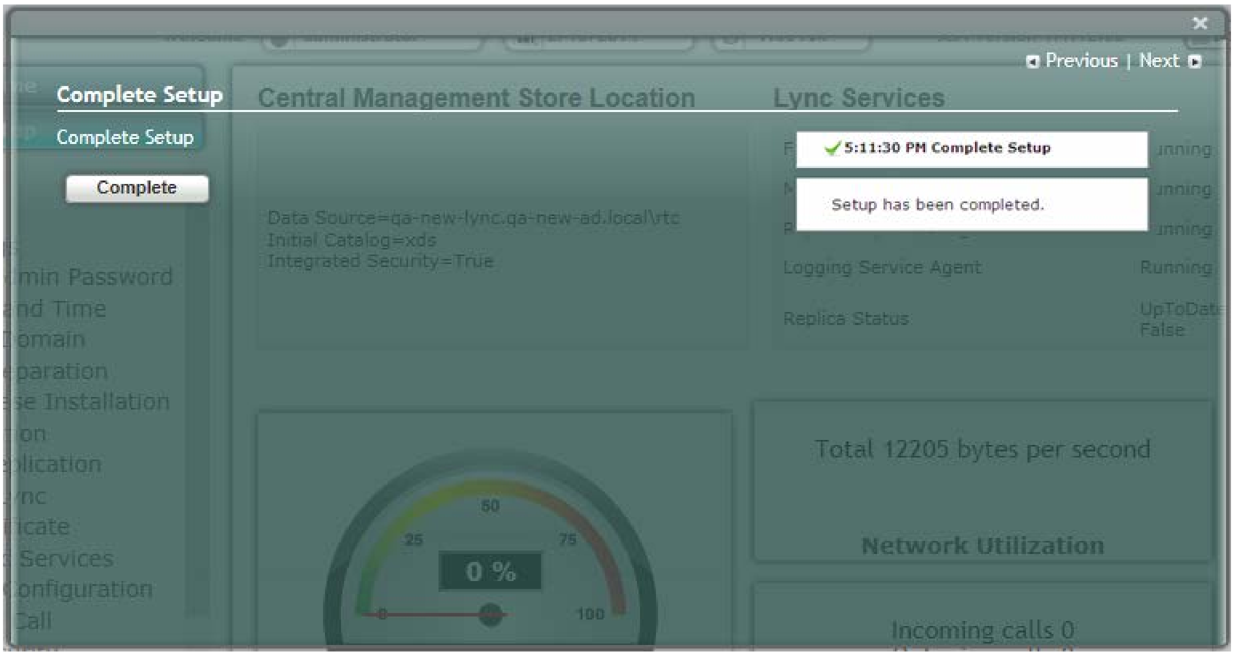
```
Front-End Server              Running
Mediation Server              Running
Replica Replicator Agent      Running
Logging Service Agent         Running
Replica Status                UpToDat
                              False
```

Total 12205 bytes per second

Incoming calls 0

3. Click **Complete**; the following screen appears, indicating that the SBA setup is complete:

Figure 12-82: SBA Setup Complete Message



Complete Setup

Complete Setup

Complete

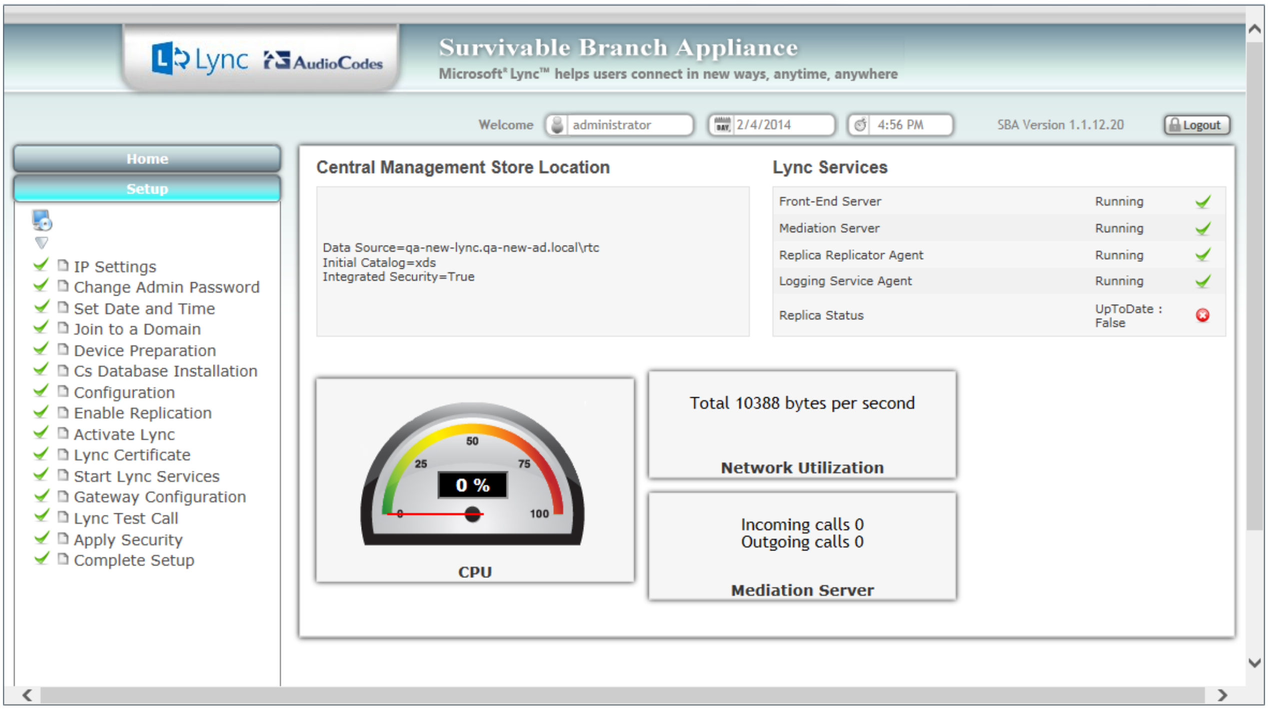
Previous | Next

✓5:11:30 PM Complete Setup

Setup has been completed.

A green check mark appears next to the 'Complete Setup' option under the Setup tab, as shown in the figure below.

Figure 12-83: Complete Setup – Completed Successfully



Survivable Branch Appliance

Microsoft® Lync™ helps users connect in new ways, anytime, anywhere

Welcome administrator 2/4/2014 4:56 PM SBA Version 1.1.12.20 Logout

Home

Setup

- ✓ IP Settings
- ✓ Change Admin Password
- ✓ Set Date and Time
- ✓ Join to a Domain
- ✓ Device Preparation
- ✓ Cs Database Installation
- ✓ Configuration
- ✓ Enable Replication
- ✓ Activate Lync
- ✓ Lync Certificate
- ✓ Start Lync Services
- ✓ Gateway Configuration
- ✓ Lync Test Call
- ✓ Apply Security
- ✓ Complete Setup

Central Management Store Location

Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

Lync Services

Front-End Server	Running	✓
Mediation Server	Running	✓
Replica Replicator Agent	Running	✓
Logging Service Agent	Running	✓
Replica Status	UpToDate : False	✗

Total 10388 bytes per second

Network Utilization

Incoming calls 0
Outgoing calls 0

Mediation Server

12.19 Monitoring and Maintenance Actions

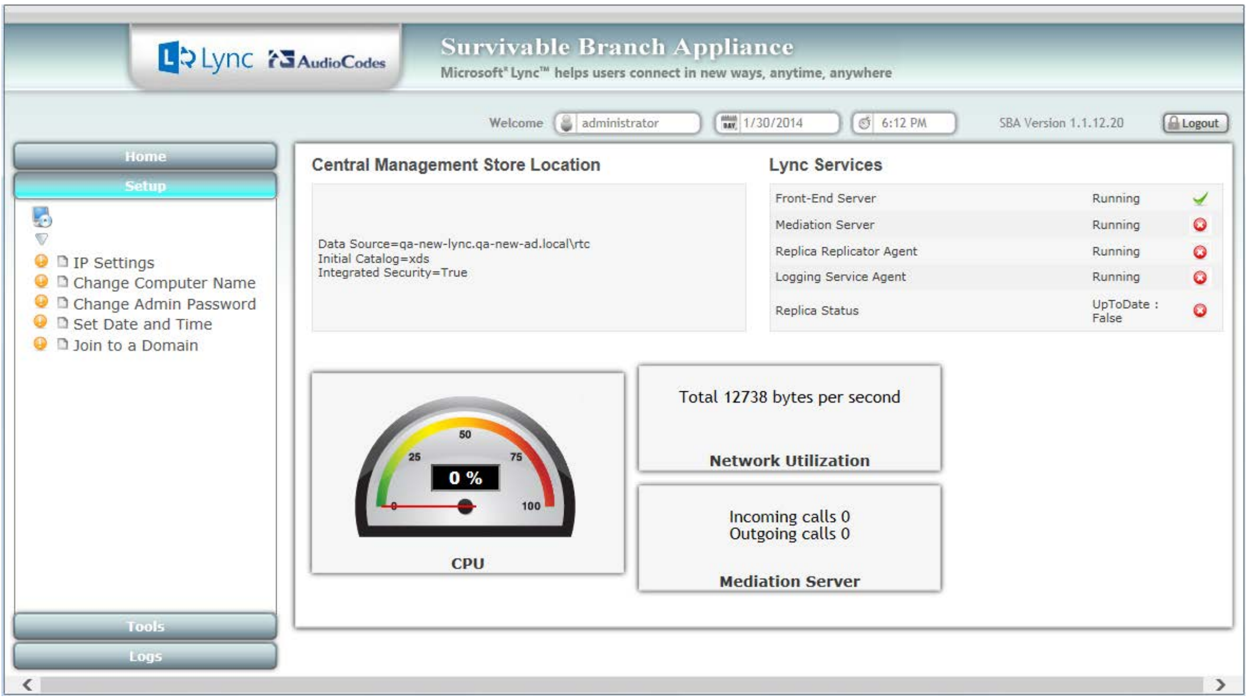
This chapter describes how to connect to the SBA Management interface and

12.19.1 Viewing General SBA Status in the Home Page

The general operating status of the SBA can be viewed in the Home page. This page displays the following:

- Central management store location
- SBA services status (stopped or running)
- CPU and network usages
- Number of incoming and outgoing calls

Figure 12-84: SBA Home Page



Welcome administrator 1/30/2014 6:12 PM SBA Version 1.1.12.20

Central Management Store Location

Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

Lync Services

Front-End Server	Running	✓
Mediation Server	Running	⊗
Replica Replicator Agent	Running	⊗
Logging Service Agent	Running	⊗
Replica Status	UpToDate : False	⊗

0 %

Total 12738 bytes per second

Incoming calls 0
Outgoing calls 0

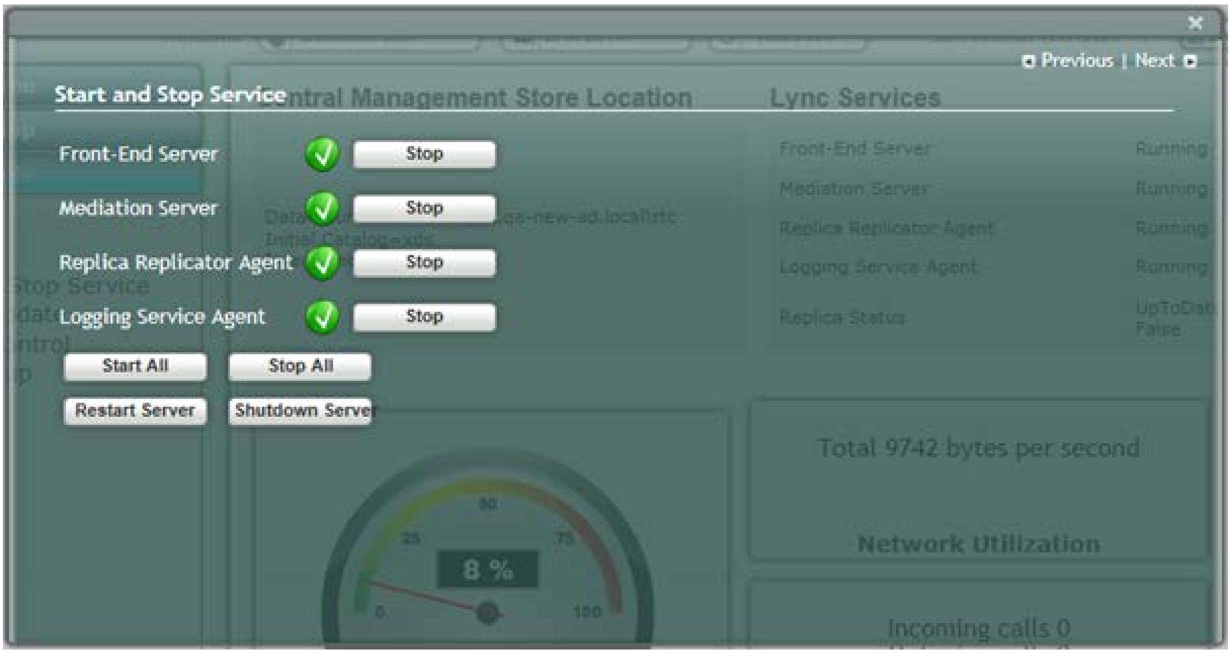
12.19.2 Starting and Stopping SBA Services

You can stop and start SBA services as described in the procedure below.

➢ To start and stop services:

1. Select the **Tools** menu tab, and then select the 'Start or Stop Service' check box; the Start and Stop Service page appears:

Figure 12-85: Start Stop Services Page



2. Stop or Start the following services:
   - Front-End Server
   - Mediation Server
   - Replica Replicator Agent
   - Logging Service Agent
   - Select one of the following actions as required:
   - **Start All**: Starts the services on the SBA
   - **Stop All**: Stops the services on the SBA
   - **Restart Server**: Restarts the server
   - **Shutdown Server:** Shuts down the server

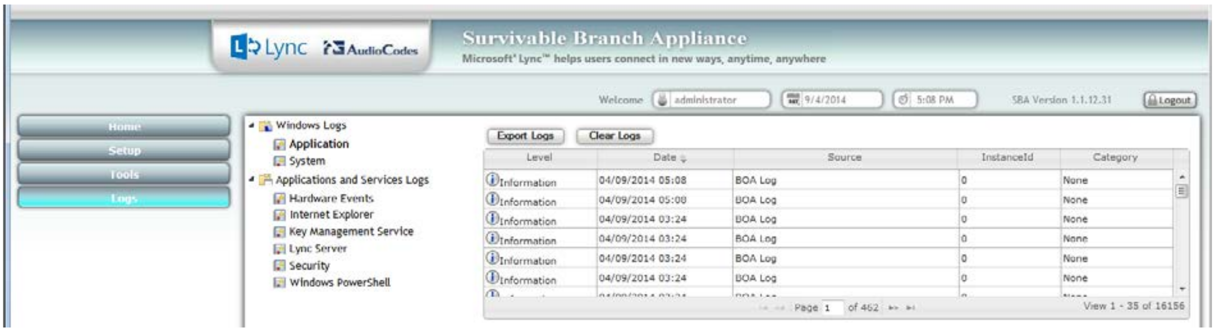
12.19.3 Viewing Logged Events

The procedure below describes how to view and handle logged events.

➢ **To view and handle logged events:**

1. Select the **Logs** tab; the Logs screen appears displaying logged events:

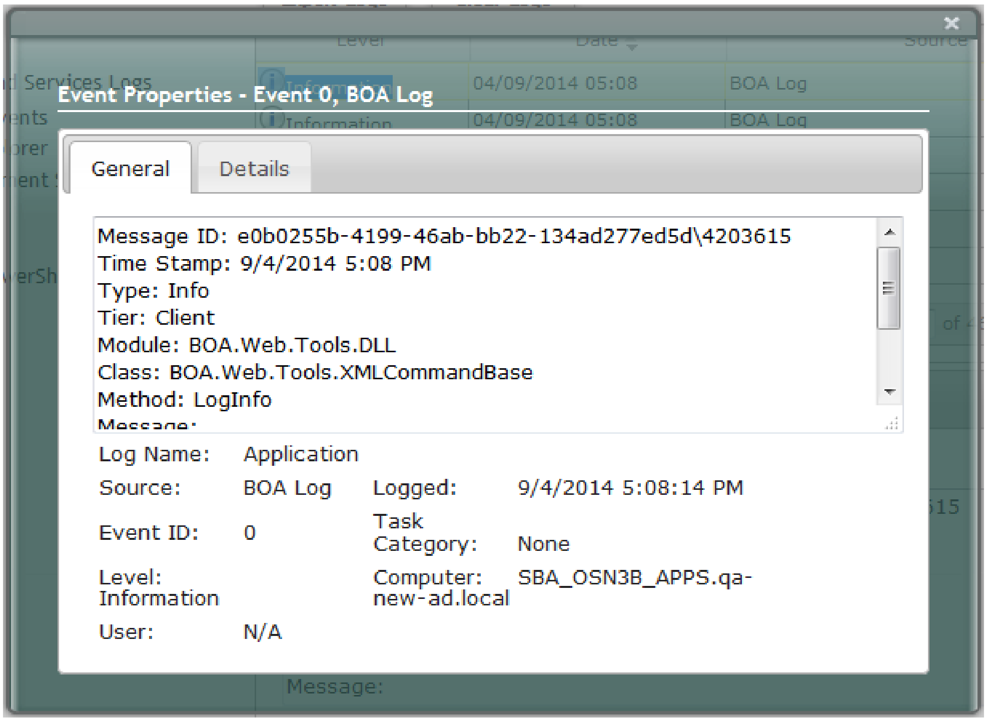
Figure 12-86: Logs Screen Displaying Logged Events



Level	Date	Source	InstanceId	Category
Information	04/09/2014 05:08	BOA Log	0	None
Information	04/09/2014 05:08	BOA Log	0	None
Information	04/09/2014 03:24	BOA Log	0	None
Information	04/09/2014 03:24	BOA Log	0	None
Information	04/09/2014 03:24	BOA Log	0	None
Information	04/09/2014 03:24	BOA Log	0	None

2. To view details of a logged event, select the event.

Figure 12-87: Detailed Log Display



Message ID: e0b0255b-4199-46ab-bb22-134ad277ed5d\4203615
Time Stamp: 9/4/2014 5:08 PM
Type: Info
Tier: Client
Module: BOA.Web.Tools.DLL
Class: BOA.Web.Tools.XMLCommandBase
Method: LogInfo
Message:

Log Name: Application
Source: BOA Log
Logged: 9/4/2014 5:08:14 PM
Event ID: 0
Task Category: None
Level: Information
Computer: SBA_OSN3B_APPS.qa-new-ad.local
User: N/A

3. To clear the displayed log, click the **Clear Logs** button. To export the logged events, click the **Export Logs**.

12.19.4 Logging Out

The procedure below describes how to log out the SBA Management Interface.

➢ **To log out the SBA Web wizard:**

- Click the **Logout** button in the top right-hand corner of the screen.

Part V

Configuring the E-SBC Device

This part describes how to configure the E-SBC device for E-SBC calls.

13 Configuring AudioCodes E-SBC

This chapter provides step-by-step procedures on how to configure AudioCodes E-SBC for interworking between Microsoft Skype for Business Server 2015 and the Vendor SIP Trunk. These configuration procedures include the following main areas:

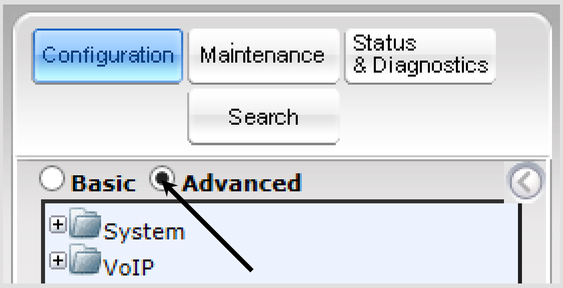
- E-SBC WAN interface - Vendor SIP Trunking environment
- E-SBC LAN interface - Skype for Business Server 2015 environment

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

Note:

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

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



  When the E-SBC is reset, the Navigation tree reverts to Basic-menu display.

13.1 Step 1: IP Network Interfaces Configuration

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

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

13.1.1 Step 1a: Configure VLANs

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

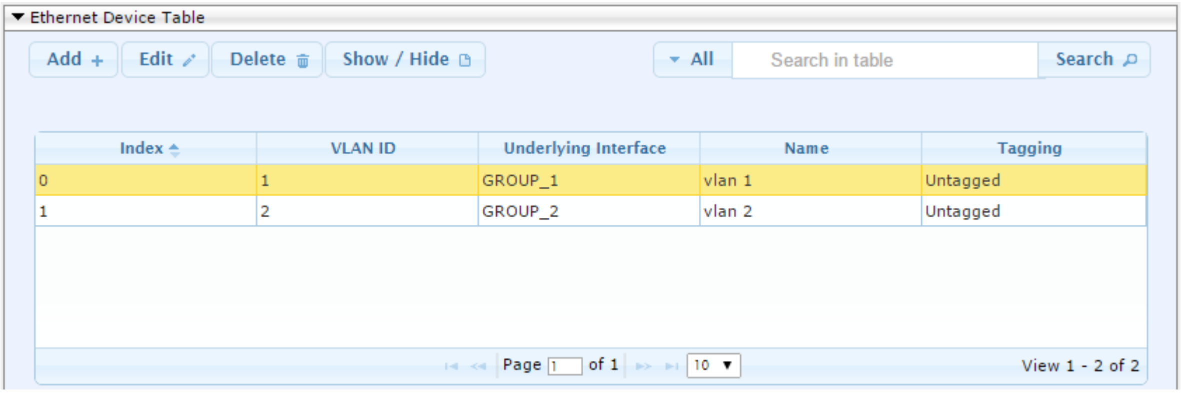
- LAN VoIP (assigned the name "Voice")
- WAN VoIP (assigned the name "WANSP")

➢ To configure the VLANs:

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

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

Figure 13-1: Configured VLAN IDs in Ethernet Device Table



Index	VLAN ID	Underlying Interface	Name	Tagging
0	1	GROUP_1	vlan 1	Untagged
1	2	GROUP_2	vlan 2	Untagged

13.1.2 Step 1b: Configure Network Interfaces

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

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

➢ To configure the IP network interfaces:

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

Parameter	Value
IP Address	**10.15.45.101** (IP address of E-SBC)
Prefix Length	**16** (subnet mask in bits for 255.255.0.0)
Default Gateway	**10.15.0.1**
VLAN ID	**1**
Interface Name	**Voice** (arbitrary descriptive name)
Primary DNS Server IP Address	**10.15.25.1**
Underlying Device	**vlan 1**

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

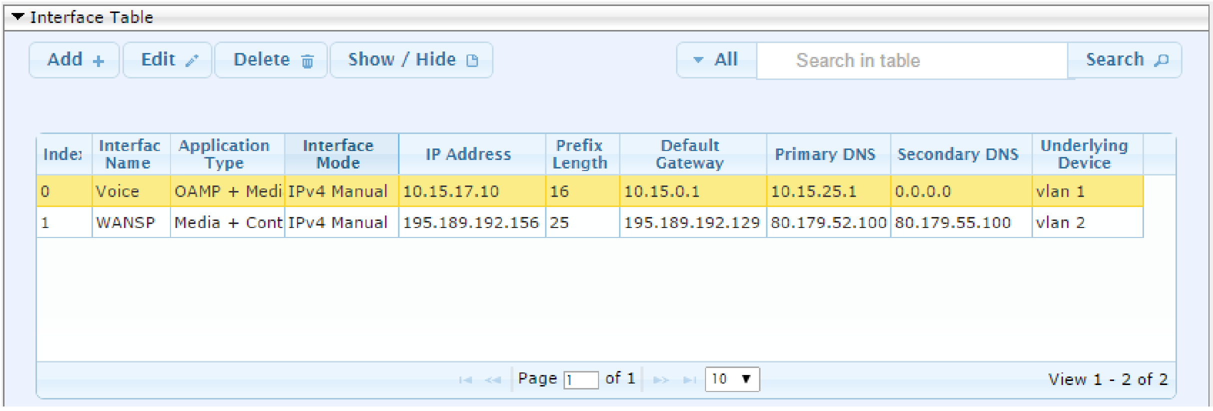
Parameter	Value
Application Type	**Media + Control**
IP Address	**195.189.192.156** (WAN IP address)

Parameter	Value
Prefix Length	**25** (for 255.255.255.128)
Default Gateway	**195.189.192.129** (router's IP address)
VLAN ID	**2**
Interface Name	**WANSP**
Primary DNS Server IP Address	**80.179.52.100**
Secondary DNS Server IP Address	**80.179.55.100**
Underlying Device	**vlan 2**

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

   The configured IP network interfaces are shown below:

Figure 13-2: Configured Network Interfaces in IP Interfaces Table



Inde:	Interfac Name	Application Type	Interface Mode	IP Address	Prefix Length	Default Gateway	Primary DNS	Secondary DNS	Underlying Device
0	Voice	OAMP + Medi	IPv4 Manual	10.15.17.10	16	10.15.0.1	10.15.25.1	0.0.0.0	vlan 1
1	WANSP	Media + Cont	IPv4 Manual	195.189.192.156	25	195.189.192.129	80.179.52.100	80.179.55.100	vlan 2

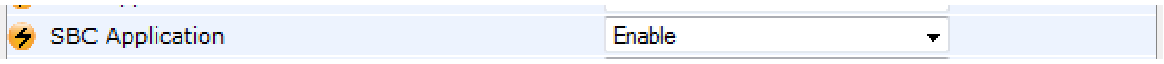
13.2 Step 2: Enable the SBC Application

This step describes how to enable the SBC application.

➢ **To enable the SBC application:**

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

Figure 13-3: Enabling SBC Application



SBC Application: Enable

2. From the 'SBC Application' drop-down list, select **Enable**.
3. Click **Submit**.
4. Reset the E-SBC with a burn to flash for this setting to take effect (see Section 13.17 on page 201).

13.3 Step 3: Configure Media Realms

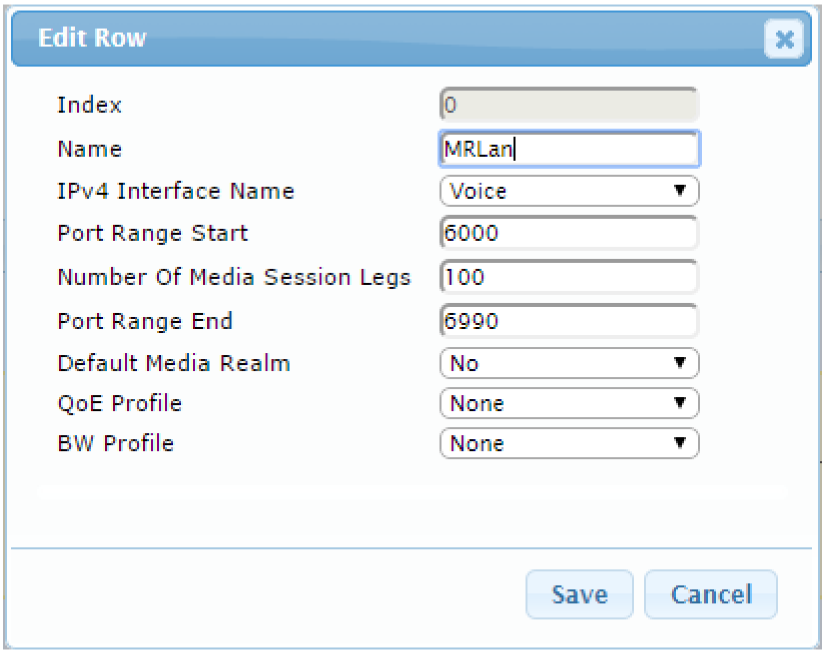
This step describes how to configure Media Realms. The simplest configuration is to create two Media Realms - one for internal (LAN) traffic and one for external (WAN) traffic.

➢ **To configure Media Realms:**

1. Open the Media Realm Table page (**Configuration** tab > **VoIP** menu > **VoIP Network** > **Media Realm Table**).
2. Add a Media Realm for the LAN interface. You can use the default Media Realm (Index 0), but modify it as shown below:

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

Figure 13-4: Configuring Media Realm for LAN

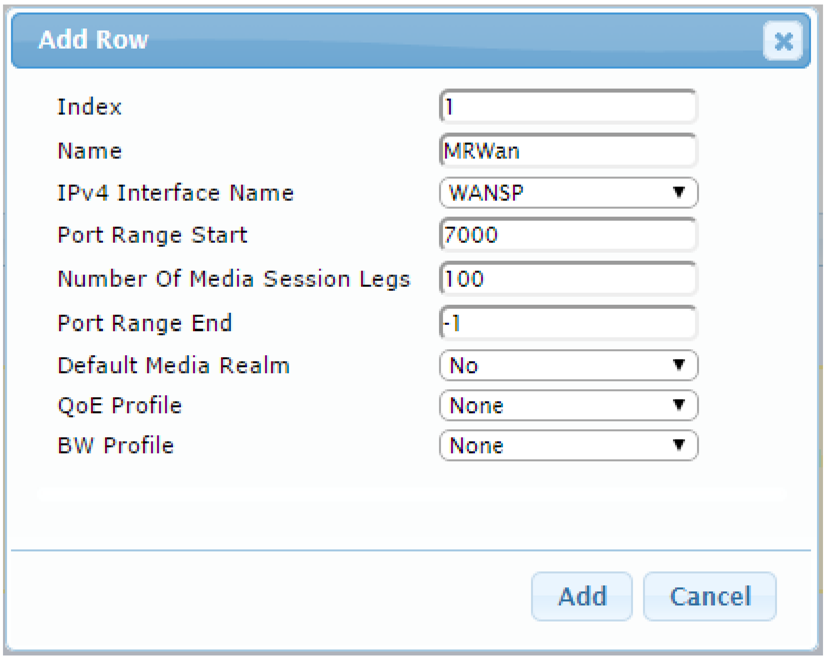


Index: 0
Name: MRLan
IPv4 Interface Name: Voice
Port Range Start: 6000
Number Of Media Session Legs: 100
Port Range End: 6990
Default Media Realm: No
QoE Profile: None
BW Profile: None

3. Configure a Media Realm for WAN traffic:

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

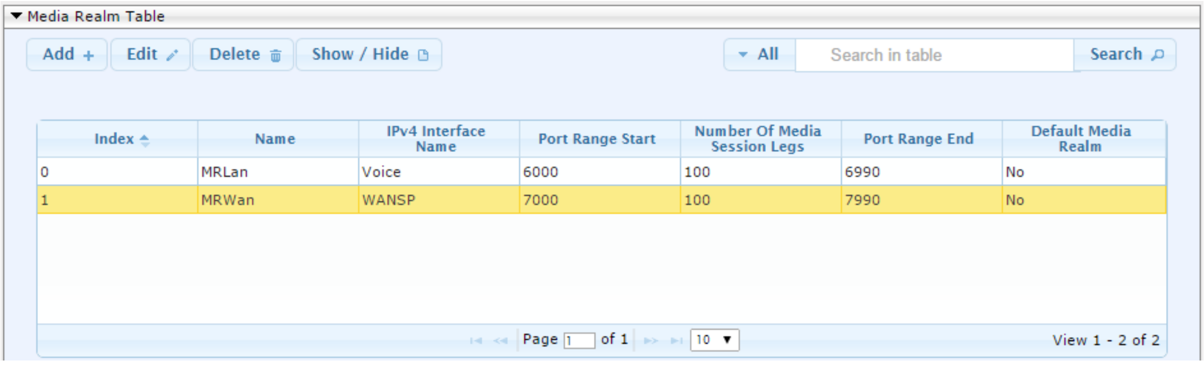
Figure 13-5: Configuring Media Realm for WAN



Index	1
Name	MRWan
IPv4 Interface Name	WANSP
Port Range Start	7000
Number Of Media Session Legs	100
Port Range End	-1
Default Media Realm	No
QoE Profile	None
BW Profile	None

The configured Media Realms are shown in the figure below:

Figure 13-6: Configured Media Realms in Media Realm Table



Index	Name	IPv4 Interface Name	Port Range Start	Number Of Media Session Legs	Port Range End	Default Media Realm
0	MRLan	Voice	6000	100	6990	No
1	MRWan	WANSP	7000	100	7990	No

13.4 Step 4: Configure SIP Signaling Interfaces

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

➢ **To configure SIP Interfaces:**

1. Open the SIP Interface Table page (**Configuration** tab > **VoIP** menu > **VoIP Network** > **SIP Interface Table**).
2. Add a SIP Interface for the LAN interface. You can use the default SIP Interface (Index 0), but modify it as shown below:

Parameter	Value
Index	**0**
Interface Name	**S4B** (see Note at the end of this section)
Network Interface	**Voice**
Application Type	**SBC**
TLS Port	**5067** (see Note below)
TCP and UDP	**0**
Media Realm	**MRLan**

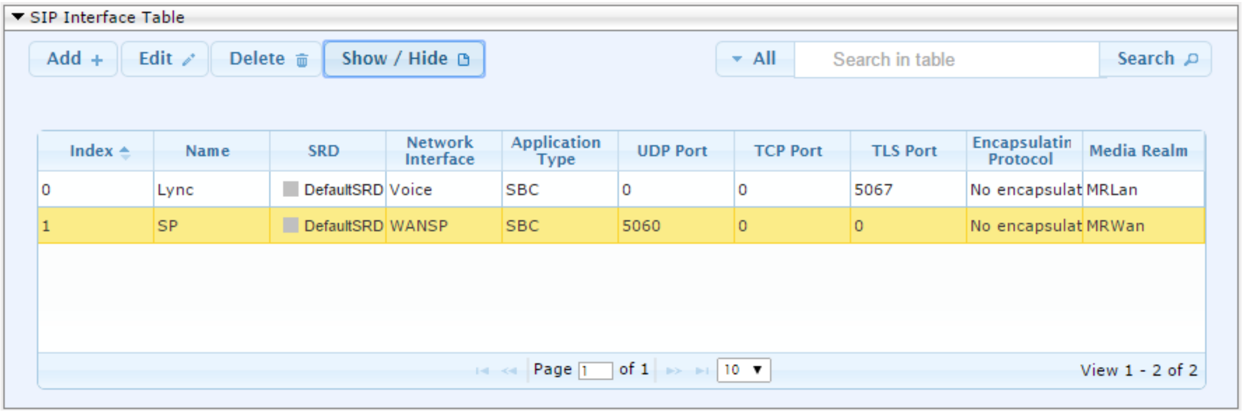
Note: The TLS port parameter must be identically configured in the Skype for Business Topology Builder (see Chapter 10 on page 9).

3. Configure a SIP Interface for the WAN:

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

The configured SIP Interfaces are shown in the figure below:

Figure 13-7: Configured SIP Interfaces in SIP Interface Table



Index	Name	SRD	Network Interface	Application Type	UDP Port	TCP Port	TLS Port	Encapsulatin Protocol	Media Realm
0	Lync	DefaultSRD	Voice	SBC	0	0	5067	No encapsulat	MRLan
1	SP	DefaultSRD	WANSP	SBC	5060	0	0	No encapsulat	MRWan

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

13.5 Step 5: Configure Proxy Sets

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

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

- Microsoft Skype for Business Server 2015
- Vendor SIP Trunk

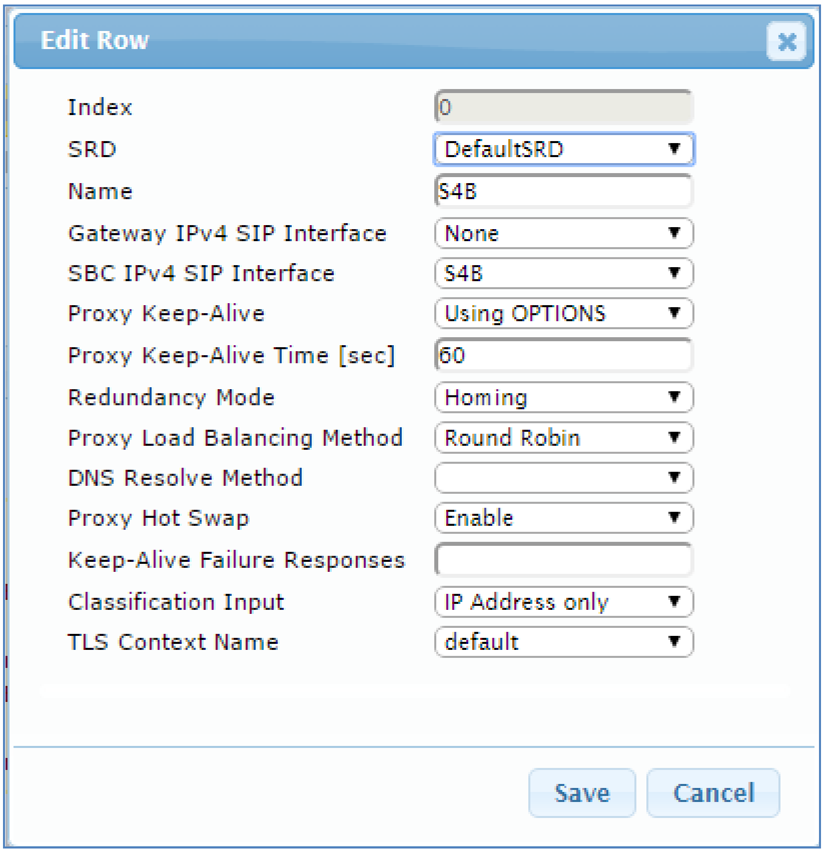
The Proxy Sets will be later applying to the VoIP network by assigning them to IP Groups.

➢ To configure Proxy Sets:

1. Open the Proxy Sets Table page (**Configuration** tab > **VoIP** menu > **VoIP Network** > **Proxy Sets Table**).
2. Add a Proxy Set for the Skype for Business Server 2015. You can use the default Proxy Set (Index 0), but modify it as shown below:

Parameter	Value
Proxy Set ID	**0**
Proxy Name	**S4B**
SBC IPv4 SIP Interface	**S4B**
Proxy Keep Alive	**Using Options**
Redundancy Mode	**Homing**
Load Balancing Method	**Round Robin**
Proxy Hot Swap	**Enable**
TLS Context Name	**default**

Figure 13-8: Configuring Proxy Set for Microsoft Skype for Business Server 2015



Index	0
SRD	DefaultSRD
Name	S4B
Gateway IPv4 SIP Interface	None
SBC IPv4 SIP Interface	S4B
Proxy Keep-Alive	Using OPTIONS
Proxy Keep-Alive Time [sec]	60
Redundancy Mode	Homing
Proxy Load Balancing Method	Round Robin
DNS Resolve Method	
Proxy Hot Swap	Enable
Keep-Alive Failure Responses	
Classification Input	IP Address only
TLS Context Name	default

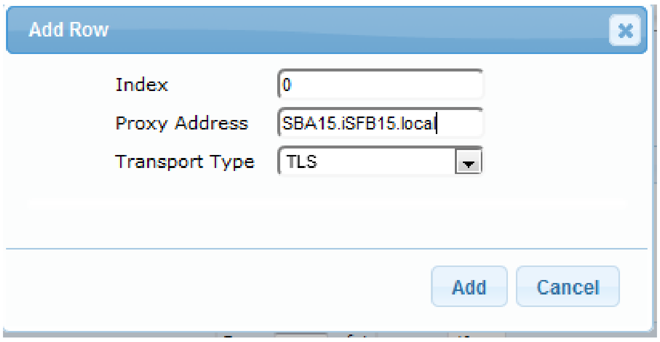
3. Configure a Proxy Address Table for Proxy Set for Skype for Business Server 2015:

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

Parameter	Value
Index	**0**
Proxy Address	**SBA15.iSFB.15.local:5067**
Transport Type	**TLS**

Note: The Proxy Address FQDN must be identically configured in the Skype for Business Topology Builder (see 10.1 on page 45).

Figure 13-9: Configuring Proxy Address for Microsoft Skype for Business Server 2015

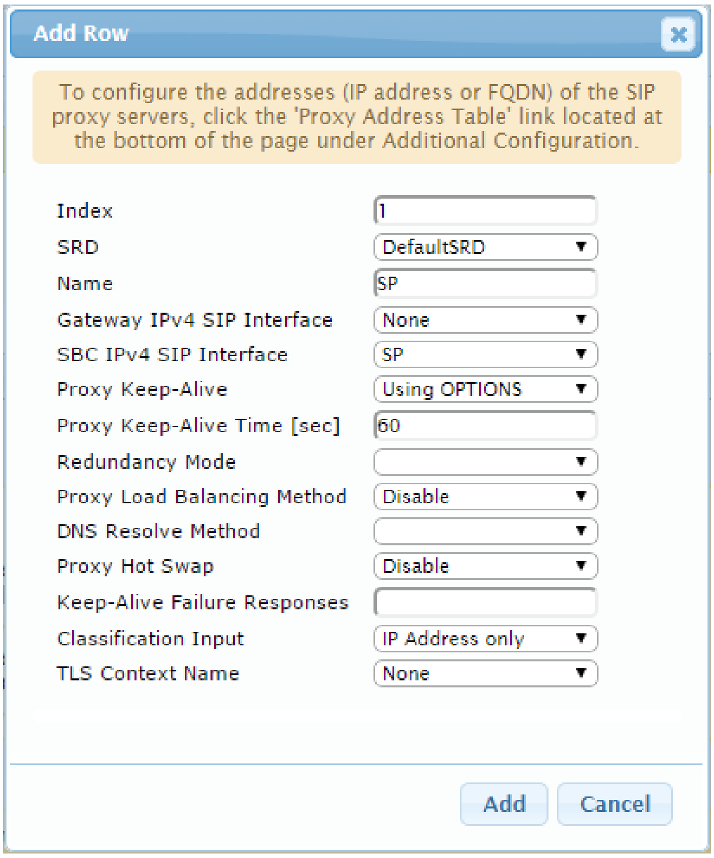


Index: 0
Proxy Address: SBA15.iSFB15.local
Transport Type: TLS

4. Configure a Proxy Set for the Vendor SIP Trunk:

Parameter	Value
Proxy Set ID	**1**
Proxy Name	**SP**
SBC IPv4 SIP Interface	**SP**
Proxy Keep Alive	**Using Options**

Figure 13-10: Configuring Proxy Set for Vendor SIP Trunk



To configure the addresses (IP address or FQDN) of the SIP proxy servers, click the 'Proxy Address Table' link located at the bottom of the page under Additional Configuration.

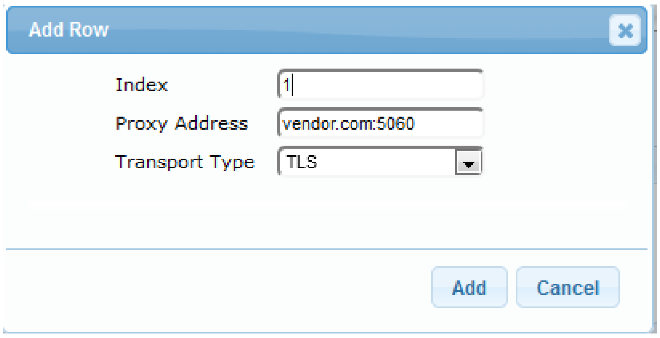
Index: 1
SRD: DefaultSRD
Name: SP
Gateway IPv4 SIP Interface: None
SBC IPv4 SIP Interface: SP
Proxy Keep-Alive: Using OPTIONS
Proxy Keep-Alive Time [sec]: 60
Redundancy Mode:
Proxy Load Balancing Method: Disable
DNS Resolve Method:
Proxy Hot Swap: Disable
Keep-Alive Failure Responses:
Classification Input: IP Address only
TLS Context Name: None

a. Configure a Proxy Address Table for Proxy Set 1:

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

Parameter	Value
Index	**0**
Proxy Address	Vendor**.com:5060** (IP address / FQDN and destination port)
Transport Type	**UDP**

Figure 13-11: Configuring Proxy Address for Vendor SIP Trunk

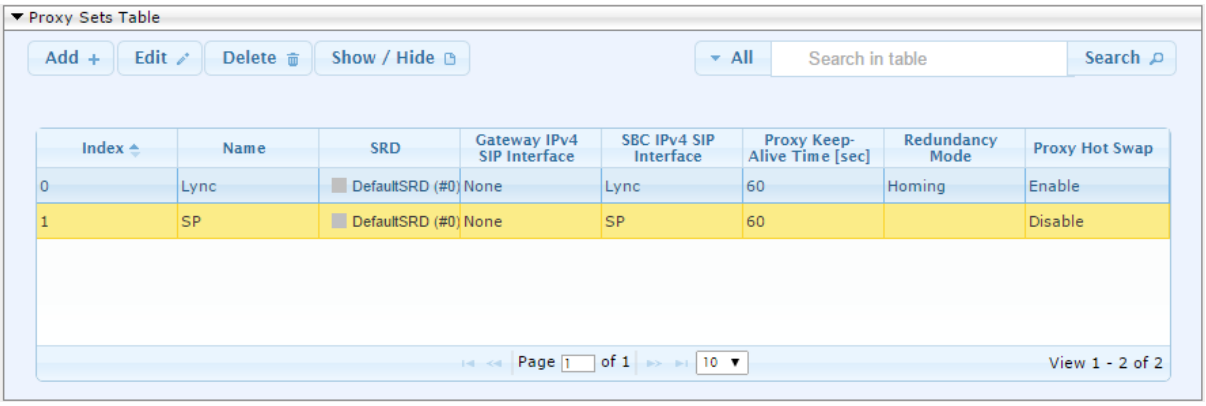


Add Row

Index	1
Proxy Address	vendor.com:5060
Transport Type	TLS

The configured Proxy Sets are shown in the figure below:

Figure 13-12: Configured Proxy Sets in Proxy Sets Table



Proxy Sets Table

Index	Name	SRD	Gateway IPv4 SIP Interface	SBC IPv4 SIP Interface	Proxy Keep-Alive Time [sec]	Redundancy Mode	Proxy Hot Swap
0	Lync	DefaultSRD (#0)	None	Lync	60	Homing	Enable
1	SP	DefaultSRD (#0)	None	SP	60		Disable

13.6 Step 6: Configure IP Profiles

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

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

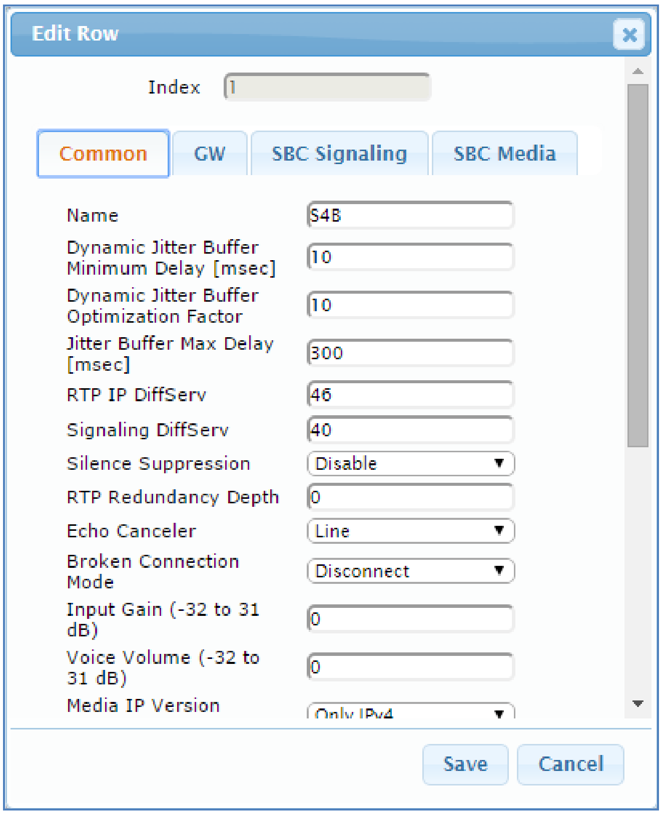
- Microsoft Skype for Business Server 2015 - to operate in secure mode using SRTP and TLS
- Vendor SIP trunk - to operate in non-secure mode using RTP and UDP

➢ To configure IP Profile for the Skype for Business Server 2015:

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

Parameter	Value
Index	**1**
Name	**S4B**
Symmetric MKI	**Enable**
MKI Size	**1**
Reset SRTP State Upon Re-key	**Enable**
Generate SRTP keys mode:	**Always**

Figure 13-13: Configuring IP Profile for Skype for Business Server 2015 – Common Tab



Index: 1

Name: S4B

Dynamic Jitter Buffer Minimum Delay [msec]: 10

Dynamic Jitter Buffer Optimization Factor: 10

Jitter Buffer Max Delay [msec]: 300

RTP IP DiffServ: 46

Signaling DiffServ: 40

Silence Suppression: Disable

RTP Redundancy Depth: 0

Echo Canceler: Line

Broken Connection Mode: Disconnect

Input Gain (-32 to 31 dB): 0

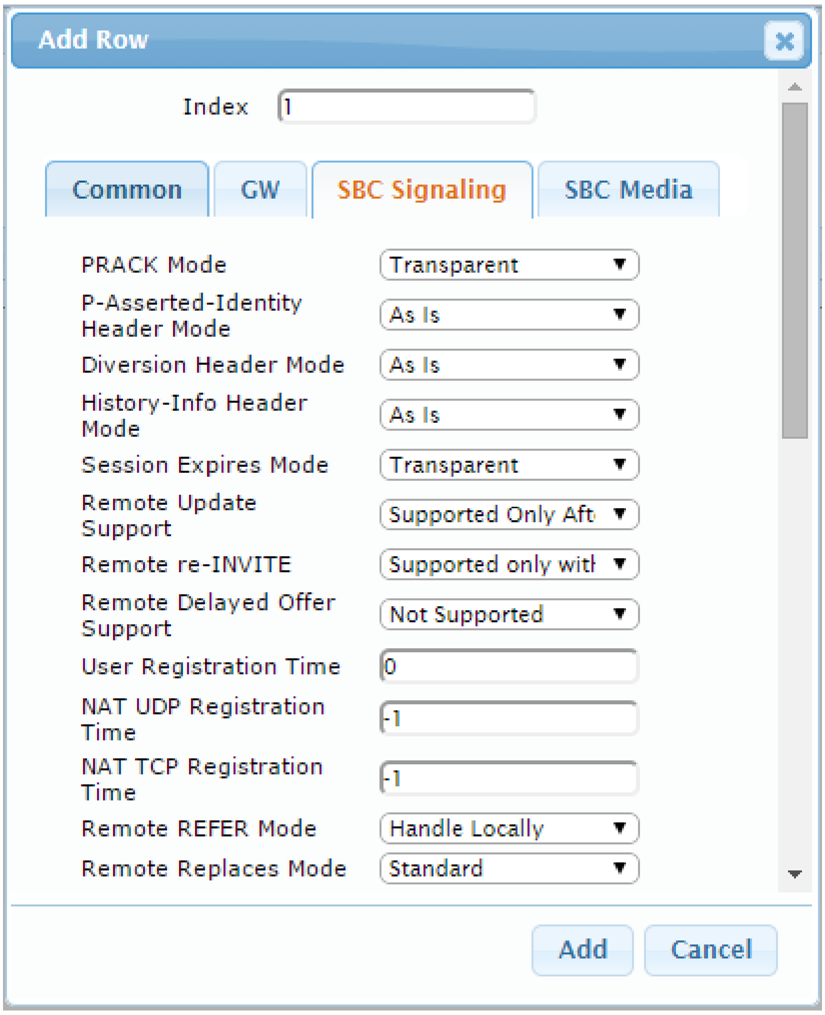
Voice Volume (-32 to 31 dB): 0

Media IP Version: Only IPv4

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

Parameter	Value
Remote Update Support	**Supported Only After Connect**
Remote re-INVITE Support	**Supported Only With SDP**
Remote Delayed Offer Support	**Not Supported**
Remote REFER Mode	**Handle Locally** (required, as Skype for Business Server 2015 does not support receipt of SIP REFER)
Remote 3xx Mode	**Handle Locally** (required, as Skype for Business Server 2015 does not support receipt of SIP 3xx responses)
Remote Early Media RTP Detection Behavior	**By Media** (required, as Skype for Business Server 2015 does not send RTP immediately to remote side when it sends a SIP 18x response)

Figure 13-14: Configuring IP Profile for Skype for Business Server 2015 – SBC Signaling Tab



Index: 1

PRACK Mode: Transparent

P-Asserted-Identity Header Mode: As Is

Diversion Header Mode: As Is

History-Info Header Mode: As Is

Session Expires Mode: Transparent

Remote Update Support: Supported Only Aft

Remote re-INVITE: Supported only witl

Remote Delayed Offer Support: Not Supported

User Registration Time: 0

NAT UDP Registration Time: -1

NAT TCP Registration Time: -1

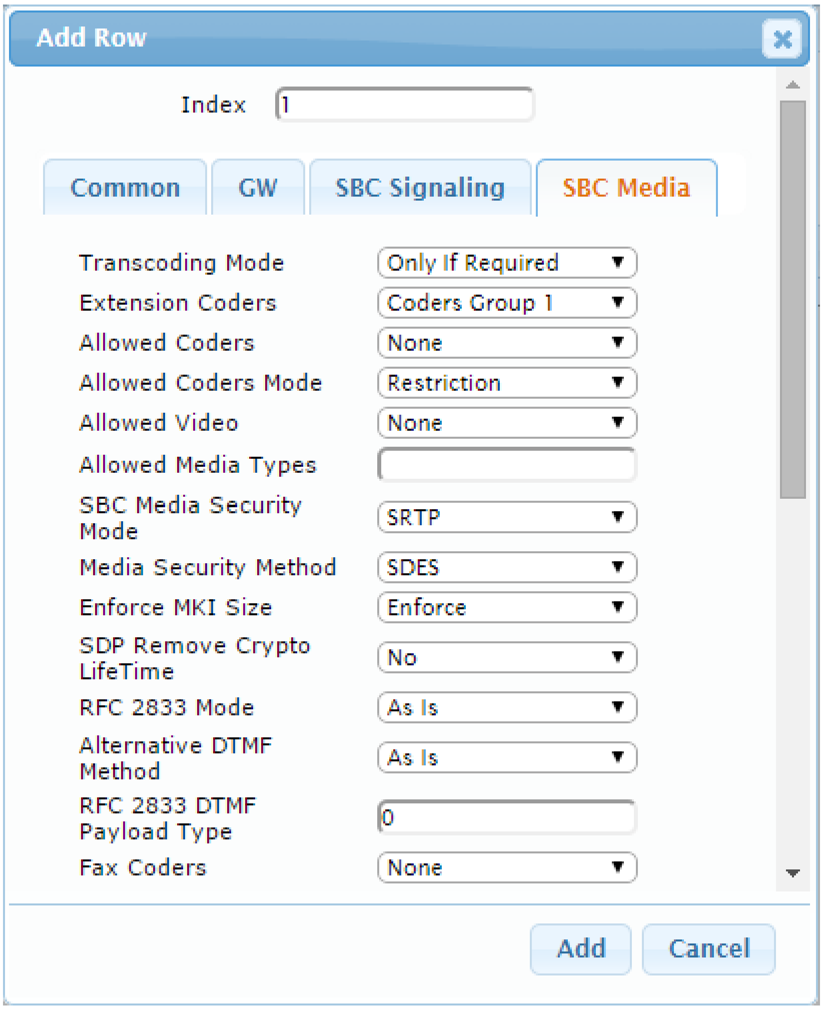
Remote REFER Mode: Handle Locally

Remote Replaces Mode: Standard

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

Parameter	Value
Extension Coders Group ID	**Coders Group 1**
SBC Media Security Mode	**SRTP**
Enforce MKI Size	**Enforce**

Figure 13-15: Configuring IP Profile for Skype for Business Server 2015 – SBC Media Tab



Index: 1

Transcoding Mode: Only If Required

Extension Coders: Coders Group 1

Allowed Coders: None

Allowed Coders Mode: Restriction

Allowed Video: None

Allowed Media Types:

SBC Media Security Mode: SRTP

Media Security Method: SDES

Enforce MKI Size: Enforce

SDP Remove Crypto LifeTime: No

RFC 2833 Mode: As Is

Alternative DTMF Method: As Is

RFC 2833 DTMF Payload Type: 0

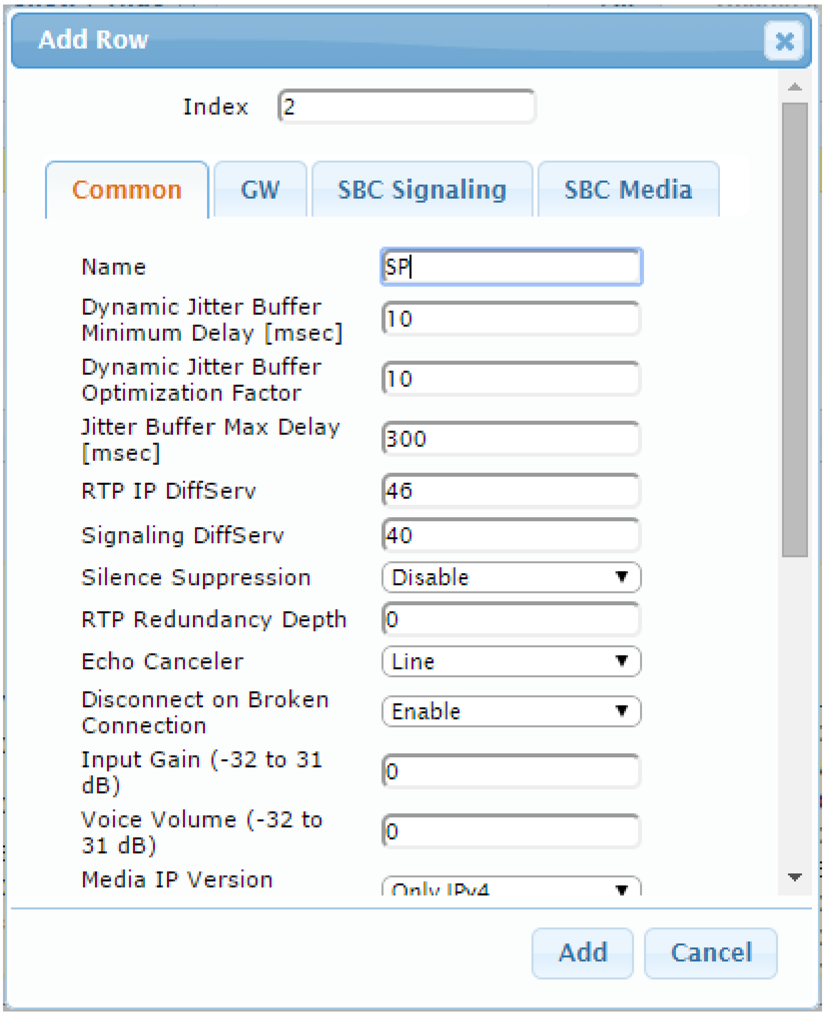
Fax Coders: None

➢ To configure an IP Profile for the Vendor SIP Trunk:

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

Parameter	Value
Index	**2**
Profile Name	**SP**

Figure 13-16: Configuring IP Profile for Vendor SIP Trunk – Common Tab



Index: 2

Name: SP

Dynamic Jitter Buffer Minimum Delay [msec]: 10

Dynamic Jitter Buffer Optimization Factor: 10

Jitter Buffer Max Delay [msec]: 300

RTP IP DiffServ: 46

Signaling DiffServ: 40

Silence Suppression: Disable

RTP Redundancy Depth: 0

Echo Canceler: Line

Disconnect on Broken Connection: Enable

Input Gain (-32 to 31 dB): 0

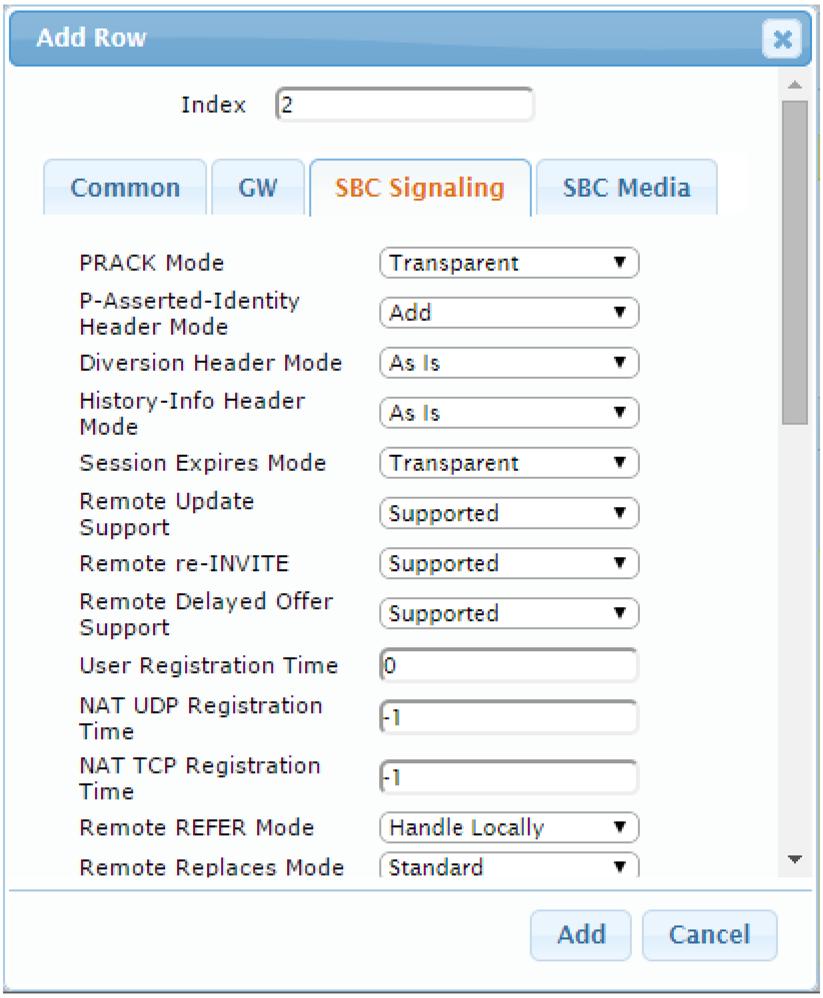
Voice Volume (-32 to 31 dB): 0

Media IP Version: Only IPv4

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

Parameter	Value
P-Asserted-Identity Header Mode	**Add** (required for anonymous calls)
Remote REFER Behavior	**Handle Locally** (E-SBC handles / terminates incoming REFER requests instead of forwarding them to SIP Trunk)
Remote Can Play Ringback	**No** (required, as Skype for Business Server 2015 does not provide a ringback tone for incoming calls)

Figure 13-17: Configuring IP Profile for Vendor SIP Trunk – SBC Signaling Tab



Index: 2

PRACK Mode: Transparent

P-Asserted-Identity Header Mode: Add

Diversion Header Mode: As Is

History-Info Header Mode: As Is

Session Expires Mode: Transparent

Remote Update Support: Supported

Remote re-INVITE: Supported

Remote Delayed Offer Support: Supported

User Registration Time: 0

NAT UDP Registration Time: -1

NAT TCP Registration Time: -1

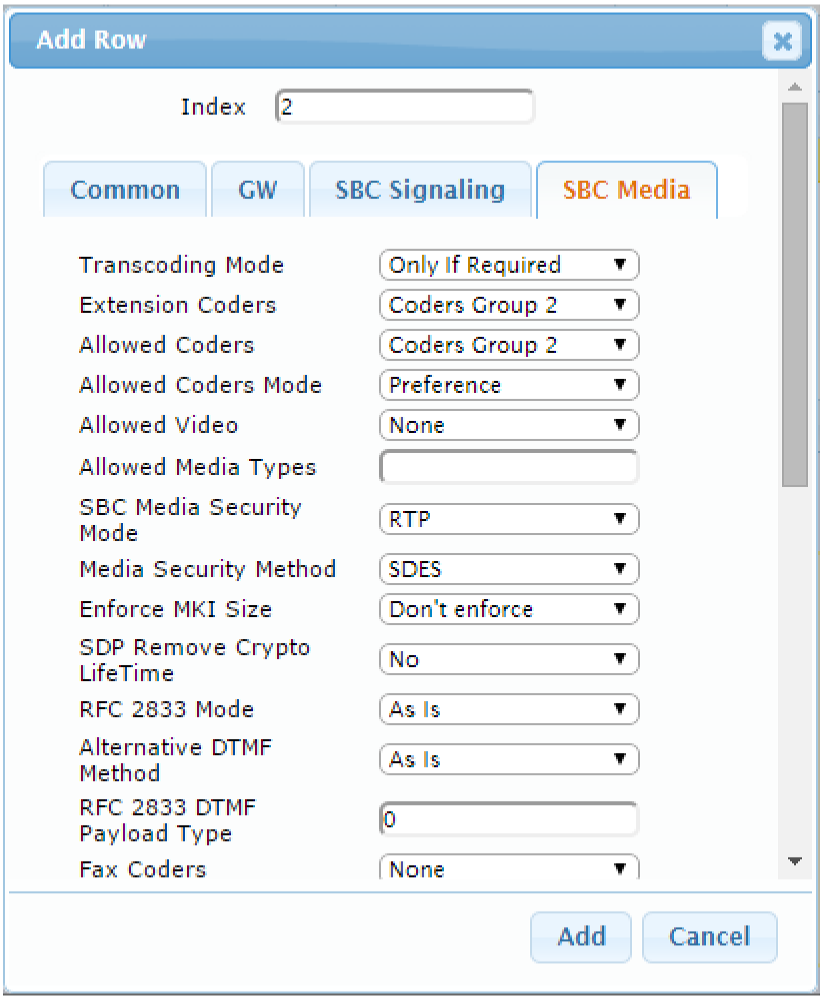
Remote REFER Mode: Handle Locally

Remote Replaces Mode: Standard

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

Parameter	Value
Extension Coders Group ID	**Coders Group 2**
Allowed Coders Group ID	**Coders Group 2**
Allowed Coders Mode	**Preference** (lists Allowed Coders first and then original coders in received SDP offer)
Media Security Behavior	**RTP**

Figure 13-18: Configuring IP Profile for Vendor SIP Trunk – SBC Media Tab



Index	2
Transcoding Mode	Only If Required
Extension Coders	Coders Group 2
Allowed Coders	Coders Group 2
Allowed Coders Mode	Preference
Allowed Video	None
Allowed Media Types	
SBC Media Security Mode	RTP
Media Security Method	SDES
Enforce MKI Size	Don't enforce
SDP Remove Crypto LifeTime	No
RFC 2833 Mode	As Is
Alternative DTMF Method	As Is
RFC 2833 DTMF Payload Type	0
Fax Coders	None

13.7 Step 7: Configure IP Groups

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

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

- Skype for Business Server 2015 (Mediation Server) located on LAN
- Vendor SIP Trunk located on WAN

➢ To configure IP Groups:

1. Open the IP Group Table page (**Configuration** tab > **VoIP** menu > **VoIP Network** > **IP Group Table**).
2. Add an IP Group for the Skype for Business Server 2015. You can use the default IP Group (Index 0), but modify it as shown below:

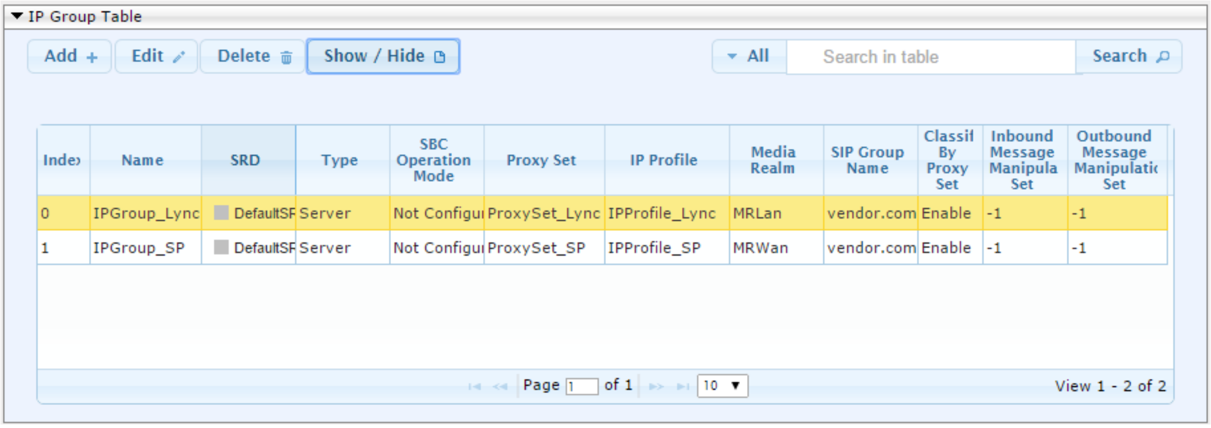
Parameter	Value
Index	**0**
Name	**S4B**
Type	**Server**
Proxy Set	**S4B**
IP Profile	**S4B**
Media Realm	**MRLan**
SIP Group Name	(according to ITSP requirement)

3. Configure an IP Group for the Vendor SIP Trunk:

Parameter	Value
Index	**1**
Name	**SP**
Type	**Server**
Proxy Set	**SP**
IP Profile	**SP**
Media Realm	**MRWan**
SIP Group Name	(according to ITSP requirement)

The configured IP Groups are shown in the figure below:

Figure 13-19: Configured IP Groups in IP Group Table



Inde›	Name	SRD	Type	SBC Operation Mode	Proxy Set	IP Profile	Media Realm	SIP Group Name	Classif By Proxy Set	Inbound Message Manipula Set	Outbound Message Manipulatic Set
0	IPGroup_Lync	DefaultSF	Server	Not Configu	ProxySet_Lync	IPProfile_Lync	MRLan	vendor.com	Enable	-1	-1
1	IPGroup_SP	DefaultSF	Server	Not Configu	ProxySet_SP	IPProfile_SP	MRWan	vendor.com	Enable	-1	-1

13.8 Step 8: Configure Coders

This step describes how to configure coders (termed *Coder Group*). As Skype for Business Server 2015 supports the G.711 coder while the network connection to Vendor SIP Trunk may restrict operation with a lower bandwidth coder such as G.729, you need to add a Coder Group with the G.729 coder for the Vendor SIP Trunk.

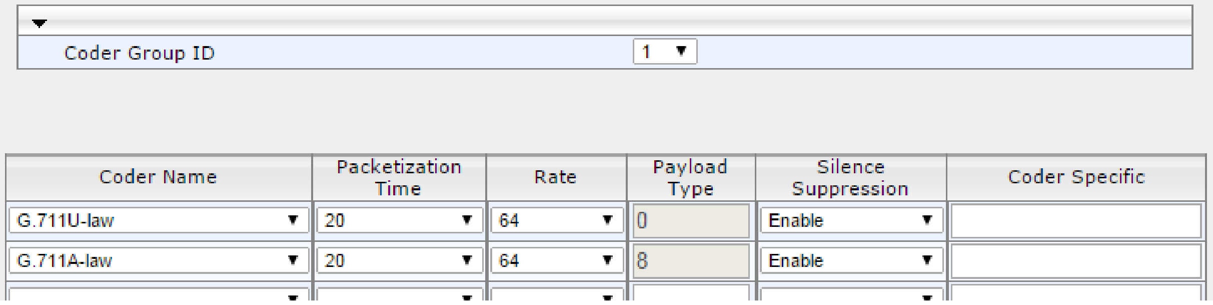
Note that the Coder Group ID for this entity was assigned to its corresponding IP Profile in the previous step (see Section 13.6 on page 160).

➢ To configure coders:

1. Open the Coder Group Settings (**Configuration** tab > **VoIP** menu > **Coders and Profiles** > **Coders Group Settings**).
2. Configure a Coder Group for Skype for Business Server 2015:

Parameter	Value
Coder Group ID	**1**
Coder Name	▪ **G.711 U-law** ▪ **G.711 A-law**
Silence Suppression	**Enable** (for both coders)

Figure 13-20: Configuring Coder Group for Skype for Business Server 2015



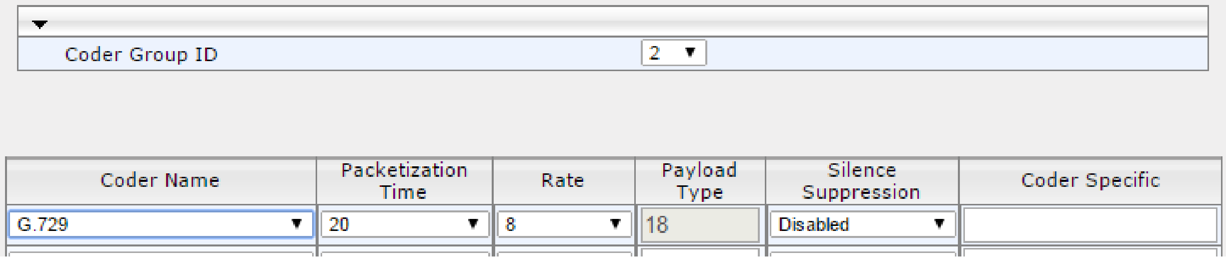
Coder Group ID: 1

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

3. Configure a Coder Group for Vendor SIP Trunk:

Parameter	Value
Coder Group ID	**2**
Coder Name	**G.729**

Figure 13-21: Configuring Coder Group for Vendor SIP Trunk



Coder Group ID: 2

Coder Name	Packetization Time	Rate	Payload Type	Silence Suppression	Coder Specific
G.729	20	8	18	Disabled	

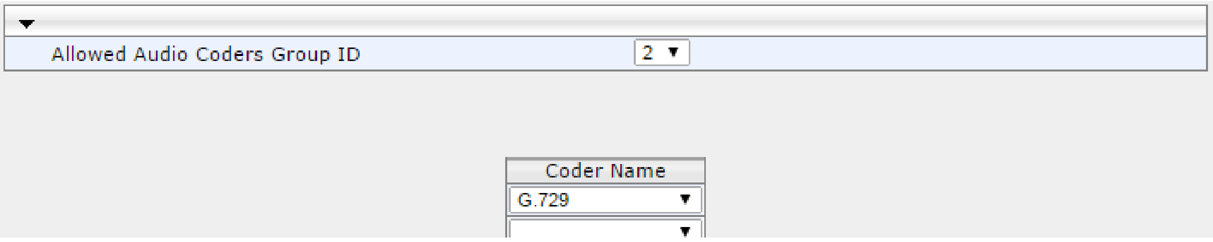
The procedure below describes how to configure an Allowed Coders Group to ensure that voice sent to the Vendor SIP Trunk uses the G.729 coder whenever possible. Note that this Allowed Coders Group ID was assigned to the IP Profile belonging to the Vendor SIP Trunk (see Section 13.6 on page 160).

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

1. Open the Allowed Coders Group page (**Configuration** tab > **VoIP** menu > **SBC** > **Allowed Audio Coders Group**).
2. Configure an Allowed Coder as follows:

Parameter	Value
Allowed Audio Coders Group ID	**2**
Coder Name	**G.729**

Figure 13-22: Configuring Allowed Coders Group for Vendor SIP Trunk

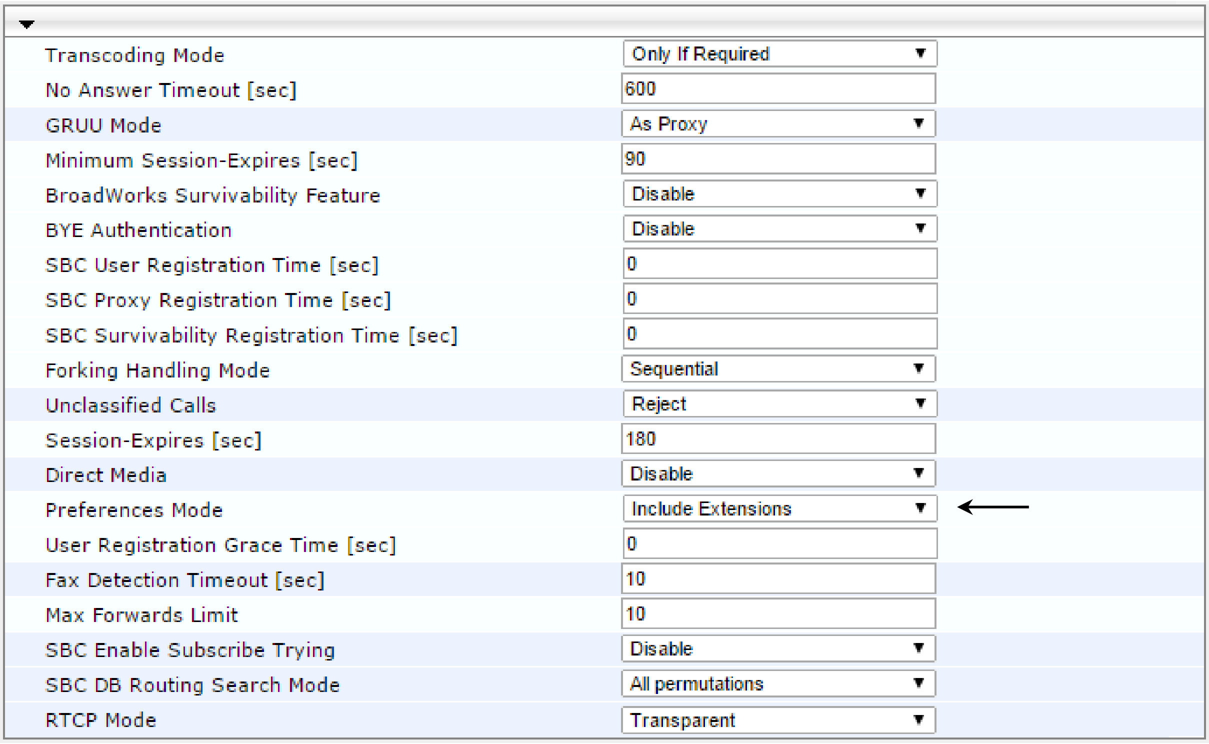


Allowed Audio Coders Group ID: 2

Coder Name
G.729

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

Figure 13-23: SBC Preferences Mode



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

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

13.9 Step 9: SIP TLS Connection Configuration

This section describes how to configure the E-SBC for using a TLS connection with the Skype for Business Server 2015 Mediation Server. This is essential for a secure SIP TLS connection.

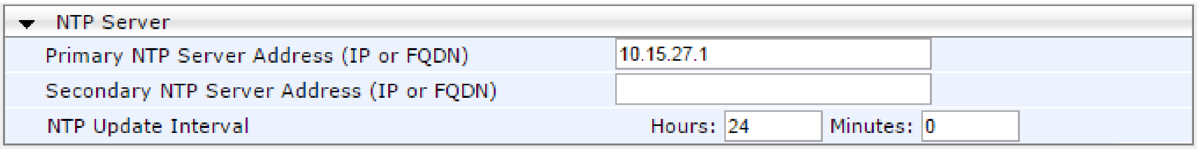
13.9.1 Step 9a: Configure the NTP Server Address

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

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

1. Open the Application Settings page (**Configuration** tab > **System** > **Time And Day**).
2. In the 'NTP Server Address' field, enter the IP address of the NTP server (e.g., **10.15.27.1**).

Figure 13-24: Configuring NTP Server Address



▾ NTP Server	
Primary NTP Server Address (IP or FQDN)	10.15.27.1
Secondary NTP Server Address (IP or FQDN)	
NTP Update Interval	Hours: 24 Minutes: 0

3. Click **Submit**.

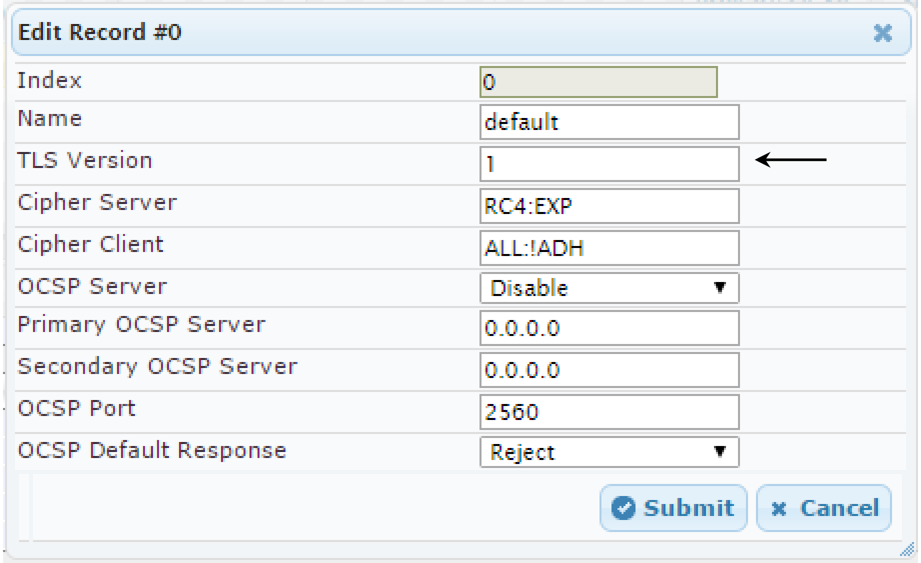
13.9.2 Step 9b: Configure the TLS version 1.0

This step describes how to configure the E-SBC to use TLS version 1.0 only. AudioCodes recommends implementing only TLS to avoid flaws in SSL.

➢ To configure the TLS version 1.0:

1. Open the TLS Contexts page (**Configuration** tab > **System** menu > **TLS Contexts**).
2. In the TLS Contexts table, select the required TLS Context index row (usually default index 0 will be used), and then click ‘Edit’.
3. In the ‘TLS Version’ field, enter **1**.

Figure 13-25: Configuring TLS version 1.0



Edit Record #0

Index	0
Name	default
TLS Version	1
Cipher Server	RC4:EXP
Cipher Client	ALL:!ADH
OCSP Server	Disable ▼
Primary OCSP Server	0.0.0.0
Secondary OCSP Server	0.0.0.0
OCSP Port	2560
OCSP Default Response	Reject ▼

4. Click **Submit**.

13.9.3 Step 9c: Configure a Certificate

This step describes how to exchange a certificate with Microsoft Certificate Authority (CA). The certificate is used by the E-SBC to authenticate the connection with Skype for Business Server 2015.

The procedure involves the following main steps:

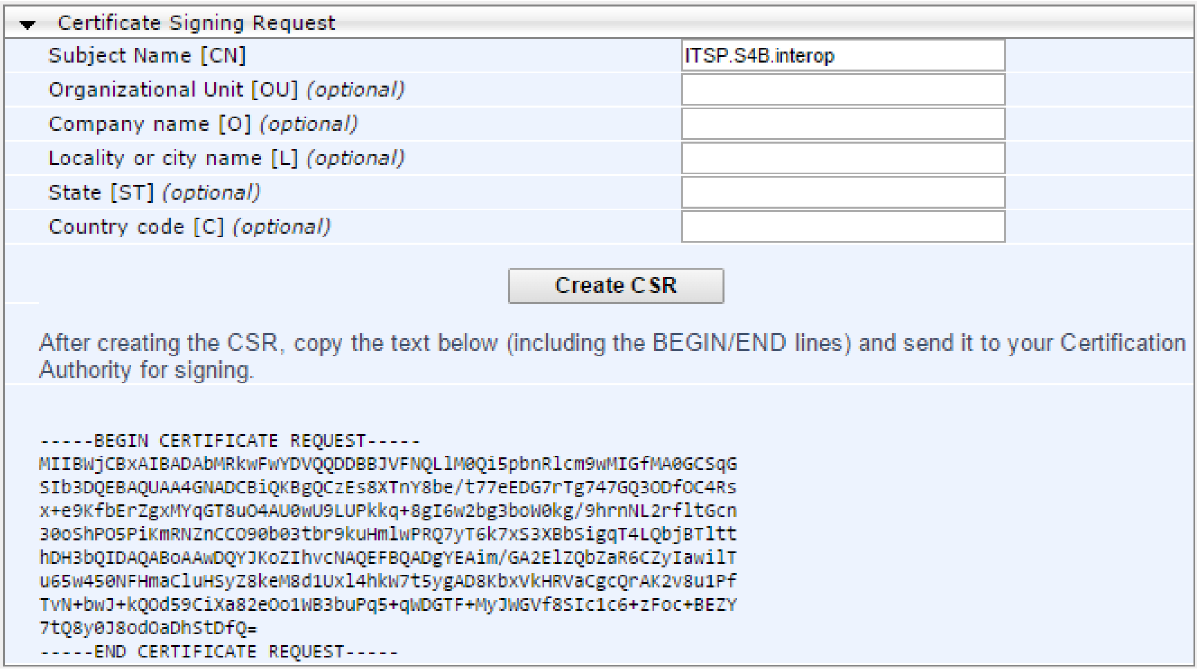
a. Generating a Certificate Signing Request (CSR).
b. Requesting Device Certificate from CA.
c. Obtaining Trusted Root Certificate from CA.
d. Deploying Device and Trusted Root Certificates on E-SBC.

> **Note:** The Subject Name (CN) field parameter should be identically configured in the DNS Active Directory and Topology Builder (see Section 10 on page 45).

➢ To configure a certificate:

1. Open the TLS Contexts page (**Configuration** tab > **System** menu > **TLS Contexts**).
2. In the TLS Contexts table, select the required TLS Context index row (usually default index 0 will be used), and then click the **TLS Context Certificates** ➡ button, located at the bottom of the TLS Contexts page; the Context Certificates page appears.
3. Under the **Certificate Signing Request** group, do the following:
   a. In the 'Subject Name [CN]' field, enter the E-SBC FQDN name (e.g., **ITSP.S4B.interop**).
   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 13-26: Certificate Signing Request – Creating CSR



Subject Name [CN]	ITSP.S4B.interop
Organizational Unit [OU] *(optional)*	
Company name [O] *(optional)*	
Locality or city name [L] *(optional)*	
State [ST] *(optional)*	
Country code [C] *(optional)*	

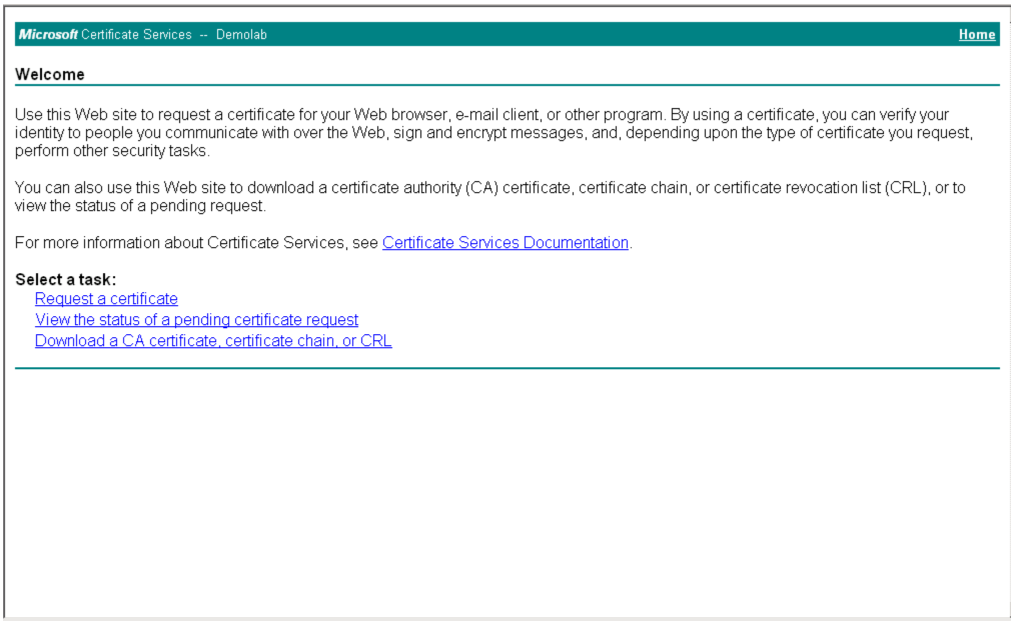
After creating the CSR, copy the text below (including the BEGIN/END lines) and send it to your Certification Authority for signing.

```
-----BEGIN CERTIFICATE REQUEST-----
MIIBWjCBxAIBADAbMRkwFwYDVQQDDBBJVFNQLlM0Qi5pbnRlcm9wMIGfMA0GCSqG
SIb3DQEBAQUAA4GNADCBiQKBgQCzEs8XTnY8be/t77eEDG7rTg747GQ3ODfOC4Rs
x+e9KfbErZgxMYqGT8uO4AU0wU9LUPkkq+8gI6w2bg3boW0kg/9hrnNL2rfltGcn
30oShPO5PiKmRNZnCCO90b03tbr9kuHmlwPRQ7yT6k7xS3XBbSigqT4LQbjBTltt
hDH3bQIDAQABoAAwDQYJKoZIhvcNAQEFBQADgYEAim/GA2ElZQbZaR6CZyIawilT
u65w450NFHmaCluHSyZ8keM8d1Uxl4hkW7t5ygAD8KbxVkHRVaCgcQrAK2v8u1Pf
TvN+bwJ+kQOd59CiXa82eOo1WB3buPq5+qWDGTF+MyJWGVf8SIc1c6+zFoc+BEZY
7tQ8y0J8odOaDhStDfQ=
-----END CERTIFICATE REQUEST-----
```

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

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

Figure 13-27: Microsoft Certificate Services Web Page



Microsoft Certificate Services -- Demolab Home

Welcome

Use this Web site to request a certificate for your Web browser, e-mail client, or other program. By using a certificate, you can verify your identity to people you communicate with over the Web, sign and encrypt messages, and, depending upon the type of certificate you request, perform other security tasks.

You can also use this Web site to download a certificate authority (CA) certificate, certificate chain, or certificate revocation list (CRL), or to view the status of a pending request.

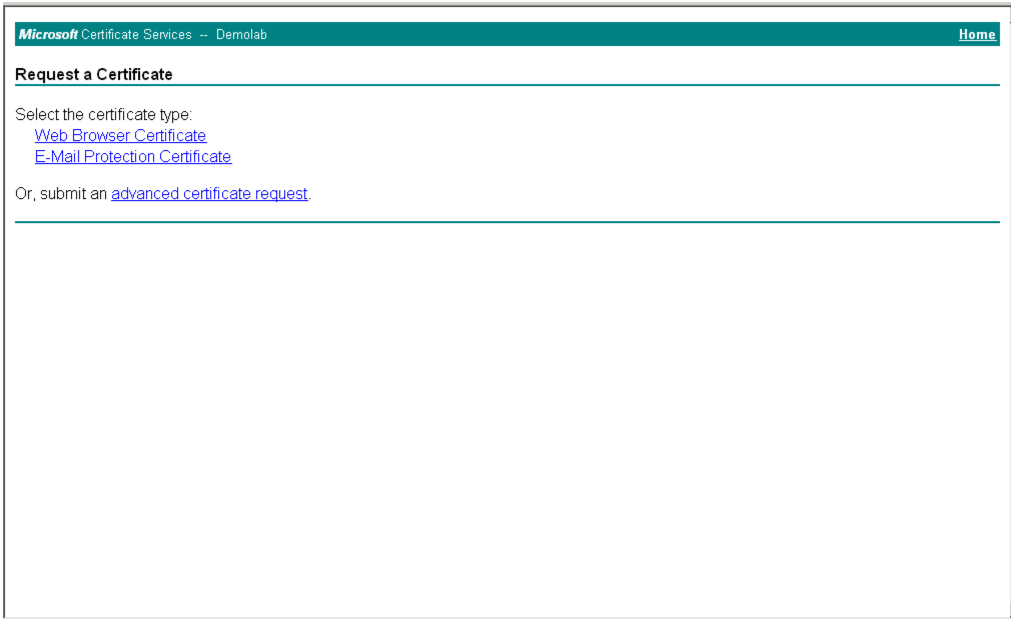
For more information about Certificate Services, see Certificate Services Documentation.

Select a task:

Request a certificate
View the status of a pending certificate request
Download a CA certificate, certificate chain, or CRL

7. Click **Request a certificate**.

Figure 13-28: Request a Certificate Page



Microsoft Certificate Services -- Demolab

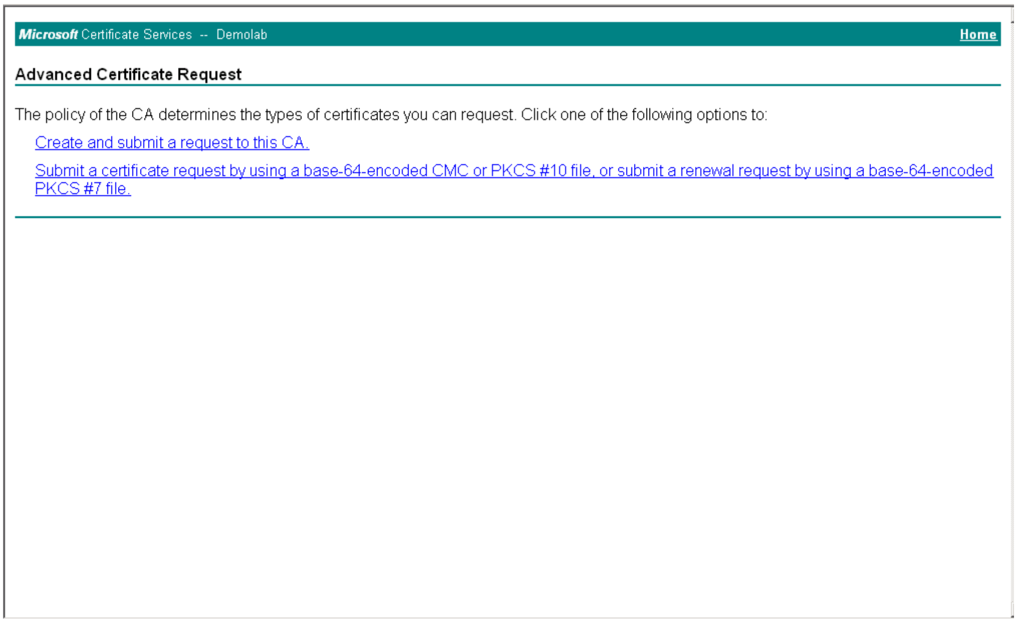
Request a Certificate

Select the certificate type:
Web Browser Certificate
E-Mail Protection Certificate

Or, submit an advanced certificate request.

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

Figure 13-29: Advanced Certificate Request Page



Microsoft Certificate Services -- Demolab

Advanced Certificate Request

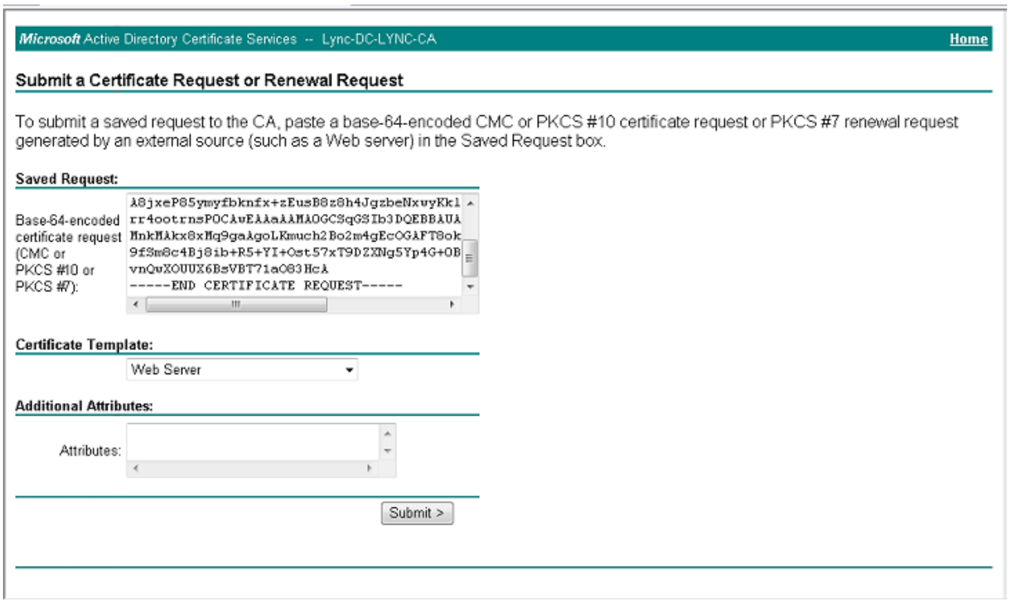
The policy of the CA determines the types of certificates you can request. Click one of the following options to:

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.

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

Figure 13-30: 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+zEusB8z8h4JgzbeNxuyKkl
rr4ootrnsPOCAwEAAaAAMAOGCSqGSIb3DQEBBAUA
MnkMAkx8xMq9gaAgoLKmuch2Bo2m4gEcOGAFT8ok
9fSm8c4Bj8ib+R5+YI+Ost57xT9DZXNg5Yp4G+OB
vnQuXOUUX6BsVBT71aO83HcA
-----END CERTIFICATE REQUEST-----
```

Certificate Template:

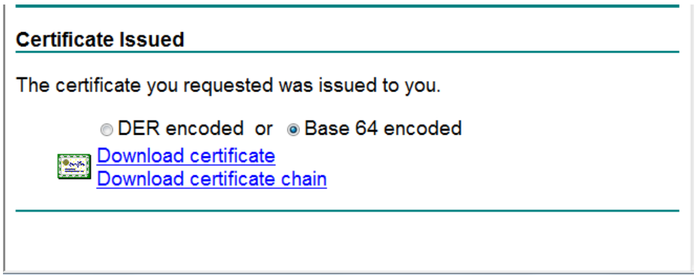
Web Server

Additional Attributes:

Attributes:

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

Figure 13-31: Certificate Issued Page



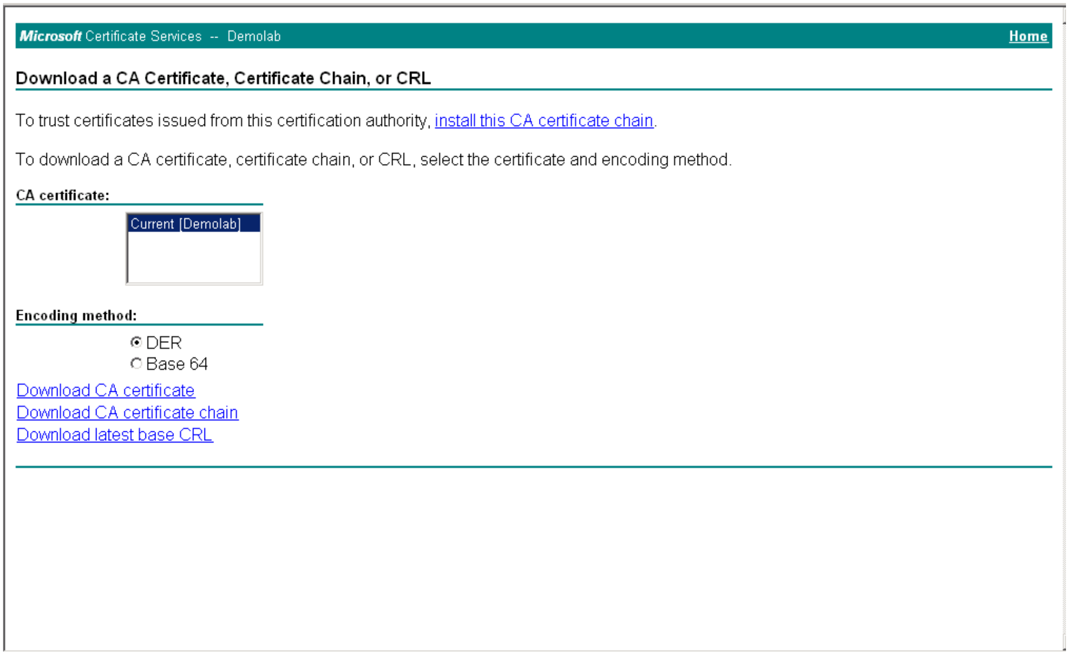
Certificate Issued

The certificate you requested was issued to you.

○ DER encoded or ● Base 64 encoded

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

Figure 13-32: 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]

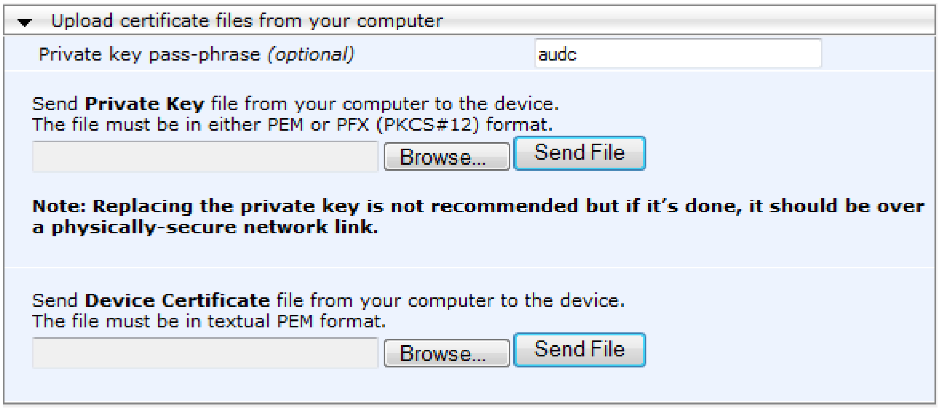
Encoding method:

● 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 the following:
    a. In the TLS Contexts table, select the required TLS Context index row (typically, the default TLS Context at Index 0 is used), and then click the **TLS Context Certificates** button, located at the bottom of the TLS Contexts page; the Context Certificates page appears.
    b. Scroll down to the **Upload certificates files from your computer** group, click the **Browse** button corresponding to the 'Send Device Certificate...' field, navigate to the *gateway.cer* certificate file that you saved on your computer in Step 14, and then click **Send File** to upload the certificate to the E-SBC.

Figure 13-33: Upload Device Certificate Files from your Computer Group



Upload certificate files from your computer

Private key pass-phrase *(optional)* audc

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

Browse... Send File

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.

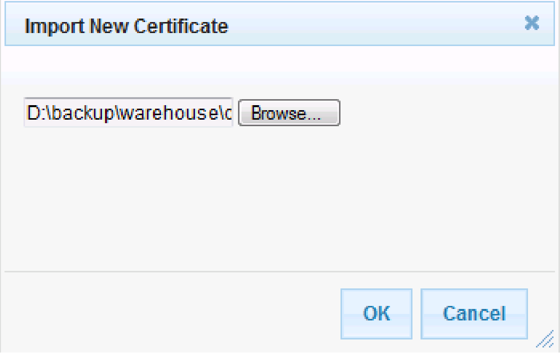
Browse... Send File

c. In the E-SBC's Web interface, return to the **TLS Contexts** page.

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

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

Figure 13-34: Importing Root Certificate into Trusted Certificates Store



Import New Certificate

D:\backup\warehouse\c

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

22. Reset the E-SBC with a burn to flash for your settings to take effect (see Section 13.17 on page 201).

13.10 Step 10: Configure SRTP

This step describes how to configure media security. If you configure the Microsoft Mediation Server to use SRTP, you need to configure the E-SBC to operate in the same manner. Note that SRTP was enabled for Skype for Business Server 2015 when you configured an IP Profile for Skype for Business Server 2015 (see Section 13.6 on page 160).

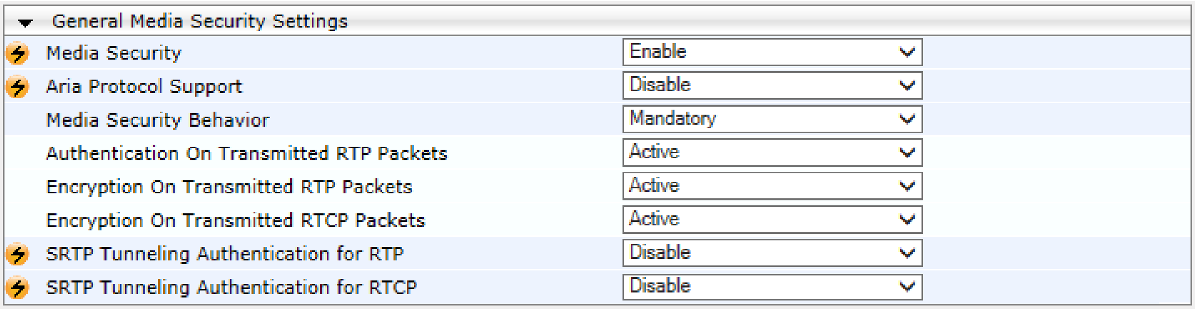
➢ To configure media security:

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

2. Configure the parameters as follows:

Parameter	Value
Media Security	**Enable**

Figure 13-35: Configuring SRTP



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

3. Click **Submit**.
4. Reset the E-SBC with a burn to flash for your settings to take effect (see Section 13.17 on page 201).

13.11 Step 11: Configure Maximum IP Media Channels

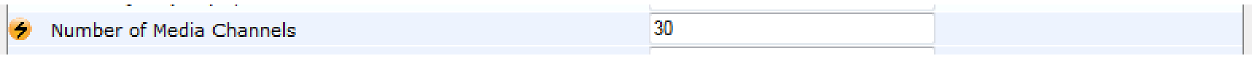
This step describes how to configure the maximum number of required IP media channels. The number of media channels represents the number of DSP channels that the E-SBC allocates to call sessions.

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

➢ To configure the maximum number of IP media channels:

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

Figure 13-36: Configuring Number of Media Channels



Number of Media Channels 30

2. In the 'Number of Media Channels' field, enter the number of media channels according to your environments transcoding calls (e.g., **30**).
3. Click **Submit**.
4. Reset the E-SBC with a burn to flash for your settings to take effect (see Section 13.17 on page 201).

13.12 Step 12: Configure IP-to-IP Call Routing Rules

This step describes how to configure IP-to-IP call routing rules. These rules define the routes for forwarding SIP messages (e.g., INVITE) received from one IP entity to another. The E-SBC selects the rule whose configured input characteristics (e.g., IP Group) match those of the incoming SIP message. If the input characteristics do not match the first rule in the table, they are compared to the second rule, and so on, until a matching rule is located. If no rule is matched, the message is rejected. The routing rules use the configured IP Groups to denote the source and destination of the call. As configured in Section 13.7 on page 159, IP Group 1 represents Skype for Business Server 2015, and IP Group 2 represents Vendor SIP Trunk.

For the interoperability test topology, the following IP-to-IP routing rules need to be configured to route calls between Skype for Business Server 2015 (LAN) and Vendor SIP Trunk (WAN):

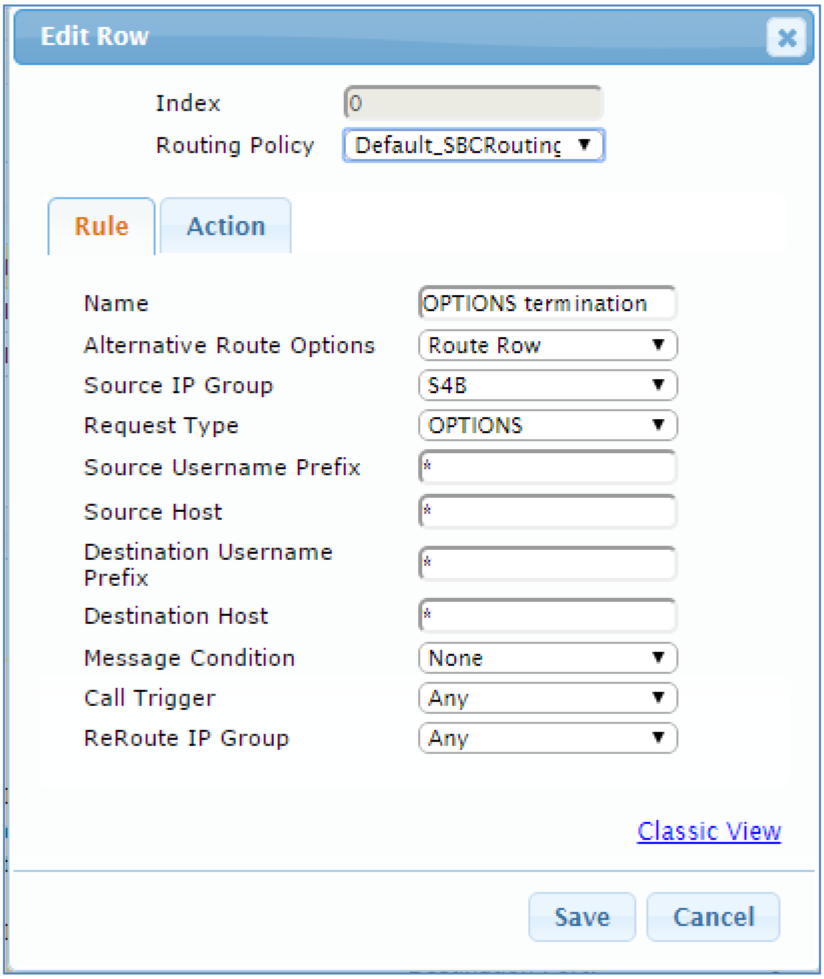
- Terminate SIP OPTIONS messages on the E-SBC that are received from the LAN
- Calls from Skype for Business Server 2015 to Vendor SIP Trunk
- Calls from Vendor SIP Trunk to Skype for Business Server 2015

➢ To configure IP-to-IP routing rules:

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

Parameter	Value
Index	**0**
Name	**Terminate OPTIONS** (arbitrary descriptive name)
Source IP Group	**S4B**
Request Type	**OPTIONS**

Figure 13-37: Configuring IP-to-IP Routing Rule for Terminating SIP OPTIONS from LAN – Rule Tab

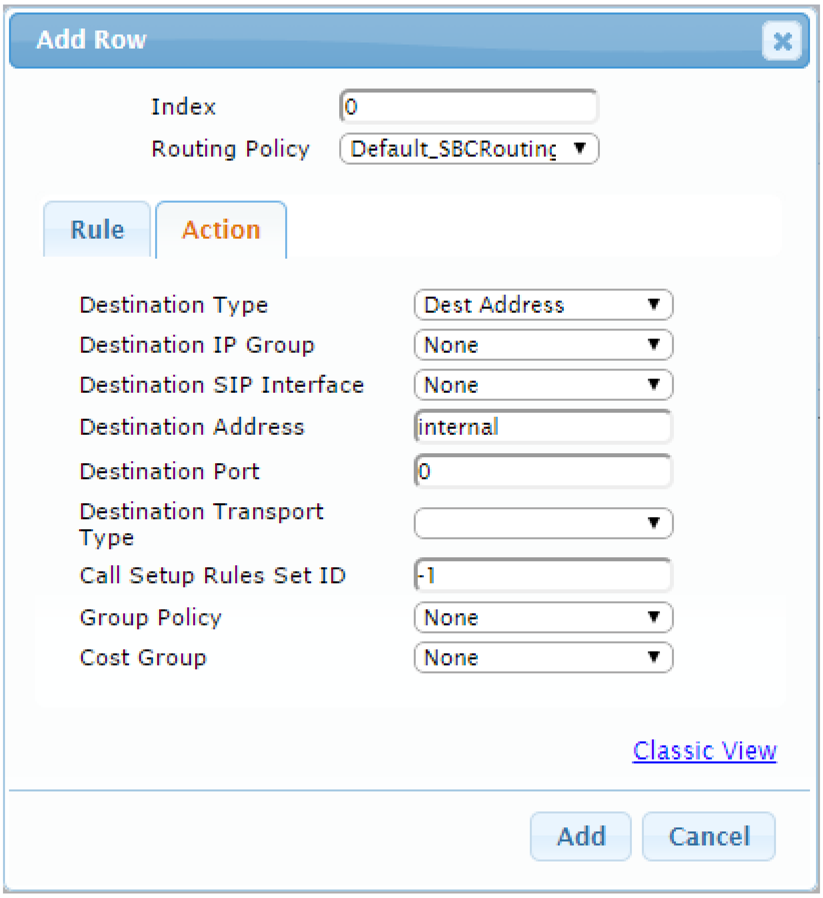


Index	0
Routing Policy	Default_SBCRouting ▼
Name	OPTIONS termination
Alternative Route Options	Route Row ▼
Source IP Group	S4B ▼
Request Type	OPTIONS ▼
Source Username Prefix	*
Source Host	*
Destination Username Prefix	*
Destination Host	*
Message Condition	None ▼
Call Trigger	Any ▼
ReRoute IP Group	Any ▼

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

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

Figure 13-38: Configuring IP-to-IP Routing Rule for Terminating SIP OPTIONS from LAN – Action Tab



Index	0
Routing Policy	Default_SBCRoutinc
Destination Type	Dest Address
Destination IP Group	None
Destination SIP Interface	None
Destination Address	internal
Destination Port	0
Destination Transport Type	
Call Setup Rules Set ID	-1
Group Policy	None
Cost Group	None

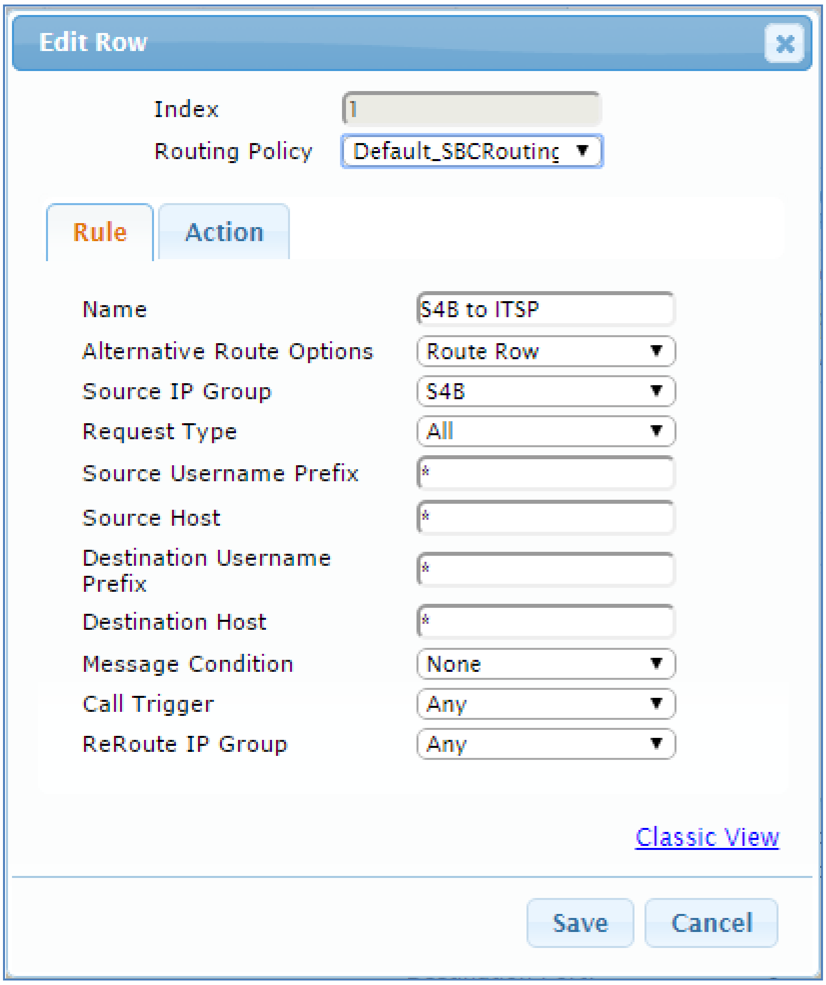
3. Configure a rule to route calls from Skype for Business Server 2015 to Vendor SIP Trunk:

   a. Click **Add**.

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

Parameter	Value
Index	**1**
Route Name	**S4B to ITSP** (arbitrary descriptive name)
Source IP Group	**S4B**

Figure 13-39: Configuring IP-to-IP Routing Rule for S4B to ITSP – Rule tab

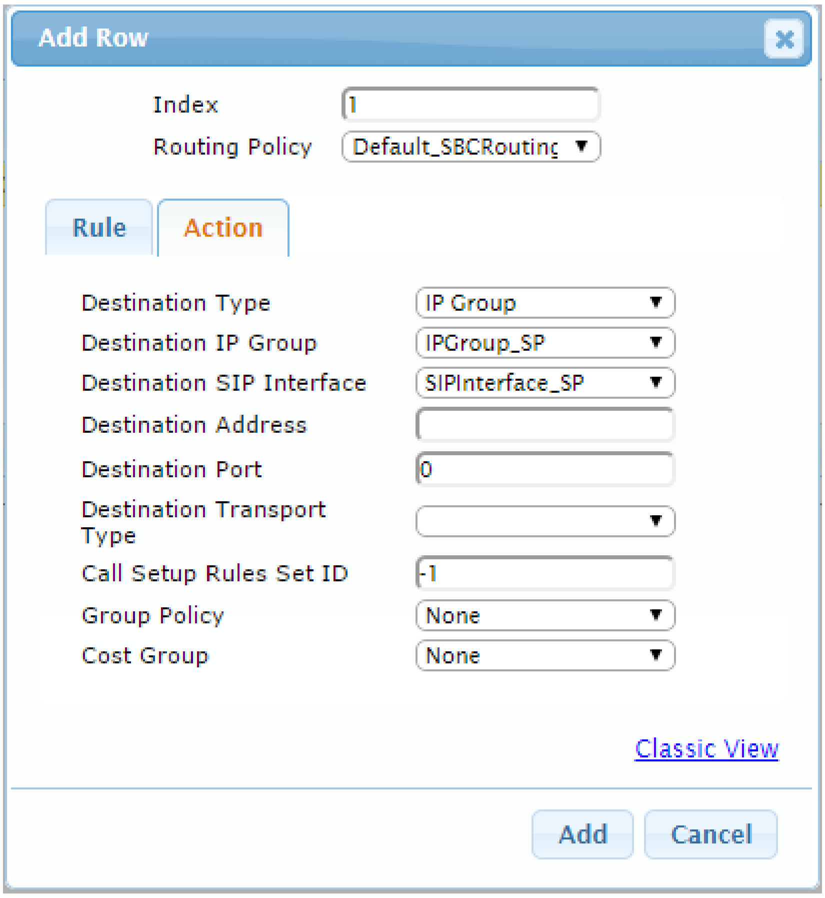


Index	1
Routing Policy	Default_SBCRouting
Name	S4B to ITSP
Alternative Route Options	Route Row
Source IP Group	S4B
Request Type	All
Source Username Prefix	*
Source Host	*
Destination Username Prefix	*
Destination Host	*
Message Condition	None
Call Trigger	Any
ReRoute IP Group	Any

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

Parameter	Value
Destination Type	**IP Group**
Destination IP Group	**SP**
Destination SIP Interface	**SP**

Figure 13-40: Configuring IP-to-IP Routing Rule for S4B to ITSP – Action tab

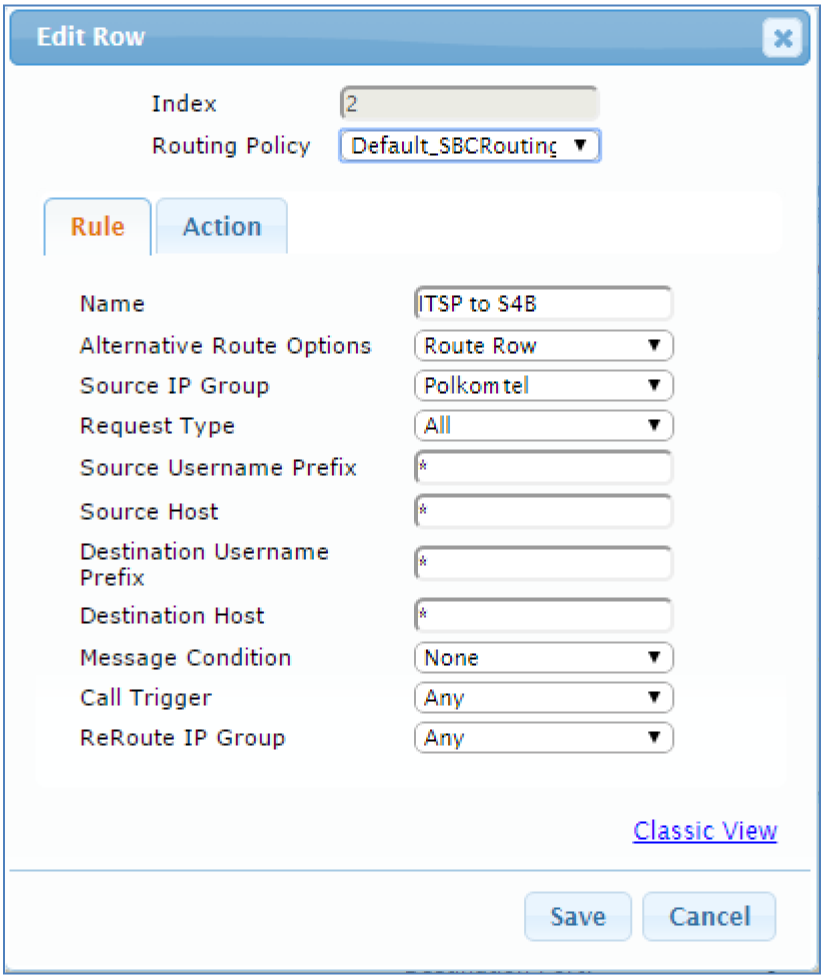


Index: 1
Routing Policy: Default_SBCRouting
Destination Type: IP Group
Destination IP Group: IPGroup_SP
Destination SIP Interface: SIPInterface_SP
Destination Address:
Destination Port: 0
Destination Transport Type:
Call Setup Rules Set ID: -1
Group Policy: None
Cost Group: None

4. To configure rule to route calls from Vendor SIP Trunk to Skype for Business Server 2015:
   a. Click Add.
   b. Click the **Rule** tab, and then configure the parameters as follows:

Parameter	Value
Index	**2**
Route Name	**ITSP to S4B** (arbitrary descriptive name)
Source IP Group	**SP**

Figure 13-41: Configuring IP-to-IP Routing Rule for ITSP to S4B – Rule tab

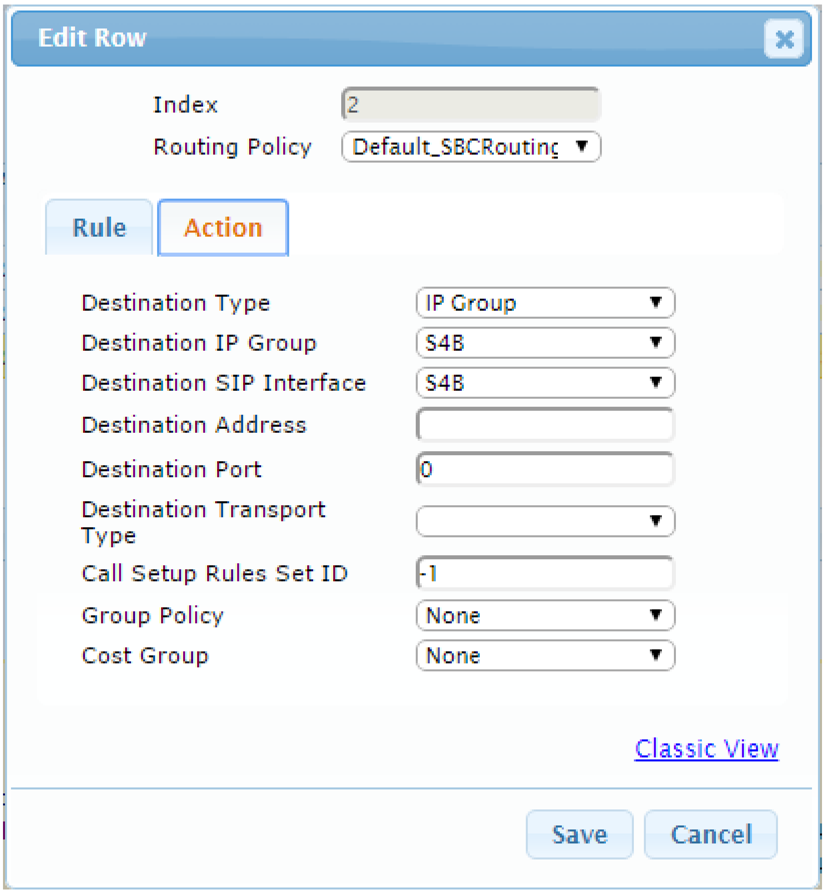


Index	2
Routing Policy	Default_SBCRouting
Name	ITSP to S4B
Alternative Route Options	Route Row
Source IP Group	Polkomtel
Request Type	All
Source Username Prefix	*
Source Host	*
Destination Username Prefix	*
Destination Host	*
Message Condition	None
Call Trigger	Any
ReRoute IP Group	Any

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

Parameter	Value
Destination Type	**IP Group**
Destination IP Group	**S4B**
Destination SIP Interface	**S4B**

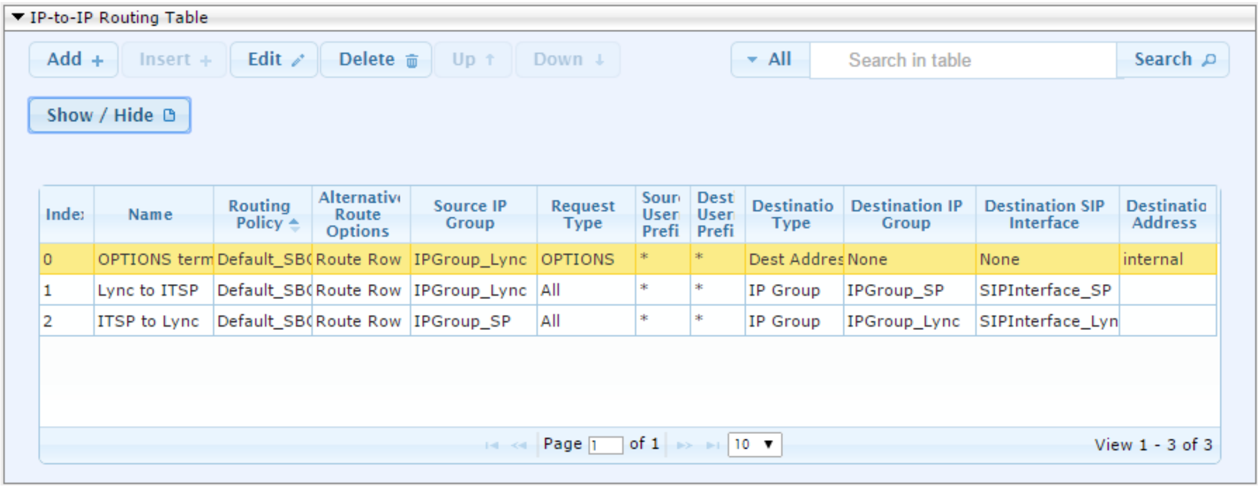
Figure 13-42: Configuring IP-to-IP Routing Rule for ITSP to S4B – Action tab



Index	2
Routing Policy	Default_SBCRoutinc
Destination Type	IP Group
Destination IP Group	S4B
Destination SIP Interface	S4B
Destination Address	
Destination Port	0
Destination Transport Type	
Call Setup Rules Set ID	-1
Group Policy	None
Cost Group	None

The configured routing rules are shown in the figure below:

Figure 13-43: Configured IP-to-IP Routing Rules in IP-to-IP Routing Table



Inde:	Name	Routing Policy	Alternativ Route Options	Source IP Group	Request Type	Sour User Prefi	Dest User Prefi	Destinatio Type	Destination IP Group	Destination SIP Interface	Destinatio Address
0	OPTIONS term	Default_SB(	Route Row	IPGroup_Lync	OPTIONS	*	*	Dest Addres	None	None	internal
1	Lync to ITSP	Default_SB(	Route Row	IPGroup_Lync	All	*	*	IP Group	IPGroup_SP	SIPInterface_SP	
2	ITSP to Lync	Default_SB(	Route Row	IPGroup_SP	All	*	*	IP Group	IPGroup_Lync	SIPInterface_Lyn	

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

13.13 Step 13: Configure IP-to-IP Manipulation Rules

This step describes how to configure IP-to-IP manipulation rules. These rules manipulate the source and / or destination number. The manipulation rules use the configured IP Groups to denote the source and destination of the call. As configured in Section 13.7 on page 159, IP Group 0 represents Skype for Business Server 2015, and IP Group 1 represents Vendor SIP Trunk.

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

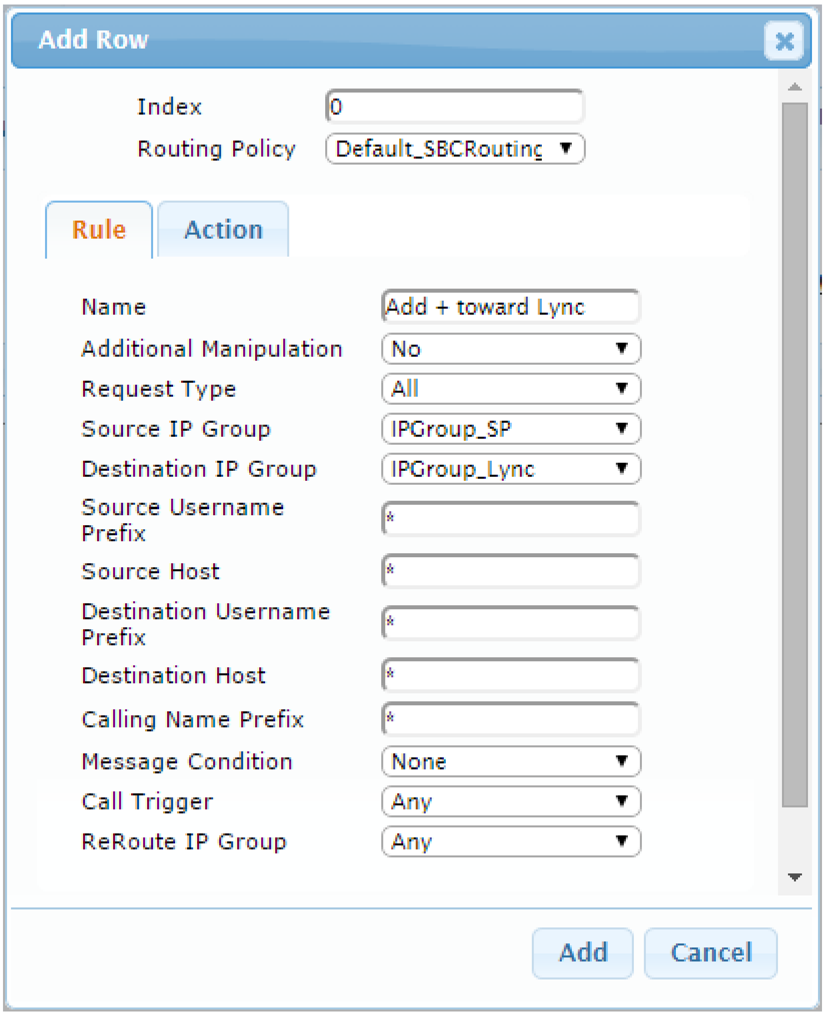
For this interoperability test topology, a manipulation is configured to add the "+" (plus sign) to the destination number for calls from the Vendor SIP Trunk IP Group to the Skype for Business Server 2015 IP Group for any destination username prefix.

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

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

Parameter	Value
Index	**0**
Name	**Add + toward S4B**
Source IP Group	**SP**
Destination IP Group	**S4B**
Destination Username Prefix	***** (asterisk sign)

Figure 13-44: Configuring IP-to-IP Outbound Manipulation Rule – Rule Tab



Add Row

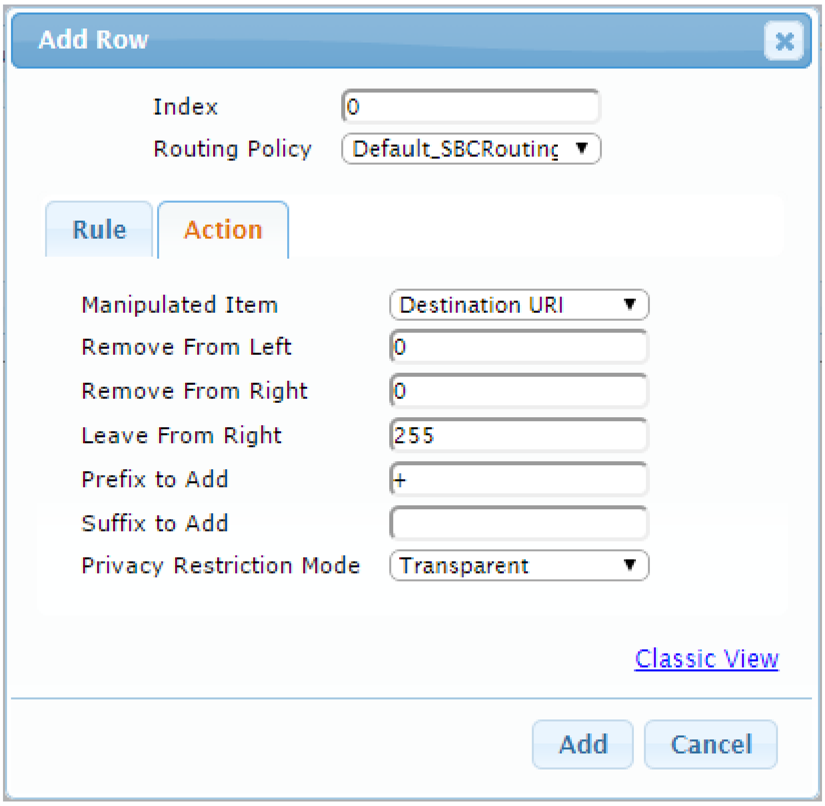
Index	0
Routing Policy	Default_SBCRouting

Name	Add + toward Lync
Additional Manipulation	No
Request Type	All
Source IP Group	IPGroup_SP
Destination IP Group	IPGroup_Lync
Source Username Prefix	*
Source Host	*
Destination Username Prefix	*
Destination Host	*
Calling Name Prefix	*
Message Condition	None
Call Trigger	Any
ReRoute IP Group	Any

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

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

Figure 13-45: Configuring IP-to-IP Outbound Manipulation Rule - Action Tab



Add Row

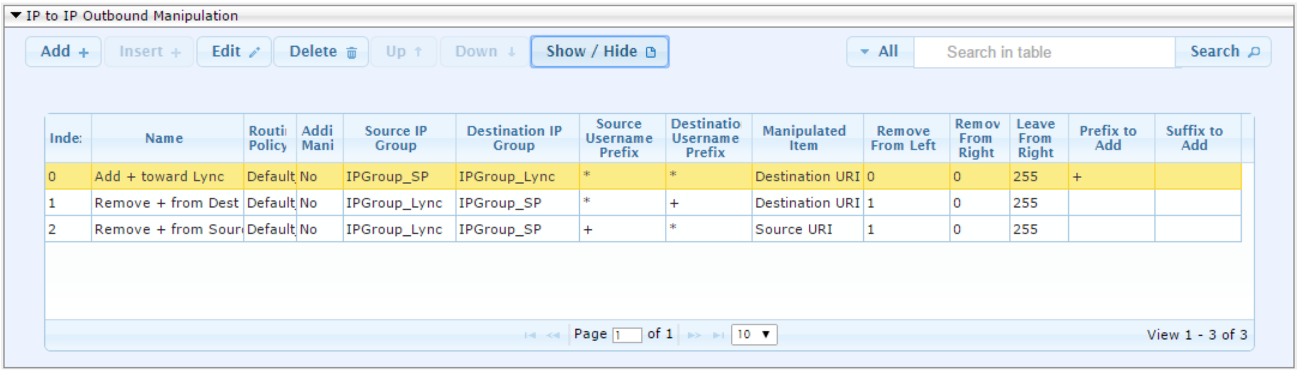
Index	0
Routing Policy	Default_SBCRouting ▼

Manipulated Item	Destination URI ▼
Remove From Left	0
Remove From Right	0
Leave From Right	255
Prefix to Add	+
Suffix to Add	
Privacy Restriction Mode	Transparent ▼

5. Click **Submit**.

The figure below shows an example of configured IP-to-IP outbound manipulation rules for calls between Skype for Business Server 2015 IP Group and Vendor SIP Trunk IP Group:

Figure 13-46: Example of Configured IP-to-IP Outbound Manipulation Rules



Inde:	Name	Routi Policy	Addi Mani	Source IP Group	Destination IP Group	Source Username Prefix	Destinatio Username Prefix	Manipulated Item	Remove From Left	Remov From Right	Leave From Right	Prefix to Add	Suffix to Add
0	Add + toward Lync	Default	No	IPGroup_SP	IPGroup_Lync	*	*	Destination URI	0	0	255	+	
1	Remove + from Dest	Default	No	IPGroup_Lync	IPGroup_SP	*	+	Destination URI	1	0	255		
2	Remove + from Sour	Default	No	IPGroup_Lync	IPGroup_SP	+	*	Source URI	1	0	255		

Rule Index	Description
1	Calls from ITSP IP Group to S4B IP Group with any destination number (*), add "+" to the prefix of the destination number.
2	Calls from S4B IP Group to ITSP IP Group with the prefix destination number "+", remove "+" from this prefix.
3	Calls from S4B IP Group to ITSP IP Group with source number prefix "+", remove the "+" from this prefix.

13.14 Step 14: Configure Message Manipulation Rules

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

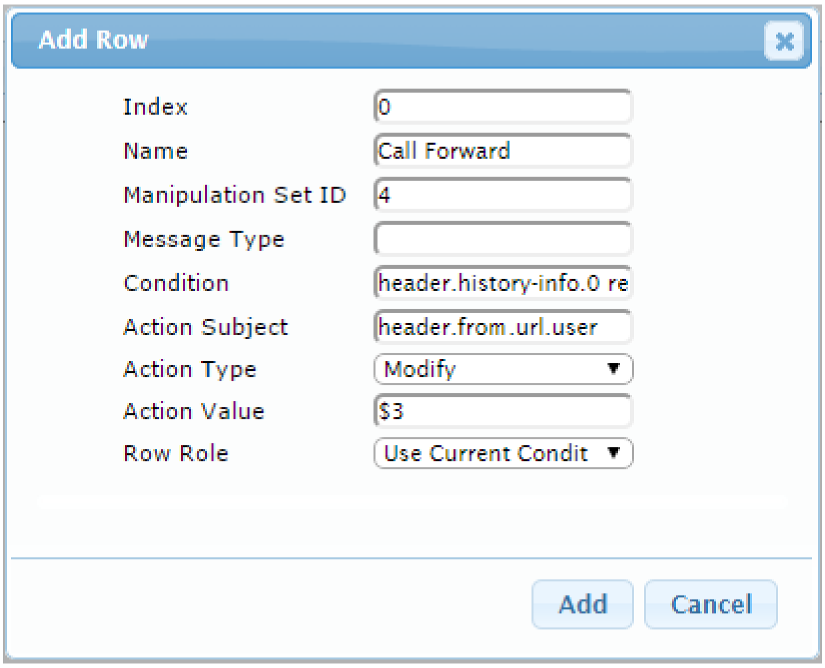
Once you have configured the SIP message manipulation rules, you need to assign them to the relevant IP Group (in the IP Group table) and determine whether they must be applied to inbound or outbound messages.

➢ To configure SIP message manipulation rule:

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

Parameter	Value
Index	**0**
Name	**Call Forward**
Manipulation Set ID	**4**
Condition	**header.history-info.0 regex (<sip:)(.*)(@)(.*)**
Action Subject	**header.from.url.user**
Action Type	**Modify**
Action Value	**$3**

Figure 13-47: Configuring SIP Message Manipulation Rule 0 (for Vendor SIP Trunk)

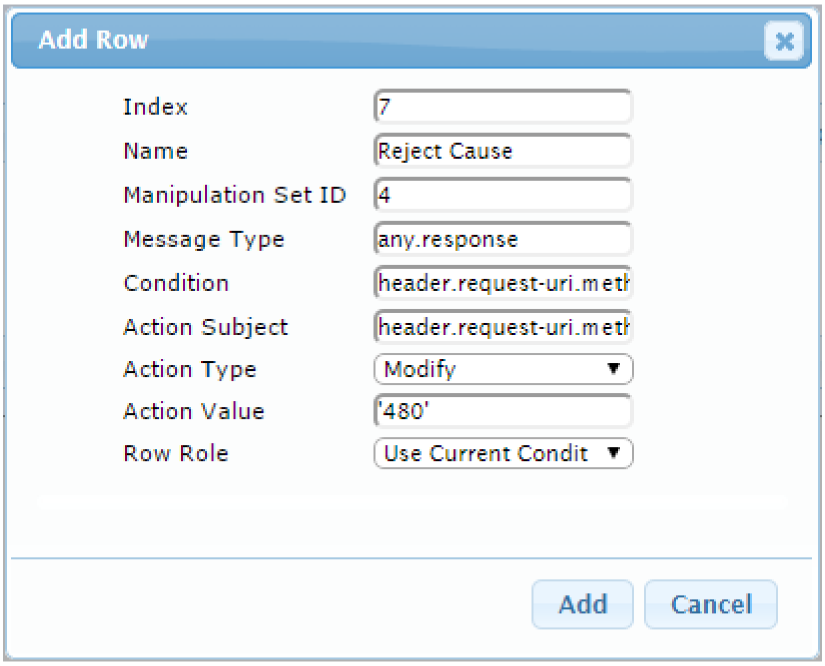


Index	0
Name	Call Forward
Manipulation Set ID	4
Message Type	
Condition	header.history-info.0 re
Action Subject	header.from.url.user
Action Type	Modify
Action Value	$3
Row Role	Use Current Condit

3. Configure another manipulation rule (Manipulation Set 4) for Vendor SIP Trunk. This rule is applied to response messages sent to the Vendor SIP Trunk IP Group for Rejected Calls initiated by the Skype for Business Server 2015 IP Group. This replaces the method type ‘503’ with the value ‘480’, because Vendor SIP Trunk not recognizes ‘503’ method type.

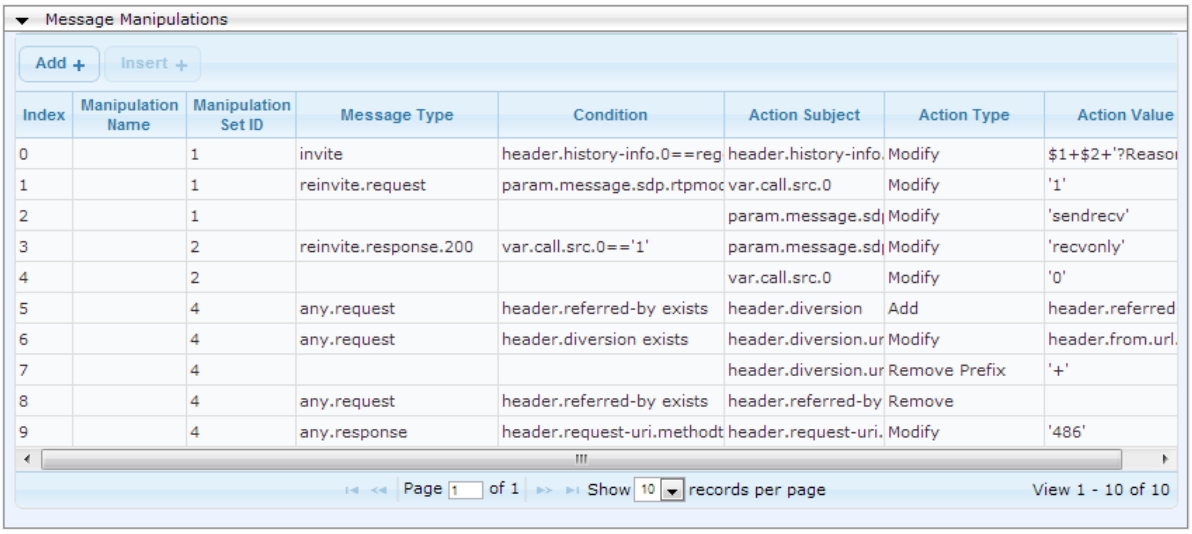
Parameter	Value
Index	**7**
Name	**Reject Cause**
Manipulation Set ID	**4**
Message Type	**any.response**
Condition	**header.request-uri.methodtype=='503'**
Action Subject	**header.request-uri.methodtype**
Action Type	**Modify**
Action Value	**'480'**

Figure 13-48: Configuring SIP Message Manipulation Rule 7 (for Vendor SIP Trunk)



Index	7
Name	Reject Cause
Manipulation Set ID	4
Message Type	any.response
Condition	header.request-uri.meth
Action Subject	header.request-uri.meth
Action Type	Modify
Action Value	'480'
Row Role	Use Current Condit

Figure 13-49: Example of Configured SIP Message Manipulation Rules



Index	Manipulation Name	Manipulation Set ID	Message Type	Condition	Action Subject	Action Type	Action Value
0		1	invite	header.history-info.0==reg	header.history-info.	Modify	$1+$2+'?Reaso
1		1	reinvite.request	param.message.sdp.rtpmoc	var.call.src.0	Modify	'1'
2		1			param.message.sd	Modify	'sendrecv'
3		2	reinvite.response.200	var.call.src.0=='1'	param.message.sd	Modify	'recvonly'
4		2			var.call.src.0	Modify	'0'
5		4	any.request	header.referred-by exists	header.diversion	Add	header.referred
6		4	any.request	header.diversion exists	header.diversion.ur	Modify	header.from.url.
7		4			header.diversion.ur	Remove Prefix	'+'
8		4	any.request	header.referred-by exists	header.referred-by	Remove	
9		4	any.response	header.request-uri.methodt	header.request-uri.	Modify	'486'

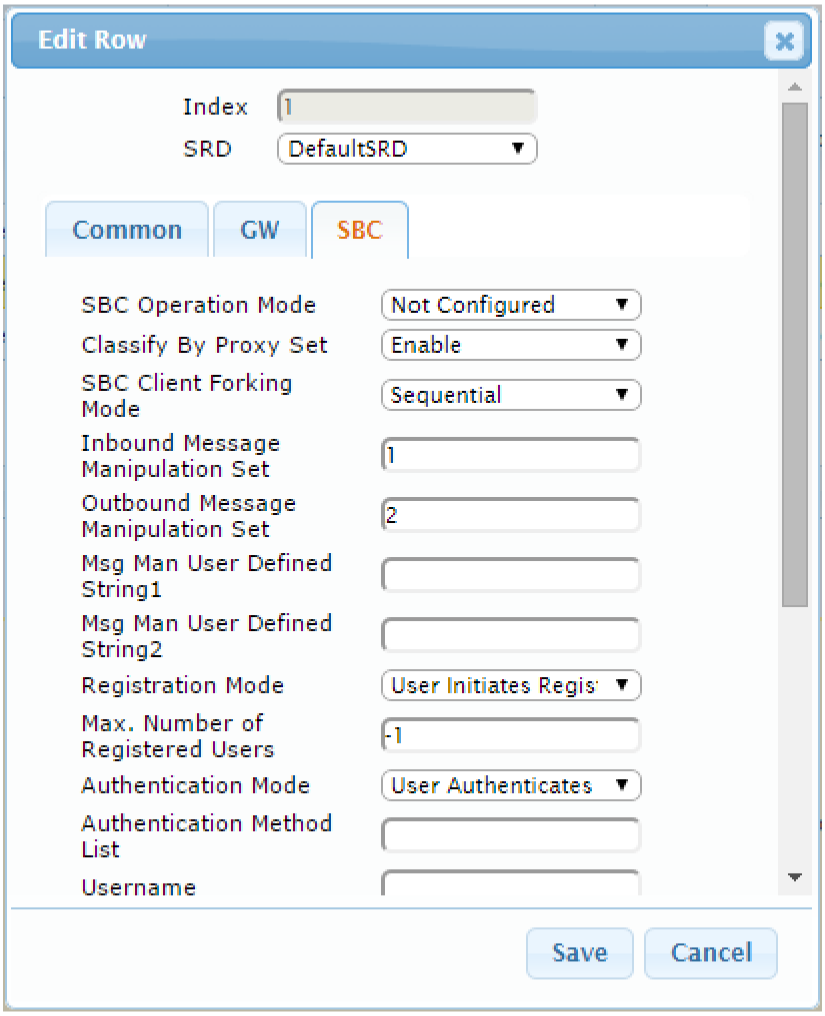
The table displayed below includes SIP message manipulation rules which are grouped together under Manipulation Set IDs (Manipulation Set IDs 1, 2, and 4) and which are executed for messages sent to and from the Vendor SIP Trunk IP Group as well as the Skype for Business Server 2015 IP Group. These rules are specifically required to enable proper interworking between Vendor SIP Trunk and Skype for Business Server 2015. The specific items are needed to support Music on Hold (rules 1-4). Refer to the *User's Manual* for further details concerning the full capabilities of header manipulation.

Table 13-1: Rule Index

	Rule Description	Reason for Introducing Rule
0	This rule applies to messages sent to the Vendor SIP Trunk IP Group in a call forward scenario. This replaces the user part of the SIP From Header with the value from the SIP History-Info Header.	For Call Forward scenarios, Vendor SIP Trunk needs that User part in SIP From Header will be defined number. In order to do this, User part of the SIP From Header replaced with the value from History-Info Header.
1	If the manipulation rule Index 0 (above) is executed, then the following rule is also executed. It removes History Info Header.	
2	For every SIP Re-INVITE request with SDP, where RTP mode = "sendonly" (occurs in a S4B-initiated Hold), create a variable and set it to **'1'**. This variable manages how the call will be handled in each state (answer, request, etc.).	In the Call Park scenario, Microsoft S4B sends Re-INVITE messages twice. The first message is sent with the SDP, where the RTP mode is set to “a=inactive”. The second message is sent with “a=sendonly”. The Vendor SIP Trunk has a problem recognizing two sequential Re-INVITE messages with different RTP modes. This causes the loss of the Music On Hold functionality in the Call Park scenario. These four rules are applied to work around this limitation.
3	If the previous manipulation rule (Index 0) is executed, then the following rule is also executed on the same SIP message: if RTP mode within the SDP is set to “sendonly”, change it to “sendrecv”.	
4	This rule attempts to normalize the call processing state back to S4B for the correct reply to the initially received “sendonly”. For every SIP Re-INVITE message with the variable set to **'1'**, change RTP mode to "recvonly". This SIP Re-INVITE message is the response sent from the Vendor SIP Trunk to the S4B-initiated Hold.	
5	If the manipulation rule Index 2 (above) is executed, then the following rule is also executed. If the variable is determined to be set to **"1"** (in the previous manipulation rule), then set it to **“0”** to normalize the call processing state. S4B now sends Music on Hold to the Vendor SIP Trunk even without the Vendor SIP Trunk knowing how to receive MoH. The call is now truly on hold with MoH.	
6	This rule applies to messages sent to Vendor SIP Trunk IP Group. This replaces the **host** part of the Referred-By Header with the value from the SIP From Header.	For Call Transfer initiated by Skype for Business Server 2015, Vendor SIP Trunk needs to replace the Host part of the SIP Referred-By Header with the value from the SIP From Header and user part of the From Header with the value from Referred-By Header.
7	If the manipulation rule Index 6 (above) is executed, then the following rule is also executed. It remove prefix ‘+47’ from the Referred-By Header.	
8	This rule applies to messages sent to the Vendor SIP Trunk IP Group. This rule replaces the **user** part of the **From** Header with the value from Referred-By Header.	

4. Assign Manipulation Set IDs 1 and 2 to the Skype for Business 2015 IP Group:
    a. Open the IP Group Table page (**Configuration** tab > **VoIP** menu > **VoIP Network** > **IP Group Table**).
    b. Select the row of the Skype for Business 2015 IP Group, and then click **Edit**.
    c. Click the **SBC** tab.
    d. Set the 'Inbound Message Manipulation Set' field to **1**.
    e. Set the 'Outbound Message Manipulation Set' field to **2**.

Figure 13-50: Assigning Manipulation Set to the Skype for Business 2015 IP Group



Index	1
SRD	DefaultSRD
SBC Operation Mode	Not Configured
Classify By Proxy Set	Enable
SBC Client Forking Mode	Sequential
Inbound Message Manipulation Set	1
Outbound Message Manipulation Set	2
Msg Man User Defined String1	
Msg Man User Defined String2	
Registration Mode	User Initiates Regis
Max. Number of Registered Users	-1
Authentication Mode	User Authenticates
Authentication Method List	
Username	

a. Click **Submit**.

5. Assign Manipulation Set ID 4 to the Vendor SIP trunk IP Group:

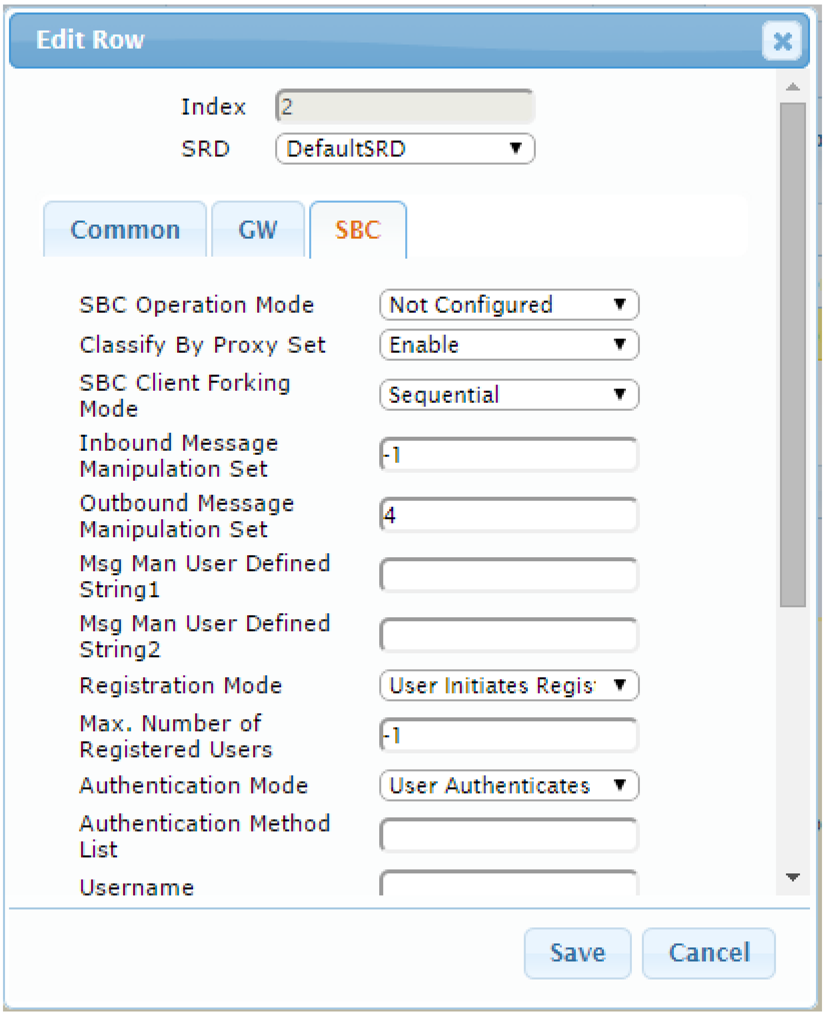
   a. Open the IP Group Table page (**Configuration** tab > **VoIP** menu > **VoIP Network** > **IP Group Table**).

   b. Select the row of the Vendor SIP trunk IP Group, and then click **Edit**.

   c. Click the **SBC** tab.

   d. Set the 'Outbound Message Manipulation Set' field to **4**.

Figure 13-51: Assigning Manipulation Set 4 to the Vendor SIP Trunk IP Group



Edit Row

Index: 2

SRD: DefaultSRD

SBC Operation Mode: Not Configured

Classify By Proxy Set: Enable

SBC Client Forking Mode: Sequential

Inbound Message Manipulation Set: -1

Outbound Message Manipulation Set: 4

Msg Man User Defined String1:

Msg Man User Defined String2:

Registration Mode: User Initiates Regis

Max. Number of Registered Users: -1

Authentication Mode: User Authenticates

Authentication Method List:

Username:

   e. Click **Submit**.

13.15 Step 15: Configure Registration Accounts

This step describes how to configure SIP registration accounts. This is required so that the E-SBC can register with the Vendor SIP Trunk on behalf of Skype for Business Server 2015. The Vendor SIP Trunk requires registration and authentication to provide service.

In the interoperability test topology, the Served IP Group is Skype for Business Server 2015 IP Group and the Serving IP Group is Vendor SIP Trunk IP Group.

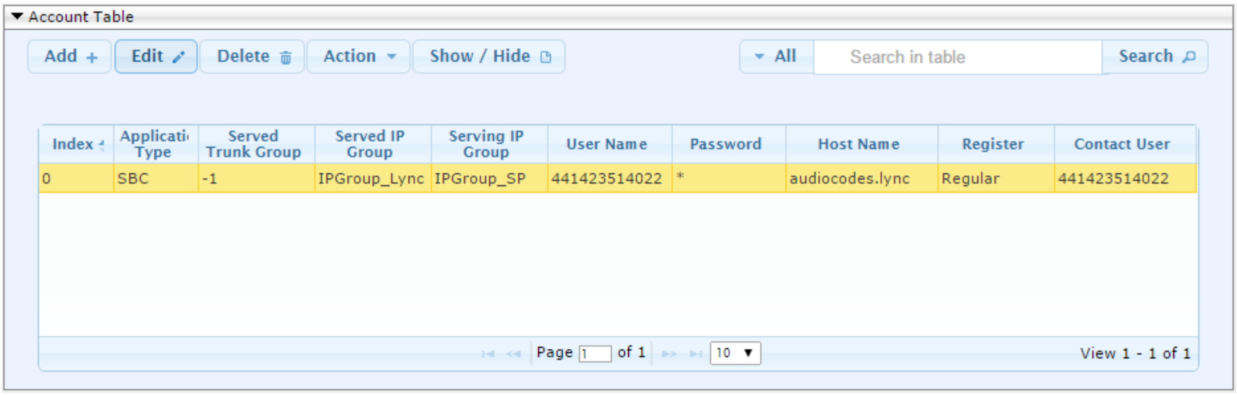
➢ To configure a registration account:

1. Open the Account Table page (**Configuration** tab > **VoIP** menu > **SIP Definitions** > **Account Table**).
2. Enter an index number (e.g., "0"), and then click **Add**.
3. Configure the account according to the provided information from , for example:

Parameter	Value
Application Type	**SBC**
Served IP Group	**S4B**
Serving IP Group	**SP**
Username	As provided by
Password	As provided by
Host Name	**audiocodes.s4b**
Register	**Regular**
Contact User	**441423514022** (trunk main line)

4. Click **Apply**.

Figure 13-52: Configuring SIP Registration Account



Index	Applicati Type	Served Trunk Group	Served IP Group	Serving IP Group	User Name	Password	Host Name	Register	Contact User
0	SBC	-1	IPGroup_Lync	IPGroup_SP	441423514022	*	audiocodes.lync	Regular	441423514022

13.16 Step 16: Miscellaneous Configuration

This section describes miscellaneous E-SBC configuration.

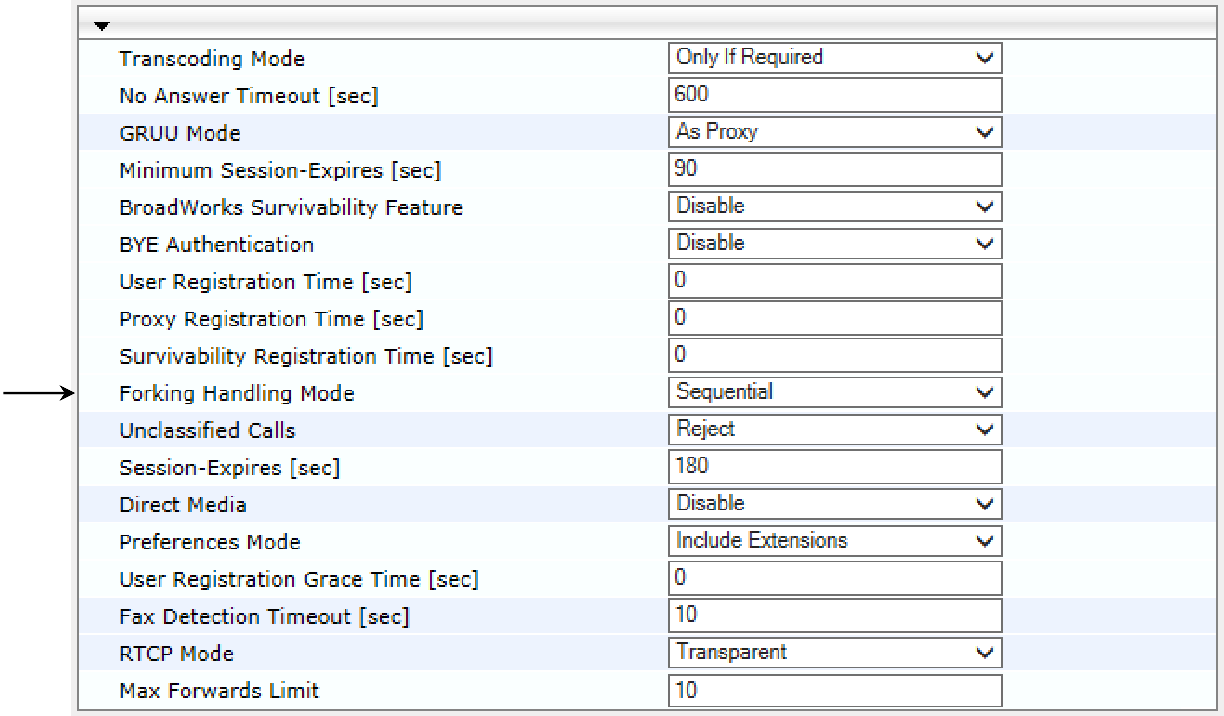
13.16.1 Step 16a: Configure Call Forking Mode

This step describes how to configure the E-SBC's handling of SIP 18x responses received for call forking of INVITE messages. For the interoperability test topology, if a SIP 18x response with SDP is received, the E-SBC opens a voice stream according to the received SDP. The E-SBC re-opens the stream according to subsequently received 18x responses with SDP or plays a ringback tone if a 180 response without SDP is received. It is mandatory to set this field for the Skype for Business Server 2015 environment.

➢ To configure call forking:

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

Figure 13-53: Configuring Forking Mode



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

3. Click **Submit**.

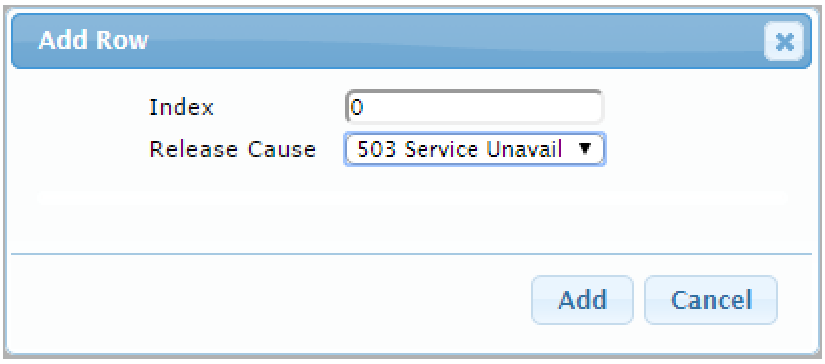
13.16.2 Step 16b: Configure SBC Alternative Routing Reasons

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

➢ To configure SIP reason codes for alternative IP routing:

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

Figure 13-54: SBC Alternative Routing Reasons Table - Add Record



Add Row

Index: 0

Release Cause: 503 Service Unavail

3. Click **Submit**.

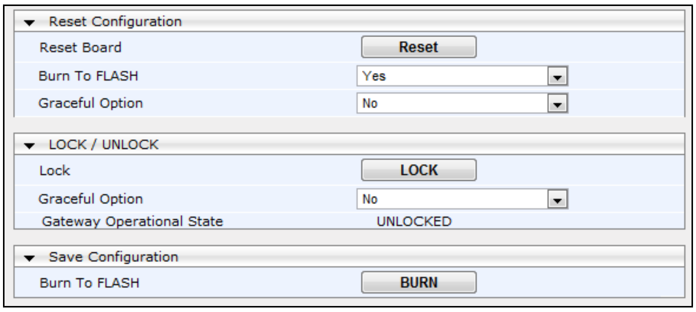
13.17 Step 17: Reset the E-SBC

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

➢ To save the configuration to flash memory:

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

Figure 13-55: Resetting the E-SBC



Reset Configuration

Reset Board	Reset
Burn To FLASH	Yes
Graceful Option	No

LOCK / UNLOCK

Lock	LOCK
Graceful Option	No
Gateway Operational State	UNLOCKED

Save Configuration

Burn To FLASH	BURN

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

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Part VI

Upgrading SBA Components

This part describes how to upgrade SBA components.

14 Upgrading MSFT and CU System Components

This section describes how to update system components using the SBA interface. The following components can be updated:

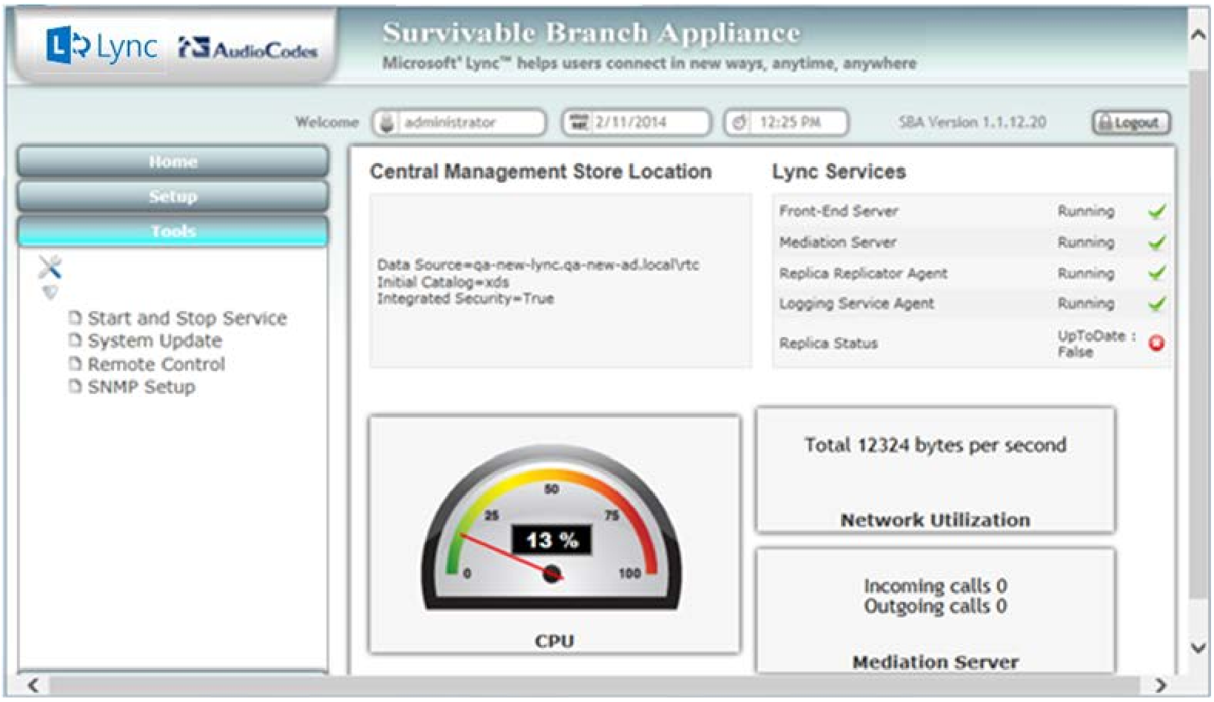
- Microsoft system components
- CU updates

The 'LyncServerUpdateInstaller.exe' provided by Microsoft installs all of the required Microsoft installation component files in a single action.

➢ To update system components:

1. Login to the SBA Management Interface.
2. In the SBA Management Interface, select the **Tools** tab, and then select the 'System Update' check box (insert red line around System Update).

Figure 14-1: Tools-System Update



Lync
AudioCodes
Survivable Branch Appliance
Microsoft® Lync™ helps users connect in new ways, anytime, anywhere
Home
Setup
Tools
Logout
50
25
75
0
100
13 %
CPU

Welcome administrator 2/11/2014 12:25 PM SBA Version 1.1.12.20

- Start and Stop Service
- System Update
- Remote Control
- SNMP Setup

Central Management Store Location

Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

Lync Services

Front-End Server	Running	✓
Mediation Server	Running	✓
Replica Replicator Agent	Running	✓
Logging Service Agent	Running	✓
Replica Status	UpToDate : False	●

Total 12324 bytes per second

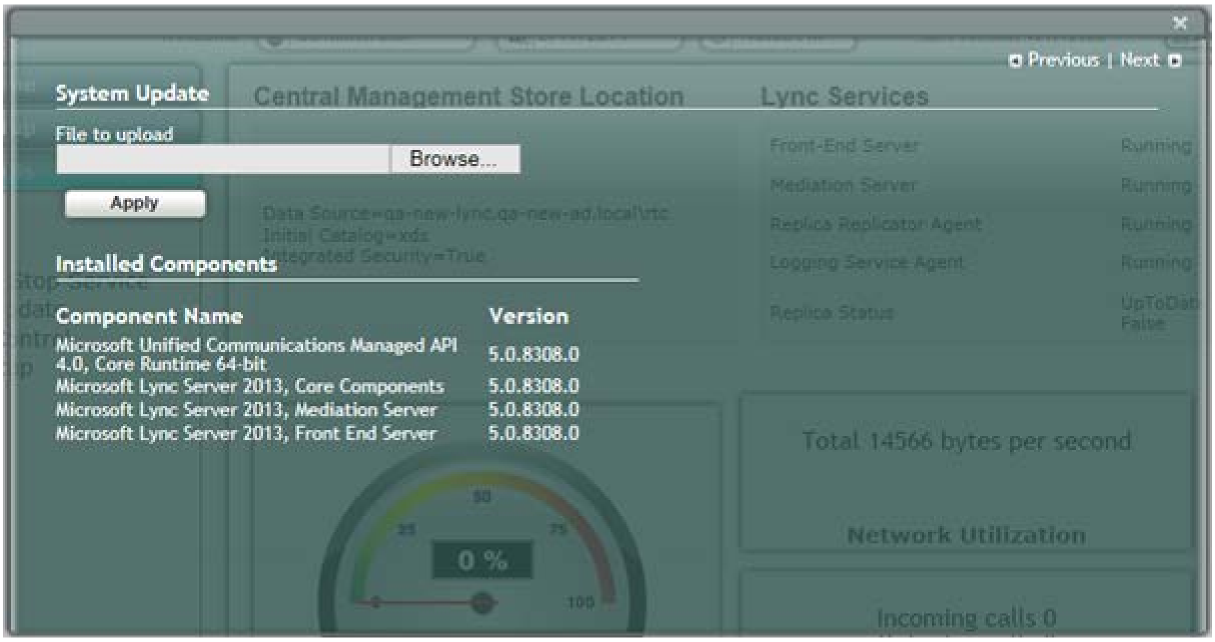
Network Utilization

Incoming calls 0
Outgoing calls 0

Mediation Server

The System Update screen is displayed:

Figure 14-2: System Update Screen



Installed Components

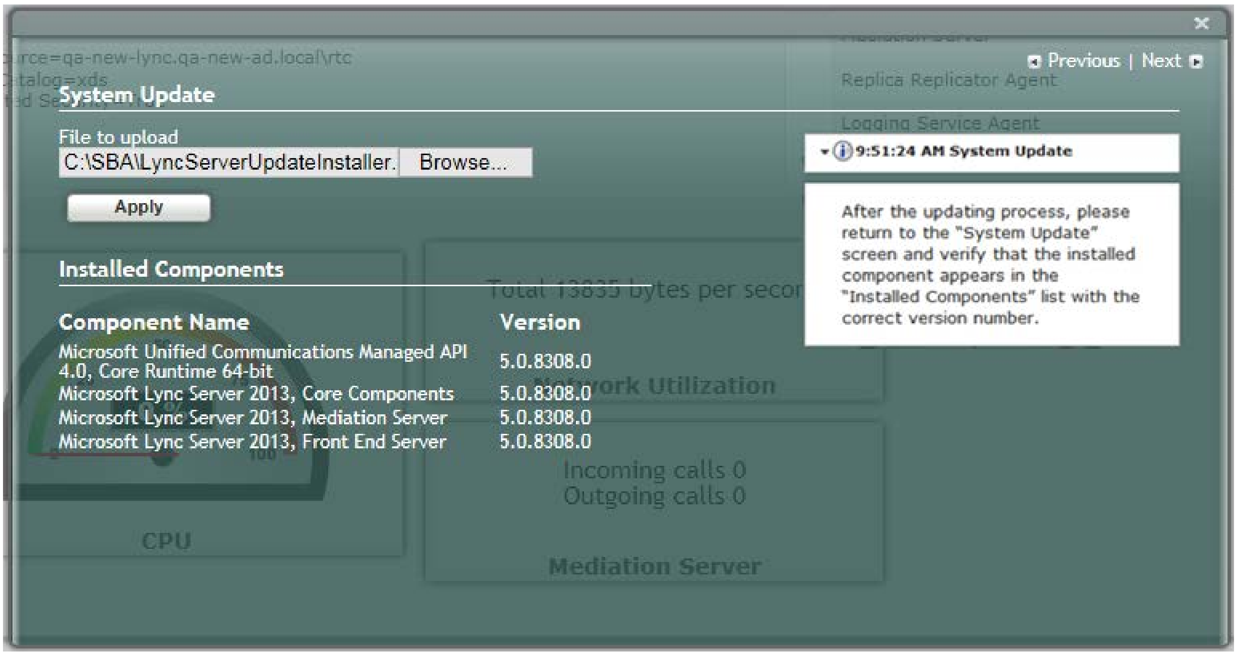
Component Name	Version
Microsoft Unified Communications Managed API 4.0, Core Runtime 64-bit	5.0.8308.0
Microsoft Lync Server 2013, Core Components	5.0.8308.0
Microsoft Lync Server 2013, Mediation Server	5.0.8308.0
Microsoft Lync Server 2013, Front End Server	5.0.8308.0

The currently installed Microsoft components are listed in the Installed Components pane.

3. In the ‘File to upload’ field, click **Browse** to select the 'LyncServerUpdateInstaller.exe' file to upload, and then click **Apply**.

The following screen is displayed:

Figure 14-3: System Update Microsoft Components



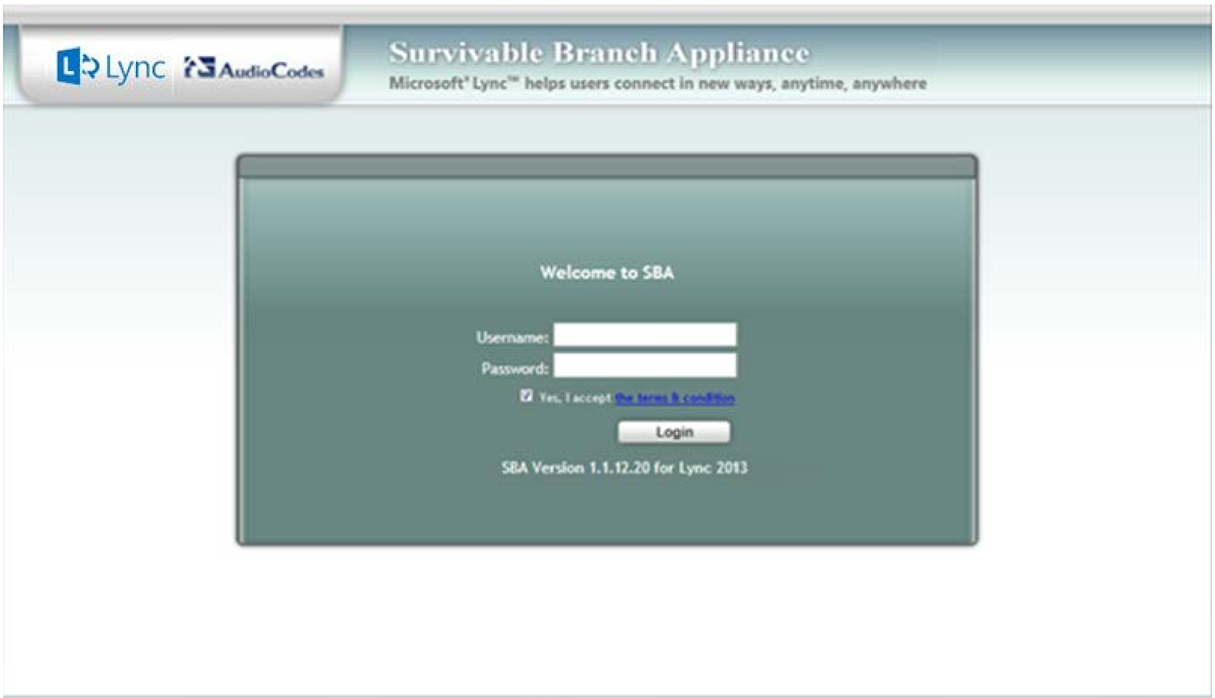
After the updating process, please return to the "System Update" screen and verify that the installed component appears in the "Installed Components" list with the correct version number.

Installed Components

Component Name	Version
Microsoft Unified Communications Managed API 4.0, Core Runtime 64-bit	5.0.8308.0
Microsoft Lync Server 2013, Core Components	5.0.8308.0
Microsoft Lync Server 2013, Mediation Server	5.0.8308.0
Microsoft Lync Server 2013, Front End Server	5.0.8308.0

Wait a few minutes for the update to apply. At the end of the process, the System Logs out automatically and the login screen is displayed:

Figure 14-4: Login Screen after Automatic Log Out


Lync
AudioCodes
Survivable Branch Appliance
Microsoft® Lync™ helps users connect in new ways, anytime, anywhere
Welcome to SBA
Username:
Password:
☑ Yes, I accept the terms & condition
Login
SBA Version 1.1.12.20 for Lync 2013

4. Enter your login and password details, and if the Terms and Conditions checkbox is displayed, select it and then click **Login**.
5. Select the **Tools** tab, and then select the 'System Update' check box.
6. Verify that the new components and respective version numbers are displayed in the Installed Components pane.

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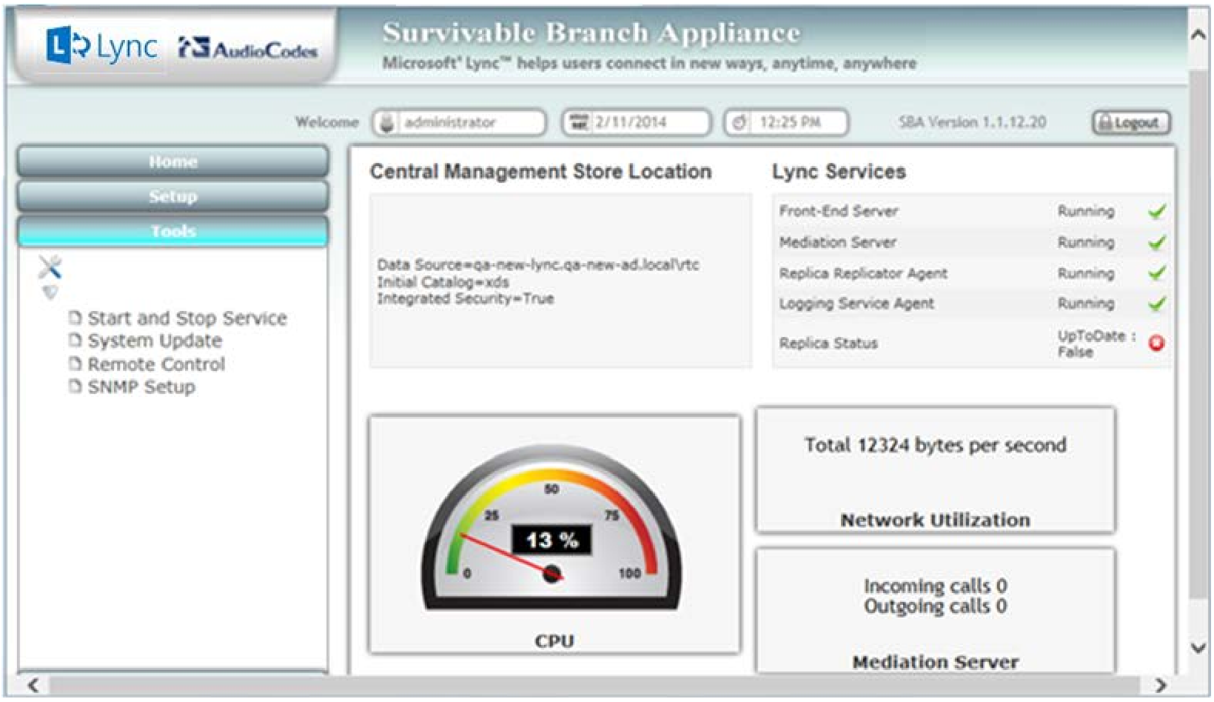
15 Upgrading the Management Interface

This section describes how to update the SBA Management Interface.

➢ To update the SBA Management Interface:

1. Login to the SBA Management Interface.
2. Select the **Tools** tab, and then select the 'System Update' check box.

Figure 15-1: Tools-System Update



Welcome administrator 2/11/2014 12:25 PM SBA Version 1.1.12.20

Central Management Store Location

Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

Lync Services

Front-End Server	Running	✓
Mediation Server	Running	✓
Replica Replicator Agent	Running	✓
Logging Service Agent	Running	✓
Replica Status	UpToDate : False	●

13 %

Total 12324 bytes per second

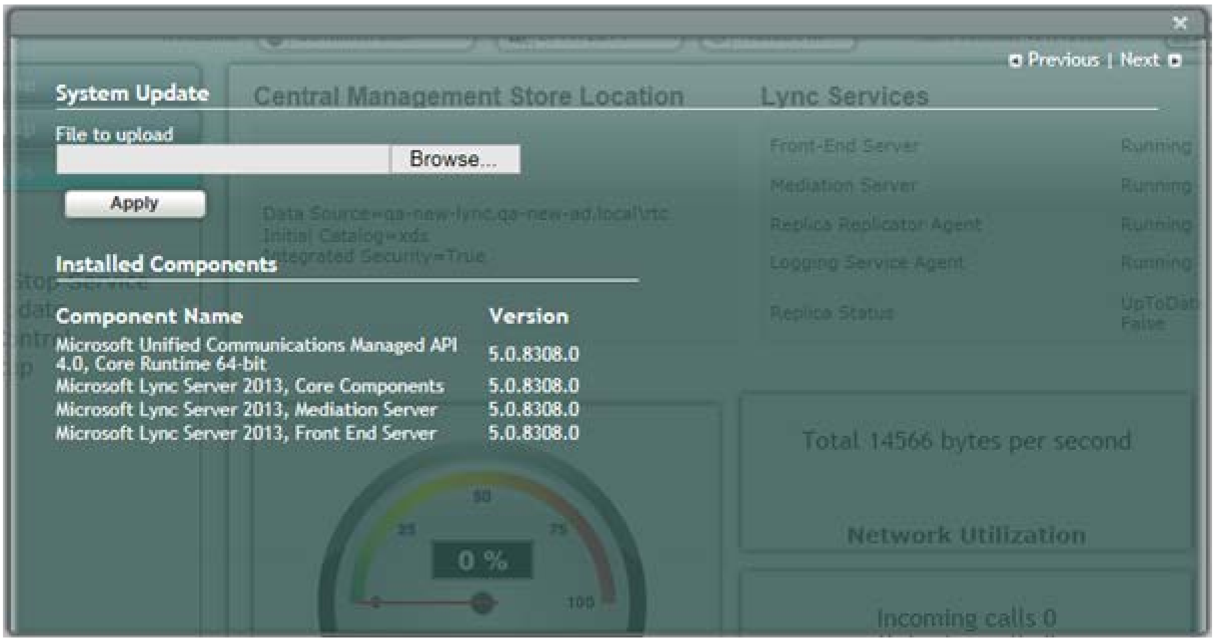
Network Utilization

Incoming calls 0
Outgoing calls 0

Mediation Server

The System Update screen is displayed:

Figure 15-2: System Update Screen

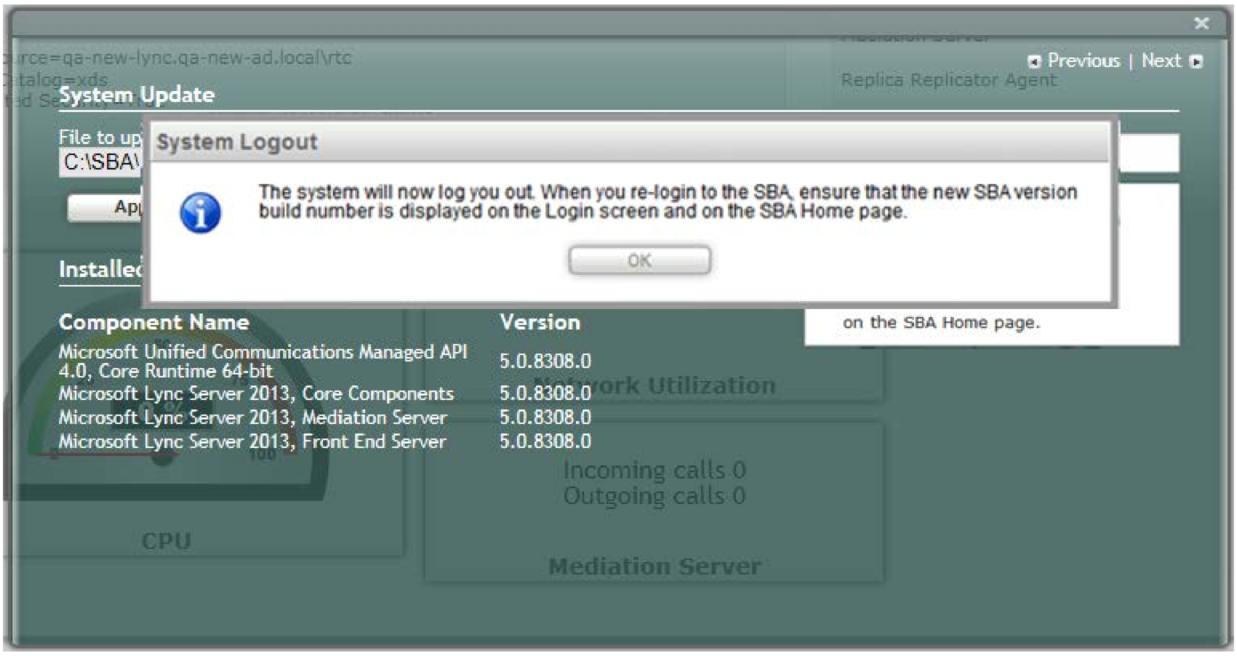


Installed Components

Component Name	Version
Microsoft Unified Communications Managed API 4.0, Core Runtime 64-bit	5.0.8308.0
Microsoft Lync Server 2013, Core Components	5.0.8308.0
Microsoft Lync Server 2013, Mediation Server	5.0.8308.0
Microsoft Lync Server 2013, Front End Server	5.0.8308.0

3. In the ‘File to upload’ field, click **Browse** to select the file to upload and then click **Apply**; the following screen is displayed:

Figure 15-3: System Update Message-SBA Management Interface Version



System Logout

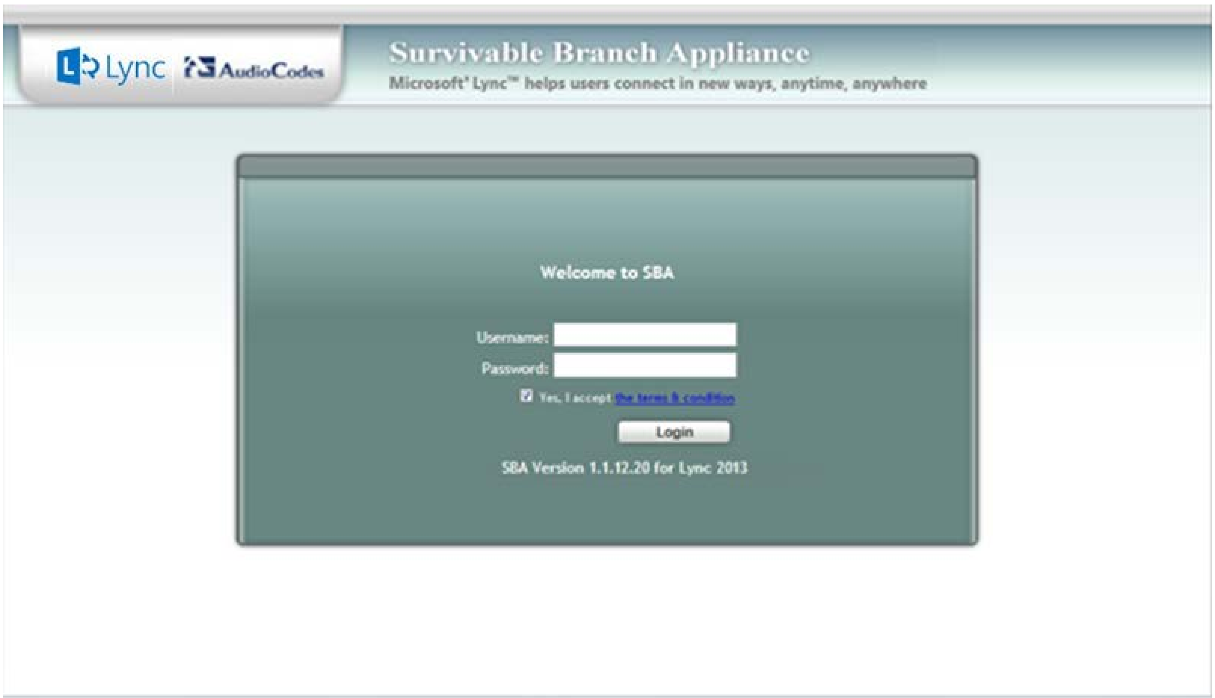
The system will now log you out. When you re-login to the SBA, ensure that the new SBA version build number is displayed on the Login screen and on the SBA Home page.

Component Name	Version
Microsoft Unified Communications Managed API 4.0, Core Runtime 64-bit	5.0.8308.0
Microsoft Lync Server 2013, Core Components	5.0.8308.0
Microsoft Lync Server 2013, Mediation Server	5.0.8308.0
Microsoft Lync Server 2013, Front End Server	5.0.8308.0

A time-stamp of the time that you commenced the System Update is displayed in the right-hand pane.

Wait a few minutes for the update to apply. At the end of the process, the System Logs out automatically and the login screen is displayed.

Figure 15-4: Login Screen after Automatic Log Out


Lync
AudioCodes
Survivable Branch Appliance
Microsoft® Lync™ helps users connect in new ways, anytime, anywhere
Welcome to SBA
Username:
Password:
☑ Yes, I accept the terms & condition
Login

SBA Version 1.1.12.20 for Lync 2013

4. In the Login screen, verify that the new SBA version number is displayed.
5. Enter your login and password details, and if the Terms and Conditions checkbox is displayed, select it and then click **Login**.
6. Ensure that the new SBA Management Interface version number is displayed in the SBA Home Page.

16 Upgrading using the SBA ProConnect

A customer with large SBA deployments might experience difficulties updating their SBA manually. Consequently, for better servicing of such deployments, AudioCodes now offers a new application 'SBA ProConnect', which is a Web Management tool for the purposes of easily installing Microsoft Cumulative Updates (CU) and for upgrading Skype for Business Server from a central location to the SBA devices.

Note: For more information, refer to the *SBA ProConnect User's Manual* and contact your AudioCodes representative.

Part VII

Upgrade and Recovery

17 Upgrade and Recovery - Introduction

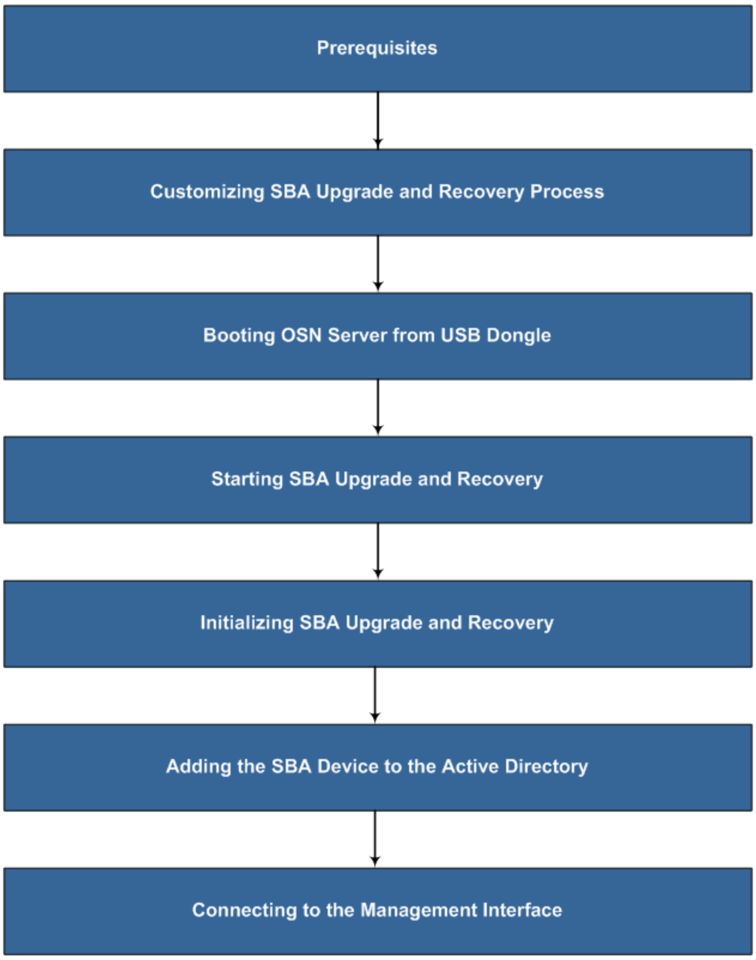
This chapter provides step-by-step instructions on how to upgrade the Survivable Branch Appliance (SBA) software application and how to recover it (in case of failure).

The SBA is hosted on the Mediant 2600B SBA OSN server platform, which is deployed at the remote branch office in the Skype for Business environment. Upon a WAN outage, the Mediant 2600B SBA maintains call continuity among Skype for Business clients and devices within the branch office.

The SBA Upgrade and Recovery procedure is done using AudioCodes SBA Upgrade and Recovery USB dongle which contains a later version of the SBA image file. The USB dongle also provides a text-based file (RecoveryUtil.ini) that allows you to customize the upgrade and recovery process.

The summary of the steps required to setup the SBA environment is shown in the figure below:

Figure 17-1: SBA-Summary of Steps


Prerequisites
Customizing SBA Upgrade and Recovery Process
Booting OSN Server from USB Dongle
Starting SBA Upgrade and Recovery
Initializing SBA Upgrade and Recovery
Adding the SBA Device to the Active Directory
Connecting to the Management Interface

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18 Upgrade and Recovery - Prerequisites

Before you can begin the SBA upgrade and recovery, do the following:

- Ensure that you have received the USB dongle in your SBA kit (from AudioCodes).

Figure 18-1: SBA Upgrade and Recovery USB Dongle

- Set the location of the SBA image file that you want to burn to the OSN server to one of the following:
- SBA Upgrade and Recovery USB dongle
- FTP server
- Local network
- Recovery Partition (drive D:\) on the OSN hard disk
- If you have recently obtained a later SBA image file version, it is recommended to copy it to the USB dongle (prior to performing the SBA upgrade and recovery), and then delete the old image from the USB dongle (the old image resides in the root folder with the file extension, *.wim).

Note:

- The USB dongle is supplied with an image of the SBA upgrade and recovery.
- When using the recovery partition of the OSN server as the location for the SBA image file, you must disable the partitions and disable disk formatting capabilities, using the RecoveryUtil.ini file (see Section 'Creating Disk Partitions' on page 220).
- You can also download the SBA image file from AudioCodes Web site at http://www.audiocodes.com/sba or obtain a DVD from AudioCodes with the new version.

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19 Customizing SBA Upgrade and Recovery

The RecoveryUtil.ini file is a text-based file that is located in the root directory on the supplied USB dongle. This file contains parameters for defining various options relating to the SBA upgrade and recovery process. The RecoveryUtil.ini file is supplied with recommended configuration settings. However, you can modify them to suit your requirements.

> **Warning:** Before plugging the USB dongle into the PC, ensure that the PC boot priority from USB is disabled or it’s set to the last priority. This setting is crucial. If your PC is set to boot from USB before it attempts to boot from the HDMX, then if your PC restarts while the USB dongle is plugged in, your PC boots from the USB dongle, thereby reformatting your PC and damaging your PC operating system.

The procedure below describes how to modify the RecoveryUtil.ini file.

➢ **To modify the RecoveryUtil.ini file:**

1. Plug the USB dongle into a USB port on the PC.
2. Open (using a text-based editor such as Notepad) the RecoveryUtil.ini file located on the USB dongle.
3. Perform the required modifications, as described in the subsequent subsections.
4. Save and close the file.
5. Remove the USB dongle from the PC.

19.1 Defining Manual or Automatic Start

You can configure the SBA upgrade and recovery to start manually or automatically, by using the RecoveryStartType parameter:

- Manually (recommended and default): To start the SBA upgrade and recovery manually, set the RecoveryStartType parameter to 1, as shown below:

  ```
  [Execution] RecoveryStartType= 1
  ```

  With this setting, you need to run the upgrade and recovery utility script manually from the DOS shell command line (using a serial communication console, i.e. HyperTerminal).

- Automatic: To start the SBA upgrade and recovery automatically, set the RecoveryStartType parameter to 0, as shown below:

  ```
  [Execution] RecoveryStartType= 0
  ```

With this setting, the SBA upgrade and recovery process runs automatically when Windows Pre-installation Environment starts. This setting should be used in scenarios where you cannot connect the serial console to Mediant 2600B SBA. In addition, it is highly recommended to set the parameter OnExit to 2 (see Section 19.6 on page 221) so that the Mediant 2600B SBA OSN server shuts down when the procedure completes.

19.2 Running the Process Immediately or Upon User Confirmation

You can configure the SBA upgrade and recovery to start automatically (immediately) or only upon user confirmation, by using the Automatic parameter.

- Upon Confirmation: To start the SBA upgrade and recovery only after user confirmation, set the Automatic parameter to 0, as shown below:

  ```
  [Execution] Automatic= 0
  ```

  Once the process starts, you are prompted (via the console) to confirm the SBA upgrade and recovery.

- Automatic (recommended and default): To start the SBA upgrade and recovery automatically (without confirmation), set the Automatic parameter to 1, as shown below:

  ```
  [Execution] Automatic= 1
  ```

  With this setting, the SBA upgrade and recovery starts immediately after the OSN server boots from the USB dongle.

19.3 Checking Disk before Image Burn

You can configure the SBA upgrade and recovery to check the disk before burning the SBA image to the OSN server, using the CheckDisk parameter. The result of this disk check is logged to the RecoveryLog.txt file, located on the USB dongle.

- Enable disk check (recommended and default): To enable disk checking before burning the image, set the CheckDisk parameter to 0, as shown below:

  ```
  [Execution] CheckDisk=0
  ```

- Disable disk check: To disable disk checking before burning the image, set the CheckDisk parameter to 1, as shown below:

  ```
  [Execution] CheckDisk=1
  ```

19.4 Creating Disk Partitions

You can configure the SBA upgrade and recovery to create disk partitions on the OSN server, using the DiskPartitions parameter.

- To enable disk partitions (recommended and default): set the DiskPartitions parameter to 1, as shown below:

  ```
  [Execution] DiskPartitions=1
  ```

Notes:

- The SBA is shipped with an image on the recovery partition (D:\ drive on the OSN hard disk). If the parameter DiskPartitions is set to 1, then this image is deleted. Therefore, before partitioning, it is recommended to backup the file to an external storage.
- If the parameter DiskPartitions is set to 1, then the image location can’t be the recovery partition

With this setting, you must also set the following:

- Partition Size: Set the main partition size in Megabytes:

```
[DiskPartitions] MainPartitionSize=100000
```

Notes:

- The recommended main partition size is "100000" (i.e., "100" Gigabytes).
- Ensure that the secondary partition is at least 10 GB, as it is used to hold SBA image file, which is downloaded through FTP.

- Format Partitions: Format disk partitions into main (C:\) and secondary (D:\) partitions, by setting the FormatPartitions parameter to 1, as shown below. (If set to 0, disk partitions are not formatted).

```
[DiskPartitions] FormatPartitions=1
```

- To disable creation of disk partitions: set the DiskPartitions parameter to 0, as shown below:

```
[Execution] DiskPartitions=0
```

19.5 Enabling SBA Image Burn on Primary Partition

You can configure the SBA upgrade and recovery to burn the SBA image on the main partition, using the RecoverImange parameter.

- To enable image burn on primary partitions (recommended and default): Set the RecoverImange parameter to 1, as shown below:

```
[Execution] RecoverImange =1
```

- To disable image burn on primary partitions: Set the RecoverImange parameter to 0, as shown below:

```
[Execution] RecoverImange =0
```

19.6 Defining Exit Operation upon Process Completion

You can configure the SBA upgrade and recovery to perform a specific operation upon the completion of the process, using the OnExit parameter.

- Start command prompt: Set the OnExit parameter to 0 to start the command prompt upon process completion:

```
[Execution] OnExit = 0
```

- Reboot OSN server: Set the OnExit parameter to 1 to reboot the OSN server upon process completion:

  ```
  [Execution] OnExit = 1
  ```

- Shut down OSN server: Set the OnExit parameter to 2 to shut down the OSN server upon process completion:

  ```
  [Execution] OnExit = 2
  ```

Notes: The recommendation for this configuration is as follows:

- If you are monitoring the procedure by connecting a monitor or serial console, it's recommended to set OnExit to 0. This setting displays log messages on the console, indicating the progress of the SBA upgrade and recovery process.
- If the process is performing automatically without monitoring via a monitor or serial console, you must set OnExit to 2. In this case, at the end of the upgrade and recovery process, the OSN server shuts down.

19.7 Defining Network Parameters

You can configure the network parameters for the SBA upgrade and recovery process, using the parameters under the [NetworkCardConfiguration] section in the *.ini file.

Note: These network settings are used only for Skype for Business between the OSN and an FTP server or a local network for downloading the image file, as described on page 223. The IP address of the OSN LAN port is assigned only after initialization (by a DHCP server or manually), as described on page 79.

- Use DHCP for obtaining IP address (recommended and default): Set the EnableDhcp to 1, as shown below:

  ```
  [NetworkCardConfiguration] EnableDhcp=1
  ```

  This is only applicable if you have a DHCP server in your network.

- Manually (Static) define IP address: Set the EnableDhcp to 0, as shown below:

  ```
  [NetworkCardConfiguration] EnableDhcp=0
  ```

  When set for static IP address, configure the static network address, as shown below:

- IpAddress: Defines the static IP address:

  ```
  [NetworkCardConfiguration] IpAddress=10.21.22.55
  ```

- SubnetMask: Defines the subnet:

  ```
  [NetworkCardConfiguration] SubnetMask=255.255.0.0
  ```

- DefaultGateway: Defines the default gateway:

  ```
  [NetworkCardConfiguration] DefaultGateway=10.21.0.1
  ```

- DnsServers: Defines the domain name server (DNS):

  ```
  [NetworkCardConfiguration] DnsServers=10.1.1.11
  ```

19.8 Defining the SBA Image File Name

You can configure the SBA image file name for the SBA upgrade and recovery, using the Filename parameter.

```
[WIM Filename] Filename
```

Note: By default, the name of the image file is for example, SBA_OSN3_1_1_11_40.wim.

19.9 Defining the SBA Image File Source

You can configure the source (location) from where the image file can be obtained for the SBA upgrade and recovery process, using the Source parameter:

- FTP: Set Source to 1, as shown below:

  ```
  [ImageSource] Source = 1
  ```

  If the image file is located on an FTP server, then see page 224 to define the FTP server address and login credentials.

- Local network: Set Source to 2, as shown below:

  ```
  [ImageSource] Source = 2
  ```

  If the image file is located on the local network, then see page 224 to define the network path (URI) to where the file is located and the logon username and password.

- SBA Recovery USB dongle (recommended and default): Set Source to 3, as shown below:

  ```
  [ImageSource] Source = 3
  ```

  If the image file is located on the USB dongle, then see page 224 to define the directory path to where the image file is located.

- Recovery partition: Set Source to 4, as shown below:

  ```
  [ImageSource] Source = 4
  ```

  If the image file is located on the recovery partition, then see page 225 to define the directory path to where the file is located.

Note: For sources 1, 2, and 3, the image is also copied to the recovery (second) partition for future use.

19.9.1 Defining the FTP

If the image file is located on an FTP server (i.e., [ImageSource] Source = 1, as defined on page 223), then you need to define the FTP server address and login credentials:

- [FtpSettings] Site: Defines the IP address or FQDN of the FTP server (FTP server can be in the local network or on the Internet):

```
[FtpSettings] Site=10.13.4.115
```

- [FtpSettings] User: Defines the FTP login user name:

```
[FtpSettings] User=Admin
```

- [FtpSettings] Password: Defines the FTP login password:

```
[FtpSettings] Password=1234
```

Note: The image file must be located on the root of the FTP server.

19.9.2 Defining the Local Network

If the image file is located on a local network (i.e., [ImageSource] Source = 2, as defined on page 223), then you need to define the network path (URI) to where the file is located and the access username and password.

- [LocalNetworkSettings] Path: Defines the network URI:

```
[LocalNetworkSettings] Path=\\192.168.1.4\images
```

- [LocalNetworkSettings] User: Defines the login user name:

```
[LocalNetworkSettings] User=audiocodes\john.smith
```

- [LocalNetworkSettings] Password: Defines the password:

```
[LocalNetworkSettings] Password=1234
```

19.9.3 Defining the Disk On Key

If the SBA image file is located on the USB dongle (i.e., [ImageSource] Source = 3, as defined on page 223), then you must define the directory path to where the image file is located. This is defined using the [DOKsettings] DirectoryPath parameter.

The path must be set without the volume (for example, "\recovery\"). The application searches for this directory in all drives. For the USB root directory, set this parameter to "\" (default and recommended), as shown below:

```
[DOKsettings] DirectoryPath=\
```

19.9.4 Defining the Recovery Partition

If the SBA image file is located on the recovery partition (i.e., [ImageSource] Source = 4), then you need to define the directory path to where the file is located. This is defined using the [RecoveryPartition] DirectoryPath parameter.

The path must be defined without the volume (for example, "\recovery\"). The application searches all the drives for this directory. For recovery partition root, set this parameter to "\" (recommended and default):

```
[RecoveryPartition] DirectoryPath=\
```

19.10 Defining the MAC Address Prefix

You can configure the MAC address (prefix or full address) of the Mediant 2600B SBA for which the SBA upgrade and recovery process can run, using the MacPrefix parameter. This prevents accidental running of the SBA upgrade and recovery on your PC. If not configured, the procedure runs on any system.

```
[User Confirm] MacPrefix=00-45-B1-22-49-B1
```

You can define several MAC addresses by suffixing the MacPrefix parameter with an index number for each MAC address, as shown in the example below:

```
[User Confirm]
MacPrefix=01034E
MacPrefix1=0
MacPrefix7=01-03-5C
MacPrefix3=01-03
```

The default MAC addresses set in the file include the following:

- MacPrefix=00-80-82
- MacPrefix1=00-40-9E
- MacPrefix2=00-0B-AB

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20 SBA Upgrade and Recovery

After you have customized the SBA upgrade and recovery process using the RecoveryUtil.ini file (see page 219), you can start the upgrade and recovery process. The process can be done with or without online monitoring.

Note: When the process completes, you can view the results of the SBA upgrade and recovery process in the log file RecoveryLog.txt. This file is located on the USB dongle.

Warnings: Before proceeding, note the following:

- Contact your AudioCodes representative to verify if there are any required updates to the BIOS.
- Enter the OSN server's BIOS setup and set the highest boot priority to the USB dongle and not the HDMX.

20.1 Starting Process without Monitoring

The procedure below describes how to start the SBA upgrade and recovery process without monitoring.

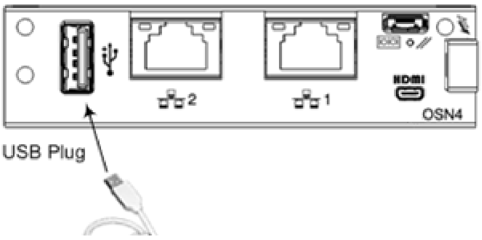
➢ **To start SBA upgrade and recovery without monitoring:**

1. Open (using a text editor such as Notepad) the RecoveryUtil.ini file and then set the OnExit parameter to 2 so that the OSN server shuts down upon SBA upgrade and recovery completion:

```
[Execution] OnExit = 2
```

2. Save and close the RecoveryUtil.ini file.
3. Plug the USB dongle into the USB port OSN on the Mediant 2600B SBA OSN module, as shown below:

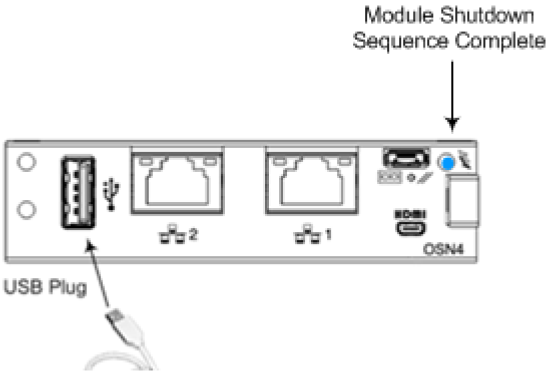
Figure 20-1: Plugging in USB Dongle



4. Power off and then power on the Mediant 2600B SBA chassis to boot the OSN server from the USB dongle; the SBA upgrade and recovery process begins.

5. Wait until the process completes, indicated by the OSN server shutting down. When the OSN server shutdown sequence is complete, the LED adjacent to the serial port is blue :

Figure 20-2: Blue LED Lit



Note: See page 19 for more information when monitoring LEDs.

6. Remove the USB dongle from the USB port on the OSN module.
7. Power off and then power on the Mediant 2600B SBA to reboot the OSN server; the initialization process starts.

Note:

- This step may take a while (about 10 minutes). While the Mediant 2600B SBA is rebooting, DO NOT power off the Mediant 2600B SBA.
- During initialization, the OSN server restarts twice.
- At the end of the process, all Network Interface Cards (NIC) of the OSN server are assigned IP addresses by your enterprise's DHCP server (if it exists).

8. Determine the NIC that is assigned to the required Ethernet port and the corresponding IP address, and then use this IP address to connect to the SBA (see page 240).

20.2 Starting Process with Online Monitoring using EMS

You can monitor the SBA upgrade and recovery process using Emergency Management Services (EMS). EMS is a technology that supports remote management and system recovery for servers that are not accessible through an in-band connection. An in-band connection is a connection between two computers that relies on a standard network such as a LAN or the 'Internet' 'http://www.techhead.co.uk/emergency-management-services-ems-connection-detected \t undefined', and on standard remote administration tools such as Remote Desktop or Telnet. You can use this type of connection to remotely manage computers only if both the local and remote computers are in a functional state and accessible on the network.

EMS redirects text output to the out-of-band connection. An out-of-band connection is a non-standard connection between two computers such as a serial port connection, and is useful when a remote server cannot access the network or is not fully functional. EMS provides a command-line environment for managing a server through the out-of-band port. The capability of redirecting text output is also Skype for Business console redirection.

Note: For the Mediant 2600B SBA OSN serial interface port (micro-USB) to be operational, you must download a special USB driver from the Internet. Download this driver at:

- http://www.silabs.com/products/mcu/pages/usbtouartbridgevcpdrivers.aspx
- http:/www.silabs.com/products/mcu/pages/usbtouartbridgevcpdrivers.aspx

➢ To monitor SBA upgrade and recovery using EMS:

1. Open (using a text editor such as Notepad) the RecoveryUtil.ini file and then set the RecoveryStartType parameter to 1, as shown below:

```
[Execution] RecoveryStartType= 1
```

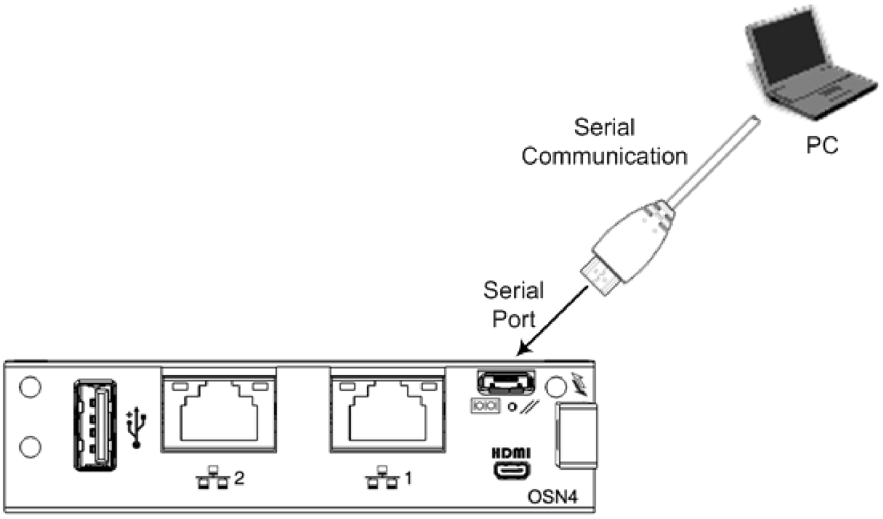
2. Save and close the RecoveryUtil.ini file.

   Do one of the following:

3. Connect a serial cable with a micro-USB connector on one end, to the serial port (labeled **IOIOI**) on the OSN4 module.

4. Connect the other end of the cable to the COM port on your computer.

Figure 20-3: Cabling OSN4 Module for Serial Communication

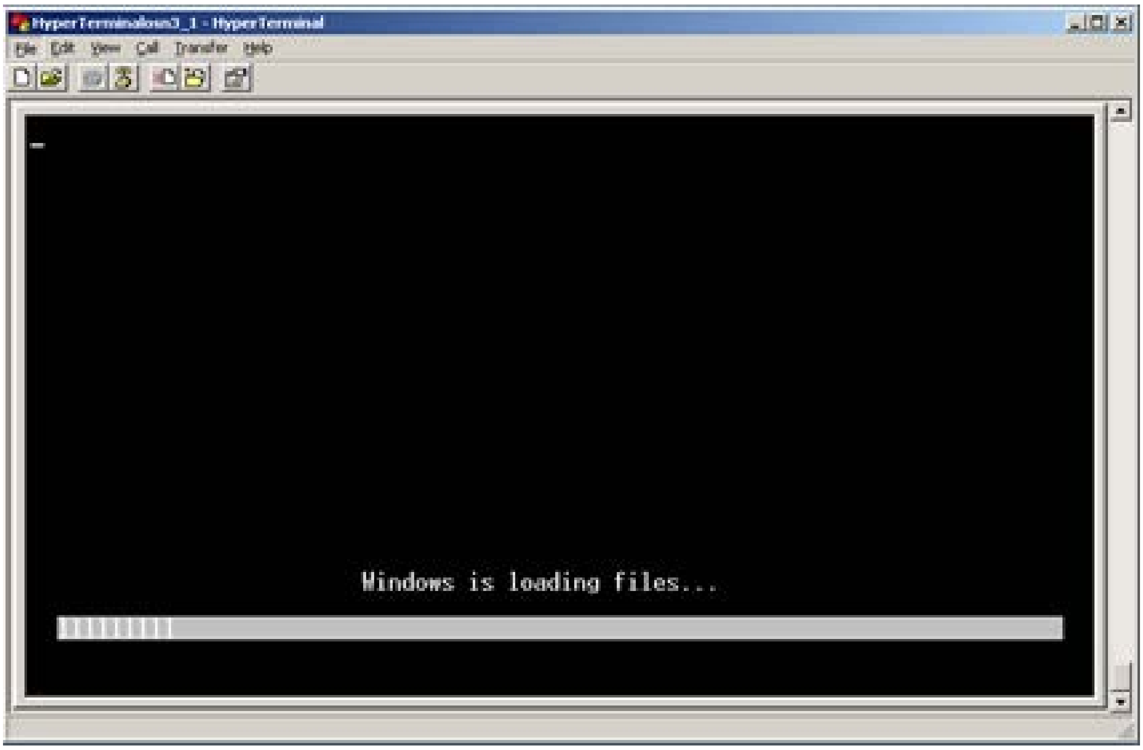


Note: For the Mediant 2600B SBA OSN serial interface port (micro-USB) to be operational, you must download a special USB driver from the Internet. Download this driver at
http://www.silabs.com/products/mcu/pages/usbtouartbridgevcpdrivers.aspx
http:/www.silabs.com/products/mcu/pages/usbtouartbridgevcpdrivers.aspx

5. Establish a serial communication session with the following port settings:
   - Bits per second: 115200
   - Data bits: 8
   - Parity: None
   - Stop bits: 1
   - Flow control: None
6. Plug the USB dongle into the USB port on the OSN module (see figures below).

7. Power off and then power on Mediant 2600B SBA to reboot the OSN server; during reboot, from the USB in the terminal window, the following message is displayed: "Windows is loading files…", as shown in the figure below.

Figure 20-4: Windows Loading Files

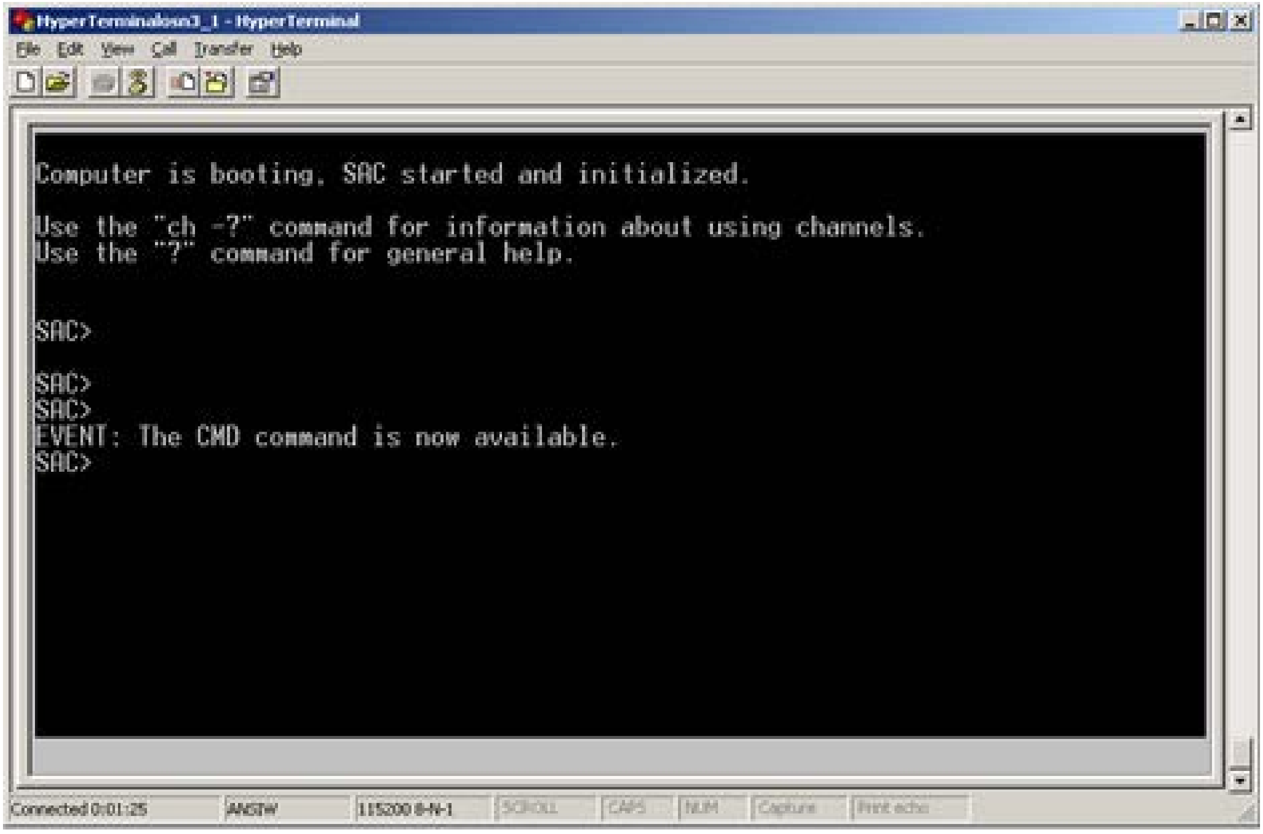

HyperTerminalosn3_1 - HyperTerminal
File Edit View Call Transfer Help

```
Windows is loading files...
```

In a few moments, the special administration console (SAC) prompt appears and the following message is displayed: "Computer is booting. SAC is started and initialized."

8. Wait for the next message: "The CMD command is now available.", as shown in the figure below.

Figure 20-5: SAC Started



HyperTerminalosn3_1 - HyperTerminal
File Edit View Call Transfer Help
Connected 0:01:25
ANSIW
115200 8-N-1
SCROLL
CAPS
NUM
Capture
Print echo

```
Computer is booting, SAC started and initialized.

Use the "ch -?" command for information about using channels.
Use the "?" command for general help.


SAC>

SAC>
SAC>
EVENT: The CMD command is now available.
SAC>
```

9. Start the command-line console, by typing the following:

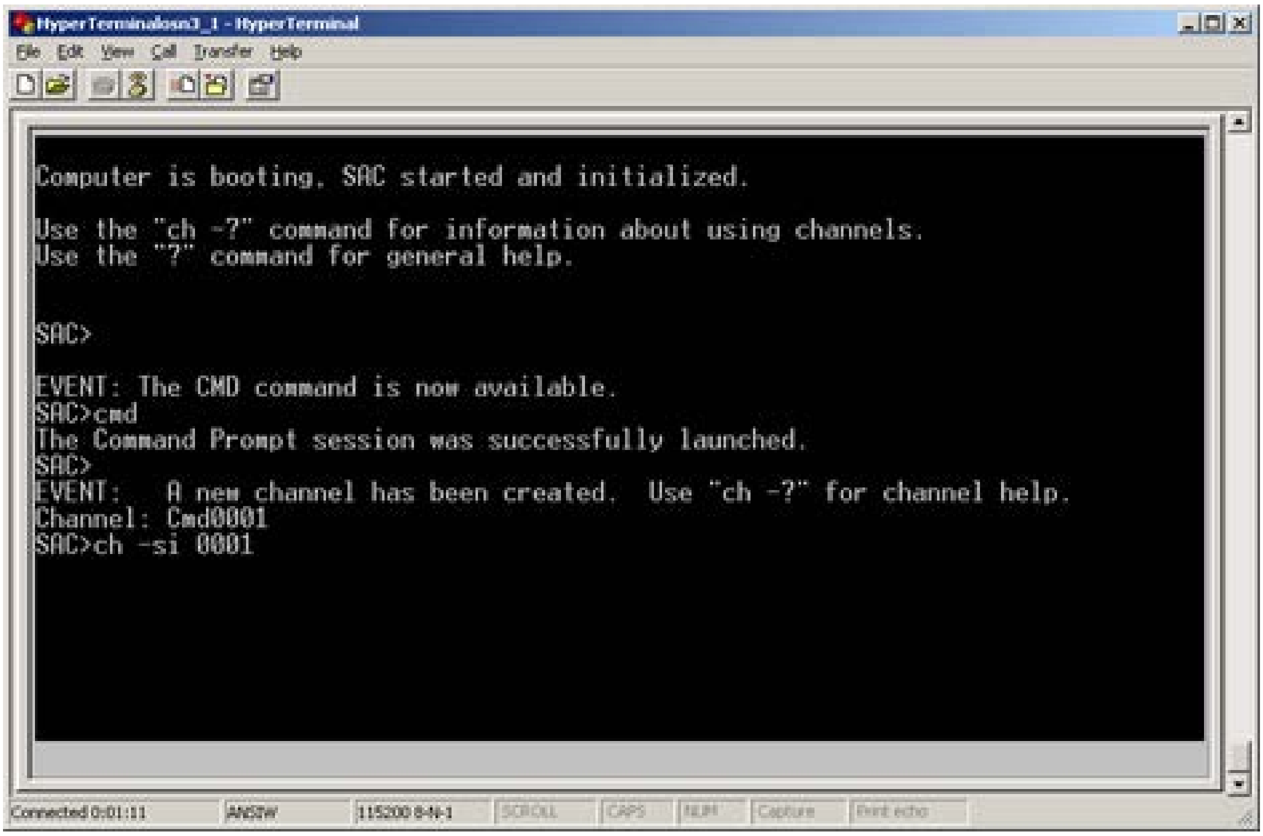
```
SAC> cmd
```

10. When the message, "A new channel has been created" is displayed, type the following command:

```
SAC> ch –si 0001
```

where 0001 is the number of the created channel.

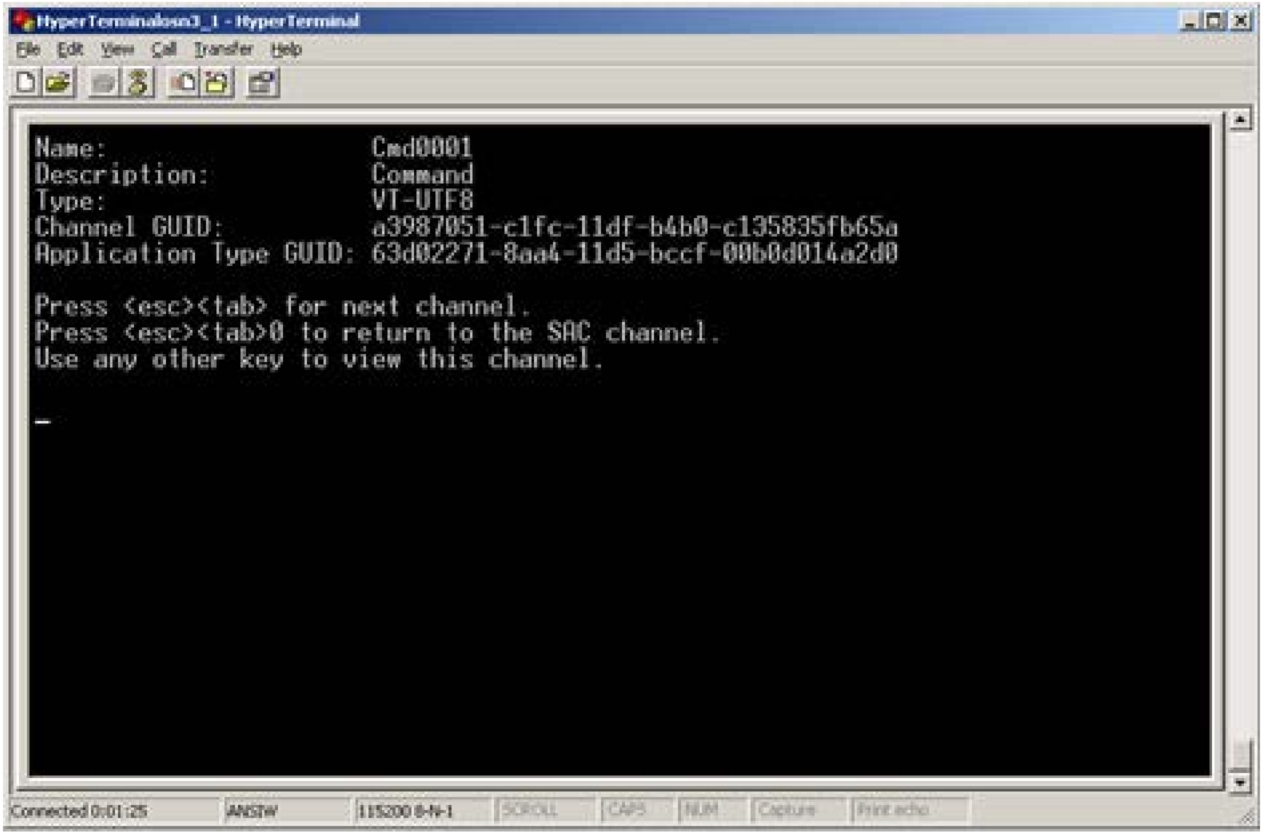
Figure 20-6: SAC Initiated


HyperTerminalosn3_1 - HyperTerminal
File Edit View Call Transfer Help
Connected 0:01:11
ANSIW
115200 8-N-1
SCROLL
CAPS
NUM
Capture
Print echo

```
Computer is booting, SAC started and initialized.

Use the "ch -?" command for information about using channels.
Use the "?" command for general help.


SAC>

EVENT: The CMD command is now available.
SAC>cmd
The Command Prompt session was successfully launched.
SAC>
EVENT:   A new channel has been created.  Use "ch -?" for channel help.
Channel: Cmd0001
SAC>ch -si 0001
```

The command console starts. When the command console is ready, the following is displayed:

Figure 20-7: Hyper Terminal

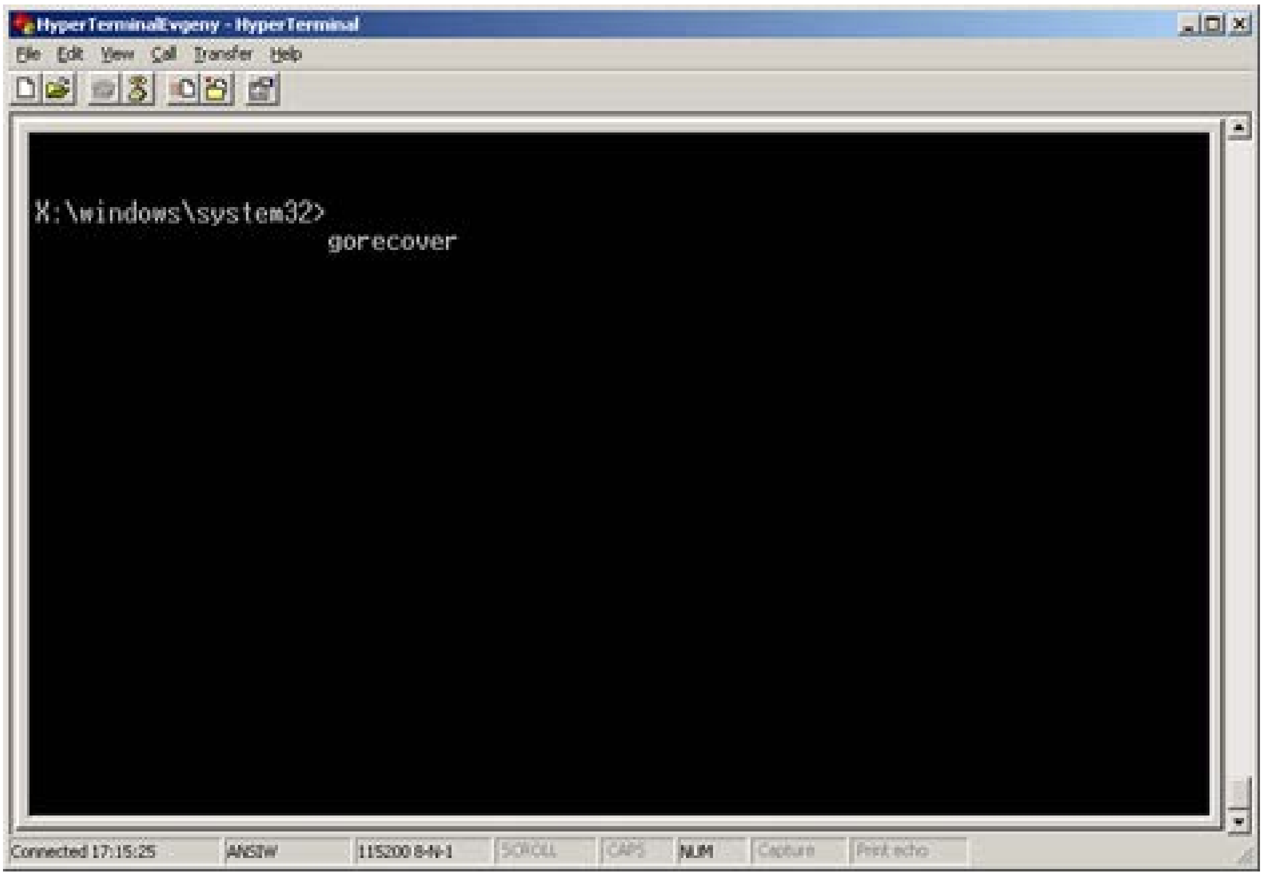

HyperTerminalosn3_1 - HyperTerminal
File Edit View Call Transfer Help
Connected 0:01:25
ANSIW
115200 8-N-1
SCROLL
CAPS
NUM
Capture
Print echo

```
Name:                  Cmd0001
Description:           Command
Type:                  VT-UTF8
Channel GUID:          a3987051-c1fc-11df-b4b0-c135835fb65a
Application Type GUID: 63d02271-8aa4-11d5-bccf-00b0d014a2d0

Press <esc><tab> for next channel.
Press <esc><tab>0 to return to the SAC channel.
Use any other key to view this channel.

_
```

11. Press the <Enter> key to continue.
12. When the X:\windows\system32 prompt appears, type the following command:

```
X:\windows\system32>gorecover
```

Figure 20-8: Gorecover

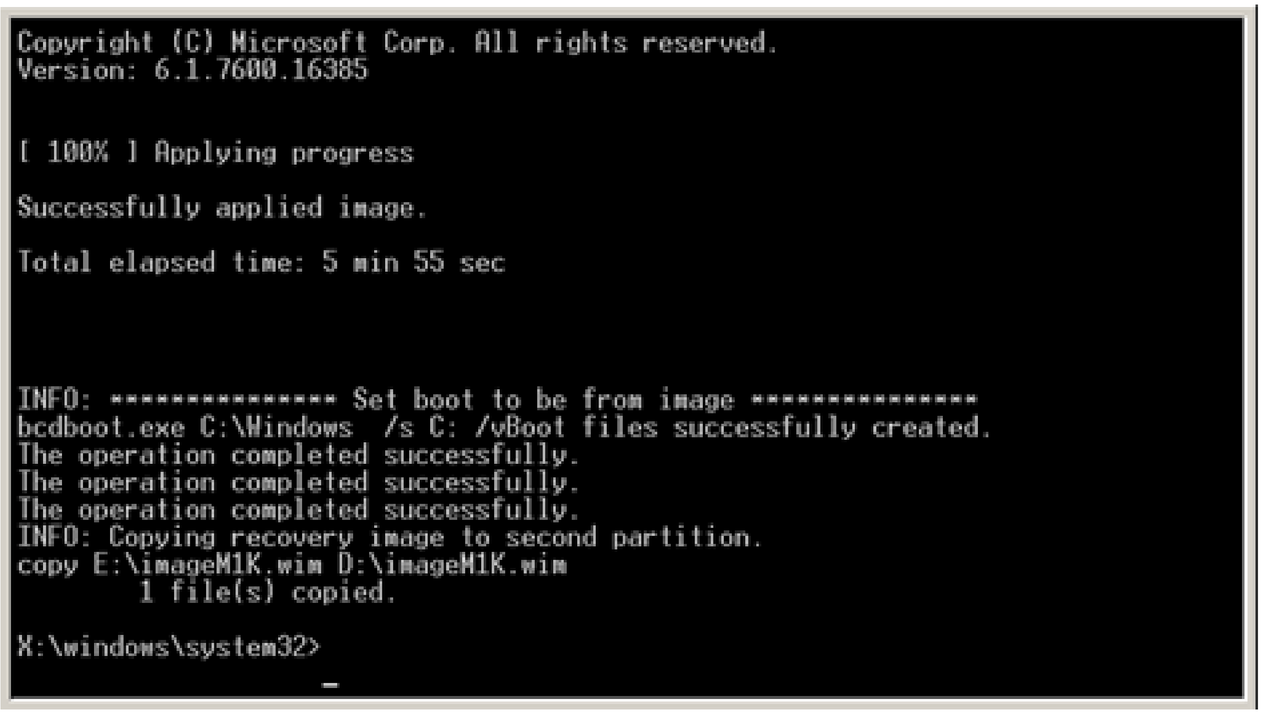


HyperTerminalEvgeny - HyperTerminal
File Edit View Call Transfer Help
Connected 17:15:25
ANSIW
115200 8-N-1
SCROLL
CAPS
NUM
Capture
Print echo

```
X:\windows\system32>
                    gorecover
```

The SBA Recovery and Upgrade process starts and logged messages are displayed in the console. When the procedure completes successfully, the following logged messages are displayed:

Figure 20-9: Logged Messages



```
Copyright (C) Microsoft Corp. All rights reserved.
Version: 6.1.7600.16385


[ 100% ] Applying progress

Successfully applied image.

Total elapsed time: 5 min 55 sec




INFO: **************** Set boot to be from image ****************
bcdboot.exe C:\Windows  /s C: /vBoot files successfully created.
The operation completed successfully.
The operation completed successfully.
The operation completed successfully.
INFO: Copying recovery image to second partition.
copy E:\imageM1K.wim D:\imageM1K.wim
        1 file(s) copied.

X:\windows\system32>
```

13. Remove the USB dongle from the USB port on the OSN module.
14. Power off and then power on the Mediant 2600B SBA to reboot the OSN server; the initialization process starts.

Notes:

- This step may take a while (about 10 minutes). While the Mediant 2600B SBA is rebooting, DO NOT power off the Mediant 2600B SBA.
- During initialization, the OSN server restarts twice.
- At the end of the process, all Network Interface Cards (NIC) of the OSN server are assigned IP addresses by your enterprise's DHCP server (if it exists).

15. Determine the NIC that is assigned to the required Ethernet port and the corresponding IP address, and then use this IP address to connect to the SBA (see page 240).

20.3 Starting Process with Online Monitoring using Monitor

You can monitor the SBA upgrade and recovery process for the OSN4 server using a VGA monitor.

➢ To monitor SBA upgrade and recovery using monitor:

1. Open (using a text editor such as Notepad) the *RecoveryUtil.ini* file and then do the following:
   - Set the 'RecoveryStartType' parameter to **0**, in order to start the process automatically when Windows PE starts.
   - Set the 'OnExit' parameter to **2** so that the OSN server shuts down upon SBA upgrade and recovery completion.

   ```
   [Execution] RecoveryStartType= 0
   [Execution] OnExit = 2
   ```
2. Save and close the *RecoveryUtil.ini* file.
3. Connect a USB hub to the USB port located on the OSN4 module, and then connect the USB hub to the following computer peripherals:
   - Mouse
   - Keyboard
   - USB storage device containing the operating system installation files (disk-on-key or external CD-ROM or DVD-ROM drive)

4. Using the supplied MINI HDMI TO HDMI 1.5m cable, connect the Micro HDMI port on the OSN module using a Type-D male connector and connect the other end to the HDMI port on the monitor using a Mini HDMI connector (for HDMI connector cable pinouts, see Section 3.1.3).

Figure 20-10: Cabling OSN4 Module for Installing Operating System

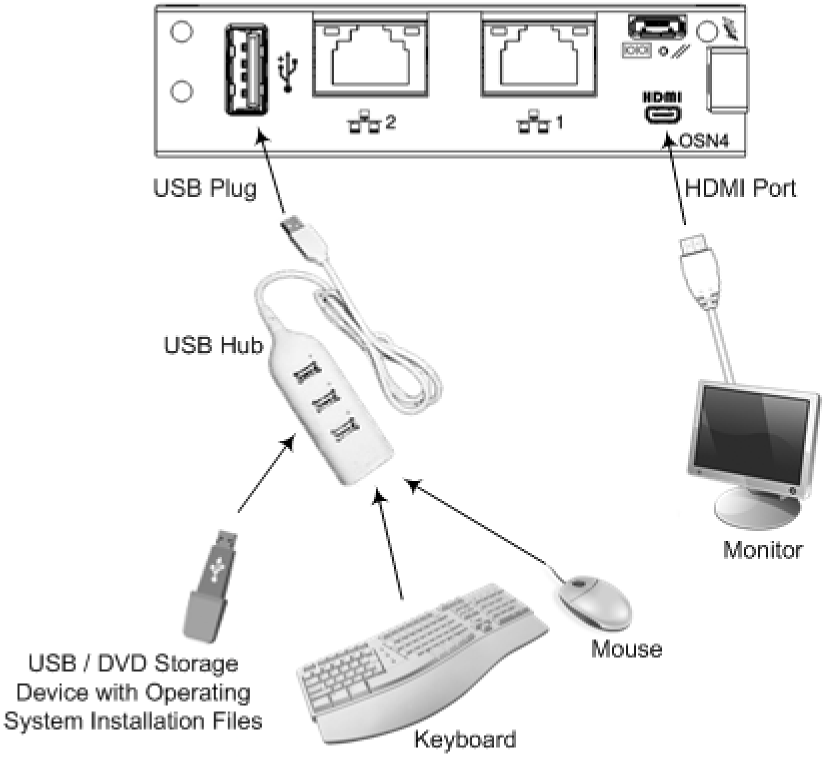

2
1
HDMI
OSN4
USB Plug
HDMI Port
USB Hub
Monitor
USB / DVD Storage Device with Operating System Installation Files
Mouse
Keyboard

Table 20-1: HDMI Type-D Connector Pinouts

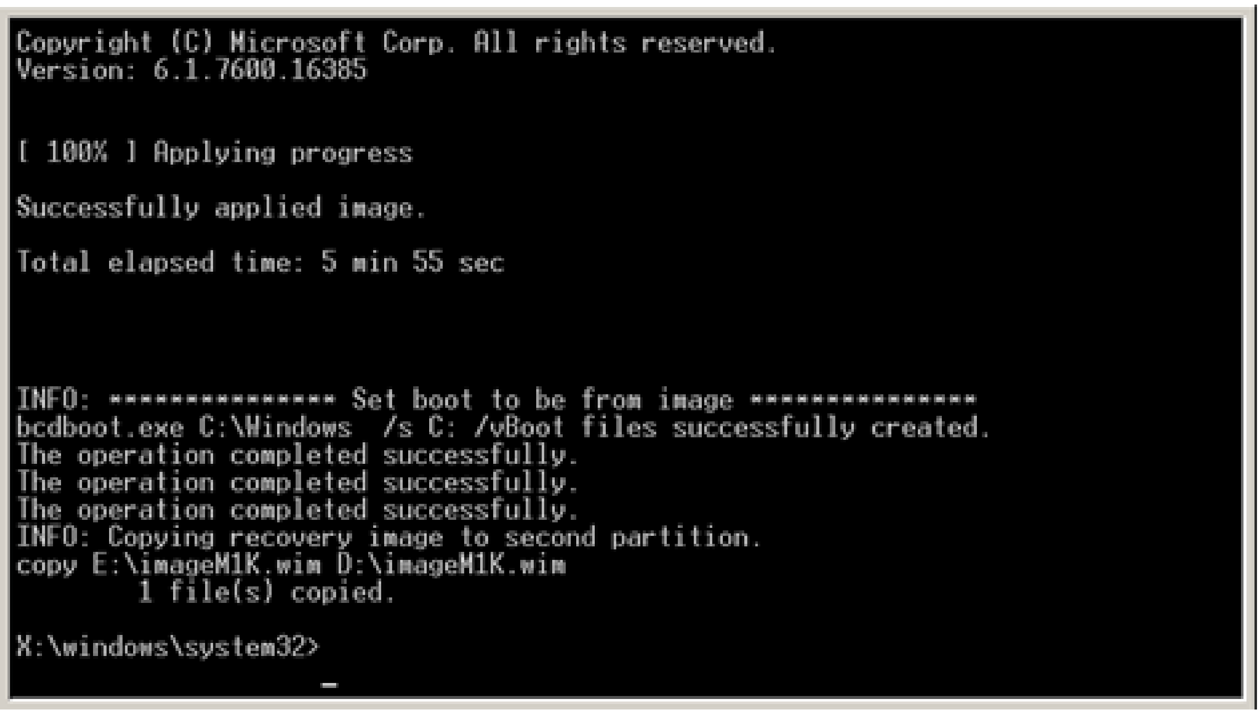
Pin	Signal
3	TMDS Data2+
4	TMDS Data2 Shield
5	TMDS Data2-
6	TMDS Data1+
7	TMDS Data1 Shield
8	TMDS Data1-
9	TMDS Data0+
10	TMDS Data0 Shield
11	TMDS Data0-
12	TMDS Clock+
13	TMDS Clock Shield
14	TMDS Clock-

Pin	Signal
15	CEC
2	Utility/HEAC+
17	SCL
18	SDA
16	DDC/CEC/HEAC Ground
19	+5 V Power
1	Hot Plug Detect/HEAC

5. Power off and then power on the Mediant 2600B SBA to reboot the OSN server; the SBA Upgrade and Recovery process starts and logged messages are displayed on the VGA monitor.

   When the process completes, the following logged messages are displayed on the VGA monitor:

Figure 20-11: Online Monitoring Using VGA



```
Copyright (C) Microsoft Corp. All rights reserved.
Version: 6.1.7600.16385

[ 100% ] Applying progress

Successfully applied image.

Total elapsed time: 5 min 55 sec



INFO: *************** Set boot to be from image ***************
bcdboot.exe C:\Windows  /s C: /vBoot files successfully created.
The operation completed successfully.
The operation completed successfully.
The operation completed successfully.
INFO: Copying recovery image to second partition.
copy E:\imageM1K.wim D:\imageM1K.wim
        1 file(s) copied.

X:\windows\system32>
                    _
```

6. Remove the USB dongle from the USB port on the USB hub.
7. Power off and then power on the Mediant 2600B SBA to reboot the OSN server; the initialization process starts.

Note:

- This step may take a while (about 10 minutes). While the Mediant 2600B SBA is rebooting, DO NOT power off the Mediant 2600B SBA.
- During initialization, the OSN server restarts twice.
- At the end of the process, all Network Interface Cards (NIC) of the OSN server are assigned IP addresses by your enterprise's DHCP server (if it exists).

8. Determine the NIC that is assigned to the required Ethernet port and the corresponding IP address, and then use this IP address to connect to the SBA (see page 240).

20.4 Acquiring an IP Address

Once the OSN server has successfully rebooted, you need to identify the NIC corresponding to the Ethernet port. All Network Interface Cards (NIC) are assigned IP addresses by your enterprise's DHCP server (if it exists). If you are not using a DHCP server, you can assign a static IP address to this NIC.

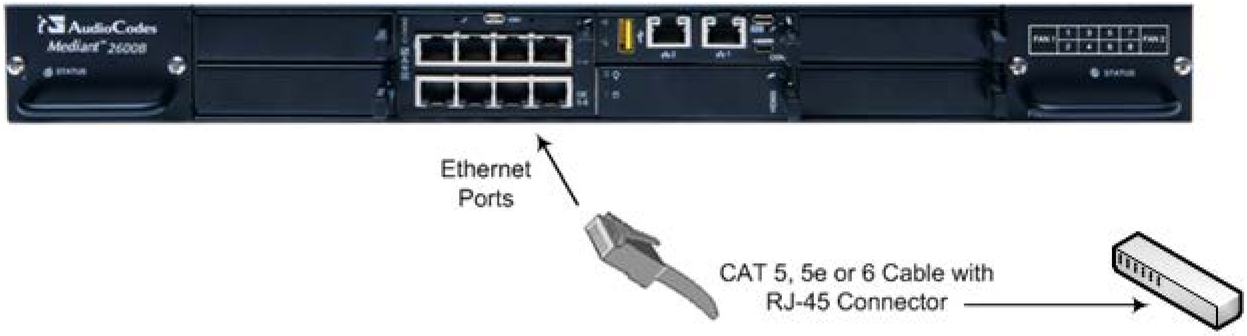
Note: If the SBA was recovered or upgraded using the AudioCodes Upgrade and Recovery Upgrade and Recovery USB dongle, the IP address of the OSN server is received from the DHCP server and therefore, the default IP address is no longer applicable.

➢ **To acquire an IP address:**

1. Do one of the following:
   - If you are connecting to the network through the **internal NIC:**

     Connect the first Ethernet LAN port on the front panel of the device directly to the network using a straight-through Ethernet cable.

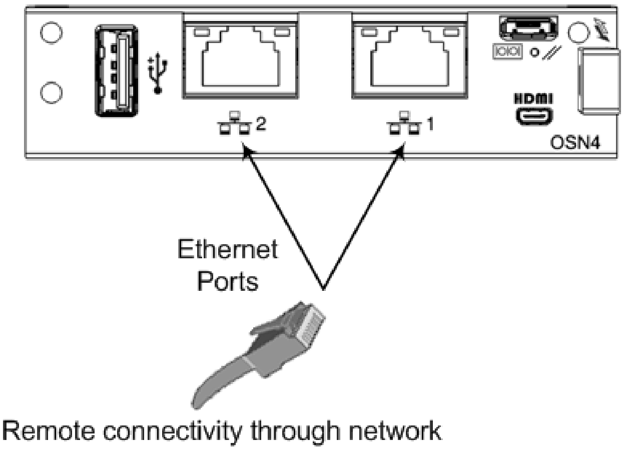
Figure 20-12: Connecting Mediant 2600B SBA LAN Port on SBC Module (Front Panel)



- If you are connecting to the network through the **external NIC:**

  Connect one of the Ethernet LAN ports (**1** or **2**) on the OSN module to the network.

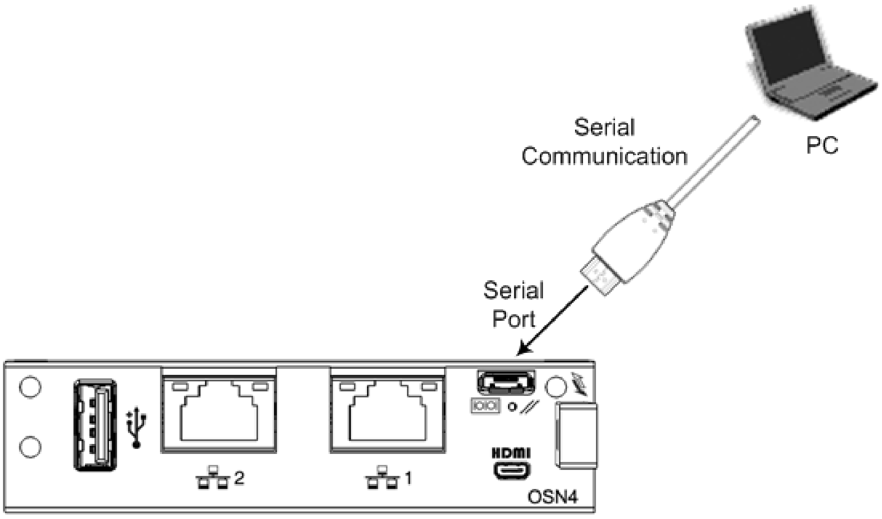
Figure 20-13: Cabling OSN4 Module to Network



2. If you have an HDMI monitor connected, do the following (otherwise, skip to Step 3):
   - For connecting to the network via the **internal NIC:**
     a. If you have a DHCP server in your network, the internal NIC should be identified by a displayed IP address (the two external Ethernet ports should be displayed as "Disconnected"). If you do not have a DHCP server in your network, define a static IP address.
     b. Skip to Step 9.
   - For connecting to the network via the **external NIC:**
     a. Determine the NIC used for the Ethernet LAN port, by removing the network cable from the Ethernet port and viewing on the monitor that the NIC (ID) has changed to "Disconnected". This is the NIC corresponding to the Ethernet LAN port.
     b. Reconnect the network cable and then do one of the following:
        - ✓ If you have a DHCP server in your network, note the IP address assigned to the Ethernet LAN port.
        - ✓ If you are not using a DHCP server, then assign a static IP address to the NIC of the Ethernet LAN port.
     c. Skip to Step 9.

3. Connect a serial cable with a micro-USB connector on one end, to the serial port (labeled **IOIOI**) on the OSN4 module. Connect the other end of the cable to the COM port on your computer.

Figure 20-14: Cabling OSN4 Module for Serial Communication



Note: For the Mediant 2600B SBA OSN serial interface port (micro-USB) to be operational, you must download a special USB driver from the Internet. Download this driver at http://www.silabs.com/products/mcu/pages/usbtouartbridgevcpdrivers.aspx

http:/www.silabs.com/products/mcu/pages/usbtouartbridgevcpdrivers.aspx

4. Establish serial communication with the OSN server through a terminal emulation program (such as HyperTerminal), using the following serial communication settings:
   - Baud Rate: 115200 (bits per second)
   - Data Bits: 8
   - Parity: None
   - Stop Bits: 1
   - Flow Control: None
5. Press Enter; the Serial Console prompt is displayed:

```
SAC>
```

6. Type the following to view all the NIC addresses:

```
SAC>i
```

7. Do one of the following:
   - If you are connecting to the network via the **internal NIC:**
     - ♦ If you have a DHCP server in your network, the internal NIC should be identified by a displayed IP address (the two external Ethernet ports should be displayed as "Disconnected").
     - ♦ If you do not have a DHCP server in your network, define a static IP address using the following command, and then press **Enter** to apply your settings:

```
SAC>i <NIC ID> <IP address> <subnet> <default gateway>
```

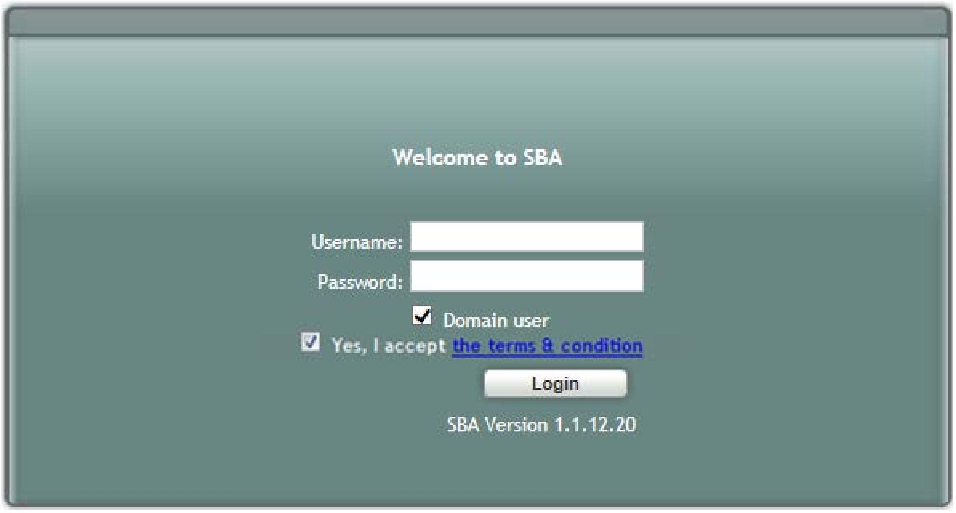
   - If you are connecting to the network via the **external NIC:**
     - d. Determine the NIC used for the Ethernet port, by removing the network cable from the Ethernet port and viewing in the serial console that the NIC (ID) has changed to "Disconnected".
     - e. Reconnect the network cable.
     - f. Do one of the following:
       - ✓ If you have a DHCP server in your network, note the IP address of the relevant Ethernet port.
       - ✓ If you do not have a DHCP server in your network, define the static IP address for the specific NIC, using the following command, and then press **Enter** to apply your settings:

```
SAC>i <NIC ID> <IP address> <subnet> <default gateway>
```

8. Disconnect the serial cable from the OSN server.
9. Open a standard Web browser (Firefox, Google Chrome, or Internet Explorer 9 and later is recommended), and then in the URL address field, enter the IP address that you determined above.

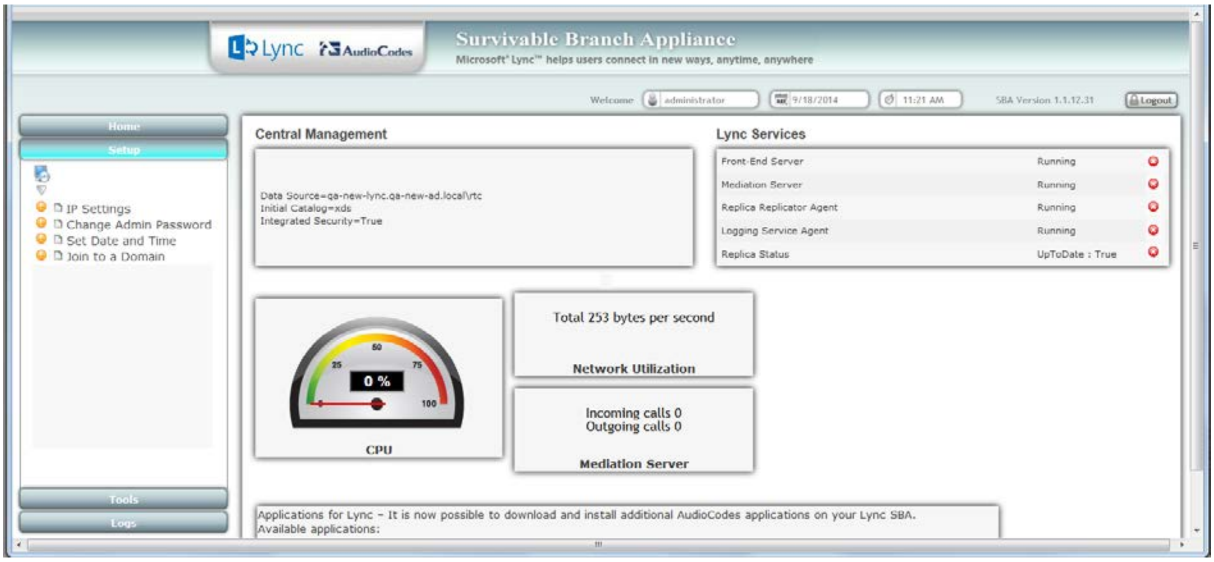
   The Survivable Branch Appliance Management Interface opens:

Figure 20-15: Welcome to SBA



10. Log in with the default username ("Administrator") and password ("Pass123"), Select the "Yes, I accept the term and condition" checkbox and then click **Login**; the Home screen appears:

Figure 20-16: SBA Home Screen



Welcome administrator 9/18/2014 11:21 AM SBA Version 1.1.12.31

Central Management

Data Source=qa-new-lync.qa-new-ad.local\rtc
Initial Catalog=xds
Integrated Security=True

Lync Services

Front-End Server	Running
Mediation Server	Running
Replica Replicator Agent	Running
Logging Service Agent	Running
Replica Status	UpToDate : True

Total 253 bytes per second

Network Utilization

Incoming calls 0
Outgoing calls 0

Mediation Server

Applications for Lync - It is now possible to download and install additional AudioCodes applications on your Lync SBA.
Available applications:

11. Change the default IP address of the SBA Management Interface to suit your network environment (see 'Step 1: Define IP Settings') on page 80.

Part VIII

Appendix

A SBA Security Default Template

This appendix describes the AudioCodes provided default SBA security template (configured in Section 'Apply No Policy' on page 123). The Microsoft SCW security configuration database utility was used to prepare this template. This utility contains information on the following:

- Server roles. See Section .'Server Roles' on page 247
- Client features. See Section 'Client Features' on page 249
- Administration and other options. See Section 'Administration and Other Options' on page 250
- Services. See Section 'Services' on page 251
- Firewall rules. See Section 'Firewall Rules' on page 272

A.1 Server Roles

Each server role can be in one the following possible status:

- Installed and enabled
- Installed and disabled
- Not installed and disabled

The following list details the server roles which must be installed and enabled on the SBA.

The SCW uses the server role information to enable services and open ports in the local firewall.

Table A-1: Server Roles

Server Role	Description
Application Server – Application Server Foundation	Application Server Foundation provides technologies for deploying and managing .NET Framework 3.0 applications. These technologies include Windows Presentation Foundation (WPF), Windows Communication Foundation (WCF), and Windows Workflow Foundation (WF). Application Server Foundation provides the means for delivering managed-code applications with seamless user experiences, secure communication, and the ability to model a range of business processes.
Application Server – Message Queuing Activation	Message Queuing Activation supports process activation via Message Queuing. Applications that use Message Queuing Activation can start and stop dynamically in response to work items that arrive over the network via Message Queuing.
Application Server – Named Pipes Activation	Named Pipes Activation supports process activation via named pipes. Applications that use Named Pipes Activation can start and stop dynamically in response to work items that arrive over the network via named pipes.

Server Role	Description
Application Server – TCP Activation	TCP Activation supports process activation via TCP. Applications that use TCP Activation can start and stop dynamically in response to work items that arrive over the network via TCP.
ASP.NET State Service	The ASP.NET state service stores session state out of process from ASP.NET applications. It ensures that session state is preserved if an ASP.NET application is restarted and also makes session state available to multiple ASP.NET applications running in a Web farm.
Distributed Transactions	The middle-tier application server can coordinate or participate in distributed transactions.
File Server	A file server shares and stores files for users or applications.
Internet Printing	Internet Printing creates a Web site where users can manage print jobs on the server. It also enables users who have Internet Printing Client installed to use a Web browser to connect and print to shared printers on this server by using the Internet Printing Protocol (IPP).
Message Queuing Server	Message Queuing Server provides guaranteed message delivery, efficient routing, security, and priority-based messaging. It can be used to implement solutions for both asynchronous and synchronous messaging scenarios.
Microsoft iSCSI Initiator Service	Manages Internet SCSI (iSCSI) sessions from this computer to remote iSCSI target devices. If this service is stopped, this computer will not be able to login or access iSCSI targets. If this service is disabled, any services that explicitly depend on it will fail to start.
Middle Tier Application Server (COM +/DTC)	A Middle-tier application server provides the core technologies required to configure, deploy, and manage distributed, transactional, or multi-tiered applications.
Print Server	A print server provides and manages access to network printers and printer drivers so that network clients can submit print jobs to network printers.
Remote COM+	COM+ provides an enterprise development environment, based on the Microsoft Component Object Model (COM), for creating component-based, distributed applications. It also provides you with the tools to create transactional, multitier applications.
Remote SCW Configuration and Analysis	The server can be remotely configured, analyzed, or rolled back using the Security Configuration Wizard (SCW) user interface or command line tool.
Shadow Copies of Shared Folders	Shadow Copies of Shared Folders provides point-in-time copies of files that are located on shared resources, such as a file server, so that users can quickly retrieve previous versions of files.
SMTP Trap Server	An SNMP trap server receives Simple Network Management Protocol (SNMP) traps from SNMP servers.
Volume Shadow Copy	Manages and implements the backup infrastructure including shadow copies. If this service is disabled shadow copy creation and backup jobs will fail and any services that explicitly depend on it will fail to start.

Server Role	Description
Web Server	Web Server provides support for HTML Web sites and optional support for ASP.NET, ASP, and Web Server extensions. You can use the Web Server to host an internal or external Web site or to provide an environment for developers to create Web-based applications.
Window Event Collector Service	This service manages persistent subscriptions to events from remote sources that support WS-Management protocol. This includes Windows Vista event logs, hardware and IPMI-enabled event sources. The service stores forwarded events in a local Event Log. If this service is stopped or disabled event subscriptions cannot be created and forwarded events cannot be accepted.
Windows Process Activation Service	The Windows Process Activation Service (WAS) provides process activation, resource management and health management services for message-activated applications.
Windows Remote management (WS-Mangement)	The Windows Remote Management Service provides firewall-friendly remote administration using Web Services.

A.2 Client Features

Servers also act as clients to other servers. Each client feature can be in one the following possible status:

- Installed and enabled
- Installed and disabled
- Not installed and disabled

The following list details only the client features that must be installed and enabled on the SBA.

Table A-2: Client Features

Client Feature	Description
Background Intelligent Transfer Service (BITS)	Transfers files in the background using idle network bandwidth.
DNS Client	DNS clients, also known as resolvers, use the DNS (Domain Name System) protocol to send queries to DNS Servers to lookup the DNS name of a computer and retrieve information associated with the computer, such as its IP address or other services it provides. This process is called name resolution.
Domain Member	A domain member is a computer that is joined to an Active Directory domain.

Client Feature	Description
Microsoft Networking Client	Creates and maintains client network connections to remote servers using the SMB protocol.
Time Synchronization	The server regularly contacts a Network Time Protocol (NTP) server in order to accurately maintain its clock.
WINS Client	A Windows Internet Name Service (WINS) client locates objects on a network using the NetBIOS Name Service (NBNS) protocol.

A.3 Administration and Other Options

Each entry can be in one the following possible statuses:

- Installed and enabled
- Installed and disabled
- Not installed and disabled

The following list details only the administration and other options that must be installed and enabled.

Table A-3: Administration and Other Options

Administration & Other Options	Description
.NET Framework 3.0	Microsoft .NET Framework 3.0 combines the power of the .NET Framework 2.0 APIs with new technologies for building applications that offer appealing user interfaces, protect your customers' personal identity information, enable seamless and secure communication, and provide the ability to model a range of business processes.
Local Application Installation	Programs can be added, removed, or repaired on the server using the Windows Installer Service.
Message Queuing Multicasting Support	Message Queuing Multicasting Support enables the queuing and sending of multicast messages to a multicast IP address.
Microsoft Fibre Channel Platform Registration Service	Registers the platform with all available Fibre Channel fabrics, and maintains the registrations.
Remote Desktop Services printer redirection	Remote Desktop Services users can redirect print jobs to their local printers.
Smart Card	Manages access to smart cards read by this computer.

A.4 Services

The SBA device doesn't require all of the default services. The services that are not required were disabled. Only the required services are enabled (either automatic or manual).

The following list details the services that are enabled during startup – manually or automatically.

Table A-4: Services

Service	Description	Startup Default
Active Directory Certificate Services	Issues, manages, and removes X.509 certificates for applications such as S/MIME and SSL. If the service is stopped, certificates will not be issued. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
Active Directory Domain Services	AD DS Domain Controller service. If this service is stopped, users will be unable to log on to the network. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
AD FS Web Agent Authentication Service	The AD FS Web Agent Authentication Service validates incoming tokens and cookies.	Automatic
AdRmsLoggingService	Sends logging messages to the logging database when logging is enabled for the Active Directory Rights Management Services role. If this service is disabled or stopped when logging is enabled, logging messages will be stored in local message queues and sent to the logging database when the service is started.	Automatic
Application Experience	Processes application compatibility cache requests for applications as they are launched	Automatic
Application Host Helper Service	Provides administrative services for IIS, for example configuration history and Application Pool account mapping. If this service is stopped, configuration history and locking down files or directories with Application Pool specific Access Control Entries will not work.	Automatic
Application Identity	Determines and verifies the identity of an application. Disabling this service will prevent AppLocker from being enforced.	Manual

Service	Description	Startup Default
Application Information	Facilitates the running of interactive applications with additional administrative privileges. If this service is stopped, users will be unable to launch applications with the additional administrative privileges they may require to perform desired user tasks.	Manual
Application Layer Gateway Service	Provides support for 3rd party protocol plug-ins for Internet Connection Sharing	Manual
Application Management	Processes installation, removal, and enumeration requests for software deployed through the Group Policy. If this service is stopped, users will be unable to install, remove, or enumerate software deployed through the Group Policy. If this service is disabled, any services that explicitly depend on it will fail to start.	Manual
ASP.NET State Service	Provides support for out-of-process session states for ASP.NET. If this service is stopped, out-of-process requests will not be processed. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
AudioEndpointBuilder	Manages audio devices for the Windows Audio service. If this service is stopped, audio devices and effects will not function properly. If this service is disabled, any services that explicitly depend on it will fail to start.	Manual
Audiosrv	Manages audio for Windows-based programs. If this service is stopped, audio devices and effects will not function properly. If this service is disabled, any services that explicitly depend on it will fail to start.	Manual
Background Intelligent Transfer Service	Transfers files in the background using idle network bandwidth. If the service is disabled, then any applications that depend on BITS, such as Windows Update or MSN Explorer, will be unable to automatically download programs and other information.	Automatic
Base Filtering Engine	The Base Filtering Engine (BFE) is a service that manages firewall and Internet Protocol security (IPsec) policies and implements user mode filtering. Stopping or disabling the BFE service will significantly reduce the security of the system. It will also result in unpredictable behavior in IPsec management and firewall applications.	Automatic
Block Level Backup Engine Service	Engine to perform block level backup and recovery of data.	Manual

Service	Description	Startup Default
BOAService	_	Automatic
Certificate Propagation	Copies user certificates and root certificates from smart cards into the current user's certificate store, detects when a smart card is inserted into a smart card reader, and, if required, installs the smart card Plug and Play minidriver.	Automatic
Client for NFS	Enables this computer to access files on NFS shares.	Automatic
clr_optimization_v2.0.50727_I64	clr_optimization_v2.0.50727_I64	Manual
Cluster Service	Enables servers to work together as a cluster to keep server-based applications highly available, regardless of individual component failures. If this service is stopped, clustering will be unavailable. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
CNG Key Isolation	The CNG key isolation service is hosted in the LSA process. The service provides key process isolation to private keys and associated cryptographic operations as required by the Common Criteria. The service stores and uses long-lived keys in a secure process complying with Common Criteria requirements.	Manual
COM+ Event System	Supports System Event Notification Service (SENS), which provides automatic distribution of events to subscribing Component Object Model (COM) components. If the service is stopped, SENS will close and will not be able to provide logon and logoff notifications. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
COM+ System Application	Manages the configuration and tracking of Component Object Model (COM)+-based components. If the service is stopped, most COM+-based components will not function properly. If this service is disabled, any services that explicitly depend on it will fail to start.	Manual
Computer Browser	Maintains an updated list of computers on the network and supplies this list to computers designated as browsers. If this service is stopped, this list will not be updated or maintained. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
Credential Manager	Provides secure storage and retrieval of credentials to users, applications and security service packages.	Manual

Service	Description	Startup Default
Cryptographic Services	Provides four management services: Catalog Database Service, which confirms the signatures of Windows files and allows new programs to be installed; Protected Root Service, which adds and removes Trusted Root Certification Authority certificates from this computer; Automatic Root Certificate Update Service, which retrieves root certificates from Windows Update and enable scenarios such as SSL; and Key Service, which helps enroll this computer for certificates. If this service is stopped, these management services will not function properly. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
DCOM Server Process Launcher	The DCOMLAUNCH service launches COM and DCOM servers in response to object activation requests. If this service is stopped or disabled, programs using COM or DCOM will not function properly. It is strongly recommended that you have the DCOMLAUNCH service up and running.	Automatic
Desktop Window Manager Session Manager	Provides Desktop Window Manager startup and maintenance services	Automatic
DFS Namespace	Integrates disparate file shares into a single, logical namespace and manages these logical volumes.	Automatic
DFS Replication	Replicates files among multiple PCs keeping them in sync. On the client, it is used to roam folders between PCs and on the server, it is used to provide high availability and local access across a wide area network (WAN). If the service is stopped, file replication does not occur, and the files on the server become out-of-date. If the service is disabled, any services that explicitly depend on it will not start.	Automatic
DHCP Client	Registers and updates IP addresses and DNS records for this computer. If this service is stopped, this computer will not receive dynamic IP addresses and DNS updates. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
DHCP Server	Performs TCP/IP configuration for DHCP clients, including dynamic assignments of IP addresses, specification of the WINS and DNS servers, and connection-specific DNS names. If this service is stopped, the DHCP server will not perform TCP/IP configuration for clients. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic

Service	Description	Startup Default
Diagnostic Policy Service	The Diagnostic Policy Service enables problem detection, troubleshooting and resolution for Windows components. If this service is stopped, diagnostics will no longer function.	Automatic
Diagnostic Service Host	The Diagnostic Service Host is used by the Diagnostic Policy Service to host diagnostics that need to run in a Local Service context. If this service is stopped, any diagnostics that depend on it will no longer function.	Manual
Diagnostic System Host	The Diagnostic System Host is used by the Diagnostic Policy Service to host diagnostics that need to run in a Local System context. If this service is stopped, any diagnostics that depend on it will no longer function.	Manual
Disk Defragmenter	Provides Disk Defragmentation Capabilities.	Manual
Distributed Link Tracking Client	Maintains links between NTFS files within a computer or across computers in a network.	Automatic
Distributed Transaction Coordinator	Coordinates transactions that span multiple resource managers, such as databases, message queues, and file systems. If this service is stopped, these transactions will fail. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
DNS Client	The DNS Client service (dnscache) caches Domain Name System (DNS) names and registers the full computer name for this computer. If the service is stopped, DNS names will continue to be resolved. However, the results of DNS name queries will not be cached and the computer's name will not be registered. If the service is disabled, any services that explicitly depend on it will fail to start.	Automatic
DNS Server	The DNS server service stores and resolves DNS names of clients in order to enable computers to locate other computers and services. If the service is stopped or disabled, DNS updates and queries from clients sent to the local computer will not be processed. Any services that explicitly depend on the DNS server on the local computer will start to see failures.	Automatic
Encrypting File System (EFS)	Provides the core file encryption technology used to store encrypted files on NTFS file system volumes. If this service is stopped or disabled, applications will be unable to access encrypted files.	Manual

Service	Description	Startup Default
Extensible Authentication Protocol	The Extensible Authentication Protocol (EAP) service provides network authentication in such scenarios as 802.1x wired and wireless, VPN, and Network Access Protection (NAP). EAP also provides application programming interfaces (APIs) that are used by network access clients, including wireless and VPN clients, during the authentication process. If you disable this service, this computer is prevented from accessing networks that require EAP authentication.	Manual
Fax	Enables you to send and receive faxes, using fax resources available on this computer or on the network.	Automatic
File Server Resource Manager	Provides services for quota and file screen management.	Automatic
File Server Storage Reports Manager	Provides services for configuration, scheduling, and generation of storage reports.	Manual
FTP Publishing Service	Enables this server to be a File Transfer Protocol (FTP) server. If this service is stopped, the server cannot function as an FTP server. If this service is disabled, any services that explicitly depend on it will fail to start.	Manual
Function Discovery Provider Host	The FDPHOST service hosts the Function Discovery (FD) network discovery providers. These FD providers supply network discovery services for the Simple Services Discovery Protocol (SSDP) and Web Services – Discovery (WS-D) protocol. Stopping or disabling the FDPHOST service will disable network discovery for these protocols when using FD. When this service is unavailable, network services using FD and relying on these discovery protocols will be unable to find network devices or resources.	Manual
Function Discovery Resource Publication	Publishes this computer and resources attached to this computer so they can be discovered over the network. If this service is stopped, network resources will no longer be published and they will not be discovered by other computers on the network.	Manual

Service	Description	Startup Default
Group Policy Client	This service is responsible for applying settings configured by administrators for the computer and users through the Group Policy component. If this service is stopped or disabled, the settings will not be applied and applications and components will not be manageable through Group Policy. Any components or applications that depend on the Group Policy component might not be functional if the service is stopped or disabled.	Automatic
Health Key and Certificate Management	Provides X.509 certificate and key management services for the Network Access Protection Agent (NAPAgent). Enforcement technologies that use X.509 certificates may not function properly without this service.	Manual
Hyper-V Image Management Service	Provides Image Management servicing for Hyper-V.	Automatic
Hyper-V Networking Management Service	Provides Hyper-V Networking WMI management.	Automatic
Hyper-V Virtual Machine Management	Management service for Hyper-V, provides service to run multiple virtual machines.	Automatic
IAS JET Database Access	IASJet	Manual
IIS Admin Service	Enables this server to administer metabase FTP services. If this service is stopped, the server will be unable to run metabase or FTP sites. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
IKE and AuthIP IPsec Keying Modules	The IKEEXT service hosts the Internet Key Exchange (IKE) and Authenticated Internet Protocol (AuthIP) keying modules. These keying modules are used for authentication and key exchange in Internet Protocol security (IPsec). Stopping or disabling the IKEEXT service will disable IKE and AuthIP key exchange with peer computers. IPsec is typically configured to use IKE or AuthIP; therefore, stopping or disabling the IKEEXT service might result in an IPsec failure and might compromise the security of the system. It is strongly recommended that you have the IKEEXT service running.	Automatic
Indexing Service	Indexes contents and properties of files on local and remote computers provide rapid access to files through flexible querying language.	Automatic
Intel(R) Capability Licensing Service Interface	Version: 1.23.605.1	Automatic

Service	Description	Startup Default
Intel(R) Dynamic Application Loader Host Interface Service	Intel(R) Dynamic Application Loader Host Interface Service - allows applications to access the local Intel (R) DAL.	Automatic
Intel(R) Management and Security Application Local Management Service	Allows applications to access the local Intel(R) Management and Security Application using its locally-available selected network interfaces.	Automatic
Intel(R) Management and Security Application User Notification Service	Intel(R) Management and Security Application User Notification Service - Updates the Windows Event Log with notifications of pre defined events received from the local Intel(R) Management and Security Application Device.	Automatic
Intel(R) PROSet Monitoring Service	The Intel(R) PROSet Monitoring Service actively monitors changes to the system and updates affected network devices to keep them running in optimal condition. Stopping this service may negatively affect the performance of the network devices on the system.	Automatic
Interactive Services Detection	Enables user notification of user input for interactive services, which enables access to dialogs created by interactive services when they appear. If this service is stopped, notifications of new interactive service dialogs will no longer function and there may no longer be access to interactive service dialogs. If this service is disabled, both notifications of and access to new interactive service dialogs will no longer function.	Manual
Intersite Messaging	Enables messages to be exchanged between computers running Windows Server sites. If this service is stopped, messages will not be exchanged, nor will site routing information be calculated for other services. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
IP Helper	Provides tunnel connectivity using IPv6 transition technologies (6to4, ISATAP, Port Proxy, and Teredo), and IP-HTTPS. If this service is stopped, the computer will not have the enhanced connectivity benefits that these technologies offer.	Automatic

Service	Description	Startup Default
IPsec Policy Agent	Internet Protocol security (IPsec) supports network-level peer authentication, data origin authentication, data integrity, data confidentiality (encryption), and replay protection. This service enforces IPsec policies created through the IP Security Policies snap-in or the command-line tool "netsh ipsec". If you stop this service, you may experience network connectivity issues if your policy requires that connections use IPsec. Also,remote management of Windows Firewall is not available when this service is stopped.	Automatic
Kerberos Key Distribution Center	On domain controllers this service enables users to log on to the network using the Kerberos authentication protocol. If this service is stopped on a domain controller, users will be unable to log on to the network. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
KtmRm for Distributed Transaction Coordinator	Coordinates transactions between the Distributed Transaction Coordinator (MSDTC) and the Kernel Transaction Manager (KTM). If it is not needed, it is recommended that this service remains stopped. If it is needed, both MSDTC and KTM will start this service automatically. If this service is disabled, any MSDTC transaction interacting with a Kernel Resource Manager will fail and any services that explicitly depend on it will fail to start.	Automatic
Link-Layer Topology Discovery Mapper	Creates a Network Map, consisting of PC and device topology (connectivity) information, and metadata describing each PC and device. If this service is disabled, the Network Map will not function properly.	Manual
Skype for Business Front-End	Skype for Business Front-End	Automatic
Skype for Business Mediation	Skype for Business Mediation	Automatic
Skype for Business Replica Replicator Agent	Skype for Business Replica Replicator Agent	Automatic
Message Queuing	Provides a messaging infrastructure and development tool for creating distributed messaging applications for Windows-based networks and programs. If this service is stopped, distributed messages will be unavailable. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
Message Queuing Downlevel Client Support	Allows MSMQ 2.0 clients to access MSMQ Active Directory features	Automatic

Service	Description	Startup Default
Message Queuing Triggers	Provides rule-based monitoring of messages arriving in a Message Queuing queue and, when the conditions of a rule are satisfied, invokes a COM component or a stand-alone executable program to process the message.	Automatic
Microsoft .NET Framework NGEN v2.0.50727_X64	Microsoft .NET Framework NGEN	Manual
Microsoft .NET Framework NGEN v2.0.50727_X86	Microsoft .NET Framework NGEN	Manual
Microsoft Fibre Channel Platform Registration Service	Registers the platform with all available Fibre Channel fabrics, and maintains the registrations.	Automatic
Microsoft iSCSI Initiator Service	Manages Internet SCSI (iSCSI) sessions from this computer to remote iSCSI target devices. If this service is stopped, this computer will not be able to login or access iSCSI targets. If this service is disabled, any services that explicitly depend on it will fail to start.	Manual
Microsoft iSNS Server	Maintains a database of iSNS client registrations and notifies clients when changes are made to the database.	Automatic
Microsoft Software Shadow Copy Provider	Manages software-based volume shadow copies taken by the Volume Shadow Copy service. If this service is stopped, software-based volume shadow copies cannot be managed. If this service is disabled, any services that explicitly depend on it will fail to start.	Manual
Net.Msmq Listener Adapter	Receives activation requests over the net.msmq and msmq.formatname protocols and passes them to the Windows Process Activation Service.	Automatic
Net.Pipe Listener Adapter	Receives activation requests over the net.pipe protocol and passes them to the Windows Process Activation Service.	Automatic
Net.Tcp Listener Adapter	Receives activation requests over the net.tcp protocol and passes them to the Windows Process Activation Service.	Automatic

Service	Description	Startup Default
Network Access Protection Agent	The Network Access Protection (NAP) agent service collects and manages health information for client computers on a network. Information collected by NAP agent is used to make sure that the client computer has the required software and settings. If a client computer is not compliant with health policy, it can be provided with restricted network access until its configuration is updated. Depending on the configuration of health policy, client computers might be automatically updated so that users quickly regain full network access without having to manually update their computer.	Manual
Network Connections	Manages objects in the Network and Dial-Up Connections folder, in which you can view both local area network and remote connections.	Manual
Network List Service	Identifies the networks to which the computer has connected, collects and stores properties for these networks, and notifies applications when these properties change.	Automatic
Network Location Awareness	Collects and stores configuration information for the network and notifies programs when this information is modified. If this service is stopped, configuration information might be unavailable. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
Network Policy Server	Manages authentication, authorization, auditing and accounting for virtual private network (VPN), dial-up, 802.1x wireless or Ethernet switch connection attempts sent by access servers that are compatible with the IETF RADIUS protocol. If this service is stopped, users might be unable to obtain a VPN, dial-up, wireless, or Ethernet connection to the network. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
Network Store Interface Service	This service delivers network notifications (e.g. interface addition/deleting etc) to user mode clients. Stopping this service will cause loss of network connectivity. If this service is disabled, any other services that explicitly depend on this service will fail to start.	Automatic

Service	Description	Startup Default
Online Responder Service	Enables the Online Certificate Status Protocol (OCSP) services for a PKI based applications such as secure e-mail, smartcard logon, secure web servers. If this service is stopped or disabled then the revocation services may not be available thereby causing authentication or application failures.	Automatic
Peer Name Resolution Protocol	Enables Serverless Peer Name Resolution over the Internet. If disabled, some Peer to Peer and Collaborative applications, such as Windows Meetings, may not function.	Manual
Peer Networking Identity Manager	Provides Identity service for Peer Networking.	Manual
Performance Counter DLL Host	Enables remote users and 64-bit processes to query performance counters provided by 32-bit DLLs. If this service is stopped, only local users and 32-bit processes will be able to query performance counters provided by 32-bit DLLs.	Manual
Performance Logs & Alerts	Performance logs and alerts collect performance data from local or remote computers based on pre-configured schedule parameters, then writes the data to a log or triggers an alert. If this service is stopped, performance information will not be collected. If this service is disabled, any services that explicitly depend on it will fail to start.	Manual
Plug and Play	Enables a computer to recognize and adapt to hardware changes with little or no user input. Stopping or disabling this service will result in system instability.	Automatic
PNRP Machine Name Publication Service	This service publishes a machine name using the Peer Name Resolution Protocol. Configuration is managed via the netsh context 'p2p pnrp peer'.	Manual
Portable Device Enumerator Service	Enforces group policy for removable mass-storage devices. Enables applications such as Windows Media Player and Image Import Wizard to transfer and synchronize content using removable mass-storage devices.	Manual
Power	Manages power policy and power policy notification delivery.	Automatic
Print Spooler	Loads files to memory for later printing.	Automatic
Problem Reports and Solutions Control Panel Support	This service provides support for viewing, sending and deletion of system-level problem reports for the Problem Reports and Solutions control panel.	Manual

Service	Description	Startup Default
Protected Storage	Provides protected storage for sensitive data, such as passwords, to prevent access by unauthorized services, processes, or users.	Manual
Quality Windows Audio Video Experience	Quality Windows Audio Video Experience (qWave) is a networking platform for Audio Video (AV) streaming applications on IP home networks. qWave enhances AV streaming performance and reliability by ensuring network quality-of-service (QoS) for AV applications. It provides mechanisms for admission control, run time monitoring and enforcement, application feedback, and traffic prioritization.	Manual
Remote Access Auto Connection Manager	Creates a connection to a remote network whenever a program references a remote DNS or NetBIOS name or address.	Manual
Remote Access Connection Manager	Manages dial-up and virtual private network (VPN) connections from this computer to the Internet or other remote networks. If this service is disabled, any services that explicitly depend on it will fail to start.	Manual
Remote Access Quarantine Agent	Removes validated remote access client from the quarantine network.	Manual
Remote Desktop Configuration	Remote Desktop Configuration service (RDCS) is responsible for all Remote Desktop Services and Remote Desktop related configuration and session maintenance activities that require SYSTEM context. These include per-session temporary folders, RD themes, and RD certificates.	Automatic
Remote Desktop Gateway	Provides secure remote connectivity to remote computers on your corporate network, from anywhere on the Internet. If this service is stopped, connections to remote computers cannot be made through this Remote Desktop Gateway server.	Automatic
Remote Desktop Licensing	Provides registered licenses for Remote Desktop Services clients. If this service is stopped, the server will be unavailable to issue Remote Desktop Services client access licenses to clients when they are requested.	Automatic
Remote Desktop Services	Allows users to connect interactively to a remote computer. Remote Desktop and Remote Desktop Session Host Server depend on this service. To prevent remote use of this computer, clear the checkboxes on the Remote tab of the System properties control panel item.	Automatic

Service	Description	Startup Default
Remote Desktop Services UserMode Port Redirector	Allows the redirection of Printers/Drives/Ports for RDP connections.	Manual
Remote Desktop Services Connection Broker	Enables a user connection request to be routed to the appropriate Remote Desktop Session Host in a cluster. If this service is stopped, connection requests will be routed to the first available server.	Automatic
Remote Packet Capture Protocol v.0 (experimental)	Allows to capture traffic on this machine from a remote machine.	Manual
Remote Packet Capture Protocol v.0 (experimental)	Allows to capture traffic on this machine from a remote machine.	Manual
Remote Procedure Call (RPC)	The RPCSS service is the Service Control Manager for COM and DCOM servers. It performs object activations requests, object exporter resolutions and distributed garbage collection for COM and DCOM servers. If this service is stopped or disabled, programs using COM or DCOM will not function properly. It is strongly recommended that you have the RPCSS service running.	Automatic
Remote Procedure Call (RPC) Locator	In Windows 2003 and earlier versions of Windows, the Remote Procedure Call (RPC) Locator service manages the RPC name service database. In Windows Vista and later versions of Windows, this service does not provide any functionality and is present for application compatibility.	Manual
Remote Registry	Enables remote users to modify registry settings on this computer. If this service is stopped, the registry can be modified only by users on this computer. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
Removable Storage	Manages and catalogs removable media and operates automated removable media devices. If this service is stopped, programs that are dependent on Removable Storage, such as Backup and Remote Storage, will operate more slowly. If this service is disabled, any services that explicitly depend on it will fail to start.	Manual
Resultant Set of Policy Provider	Provides a network service that processes requests to simulate application of Group Policy settings for a target user or computer in various situations and computes the Resultant Set of Policy settings.	Manual

Service	Description	Startup Default
Secondary Logon	Enables starting processes under alternate credentials. If this service is stopped, this type of logon access will be unavailable. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
Secure Socket Tunneling Protocol Service	Provides support for the Secure Socket Tunneling Protocol (SSTP) to connect to remote computers using VPN. If this service is disabled, users will not be able to use SSTP to access remote servers.	Manual
Security Accounts Manager	The startup of this service signals other services that the Security Accounts Manager (SAM) is ready to accept requests. Disabling this service will prevent other services in the system from being notified when the SAM is ready, which may in turn cause those services to fail to start correctly. This service should not be disabled.	Automatic
Server	Supports file, print, and named-pipe sharing over the network for this computer. If this service is stopped, these functions will be unavailable. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
Server for NFS	Enables a Windows based computer to act as an NFS Server.	Automatic
Shell Hardware Detection	Provides notifications for AutoPlay hardware events.	Automatic
Simple Mail Transfer Protocol (SMTP)	Transports electronic mail across the network.	Manual
Simple TCP/IP Services	Supports the following TCP/IP services: Character Generator, Daytime, Discard, Echo, and Quote of the Day.	Automatic
Smart Card	Manages access to smart cards read by this computer. If this service is stopped, this computer will be unable to read smart cards. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
SNMP Service	Enables Simple Network Management Protocol (SNMP) requests to be processed by this computer. If this service is stopped, the computer will be unable to process SNMP requests.	Automatic

Service	Description	Startup Default
SNMP Trap	Receives trap messages generated by local or remote Simple Network Management Protocol (SNMP) agents and forwards the messages to SNMP management programs running on this computer. If this service is stopped, SNMP-based programs on this computer will not receive SNMP trap messages. If this service is disabled, any services that explicitly depend on it will fail to start.	Manual
Software Protection	Enables the download, installation and enforcement of digital licenses for Windows and Windows applications. If the service is disabled, the operating system and licensed applications may run in a notification mode. It is strongly recommended that you not disable the Software Protection service.	Automatic
Special Administration Console Helper	Allows administrators to remotely access a command prompt using Emergency Management Services.	Manual
SPP Notification Service	Provides Software Licensing activation and notification	Manual
SQL Active Directory Helper Service	Enables integration with Active Directories	Automatic
SQL Server (RTCLOCAL)	Provides storage, processing and controlled access of data, and rapid transaction processing.	Automatic
SQL Server Agent (RTCLOCAL)	Executes jobs, monitors SQL Server, fires alerts, and allows automation of some administrative tasks.	Automatic
SQL Server Browser	Provides SQL Server connection information to client computers.	Automatic
SQL Server VSS Writer	Provides the interface to backup/restore Windows internal database through the Windows VSS infrastructure.	Automatic
SSDP Discovery	Discovers networked devices and services that use the SSDP discovery protocol, such as UPnP devices. Also announces SSDP devices and services running on the local computer. If this service is stopped, SSDP-based devices will not be discovered. If this service is disabled, any services that explicitly depend on it will fail to start.	Manual
System Event Notification Service	Monitors system events and notifies subscribers to COM+ Event System of these events.	Automatic

Service	Description	Startup Default
Task Scheduler	Enables a user to configure and schedule automated tasks on this computer. The service also hosts multiple Windows system-critical tasks. If this service is stopped or disabled, these tasks will not be run at their scheduled times. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
TCP/IP NetBIOS Helper	Provides support for the NetBIOS over TCP/IP (NetBT) service and NetBIOS name resolution for clients on the network, therefore enabling users to share files, print, and log on to the network. If this service is stopped, these functions might be unavailable. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
TCP/IP Print Server	Enables TCP/IP-based printing using the Line Printer Daemon protocol. If this service is stopped, TCP/IP-based printing will be unavailable. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
Telephony	Provides Telephony API (TAPI) support for programs that control telephony devices on the local computer and, through the LAN, on servers that are also running the service.	Manual
TPM Base Services	Enables access to the Trusted Platform Module (TPM), which provides hardware-based cryptographic services to system components and applications. If this service is stopped or disabled, applications will be unable to use keys protected by the TPM.	Manual
UPnP Device Host	Allows UPnP devices to be hosted on this computer. If this service is stopped, any hosted UPnP devices will stop functioning and no additional hosted devices can be added. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
User Profile Service	This service is responsible for loading and unloading user profiles. If this service is stopped or disabled, users will no longer be able to successfully logon or logoff, applications may have problems accessing users' data, and components registered to receive profile event notifications will not receive them.	Automatic
Virtual Disk	Provides management services for disks, volumes, file systems, and storage arrays.	Manual

Service	Description	Startup Default
Volume Shadow Copy	Manages and implements Volume Shadow Copies used for backup and other purposes. If this service is stopped, shadow copies will be unavailable for backup and the backup may fail. If this service is disabled, any services that explicitly depend on it will fail to start.	Manual
Web Client	Enables Windows-based programs to create, access, and modify Internet-based files. If this service is stopped, these functions will not be available. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
Web Management Service	The Web Management Service enables remote and delegated management capabilities for administrators to manage for the Web server, sites and applications present on this machine.	Automatic
Windows CardSpace	Securely enables the creation, management, and disclosure of digital identities.	Manual
Windows Color System	The WcsPlugInService service hosts third-party Windows Color System color device model and gamut map model plug-in modules. These plug-in modules are vendor-specific extensions to the Windows Color System baseline color device and gamut map models. Stopping or disabling the WcsPlugInService service will disable this extensibility feature, and the Windows Color System will use its baseline model processing rather than the vendor's desired processing. This might result in inaccurate color rendering.	Automatic
Windows Driver Foundation - User-mode Driver Framework	Manages user-mode driver host processes.	Manual
Windows Error Reporting Service	Allows errors to be reported when programs stop working or responding and allows existing solutions to be delivered. Also allows logs to be generated for diagnostic and repair services. If this service is stopped, error reporting might not work correctly and results of diagnostic services and repairs might not be displayed.	Automatic

Service	Description	Startup Default
Windows Event Collector	This service manages persistent subscriptions to events from remote sources that support WS-Management protocol. This includes Windows Vista event logs, hardware and IPMI-enabled event sources. The service stores forwarded events in a local Event Log. If this service is stopped or disabled event subscriptions cannot be created and forwarded events cannot be accepted.	Manual
Windows Event Log	This service manages events and event logs. It supports logging events, querying events, subscribing to events, archiving event logs, and managing event metadata. It can display events in both XML and plain text format. Stopping this service may compromise security and reliability of the system.	Automatic
Windows Firewall	Windows Firewall helps protect your computer by preventing unauthorized users from gaining access to your computer through the Internet or a network.	Automatic
Windows Font Cache Service	Optimizes performance of applications by caching commonly used font data. Applications will start this service if it is not already running. It can be disabled, though doing so will degrade application performance.	Automatic
Windows Installer	Adds, modifies, and removes applications provided as a Windows Installer (*.msi) package. If this service is disabled, any services that explicitly depend on it will fail to start.	Manual
Windows Internal Database	Windows Internal Database uses SQL Server 2005 Embedded Edition (Windows) as a relational data store for Windows roles and features only, such as Windows Sharepoint Services, Active Directory Rights Management Services, UDDI Services, Windows Server Update Services, and Windows System Resources Manager.	Automatic
Windows Management Instrumentation	Provides a common interface and object model to access management information about operating system, devices, applications and services. If this service is stopped, most Windows-based software will not function properly. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic

Service	Description	Startup Default
Windows Modules Installer	Enables installation, modification, and removal of Windows updates and optional components. If this service is disabled, install or uninstall of Windows updates might fail for this computer.	Manual
Windows Presentation Foundation Font Cache 3.0.0.0	Optimizes performance of Windows Presentation Foundation (WPF) applications by caching commonly used font data. WPF applications will start this service if it is not already running. It can be disabled, though doing so will degrade the performance of WPF applications.	Manual
Windows Process Activation Service	The Windows Process Activation Service (WAS) provides process activation, resource management and health management services for message-activated applications.	Automatic
Windows Remote Management (WS-Management)	Windows Remote Management (WinRM) service implements the WS-Management protocol for remote management. WS-Management is a standard web services protocol used for remote software and hardware management. The WinRM service listens on the network for WS-Management requests and processes them. The WinRM Service needs to be configured with a listener using winrm.cmd command line tool or through Group Policy in order for it to listen over the network. The WinRM service provides access to WMI data and enables event collection. Event collection and subscription to events require that the service is running. WinRM messages use HTTP and HTTPS as transports. The WinRM service does not depend on IIS but is preconfigured to share a port with IIS on the same machine. The WinRM service reserves the /wsman URL prefix. To prevent conflicts with IIS, administrators should ensure that any websites hosted on IIS do not use the /wsman URL prefix.	Automatic
Windows Search	Provides content indexing and property caching for file, email and other content (via extensibility APIs). The service responds to file and email notifications to index modified content. If the service is stopped or disabled, the Explorer will not be able to display virtual folder views of items, and search in the Explorer will fall back to item-by-item slow search.	Automatic
Windows SharePoint Services Timer	Sends notifications and performs scheduled tasks for Windows SharePoint Services	Automatic

Service	Description	Startup Default
Windows SharePoint Services Tracing	Manages trace output	Automatic
Windows SharePoint Services VSS Writer	Windows SharePoint Services VSS Writer	Manual
Windows System Resource Manager	Assigns computer resources to multiple applications running on Windows Vista Server. If this service is stopped or disabled, no management will occur, no accounting data will be collected, and the administrator will not be able to administer Windows System Resource Manager.	Automatic
Windows Time	Maintains date and time synchronization on all clients and servers in the network. If this service is stopped, date and time synchronization will be unavailable. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
Windows Update	Enables the detection, download, and installation of updates for Windows and other programs. If this service is disabled, users of this computer will not be able to use Windows Update or its automatic updating feature, and programs will not be able to use the Windows Update Agent (WUA) API.	Disable
WinHTTP Web Proxy Auto-Discovery Service	WinHTTP implements the client HTTP stack and provides developers with a Win32 API and COM Automation component for sending HTTP requests and receiving responses. In addition, WinHTTP provides support for auto-discovering a proxy configuration via its implementation of the Web Proxy Auto-Discovery (WPAD) protocol.	Manual
WINS	Manages the Windows Internet Name Service (WINS), which translates NetBIOS computer names to IP addresses.	Automatic
Wired AutoConfig	The Wired AutoConfig (DOT3SVC) service is responsible for performing IEEE 802.1X authentication on Ethernet interfaces. If your current wired network deployment enforces 802.1X authentication, the DOT3SVC service should be configured to run for establishing Layer 2 connectivity and/or providing access to network resources. Wired networks that do not enforce 802.1X authentication are unaffected by the DOT3SVC service.	Manual

Service	Description	Startup Default
WMI Performance Adapter	Provides performance library information from Windows Management Instrumentation (WMI) providers to clients on the network. This service only runs when Performance Data Helper is activated.	Manual
Workstation	Creates and maintains client network connections to remote servers using the SMB protocol. If this service is stopped, these connections will be unavailable. If this service is disabled, any services that explicitly depend on it will fail to start.	Automatic
World Wide Web Publishing Service	Provides Web connectivity and administration through the Internet Information Services Manager.	Automatic

A.5 Windows Update Policy

Note the following in reference to Windows Update Policy:

- AudioCodes is obligated to test and approve all SBA Cumulative Updates (CU) within 1 month of Microsoft releasing them.
- AudioCodes ships all SBAs with the Windows Update service disabled as default (Never check for updates (not recommended).
- AudioCodes does not test (as a rule) every Windows Update released by Microsoft.
- In case customers wish to enable the Windows Update service- Install Updates automatically (recommended) (according to their corporate update policy), they can verify the updates, based upon Microsoft’s recommendations.

A.6 Firewall Rules

This section describes the firewall rules that are used in the SBA deployment. These include the following:

- Default SBA internal firewall rules (see below)
- SBA network firewall settings (see Section A.6.2)

Note: Many firewall rules are required for normal SBA operation. The listing is extensive and therefore not all of the relevant firewall rules are listed in the document. To retrieve the full list of the firewall rules – open the scw_sba_W14 XML file with the SCW tool and open the firewall.

A.6.1 Default SBA Internal Firewall Rules

The table below describes the default SBA internal firewall rules.

Table A-5: Firewall Rules

Firewall Rule	Description	Protocol Keyword	Direction	Program/ Service	Local Ports	Remote Ports
Allow inbound connections for service: RTCMEDSRV for protocol: TCP	–	TCP	Inbound	RTCMEDSRV	–	–
Allow inbound connections for service: SQLBrowser for protocol: UDP	–	UDP	Inbound	SQLBrowser	–	–
Allow inbound connections for service: MSSQL$RTCLOCAL for protocol: TCP	–	TCP	Inbound	MSSQL$RTCLOCAL	–	–
Allow inbound connections for service: RtcSrv for protocol: TCP	–	TCP	Inbound	RtcSrv	–	–

Firewall Rule	Description	Protocol Keyword	Direction	Program/ Service	Local Ports	Remote Ports
Core Networking - Dynamic Host Configuration Protocol (DHCP-In)	Allows DHCP (Dynamic Host Configuration Protocol) messages for stateful auto-configuration.	UDP	Inbound	dhcp	68	67
Core Networking - Dynamic Host Configuration Protocol (DHCP-Out)	Allows DHCP (Dynamic Host Configuration Protocol) messages for stateful auto-configuration	UDP	Outbound	dhcp	68	67
Core Networking - DNS (UDP-Out)	Outbound rule to allow DNS requests. DNS responses based on requests that matched this rule will be permitted regardless of source address. This behavior is classified as loose source mapping. [LSM] [UDP 53]	UDP	Outbound	dnscache	_	53

Firewall Rule	Description	Protocol Keyword	Direction	Program/ Service	Local Ports	Remote Ports
Core Networking - Group Policy (LSASS-Out) Description: . Group: Core Networking Protocol Keyword: TCP Direction: Outbound Program: %systemroot%\system32\lsass.exe Enabled: True Action: AllowConnections Profiles: Domain	Outbound rule to allow remote LSASS traffic for Group Policy updates [TCP]	TCP	Outbound	lsass.exe	_	_
Core Networking - Group Policy (NP-Out)	Core Networking - Group Policy (NP-Out)	TCP	Outbound	_	_	445
Core Networking - Group Policy (TCP-Out)	Outbound rule to allow remote RPC traffic for Group Policy	TCP	Outbound	_	_	_

Firewall Rule	Description	Protocol Keyword	Direction	Program/ Service	Local Ports	Remote Ports
Core Networking - Destination Unreachable Fragmentation Needed (ICMPv4-In)	Destination Unreachable Fragmentation Needed error messages are sent from any node that a packet traverses which is unable to forward the packet because fragmentation was needed and the don't fragment bit was set.	ICMP_V4	Inbound	_	_	_
Core Networking - Destination Unreachable (ICMPv6-In)	Destination Unreachable error messages are sent from any node that a packet traverses which is unable to forward the packet for any reason except congestion.	ICMP_V6	Inbound	_	_	_

Firewall Rule	Description	Protocol Keyword	Direction	Program/ Service	Local Ports	Remote Ports
Core Networking - Multicast Listener Done (ICMPv6-In)	Multicast Listener Done messages inform local routers that there are no longer any members remaining for a specific multicast address on the subnet.	ICMP_V6	Inbound	–	–	–
Core Networking - Multicast Listener Done (ICMPv6-Out)	Multicast Listener Done messages inform local routers that there are no longer any members remaining for a specific multicast address on the subnet	ICMP_V6	Outbound	–	–	–
Core Networking - Multicast Listener Query (ICMPv6-In)	An IPv6 multicast-capable router uses the Multicast Listener Query message to query a link for multicast group membership	ICMP_V6	Inbound	–	–	–

Firewall Rule	Description	Protocol Keyword	Direction	Program/ Service	Local Ports	Remote Ports
Core Networking - Multicast Listener Query (ICMPv6-Out)	An IPv6 multicast-capable router uses the Multicast Listener Query message to query a link for multicast group membership	ICMP_V 6	Outboun d	_	_	_
Core Networking - Multicast Listener Report (ICMPv6-Out)	The Multicast Listener Report message is used by a listening node to either immediately report its interest in receiving multicast traffic at a specific multicast address or in response to a Multicast Listener Query	ICMP_V 6	Outboun d	_	_	_

Firewall Rule	Description	Protocol Keyword	Direction	Program/ Service	Local Ports	Remote Ports
Core Networking - Multicast Listener Report v2 (ICMPv6-In)	Multicast Listener Report v2 message is used by a listening node to either immediately report its interest in receiving multicast traffic at a specific multicast address or in response to a Multicast Listener Query	ICMP_V6	Inbound	_	_	_
Core Networking - Multicast Listener Report v2 (ICMPv6-Out)	Multicast Listener Report v2 message is used by a listening node to either immediately report its interest in receiving multicast traffic at a specific multicast address or in response to a Multicast Listener Query	ICMP_V6	Outbound	_	_	_

Firewall Rule	Description	Protocol Keyword	Direction	Program/ Service	Local Ports	Remote Ports
Core Networking - Neighbor Discovery Advertisement (ICMPv6-In)	Neighbor Discovery Advertisement messages are sent by nodes to notify other nodes of link-layer address changes or in response to a Neighbor Discovery Solicitation request	ICMP_V6	Inbound	–	–	–
Core Networking - Neighbor Discovery Advertisement (ICMPv6-Out)	Neighbor Discovery Advertisement messages are sent by nodes to notify other nodes of link-layer address changes or in response to a Neighbor Discovery Solicitation request	ICMP_V6	Outbound	–	–	–
Core Networking - Neighbor Discovery Solicitation (ICMPv6-In)	Neighbor Discovery Solicitations are sent by nodes to discover the link-layer address of another on-link IPv6 node	ICMP_V6	Inbound	–	–	–

Firewall Rule	Description	Protocol Keyword	Direction	Program/ Service	Local Ports	Remote Ports
Core Networking - Neighbor Discovery Solicitation (ICMPv6-Out)	Neighbor Discovery Solicitations are sent by nodes to discover the link-layer address of another on-link IPv6 node	ICMP_V6	Outbound	–	–	–
Core Networking - Parameter Problem (ICMPv6-In)	Parameter Problem error messages are sent by nodes as a result of incorrectly generated packets.	ICMP_V6	Inbound	–	–	–
Core Networking - Parameter Problem (ICMPv6-Out)	Parameter Problem error messages are sent by nodes as a result of incorrectly generated packets	ICMP_V6	Outbound	–	–	–
Core Networking - Packet Too Big (ICMPv6-In) Description: . Group: Core Networking Protocol Keyword: ICMP_V6 Direction: Inbound	Packet Too Big error messages are sent from any node that a packet traverses which is unable to forward the packet because the packet is too large for the next link	ICMP_V6	Inbound	–	–	–

Firewall Rule	Description	Protocol Keyword	Direction	Program/ Service	Local Ports	Remote Ports
Core Networking - Packet Too Big (ICMPv6-Out)	Packet Too Big error messages are sent from any node that a packet traverses which is unable to forward the packet because the packet is too large for the next link	ICMP_V6	Outbound	–	–	–
Core Networking - Router Advertisement (ICMPv6-In)	Router Advertisement messages are sent by routers to other nodes for stateless auto-configuration	ICMP_V6	Inbound	–	–	–
Core Networking - Router Advertisement (ICMPv6-Out)	Router Advertisement messages are sent by routers to other nodes for stateless auto-configuration.	ICMP_V6	Outbound	–	–	–
Core Networking - Router Solicitation (ICMPv6-Out)	Router Solicitation messages are sent by nodes seeking routers to provide stateless auto-configuration	ICMP_V6	Outbound	–	–	–

Firewall Rule	Description	Protocol Keyword	Direction	Program/ Service	Local Ports	Remote Ports
Core Networking - Time Exceeded (ICMPv6-In)	Time Exceeded error messages are generated from any node that a packet traverses if the Hop Limit value is decremented to zero at any point on the path.	ICMP_V 6	Inbound	–	–	–
Core Networking - Time Exceeded (ICMPv6-Out)	Time Exceeded error messages are generated from any node that a packet traverses if the Hop Limit value is decremented to zero at any point on the path.	ICMP_V 6	Outboun d	–	–	–
Core Networking - Internet Group Management Protocol (IGMP-In)	IGMP messages are sent and received by nodes to create, join and depart multicast groups.	IGMP	Inbound	–	–	–

Firewall Rule	Description	Protocol Keyword	Direction	Program/ Service	Local Ports	Remote Ports
Core Networking - Internet Group Management Protocol (IGMP-Out)	IGMP messages are sent and received by nodes to create, join and depart multicast groups	IGMP	Outbound	–	–	–
Core Networking - IPHTTPS (TCP-In)	Inbound TCP rule to allow IPHTTPS tunneling technology to provide connectivity across HTTP proxies and firewalls.	TCP	Inbound	–	–	–
Core Networking - IPHTTPS (TCP-Out)	Outbound TCP rule to allow IPHTTPS tunneling technology to provide connectivity across HTTP proxies and firewalls	TCP	Outbound	–	–	–
Core Networking - IPv6 (IPv6-In)	Inbound rule required to permit IPv6 traffic for ISATAP (Intra-Site Automatic Tunnel Addressing Protocol) and 6to4 tunneling services.	IPV6	Inbound	–	–	–

Firewall Rule	Description	Protocol Keyword	Direction	Program/ Service	Local Ports	Remote Ports
Core Networking - IPv6 (IPv6-Out)	Outbound rule required to permit IPv6 traffic for ISATAP (Intra-Site Automatic Tunnel Addressing Protocol) and 6to4 tunneling services	IPV6	Outbound	–	–	–
Core Networking - Teredo (UDP-In)	Inbound UDP rule to allow Teredo edge traversal, a technology that provides address assignment and automatic tunneling for unicast IPv6 traffic when an IPv6/IPv4 host is located behind an IPv4 network address translator.	UDP	Inbound	–	–	–

Firewall Rule	Description	Protocol Keyword	Direction	Program/ Service	Local Ports	Remote Ports
Core Networking - Teredo (UDP-Out)	Outbound UDP rule to allow Teredo edge traversal, a technology that provides address assignment and automatic tunneling for unicast IPv6 traffic when an IPv6/IPv4 host is located behind an IPv4 network address translator	UDP	Outbound	–	–	–
File and Printer Sharing (Echo Request - ICMPv4-In)	Echo Request messages are sent as ping requests to other nodes	ICMP_V4	Inbound	–	–	–
File and Printer Sharing (Echo Request - ICMPv4-Out)	Echo Request messages are sent as ping requests to other nodes. Group: File and Printer Sharing	ICMP_V4	Outbound	–	–	–

Firewall Rule	Description	Protocol Keyword	Direction	Program/ Service	Local Ports	Remote Ports
File and Printer Sharing (Echo Request - ICMPv6-In)	Echo Request messages are sent as ping requests to other nodes	ICMP_V6	Inbound	_	_	_
File and Printer Sharing (Echo Request - ICMPv6-Out)	Echo Request messages are sent as ping requests to other nodes	ICMP_V6	Outbound	_	_	_
File and Printer Sharing (NB-Datagram-In)	Inbound rule for File and Printer Sharing to allow NetBIOS Datagram transmission and reception. [UDP 138]	UDP	Inbound	_	138	_
File and Printer Sharing (NB-Datagram-Out)	Outbound rule for File and Printer Sharing to allow NetBIOS Datagram transmission and reception. [UDP 138]	UDP	Outbound	_	_	138
File and Printer Sharing (NB-Name-In)	Inbound rule for File and Printer Sharing to allow NetBIOS Name Resolution. [UDP 137]	UDP	Inbound	_	137	_

Firewall Rule	Description	Protocol Keyword	Direction	Program/ Service	Local Ports	Remote Ports
File and Printer Sharing (NB-Session-In)	Inbound rule for File and Printer Sharing to allow NetBIOS Session Service connections. [TCP 139]	TCP	Inbound	_	139	_
File and Printer Sharing (NB-Session-Out)	Outbound rule for File and Printer Sharing to allow NetBIOS Session Service connections. [TCP 139]	TCP	Outbound	_	_	139
File and Printer Sharing (Spooler Service - RPC-EPMAP)	Inbound rule for the RPCSS service to allow RPC/TCP traffic for the Spooler Service.	TCP	Inbund	rpcss	RPCEndPoint Mapper	_
File and Printer Sharing (SMB-In)	Inbound rule for File and Printer Sharing to allow Server Message Block transmission and reception via Named Pipes. [TCP 445]	TCP	Inbound	_	445	_

Firewall Rule	Description	Protocol Keyword	Direction	Program/ Service	Local Ports	Remote Ports
File and Printer Sharing (SMB-Out)	Outbound rule for File and Printer Sharing to allow Server Message Block transmission and reception via Named Pipes. [TCP 445]	TCP	Outbound	_	_	445
World Wide Web Services (HTTP Traffic-In)	An inbound rule to allow HTTP traffic for Internet Information Services (IIS) [TCP 80]	TCP	Inbound	_	80	_
World Wide Web Services (HTTPS Traffic-In)	An inbound rule to allow HTTPS traffic for Internet Information Services (IIS) [TCP 443]	TCP	Inbound	_	443	_
Message Queuing	Message Queuing	TCP	Inbound	mqsvc.exe	_	_
Message Queuing Description: Group: Message Queuing Protocol Keyword: UDP Direction: Inbound	Message Queuing	UDP	Inbound	mqsvc.exe	_	_
Message Queuing	Message Queuing	TCP	Outbound	Mqsvc.exe	_	_
Message Queuing	Message Queuing	UDP	Outbound	Mqsvc.exe	_	_
Message Queuing	Message Queuing	PGM	Inbound	_	_	_

Firewall Rule	Description	Protocol Keyword	Direction	Program/ Service	Local Ports	Remote Ports
Message Queuing	Message Queuing	PGM	Outbound	_	_	_
Netlogon Service (NP-In)	Inbound rule for the NetLogon service to be remotely managed over Named Pipes	TCP	Inbound	_	445	_
Remote Administration (RPC)	Inbound rule for all services to be remotely managed via RPC/TCP	TCP	Inbound	_	DynamicRPC	_
Remote Administration (NP-In)	Inbound rule for all services to be remotely managed over Named Pipes	TCP	Inbound	_	445	_
Remote Administration (RPC-EPMAP) Description: .	Inbound rule for the RPCSS service to allow RPC/TCP traffic for all the local services	TCP	Inbound	rpcss	RPCEndPoint Mapper	_
Remote Desktop (TCP-In)	Inbound rule for the Remote Desktop service to allow RDP traffic. [TCP 3389]	TCP	Inbound	_	3389	_

Firewall Rule	Description	Protocol Keyword	Direction	Program/ Service	Local Ports	Remote Ports
Remote Event Log Management (RPC)	Inbound rule for the local Event Log service to be remotely managed via RPC/TCP.	TCP	Inbound	_	DynamicRPC	_
Remote Event Log Management (NP-In)	Inbound rule for the local Event Log service to be remotely managed over Named Pipes	TCP	Inbound	_	445	_
Remote Event Log Management (RPC-EPMAP)	Inbound rule for the RPCSS service to allow RPC/TCP traffic for the local Event Log Service.	TCP	Inbound	Rpcss	RPCEndPoint Mapper	_
Windows Firewall Remote Management (RPC)	Inbound rule for the Windows Firewall to be remotely managed via RPC/TCP	TCP	Inbound	policyagent	DynamicRPC	_
Windows Firewall Remote Management (RPC-EPMAP)	Inbound rule for the RPCSS service to allow RPC/TCP traffic for the Windows Firewall	TCP	Inbound	rpcss	RPCEndPoint Mapper	_

Firewall Rule	Description	Protocol Keyword	Direction	Program/ Service	Local Ports	Remote Ports
SCW remote access firewall rule - Scshost - Dynamic RPC	Allow inbound access for scshost using dynamic RPC and protocol TCP	TCP	Inbound	scshost	DynamicRPC	_
SCW remote access firewall rule - Scshost - End Point RPC Mapper	Allow inbound access for scshost using end point RPC mapper and protocol TCP	TCP	Inbound	scshost	RPCEndPoint Mapper	_
SCW remote access firewall rule - Svchost - TCP	Allow inbound access for svchost using port 135 and protocol TCP	TCP	Inbound	svschost	135	_
SCW inbound access firewall rule - System - TCP	Allow inbound access for system using ports 139, 445 and protocol TCP	TCP	Inbound	_	139, 445	_
SCW remote access firewall rule - System - UDP	Allow inbound access for system using port 137 and protocol UDP	UDP	Inbound	_	137	_
SNMP Service (UDP In)	Inbound rule for the Simple Network Management Protocol (SNMP) Service to allow SNMP traffic. [UDP 161]	UDP	Inbound	snmp	161	_

Firewall Rule	Description	Protocol Keyword	Direction	Program/ Service	Local Ports	Remote Ports
SNMP Trap Service (UDP In)	Inbound rule for the SNMP Trap Service to allow SNMP traps. [UDP 162]	UDP	Inbound	snmptrap	162	LocalSubnet
SNMP Trap Service (UDP In)	Inbound rule for the SNMP Trap Service to allow SNMP traps. [UDP 162]	UDP	Inbound	snmptrap	162	_
Windows Communication Foundation Net.TCP Listener Adapter (TCP-In)	An inbound rule for Windows Communication Foundation to allow TCP traffic to the Net.TCP Listener Adapter [TCP 808]	TCP	Inbound	nettcpactivator	808	_
Windows Management Instrumentation (ASync-In)	Inbound rule to allow Asynchronous WMI traffic for remote Windows Management Instrumentation. [TCP]	TCP	Inbound	Unsecapp	_	_

A.6.2 SBA Network Firewall Settings

The table below describes the various network firewall settings that are required for connections between the different components in the SBA network.

Table A-6: SBA Network Firewall Setting

Source	Destination	Destination port	Transport	Protocol	Notes
CMS	SBA	445	TCP	SMB	Central Management Server Replication
Front End Servers	SBA	5061	TCP	SIP/MTLS	SIP Signalling
Front End Servers	SBA	444	TCP	HTTPS	Certificate replication
Front End Servers	SBA	50001	TCP	SIP/MTLS	Centralized Logging Service
Front End Servers	SBA	50002	TCP	SIP/MTLS	Centralized Logging Service
Front End Servers	SBA	50003	TCP	SIP/MTLS	Centralized Logging Service
Front End Servers	SBA	5090	TCP	SIP/MTLS	WinFabFederationPort
Front End Servers	SBA	5091	TCP	SIP/MTLS	WinFabLeaseAgentPort
Front End Servers	SBA	5092	TCP	SIP/MTLS	WinFabClientConnectionPort
Front End Servers	SBA	5093	TCP	SIP/MTLS	WinFabIPCPort
Front End Servers	SBA	5094	TCP	SIP/MTLS	WinFabReplicationPort
SBA	Front End Servers	444	TCP	HTTPS	Certificate replication
SBA	Front End Servers	5061	TCP	SIP/MTLS	SIP signalling
SBA	Front End Servers	5088	TCP	SIP/MTLS	Lync 2013 mobility - UCWA
SBA	Front End Servers	5089	TCP	SIP/MTLS	Lync 2013 mobility-UCWA
SBA	Front End Servers	50001	TCP	SIP/MTLS	Centralized Logging Service

Source	Destination	Destination port	Transport	Protocol	Notes
SBA	Front End Servers	50002	TCP	SIP/MTLS	Centralized Logging Service
SBA	Front End Servers	50003	TCP	SIP/MTLS	Centralized Logging Service
SBA	Front End Servers	5090	TCP	SIP/MTLS	WinFabFederationPort
SBA	Front End Servers	5091	TCP	SIP/MTLS	WinFabLeaseAgentPort
SBA	Front End Servers	5092	TCP	SIP/MTLS	WinFabClientConnectionPort
SBA	Front End Servers	5093	TCP	SIP/MTLS	WinFabIPCPort
SBA	Front End Servers	5094	TCP	SIP/MTLS	WinFabReplicationPort
SBA	Director	444	TCP	HTTPS	Certificate replication
SBA	Edge Pool	5062	TCP	SIP/MTLS	SIP connection for requesting MRAS credentials
SBA	Edge Pool	443	TCP	SRTP	Audio Ports to external
SBA	Edge Pool	3478	UDP	SRTP	Audio Ports to external

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B Running Anti-Virus Software

When Anti-Virus software is run on SBA components, ensure that the Antivirus file scanning exclusions are based on the following Microsoft recommendations:

- SBA with Microsoft Lync 2010: https://technet.microsoft.com/en-us/library/gg195736.aspx
- SBA with Microsoft Lync 2013: https://technet.microsoft.com/en-us/library/dn440138%28v=ocs.15%29.aspx

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C Configuring RAID

This appendix describes how to set up and enable RAID 1 (**R**edundant **A**rray of **I**ndependent **D**isks) on the Mediant 2600B SBA. RAID 1 is achieved by using two installed OSN hard drives (HDMX) that serve as Master-Slave configuration, where the Slave disk has an exact copy (or mirror) of the data on the Master disk. Thus, RAID 1 provides redundancy of the SBA in case of failure of one of the disks.

C.1 Prerequisites

Before configuring RAID, ensure that you do the following:

- Complete the SBA installation and configuration as described in Chapter '8' on page 79 .
- Ensure that the HDMX disk in Slot 8 (slave) is unallocated (without a volume allocated).
- Ensure that the storage capacity of both the HDMX disks is identical (e.g., **120 GB).**

C.2 Slot Assignments for OSN Hard Drives

The Mediant 2600B SBA rear panel is displayed in the figure below and described in the subsequent table.

Table C-1: OSN Slot Assignment

Slot #	Description
5	OSN4 Module
6	HDMX Master – Hard Disk functionality for OSN platform.
7	HDMX Slave – Hard Disk functionality for OSN platform.

Note: Power down the device before inserting the HDMX into Slot 7.

Before inserting the second hard disk drive, ensure that this drive is compatible with the existing SBA hard disk drive storage as described in the table below.

Table C-2: Mediant 2600B SBA HDD Type RAID 1 Compatibility Table

SBA	Prime Storage Type	Second HDD for RAID	
M1KB SBA2G or 4G	HDMX	M1KB-HDD	
M1KB-4G-SBA-SSD	SSD	M1KB-SSD-120	
M1KB-SBA-SSD	SSD	M1KB-SSD-120	
M1KB-SBA-ES	SSD	M1KB-SSD-120	All SBA family products with a CPN which ends with ES

C.3 Configuring RAID 1

The procedure below describes how to configure RAID 1 on the Mediant 2600B SBA.

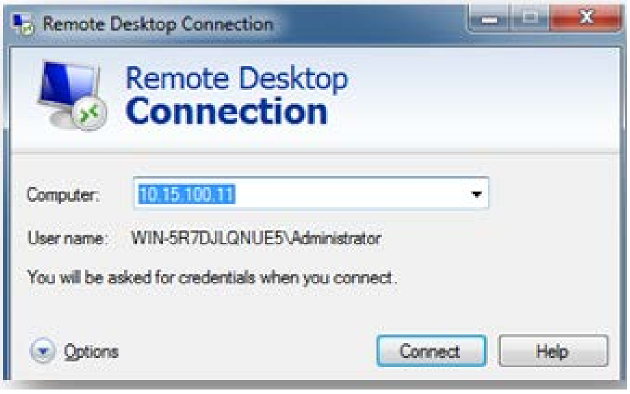
The procedure below describes how to configure RAID 1 on the Mediant 2600B SBA.

Note: As this is an uptime solution (i.e., it allows you to plan the installation and keep the SBA running using the secondary HDD), if there is a hard disk failure, a complete re-install of the SBA is required.

➢ How to configure RAID 1:

1. Connect to the SBA using Remote Desktop Connection (**Start** > **Accessories** > **Remote Desktop Connection**).

Figure C-1: Remote Desktop Connection



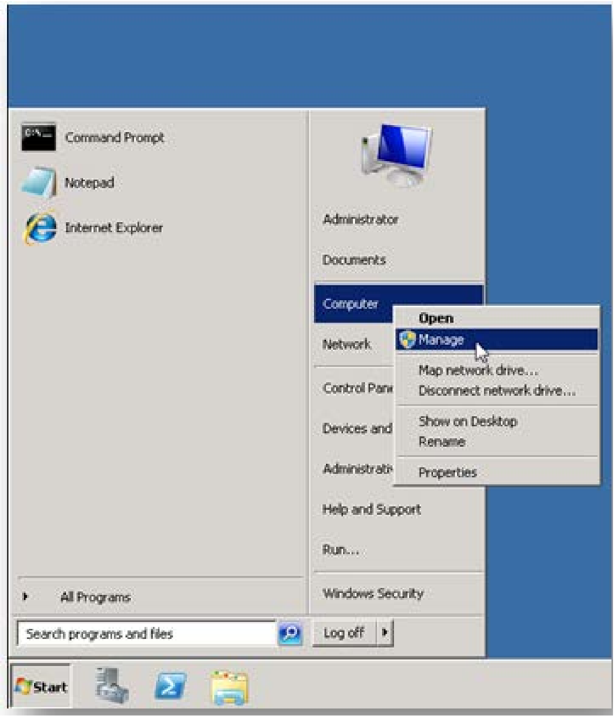
Computer: 10.15.100.11

User name: WIN-5R7DJLQNUE5\Administrator

You will be asked for credentials when you connect.

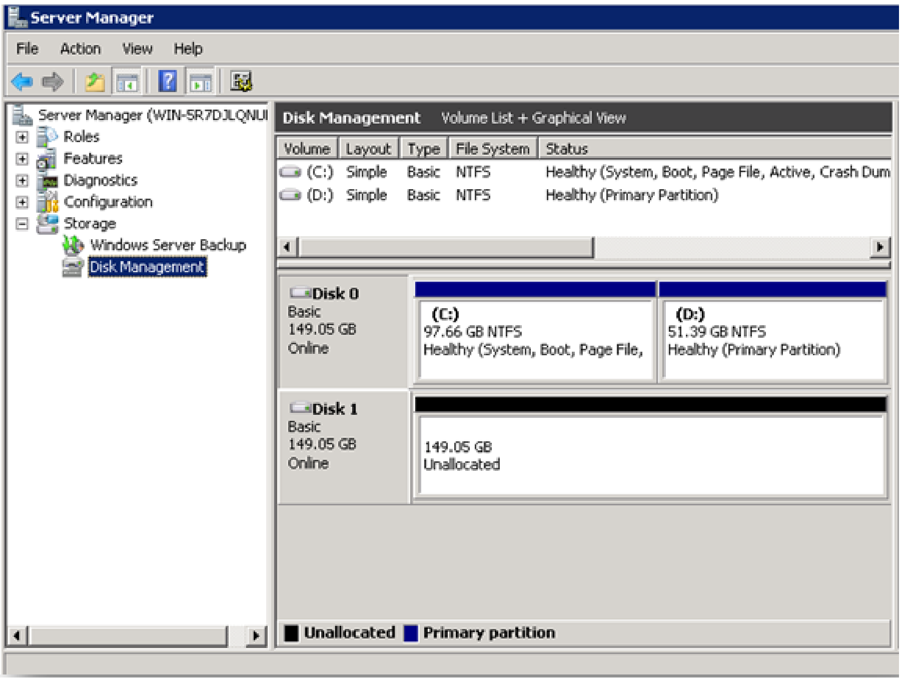
2. Open Computer Management (**Start Menu** > right-click **Computer** > **Manage** or ‘compmgmt.msc’).

Figure C-2: Computer Management



3. In the Server Manager, navigate to the **Disk Management** menu option.

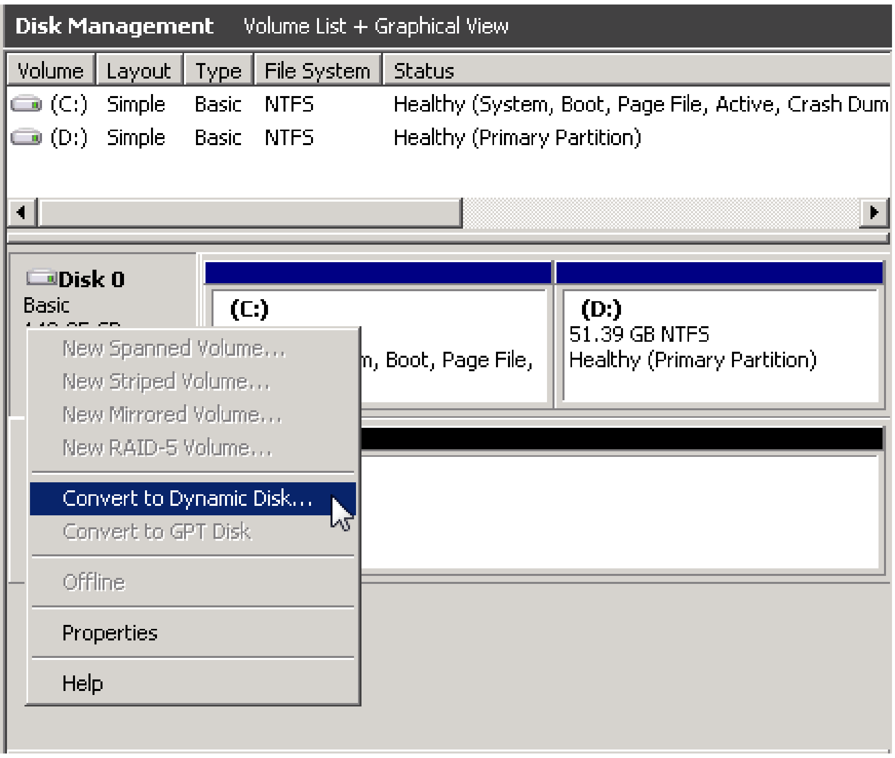
Figure C-3: Disk Management



Volume	Layout	Type	File System	Status
(C:)	Simple	Basic	NTFS	Healthy (System, Boot, Page File, Active, Crash Dum
(D:)	Simple	Basic	NTFS	Healthy (Primary Partition)

4. Convert the disks to ‘Dynamic’ by right-clicking **Disc 0**, and then selecting the **Convert to Dynamic Disk** menu option.

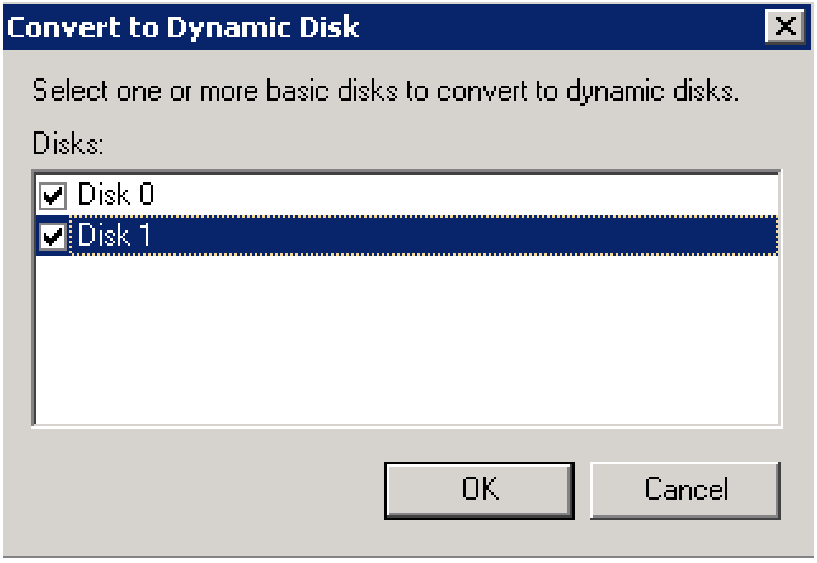
Figure C-4: Convert to Dynamic Disk



Volume	Layout	Type	File System	Status
(C:)	Simple	Basic	NTFS	Healthy (System, Boot, Page File, Active, Crash Dum
(D:)	Simple	Basic	NTFS	Healthy (Primary Partition)

5. Select one or more basic disks to convert to dynamic disks, and then click **OK**.

Figure C-5: Convert to Dynamic Disk Selection



Convert to Dynamic Disk

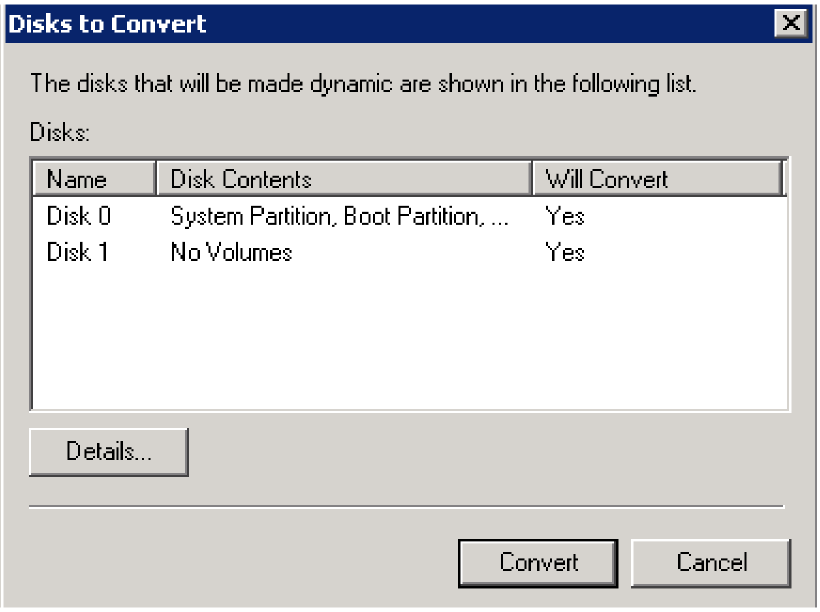
Select one or more basic disks to convert to dynamic disks.

Disks:

☑ Disk 0
☑ Disk 1

6. In the Disks to Convert screen, click **Convert**.

Figure C-6: Disks to Convert



Disks to Convert

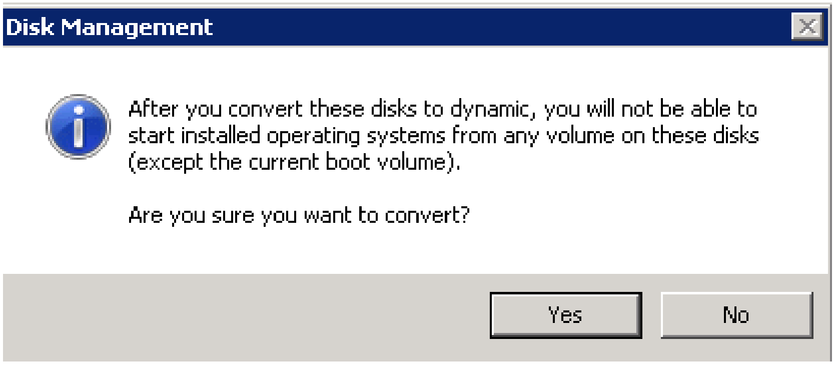
The disks that will be made dynamic are shown in the following list.

Disks:

Name	Disk Contents	Will Convert
Disk 0	System Partition, Boot Partition, ...	Yes
Disk 1	No Volumes	Yes

7. In the Disk Management screen, click **Yes**.

Figure C-7: Disks Management



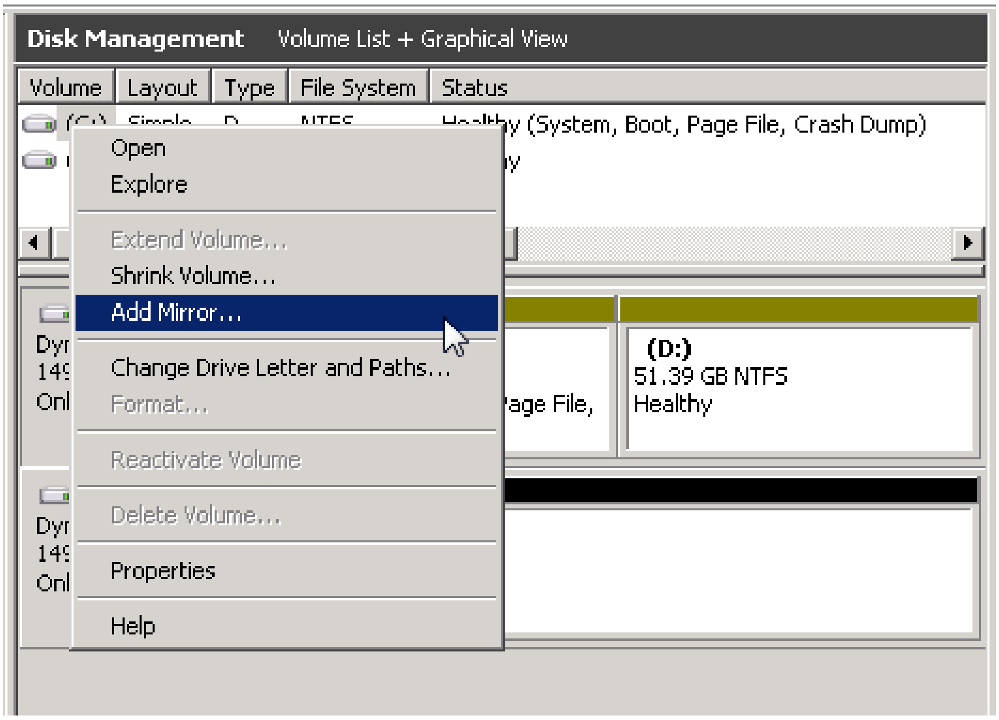
Disk Management

After you convert these disks to dynamic, you will not be able to start installed operating systems from any volume on these disks (except the current boot volume).

Are you sure you want to convert?

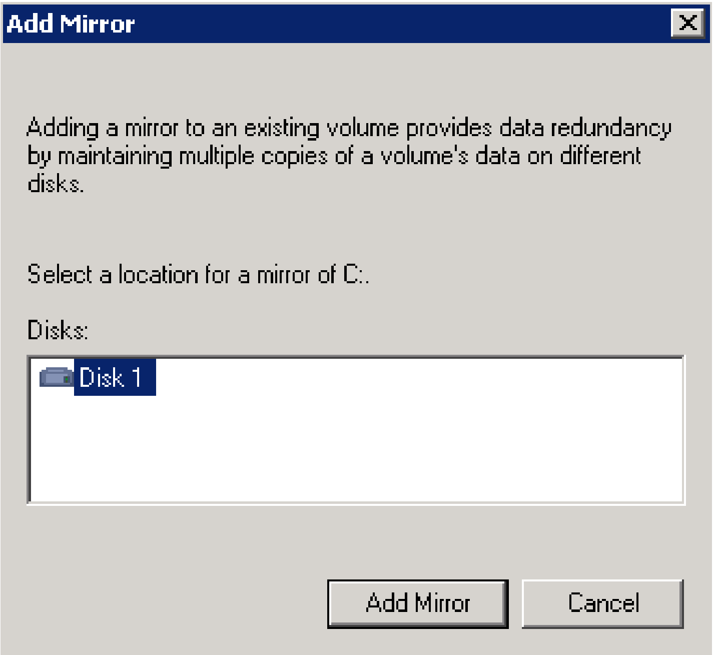
8. Add the Mirror, by right-clicking **Partition C**, and then select the **Add Mirror** menu option.

Figure C-8: Add Mirror



9. Select a location for a mirror of Disk C, and then click **Add Mirror**.

Figure C-9: Add Mirror Disk 1



Add Mirror

Adding a mirror to an existing volume provides data redundancy by maintaining multiple copies of a volume's data on different disks.

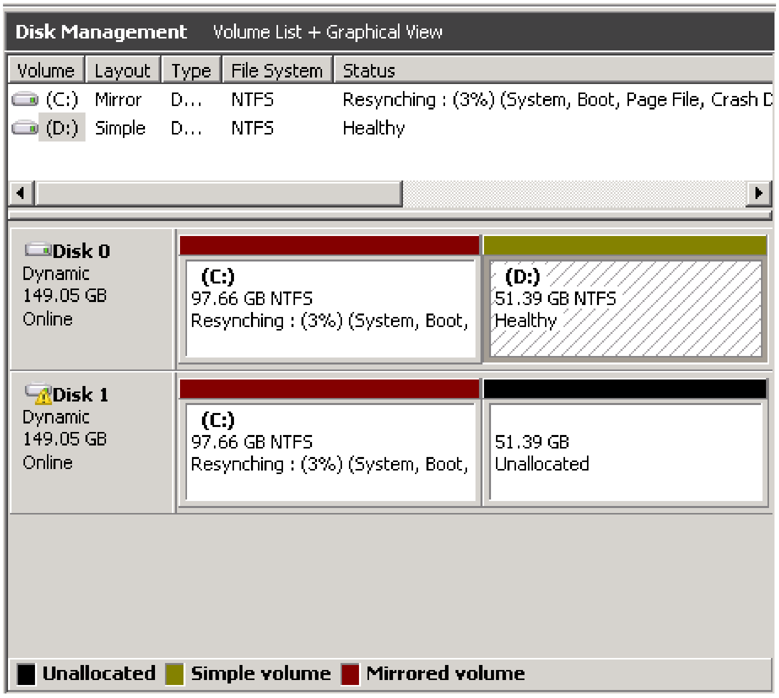
Select a location for a mirror of C:.

Disks:

Disk 1

10. The ‘Add Mirror’ process appears displaying progress in the Status column.

Figure C-10: Disk Management - Resynchronization



Disk Management Volume List + Graphical View

Volume	Layout	Type	File System	Status
(C:)	Mirror	D...	NTFS	Resynching : (3%) (System, Boot, Page File, Crash D
(D:)	Simple	D...	NTFS	Healthy

Disk 0
Dynamic
149.05 GB
Online

(C:)
97.66 GB NTFS
Resynching : (3%) (System, Boot,

(D:)
51.39 GB NTFS
Healthy

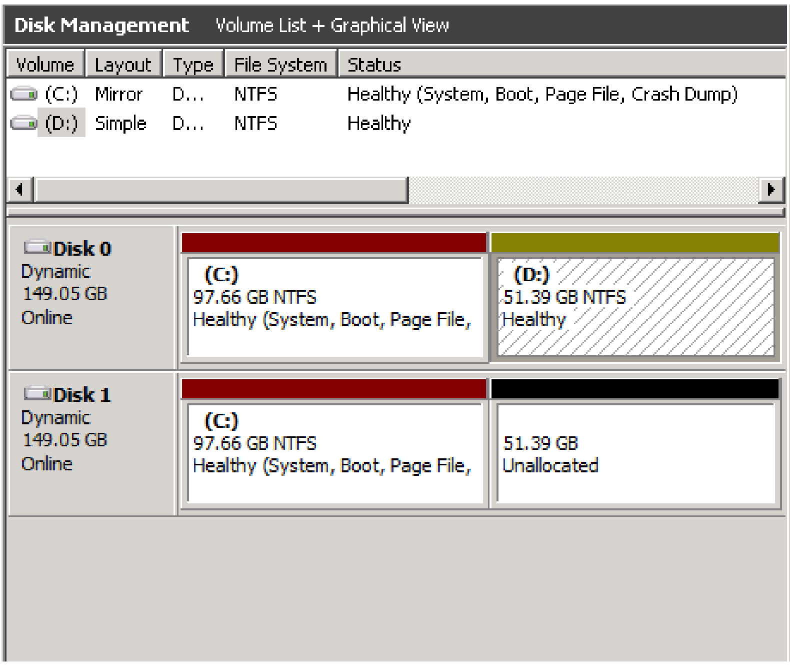
Disk 1
Dynamic
149.05 GB
Online

(C:)
97.66 GB NTFS
Resynching : (3%) (System, Boot,

51.39 GB
Unallocated

11. When the process has completed, the following screen appears:

Figure C-11: Disk Management – End of Process



Disk Management Volume List + Graphical View

Volume	Layout	Type	File System	Status
(C:)	Mirror	D...	NTFS	Healthy (System, Boot, Page File, Crash Dump)
(D:)	Simple	D...	NTFS	Healthy

Disk 0
Dynamic
149.05 GB
Online

(C:)
97.66 GB NTFS
Healthy (System, Boot, Page File,

(D:)
51.39 GB NTFS
Healthy

Disk 1
Dynamic
149.05 GB
Online

(C:)
97.66 GB NTFS
Healthy (System, Boot, Page File,

51.39 GB
Unallocated

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International Headquarters
1 Hayarden Street,
Airport City
Lod 7019900, Israel
Tel: +972-3-976-4000
Fax: +972-3-976-4040

AudioCodes Inc.
27 World's Fair Drive,
Somerset, NJ 08873
Tel: +1-732-469-0880
Fax: +1-732-469-2298

Contact us: www.audiocodes.com/info
Website: www.audiocodes.com