Session Border Controllers (SBCs)

AudioCodes Mediant<sup>™</sup> Series

Interoperability Lab

# Configuration Note Microsoft<sup>®</sup> Office 365 Exchange UM with IP PBXs using AudioCodes Mediant SBC



Microsoft Partner





# Version 6.8

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### Notice

This note shows how to configure Microsoft Office 365 Exchange UM with IP PBXs using AudioCodes Mediant E-SBC product series, which includes the Mediant 800 Gateway & E-SBC, Mediant 1000B Gateway & E-SBC, Mediant 3000 Gateway & E-SBC, Mediant 2600 SBC, Mediant 4000 E-SBC, Mediant Server Edition SBC, and Mediant Virtual Edition SBC.

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### **Related Documentation**

Mediant 500 E-SBC User's Manual Ver. 6.8					
Mediant 800B Gateway and E-SBC SIP User's Manual Ver. 6.8					
Mediant 1000B Gateway & E-SBC User's Manual Ver. 6.8					
Mediant 2600 E-SBC User's Manual Ver. 6.8					
Mediant 3000 SIP User's Manual Ver. 6.8					
Mediant 4000 SBC User's Manual Ver. 6.8					
Mediant Server Edition SBC User's Manual					
Mediant Virtual Edition SBC User's Manual					

Downloadable from AudioCodes Web site at <a href="http://www.audiocodes.com/downloads">http://www.audiocodes.com/downloads</a>

# 1 Introduction

Office 365 Microsoft Exchange Online Unified Messaging (UM) provides voice mail for Exchange mailboxes "in the cloud". To allow telephony equipment to communicate securely with the Office 365 network, customers are required to deploy AudioCodes' Mediant Session Border Controller (SBC) which has been tested for interoperability with Unified Messaging (UM).

Exchange Online Unified Messaging (Exchange UM) supports a wide range of telephony/voice solutions, including many PBXs and IP PBXs. A list is published under the title "Exchange Telephony Advisor".

When making or receiving telephone calls, Exchange Online UM only communicates with voice-over-IP (VoIP) protocols. PBXs that support circuit-switched telephony protocols must be connected to Exchange Online UM with a suitable VoIP gateway. The gateway performs the necessary protocol conversion. VoIP gateways are also listed in the Exchange Telephony Advisor.

The Exchange Telephony Advisor also includes links to configuration notes that explain how to configure the PBX to work with Exchange Online UM.

Exchange Online UM is now offered as an online service, in certain Microsoft Office 365 service plans. The telephony/voice solution remains on customer premises, but UM is now 'in the cloud', and VoIP communication between them is carried by the public IP network.

Figure 1-1 shows two fictional Office 365 customers and their connections to Exchange Online UM.

#### Figure 1-1: Two Organizations, Connected to Exchange Online Unified Messaging



*Contoso* has a circuit-switched PBX. This is connected to a VoIP gateway, just as if Exchange Online UM were running on Contoso's own premises.

Fabrikam has an IP PBX that supports direct (VoIP) connection to Exchange Online UM.

Figure 1-1 also shows devices labeled "SBC" at the interface between the customers' networks and the public IP network. SBC stands for Session Border Controller. Here, the SBC acts as a VoIP-aware network border element that protects the customer's internal network. The SBC must also allow secure traversal of all the signaling and audio (voice) data that are required by Exchange Online UM scenarios.

The SBC has two physical network interfaces. One interface is internal. It is connected, via the customer's private network, to the IP PBX or VoIP gateway. The other interface is external. It is connected to the public IP network ("the Internet"), and thus to Office 365 Exchange Online UM.

Exchange Online UM requires that both signaling and audio media be secured. Signaling is performed with SIP over mutual TLS (Transport Layer Security). Media are carried over

# 

SRTP (Secure Real Time Protocol). The establishment of secure communication between the SBC and Exchange Online UM requires that a suitable digital certificate be loaded into the SBC.

Customers must protect themselves against malicious attempts to intrude into or disrupt their internal networks. IP PBXs and VoIP gateways, in their basic configurations, are not designed to be exposed on public IP addresses. SBCs are thus regarded as an essential part of the architecture for Office 365 Exchange UM customers with PBXs or IP PBXs.

Some SBCs are designed and marketed as standalone devices. Others are integrated into a single chassis with a VoIP Gateway (though the capabilities may be licensed separately).

This guide describes the SBC configuration necessary to deploy it on an organization's network's edge for interoperability with Exchange Online UM.

The purpose of the configuration is to ensure that traffic from the IP PBX or VoIP Gateway, which is sent to the SBC's internal interface, is routed to the SBC's external interface (and thus to Exchange Online UM).

Similarly, traffic from Exchange Online UM, arriving at the SBC's external interface, must be routed to the SBC's internal interface (and thus to the IP PBX or VoIP Gateway).

Configuring routing rules between the SBC's interfaces is the main subject of this guide.



Figure 1-2: SBC as a VoIP Network Traffic Router

Voice over IP

# **1.1 Focus of the Guide**

This guide describes the following:

- How to configure an AudioCodes SBC to establish communication between telephony equipment on customer premises and Office 365 Unified Messaging.
- How to configure Exchange Online UM to work with the AudioCodes SBC. Customers will need an Office 365 subscription that includes an appropriate Exchange Online service plan.

This guide focuses on AudioCodes SBC capabilities (the VoIP Gateway or the IP PBX are external devices) required for interoperability with Office 365 Exchange Online UM.

In the guide, it's assumed that the external VoIP Gateway or IP PBX are using SIP UDP transport type and RTP (not SRTP) for media.

AudioCodes' SBC may support additional characteristics that are not described in the guide. For a complete product description, see page 6 under Related Documentation.



**Note:** The configuration described in this guide is generic for all IP PBXs and VoIP Gateways. However, the IP PBX or VoIP Gateway used in your network may support different capabilities and consequently, may require additional configuration. If so, refer to AudioCodes' SBC Wizard application (<u>http://www.audiocodes.com/mediant-sbc-configuration-wizard</u>) to find the correct SBC template for your IP PBX integration. Contact your AudioCodes sales representative for further information.



#### Figure 1-3: AudioCodes SBC Interfacing between IP PBX and Office 365



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# 2 **Prepare for SBC Configuration**

Before configuring the SBC to route traffic to and from Office 365 Exchange Online UM, there are several steps that must be followed. Specifically, DNS configuration is required, followed by some Exchange Online UM configuration.

# 2.1 Configure DNS

The Exchange Online UM service in Office 365 must be able to locate the AudioCodes SBC when Exchange Online UM needs to initiate communication. Exchange Online UM relies on its own configuration and use of the Domain Name Service (DNS) to discover the IP address of the (external interface of the) SBC.

Assign (have your network administrator assign) an IP address and host name for the external interface of the SBC. For example, Contoso (see Figure 1-1) might decide to use sbcexternal.contoso.com as the name. Add this name and the corresponding IP address to the public DNS entries for your domain.

## 2.2 Certificate Generation

You must replace the SBC's self-signed certificate. This can be done during the main process of SBC configuration. However, you may wish to consider the requirements before embarking on the configuration.

The new certificate must meet the following requirements:

- It must be signed by a recognized Certificate Authority (CA). Self-signed certificates (the kind that customers can generate and sign themselves) are not suitable for communication with Exchange Online UM.
- The Subject Name (CN) that is contained in the certificate must match the fully qualified domain name (FQDN) of the SBC's external address (see DNS Configuration above). For example, if the SBC will be addressed as sbcexternal.contoso.com, make sure that the Subject Name in the certificate contains exactly the same string, i.e. sbcexternal.contoso.com.
- The certificate should be suitable for use for SSL (Secure Sockets Layer).

You must generate and send a Certificate Signing Request to one of the supported Certificate Authorities (see below). The CA will sign and issue a certificate for the device. The details of submitting the request, making payment and receiving the certificate issued will depend on the CA chosen.

At the time of writing, the following Certificate Authorities are supported by Office 365 Exchange Online UM:

- DigiCert (<u>http://www.digicert.com/</u>)
- Entrust (<u>http://www.entrust.com/</u>)
- Geotrust (<u>http://www.geotrust.com/</u>)
- GoDaddy (<u>http://www.godaddy.com/</u>)
- GTE CyberTrust (<u>http://www.verizonbusiness.com/Products/security/identity/ssl/</u>)
- RSA Security (<u>http://www.rsa.com/</u>)
- Thawte (<u>http://www.thawte.com/</u>)
- Verisign (<u>http://www.verisign.com/</u>)

When the CA issues the certificate and returns it, save the certificate to a text file. For more information on retrieving certificates for Exchange UM Online, refer to the following link: https://msdn.microsoft.com/en-us/library/gg702672(v=exchsrvcs.149).aspx

For details on the process and how to load the certificate to the device, see Section 3.10 on page 48.

# 2.3 Configure UM

Before communication can be established from a telephony solution (via the SBC) to Office 365 Exchange Online UM, specific Exchange Online UM configuration must be performed. At a minimum, this consists of creating and configuring a UM Dial Plan and a UM IP Gateway. These are configuration objects that represent devices that are part of the telephony solution.

### 2.3.1 Create a UM Dial Plan

A UM Dial Plan represents a set of fixed-length telephone numbers and the PBX (or equivalent) to which they are attached. All Exchange users whose mailboxes are enabled for Exchange Online UM must be associated with a UM Dial Plan.

In Exchange Control Panel (ECP), create a new UM Dial Plan (shown in Figure 2-1 to Figure 2-4 below).

tea					sign out Michael	Wison
lail > Options: Manage sers & Groups	My Organization • UM Dial Plans UM	IP Gateways			My M	ail 🕜
	UM Dial Plans Unified Messaging organization. For	Unified Messaging Reports Call Statistics User Call Logs				
	New Dr	etails 🗙	S			

Figure 2-1: Initial (Empty) UM Dial Plans List in Exchange Control Panel

In the screen above:

The **UM Dial Plans** tab in the ECP's Phone & Voice configuration initially shows an empty list. Click on the **New...** button to create a new UM Dial Plan.

Exchange Online			mar Michael Wisco.
Min Contract Lange			
one i opriorit opringe	Ca		D Synds O
Isers & Groups			
None & Voice	-		
	New UM Dial Plan	0	
	Required fields		Messaging Reports
	Use UM dial plans to manage the UM features for a group of extension numbers, Learn more		etics (Logs
	*Name:		
	Contoso PEX users	Extension length	
	* Extension length (digits):	Enter the number of digits in the telephone	
	* Dial plan URI type:	extensions assigned to your users on your telephone system (HBDG).	
	Telephone Extension •	Learn More	
	* Audio latonate		
	English (United States)		
	* Country/Region code:		
	After you click Save, select this UM dial plan and click Details to configure dial codes, Outlook Voice Access, voice mail settings, and dialing rules.		
		J Save Cantel	

Figure 2-2: Specifying Properties for a New UM Dial Plan for a PBX or an IP PBX

In the screen above:

- Enter a name for the UM Dial Plan.
- The extension number (along with a PIN) is what UM-enabled users must enter to identify themselves to UM when they call it from a telephone and try to log in to their mailbox. All extension numbers in a Dial Plan must have the same number of digits. It will be determined by the PBX's numbering plan. You enter this length, here.
- Select the UM Dial Plan type to be Telephone Extension. This indicates that the telephony solution in use is a PBX or IP PBX (and not Microsoft Lync).



Exchange Online			signicut. Michael Wilson
Exchange Online	ation	Country/region Enter the numer for the country or region of this do so that UM can domestic and	Code C code Messaging Reports Bics Logs Code A plan dial
•	After you click Save, select this UM dial plan and click Details to configure dial codes, Outlook Voice Access, voice mail settings, and dialog rules.	oternational nun correctly. For ex- your UM dial plu the United State code is 1. This fi accepts 1 to 4 m Learn More	nbers ample, if unis in s, the eld umbers.

Figure 2-3: Specifying the Country Code for a New UM Dial Plan for PBX or an IP PBX

In the screen above:

- All UM Dial Plans must have a country code. This is the international dialing code for the country in which the telephony solution (PBX or IP PBX) is operating. For example, enter 1 for the United States, 44 for the United Kingdom, etc.
- Click Save when you have entered all the information required to specify the new UM Dial Plan.

🗧 😔 📑 http:	c//sdf.outlook.com/e	cp/?rfi 🔍 🔹	€ C X	🐴 UM Dial Plans - Micros	<b>↑</b> ★ <
Exchange Onlin	e				igh eur Michael Witton
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one & Voice	UM Dial Plans	UM IP Getennings			
	UM Dial Plan	15			Unified Messaging Reports
	Unified Messa organization. I plan. Learn m	iging dial plans For UM to ansi ore	define the format inver calls for your us	for telephone numbers in your ers, you have to set up at least one dial	Call Statistics User Call Logs
	E New_ E	Details X	0		
	Name	* Ex	tension Length	URI Type	
	Contoso PEX ur	sers: 4		Telephone Estension	
	3 calendard of 3	had at			

Figure 2-4: List Showing one UM Dial Plan

In the screen above:

The UM Dial Plan that you created is now listed. You can click the **Details** button to view and edit its properties, and those of associated objects such as **UM Mailbox Policies**.

Set a number for user access on the new UM Dial Plan (see Figure 2-5). This can be in any readable format, because it is for display to users. For example, the user access number could be set to "(425) 266 8676" or "425-CONTOSO". Two or more values can be supplied. The user access number(s) should be consistent with call routing number(s), or users will become confused. The user access number is included in the body of the "Welcome to Exchange Unified Messaging" e-mail that is sent to each user when they are UM-enabled. It is also displayed in the Outlook Voice Access section of the user's Phone personal options (accessed via OWA/Exchange Control Panel).





Figure 2-5: Editing the Display Access Numbers for a UM Dial Plan

### 2.3.2 Create a UM IP Gateway

In ECP, go to the UM IP Gateways tab and create a new UM IP Gateway (see Figure 2-7). For UM, this will represent (the external interface of) your SBC. Associate the UM IP Gateway with the UM Dial Plan that you created by clicking the Browse... button and selecting the Dial Plan from the list that is displayed (see Figure 2-7 and Figure 2-8).

Figure 2-6: Creating a New UM IP Gateway to Represent an SBC on the Customer's Premises

Exchange Onlin	e	rynoul Michael Wilson
al > Options: Mana	ge My Organization 🔹	My Mail 😡
ers & Groups	(T) (T)	
one & Voice	Ult Car Para UM P Galenage	
	Constant of Constant Strend Department Constant	
	https://sdf.outlook.com/ecp/UniTedMessaging/NewUMIPGateway.aspx?pwr	mok 📾
	New UM IP Gateway	O tundle calls from your
	*Required fields	
	UM IP gateways represent a physical session border controller (SRC, IP gateway, or IP FRX in Active Directory. You have to configure a UM IP gateway before UM can accept calls from the device.	Inateg Indicator
	*Name	
	Contoso SBC Address	
	Enter the FQDN	of the
	sboentemal.contoso.com or P PEX device	pateway: used to
	forward and rec calls to and from	elee NUMA
	UM dial plan	
	Bowse Lawrence	
		_
	√ Save X Ca	ncel
	\$ 100	

In the screen above:

- The Name of the UM IP Gateway is for your reference only. It must be unique within your Office 365 organization. The object represents an SBC on Contoso's premises. This example shows that the administrator chose a name to indicate this.
- The Address must be the exact FQDN that represents the public (external) interface of the SBC for your organization.



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0	Pan - Wrebeen		×		
https://sdf.out	look.com/ecp/Pi	skers/UMDialPlanPicker.aipi	<b>a</b>		
Plane	URD Type	Extension length (digits)	_	[am   020	-
COROSO PEX USERS	reseptione cities	L 4	Www.UMIPGa	leway.aspx?pwmcic 🔒	-
			1	0	is handle calls fro
			atrolar.		-
			No.		
					many rocat
				UM dial plan	
				To automatically create a default UM hurt	
	_	V OK X Cancel		group that links this UM IP gateway to a dial	
	UM dial plan		_	plan, specify the dial plan here. To process	
			Doese.	incoming and outgoing calls, you must have at	
				least one UM hunt group that links this UM	
				P gateway with a dial plan.	
				Laura Moré	
				The second secon	

Figure 2-7: Associating the New UM IP Gateway with a UM Dial Plan

In the screen above:

The Browse... button on the UM IP Gateway details page displays a list of all the UM Dial Plans of type Telephone Extension. Select one of these and click OK.

Exchange Online		zignituz Michael Wison
Nal > Options: Manage sers & Groups home & Volce	My Organization - UN Dial Pares UN D Gateways UN Dial Pares UN D Gateways UN Dial Pares UN D Gateways Windows Informet Explaner	My Mail @
	New UM IP Gateway         *Required fields         UM IP gateways represent a physical session border controller (SBC), IP gateway, or IP RIX in Active Directory, You have to configure a UM IP gateway before UM can accept calls from the device.         *Name:         Contoss SBC         *Address:         sobeixternal.contoso.com         UM dial plan:         Contoss FBX users         Contoss FBX users         X         Browse         Contoss FBX users	A     A
	V 500 A	Cartes

Figure 2-8: New UM IP Gateway Associated with a UM Dial Plan

When you create the UM IP Gateway, it is automatically assigned a **Forwarding Address**. You're alerted to this when you save the gateway configuration (see the figure below).



#### Figure 2-9: Alert that UM IP Gateway Forwarding Address is needed for the SBC Configuration



To see the **Forwarding Address**, view the details of the UM IP Gateway object (see the figure below).

Exchange Online		
Aail > Options: Manage	My Organization -	
sers & Groups	UM Dial Plant IM IP Gateways	
hone & Voice	Contractions of a contraction of the contraction of	
	ow be careway becars - windows internet explorer	Channel Land
	<u></u>	
	Contoso SBC	
	*Required fields	
	Status: Enabled Forwarding address: 7344b2b0-20e6-4332-9/5b-b508/7306ac1.um.outlook.com	Forwarding address Configure your physica device (SBC, gateway, o IP PBX) to forward call
	* Name:	to UM using this address.
	Contoso SBC	Learn More
	* Address:	
	* Address: sbcexternal.contoso.com	
	* Address: sbcexternal.contoso.com Allow outgoing calls through this UM IP gateway     Allow message waiting indicator	
	* Address: sbcexternal.contoso.com Allow outgoing calls through this UM IP gateway Allow message waiting indicator	✓ Save X Cancel

Figure 2-10: Viewing the Forwarding Address of a UM IP Gateway

In the screen above:

Forwarding addresses are of the form guid.um.outlook.com, where guid is replaced by a 36-character string that uniquely identifies the organization (using UM) within the Office 365 system.



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# 3 Configure AudioCodes SBC

Using your Web browser, connect to the SBC's administration interface (the default address is **192.168.0.2**).

After providing the required credentials (the default user name is "Admin" and the default password is "Admin"), the Home page of the Web interface is displayed.

Use the Full navigation menu tree to perform SBC configuration.

# 3.1 Configure IP Network Interfaces

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

- The SBC interfaces with the following IP entities:
  - IP PBX, located on the LAN
  - O365 Exchange UM, located on the WAN
- The 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, SBC connects to the LAN and WAN using dedicated LAN ports (i.e., two ports and two network cables are used).
- SBC also uses two logical network interfaces:
  - LAN (VLAN ID 1)
  - WAN (VLAN ID 2)

#### Figure 3-1: Network Interfaces in Topology



# 

## 3.1.1 Step A: 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 > VolP 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

#### Figure 3-2: Configured VLAN IDs in Ethernet Device Table

▼ Ethernet Device Table							
Add +							
Index 4	VLAN ID	Underlying Interface	Name				
0	1	GROUP_1	vlan 1				
1	2	GROUP_2	vlan 2				
	I <	of 1 🕨 🕨 Show 10 🗸 records per page	View 1 - 2 of 2				

### 3.1.2 Step B: 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:

- 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	10.15.8.2 (IP address of the SBC)
Prefix Length	<b>16</b> (subnet mask in bits for 255.255.0.0)
Gateway	10.15.0.1

Parameter	Value
VLAN ID	1
Interface Name	Voice (arbitrary descriptive name)
Primary DNS Server IP Address	10.15.25.1 (company DNS server)
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	195.189.192.155 (WAN IP address)
Prefix Length	<b>25</b> (for 255.255.255.128)
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

Click Apply, and then Done; the configured IP network interfaces are shown below:
 Figure 3-3: Configured Network Interfaces in IP Interfaces Table

<ul> <li>Interfac</li> </ul>	ce Table									
Add +	Edit 🥕 De	lete 🍵							Show/Hide 🗅	
Index 📚	Application Type	Interface Mode	IP Address	Prefix Length	Default Gateway	Interface Name	Primary DNS	Secondary DNS	Underlying Device	
0	OAMP + Media	IPv4 Manual	10.15.8.2	16	10.15.0.1	Voice	10.15.25.1	0.0.0.0	vlan 1	
1	Media + Contro	IPv4 Manual	195.189.192.1	25	195.189.192.12	WANSP	80.179.52.100	80.179.55.100	vlan 2	
			NU 🕸 Page	1 of 1 🕬	Del Show 10 🗸	records per pa	ige		View 1 - 2 of	2

### 3.1.3 Step C: Configure the Native VLAN ID

This step describes how to configure the Native VLAN ID for the LAN and WAN interfaces.

- To configure the Native VLAN ID for the IP network interfaces:
- Open the Physical Ports Settings page (Configuration tab> VolP menu > Network > Physical Ports Table).
- 2. For the **GROUP\_1** member ports, set the 'Native Vlan' field to **1**. This VLAN was assigned to network interface "Voice".
- 3. For the **GROUP\_2** member ports, set the 'Native Vlan' field to 2. This VLAN was assigned to network interface "WANSP".



3

GE 4 4

Enable

Redundant

		ΓI	Jule 3-4. CO	illiguleu Pol				
Index :	Port	Mode	Native Vlan	Speed&Duplex	Description	Group Member	Group Status	
0	GE_4_1	Enable	1	Auto Negotiation	User Port #0	GROUP_1	Active	
1	GE_4_2	Enable	1	Auto Negotiation	User Port #1	GROUP_1	Redundant	
2	GE 4 3	Enable	2	Auto Negotiation	User Port #2	GROUP 2	Active	
				3				

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

# **3.2 Configure the NTP Server IP Address**

2

The SBC requires Network Time Protocol (NTP) for successful Transport Layer Security (TLS) negotiation with the Office 365 Exchange Online UM system<sup>1</sup>.

Auto Negotiation User Port #3 GROUP 2

- > To configure the NTP server IP address:
- Open the Application Settings page (Configuration > System > Application Settings).
- 2. Configure the NTP Server (e.g., server IP address), as required.

#### Figure 3-5: Application Settings Page

Application Settings	
- NTD Sations	
In Securitys	
NTP Server IP Address	
NTP UTC Offset Hours: 0 Minutes: 0	
NTP Updated Interval Hours: 24 Minutes: 0	
Day Light Saving Time Disable	
	Submit

3. Click Submit.

# 3.3 Enable SBC Functionality

This step describes how to enable the SBC application.

- **To enable the SBC application:**
- Open the Applications Enabling page (Configuration tab > VolP menu > Applications Enabling > Applications Enabling).

Figure 3-6:	Enabling	SBC	Application
-------------	----------	-----	-------------

▼		
🗲 SAS Application	Disable 🗸	
🗲 SBC Application	Enable 🗸	]
🤣 IP to IP Application	Disable 🗸	]

- 2. From the 'SBC Application' drop-down list, select **Enable**.
- 3. Click Submit.
- 4. Reset the SBC with a burn to flash for this setting to take effect (see Section 3.11 on page 54).

<sup>&</sup>lt;sup>1</sup> In principle, all that's required is that the E-SBC and the Office 365 system have a sufficiently similar view of the current time. It's possible to manually set the date and time on the E-SBC itself; it has a clock that keeps it updated. However, without the use of NTP it's likely that the E-SBC's time will eventually offset sufficiently, relative to the Office 365 system, for TLS negotiation to stop working. This may be difficult to diagnose and thus, it is recommended to use NTP to maintain the E-SBC's time in sync.

# 3.4 **Configure Signaling Routing Domains**

This step describes how to configure Signaling Routing Domains (SRD). The SRD represents a logical VoIP network. Each logical or physical connection requires an SRD, for example, if the SBC interfaces with both the LAN and WAN, a different SRD would be required for each one.

The SRD is composed of the following:

- Media Realm: defines a UDP port range for RTP/SRTP (media) traffic on a specific logical IP network interface of the SBC.
- SIP Interface: defines a listening port and type (UDP, TCP, or TLS) for SIP signaling traffic on a specific logical IP network interface of the SBC.

### 3.4.1 Step A: 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:**
- Open the Media Realm Table page (Configuration tab > VolP menu > VolP Network > Media Realm Table).
- 2. Modify the existing Media Realm for LAN traffic:

Parameter	Value
Index	0
Media Realm Name	MRLan (descriptive name)
IPv4 Interface Name	Voice
Port Range Start	<b>6000</b> (represents lowest UDP port number used for media on LAN)
Number of Media Session Legs	10 (media sessions assigned with port range)

#### Figure 3-7: Configuring Media Realm for LAN

Edit Record #0		×
Index	þ	
Media Realm Name	MRLan	
IPv4 Interface Name	Voice 🗸	
IPv6 Interface Name	None 🗸	
Port Range Start	6000	
Number Of Media Session Legs	10	
Port Range End	6090	
Default Media Realm	Yes 🗸	
QOE Profile	None 🗸	
BW Profile	None 🗸	
	Submit × Cance	1

# 

**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	<b>7000</b> (represents lowest UDP port number used for media on WAN)
Number of Media Session Legs	10 (media sessions assigned with port range)

#### Figure 3-8: Configuring Media Realm for WAN

Add Record	×
Index	1
Media Realm Name	MRWan
IPv4 Interface Name	WANSP 🗸
IPv6 Interface Name	None 🗸
Port Range Start	7000
Number Of Media Session Legs	10
Port Range End	-1
Default Media Realm	No 🗸
QOE Profile	None 🗸
BW Profile	None 🗸
	Submit × Cancel

The configured Media Realms are shown in the figure below:

Figure 3-9: Configured Media Realms in Media Realm Table

	▼ Media Realm Table							
ľ	Add +							
Index : Media Realm Name IPv4 Interface Name IPv6				IPv6 Interface Name				
C	)	MRLan	Voice	None				
1	L	MRWan	WANSP	None				
		ra 🛹 Page 1	of 1 🕞 ы Show 10 🗸 records per	page View 1 - 2 of 2				

### 3.4.2 Step B: Configure SRDs

This step describes how to configure the SRDs.

- **To configure SRDs:**
- Open the SRD Settings page (Configuration tab > VoIP menu > VoIP Network > SRD Table).
- 2. Configure an SRD for the SBC's internal interface:

Parameter	Value
SRD Index	1
SRD Name	SRDLan (descriptive name for SRD)
Media Realm Name	MRLan (associates SRD with Media Realm)

#### Figure 3-10: Configuring LAN SRD

Edit Record #1	×
Index	1
Name	SRDLan
Media Realm Name	MRLan 🗸
Media Anchoring	Enable 🗸
Block Unregistered Users	NO 🗸
Max. Number of Registered Users	-1
Enable Un-Authenticated Registrations	Enable 🗸
	Submit × Cancel

3. Configure an SRD for the SBC's external interface:

Parameter	Value
SRD Index	2
SRD Name	SRDWan
Media Realm	MRWan

#### Figure 3-11: Configuring WAN SRD

Edit Record #2		×
Index	2	
Name	SRDWan	
Media Realm Name	MRWan 🗸	
Media Anchoring	Enable 🗸	
Block Unregistered Users	NO V	
Max. Number of Registered Users	-1	
Enable Un-Authenticated Registrations	Enable 🗸	
	Submit × Canc	el

#### Figure 3-12: Configured SRD Table

dex	Name	Media Realm Name	Media Anchoring
	SRDLan	MRLan	Enable
	SRDWan	MRWan	Enable

### 3.4.3 Step C: 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 SBC.

- > To configure SIP Interfaces:
- Open the SIP Interface Table page (Configuration tab > VoIP menu > VoIP Network > SIP Interface Table).
- 2. Configure a SIP interface for the LAN:

Parameter	Value			
Index	1			
Interface Name	IP PBX (arbitrary descriptive name)			
Network Interface	Voice			
Application Type	SBC			
UDP Port	5060			
TCP and TLS	0			
SRD	1			

3. Configure a SIP interface for the WAN:

Parameter	Value
Index	2
Interface Name	<b>Exchange Online</b> (arbitrary descriptive name)
Network Interface	WANSP
Application Type	SBC
TLS Port	5061
UDP and TCP	0
SRD	2

The configured SIP Interfaces are shown in the figure below:

Figure 3-13: Configured SIP Interfaces in SIP Interface Table

▼ SIP I	▼ SIP Interface Table							
Add -	Add + Edit i Delete 🝵							
Index ;	SIP Interface Name	Network Interface	Application Type	UDP Port	TCP Port	TLS Port		SRD
1	IP PBX	Voice	SBC	5060	0	0	1	
2	Exchange Online	WANSP	SBC	0	0	5061	2	
	View 1 - 2 of 2							

# 3.5 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:

- IP PBX
- Exchange Online UM

These Proxy Sets will later be associated with IP Groups.

- **To configure Proxy Sets:**
- Open the Proxy Sets Table page (Configuration tab > VolP menu > VolP Network > Proxy Sets Table).
- 2. Configure a Proxy Set for IP PBX:

Parameter	Value
Proxy Set ID	1
Proxy Address	10.15.9.131:5060 (IP PBX IP address / FQDN and destination port)
Transport Type	UDP
Proxy Name	IP PBX (arbitrary descriptive name)
Enable Proxy Keep Alive	Using Options
SRD Index	1

•						
Proxy Set ID		1	1 🗸			
	Proxy Address			Transport Type		
	1	10.15.9.131:5060			UDP 👻	]
	2				•	]
	3					1
	4				-	]
	5				-	]
	6				-	]
	7					]
	8				-	]
	9				-	]
	10				-	]
•	·					
Proxy Na	me		IP PBX	IP PBX		
Enable P	roxy I	Keep Alive	Using	Using Options 👻		
Proxy Ke	ep Ali	ve Time	60	60		
Proxy Lo	ad Ba	lancing Method	Disab	Disable -		
Is Proxy	Is Proxy Hot Swap		No	No 🗸		
Proxy Re	dund	ancy Mode	Not C	Not Configured -		
SRD Inde	ex		1	1		
Classification Input		IP only				

#### Figure 3-14: Configuring Proxy Set for IP PBX

#### 3. Click Submit.

#### 4. Configure a Proxy Set for Exchange Online UM.

Configure the SBC external interface to communicate with Office 365 Exchange UM. For the *Proxy Address* of the external set, you must enter the Forwarding Address assigned to the UM IP Gateway object created earlier (see Figure 2-10 on page 21). Only the end of a sample address is visible in the figure below. The length of the address is such that the view is clipped in the user interface, and only part of the address is visible.

As secured communication is required, note that ":5061" must be appended to the  $\ensuremath{\mathsf{address}}^2.$ 

Parameter	Value		
Proxy Set ID	2		
Proxy Address	022146dc-bef4-45e9-8a5e- c87f09bfe19b.um.outlook.com:5061 (Exchange Online FQDN and destination port)		
Transport Type	TLS		
Proxy Name	Exchange Online (arbitrary descriptive name)		
Enable Proxy Keep Alive	Using Options		
Is Proxy Hot Swap	Yes		
SRD Index	<b>2</b> (enables classification by Proxy Set for SRD of IP Group belonging to Exchange Online)		
TLS Context	0 – the "default" context		

#### Figure 3-15: Configuring Proxy Set for Exchange Online

Proxy Set ID		2					
		Proxy Address	_	Tra	nsport T	уре	
1	1	022146dc-bef4-45e9-8a5e-c8	7f09b		TLS 👻	]	
2	2				-	]	
3	3				-	]	
4	4				-	]	
5	5				-	]	
e	5				-	]	
7	7				+	1	
8	3				+	1	
9	•				+	]	
1	0				-	]	
	-	- -		1		-	
		Proxy Name	Exc	hange Onlir	e UM		
		Enable Proxy Keep Alive	Usir	ng Options		•	
		Proxy Keep Alive Time	60				
		KeepAlive Failure responses					
		DNS Resolve Method		Configure	b	•	
		Proxy Load Balancing Method	Dis	able		-	
		Is Proxy Hot Swap	No			-	
		Proxy Redundancy Mode	Not	Configure	d	•	
		SRD Index	2				

IP only

0

<sup>2</sup> Port 5061 is used by Office 365 Exchange Online UM for all SIP/TLS traffic.

Classification Input

TLS Context Index

•



#### 5. Click Submit.



**Note:** In the latest versions of AudioCodes firmware, the "default" **TLS Context** (context 0), is referenced from the **SIP Interface**, not in the **Proxy Set** as shown above (using the context 0as the default setting).

## 3.6 Configure IP Groups

An SBC "IP Group" represents a SIP trunk or SIP-capable peer system. It is associated with a Signaling Routing Domain (SRD). You will need to define two IP Groups, one representing the internal SIP peer (i.e., IP PBX), and one representing Office 365 Exchange Online UM<sup>3</sup>.

### 3.6.1 Configure an Internal IP Group

#### > To configure an internal IP Group:

- Open the IP Group Table page (Configuration tab > VoIP menu > VoIP Network > IP Group Table).
- 2. Add a new entry with index 1 to represent the internal SIP peer.
- 3. From the 'Type' drop-down list, select **SERVER**.
- 4. In the 'Description' field, add a name that will help to identify this as the internal group (i.e., IP PBX).
- 5. In the 'Proxy Set ID', select 1 to associate this IP Group with Proxy Set 1.
- 6. In the 'SRD' field, Enter 1 to associate this IP Group with SRD 1
- 7. In the 'IP Profile ID' field, Enter 1 to associate this IP Group with IP Profile 1
- 8. From the 'Media Realm' drop-down list, select **MRLan** to associate this IP Group with the LAN Media Realm (see Section 3.4.1 on page 27).

Common GW SBC	
Index	1
Туре	Server 👻
Description	IP PBX
Proxy Set ID	1
SIP Group Name	
Contact User	
SRD	1
Media Realm Name	MRLan 👻
IP Profile ID	1
Local Host Name	
UUI Format	Disable 👻
QoE Profile	None 👻
Bandwidth Profile	None 👻
Media Enhancement Profile	None 👻
Always Use Source Address	No 👻

9. Click Submit.

<sup>&</sup>lt;sup>3</sup> If you intend to use a hosted fax service in conjunction with Office 365 Exchange Online UM, you will also need to create an IP Group to represent the IP interface to the fax service.

# 

## 3.6.2 Configure an External IP Group

This section shows how to configure an external IP group.

- **To configure an external IP Group:**
- Open the IP Group Table page (Configuration tab > VoIP menu > VoIP Network > IP Group Table).
- 2. Add a new entry with index 2 to represent the external SIP peer.
- 3. From the 'Type' drop-down list, select **Server**.
- 4. In the 'Description' field, add a name that will help to identify this as the external group.
- 5. In the 'Proxy Set ID' field, enter **2** to associate this IP Group with Proxy Set 2.
- 6. In the 'SIP Group Name', Enter the Forwarding Address assigned to the UM IP Gateway object.
- 7. In the 'SRD' field, Enter 2 to associate this IP Group with SRD 2
- 8. In the 'IP Profile ID' field, Enter 2 to associate this IP Group with IP Profile 2
- **9.** From the 'Media Realm' drop-down list, select **MRWan** to associate this IP Group with the WAN Media Realm.

Common GW SBC					
Index	2				
Туре	Server 👻				
Description	Exchange Online				
Proxy Set ID	2				
SIP Group Name	09bfe19b.um.outlook.com				
Contact User					
SRD	2				
Media Realm Name	MRWan 👻				
IP Profile ID	2				
Local Host Name					
UUI Format	Disable 🔻				
QoE Profile	None 👻				
Bandwidth Profile	None 👻				
Media Enhancement Profile	None 👻				
Always Use Source Address	No				
	Submit × Cancel				

10. Click Submit.

▼ IP Group Table									
Add + Edit 🖍 Delete 🍵								Show/Hide 🕒	
Index	Туре	Description	Proxy Set ID	SIP Group Name	Contact User	SIP Re-Routing Mode	Always Use Route Table		SRD
1	Server	IP PBX	1			Not Configured	No	1	
2	Server	Exchange Online	2	022146dc-bef4-4		Not Configured	No	2	
view 1 - 2 of 1 view 10 ▼ records per page View 1 - 2 of 2									

Figure 3-18: IP Group Table Configuration

## 3.7 Configure Media Security

This configuration forces the SBC to reject calls where the SIP peer does not use SRTP. Office 365 Exchange UM requires that all (audio) media be secured with the SRTP protocol (see SRTP reference on page 8).

#### > To configure media security:

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

Parameter		Value
Media Security		Enable

#### Figure 3-19: Configuring SRTP

•	General Media Security Settings		
4	Media Security	Enable	~
4	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	~
4	SRTP Tunneling Authentication for RTP	Disable	~
4	SRTP Tunneling Authentication for RTCP	Disable	~

#### 3. Click Submit.

4. Reset the SBC with a burn to flash for your settings to take effect (see Section 3.11 on page 54).

## 3.8 **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:

- IP PBX to operate in non-secure mode using RTP and UDP
- Exchange Online UM to operate in secure mode using SRTP and TLS

Note that the IP Profiles were assigned to these entities (i.e., IP Groups) in the step shown in Section 0 on page 34.

#### **To configure IP Profiles:**

- 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
Profile Name	IP PBX (arbitrary descriptive name)

#### Figure 3-20: Configuring IP Profile for IP PBX – Common Tab

Соттол	GW	SBC		
Index			1	
Profile Name			IP PBX	

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

Parameter	Value
SBC Media Security Behavior	RTP

#### Figure 3-21: Configuring IP Profile for IP PBC – SBC Tab

Common GW SBC				
Index	1			
Extension Coders Group ID	None 👻			
Transcoding Mode	Only If Required 👻			
Allowed Media Types				
Allowed Coders Group ID	None 👻			
Allowed Video Coders Group ID	None -			
Allowed Coders Mode	Restriction -			
SBC Media Security Behavior	RTP -			
Remote REFER Behavior	Handle Locally 🗸			
Remote 3xx Behavior	Handle Locally -			

- 5. Configure an IP Profile for the Exchange Online UM:
- 6. Click Add.
- 7. Click the **Common** tab, and then configure the parameters as follows:

Parameter	Value
Index	2
Profile Name	Exchange Online (arbitrary descriptive name)
MKI Size	4

#### Figure 3-22: Configuring IP Profile for Exchange Online – Common Tab

Common GW SBC	
Index	2
Profile Name	Exchange Online
Profile Preference	1
Dynamic Jitter Buffer Minimum Delay [msec]	10
Dynamic Jitter Buffer Optimization Factor	10
RTP IP DiffServ	46
Signaling DiffServ	40
Silence Suppression	Disable 👻
RTP Redundancy Depth	0
Echo Canceler	Line 👻
Disconnect on Broken Connection	Yes 🔻
Input Gain (-32 to 31 dB)	0
Voice Volume (-32 to 31 dB)	0
Media IP Version Preference	Only IPv4 👻
Symmetric MKI	Disable 🔻
MKI Size	4
Reset SRTP Upon Re-key	Disable 🔹
Generate SRTP keys mode	Only If Required 👻

# 

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

Parameter	Value
Profile ID	2
SBC Media Security Behavior	SRTP
Enforce MKI Size	Enforce
Diversion Mode	Add (required for forwarded calls)

### Figure 3-23: Configuring IP Profile for Exchange Online – SBC Tab

Common GW SBC	
Index	2
Extension Coders Group ID	None 🗸
Transcoding Mode	Only If Required 👻
Allowed Media Types	
Allowed Coders Group ID	None 👻
Allowed Video Coders Group ID	None -
Allowed Coders Mode	Restriction -
SBC Media Security Behavior	SRTP -
RFC 2833 Behavior	As Is 👻
Alternative DTMF Method	As Is 👻
P-Asserted-Identity	As Is 👻
Diversion Mode	Add 👻
Enforce MKI Size	Enforce -

# 3.9 Configure IP-to-IP Call Routing Rules

This step describes how to configure IP-to-IP call routing rules. These rules define the routes for forwarding SIP messages (e.g., INVITE) received from one IP entity to another. The SBC selects the rule whose configured input characteristics (e.g., IP Group) match those of the incoming SIP message. If the input characteristics do not match the first rule in the table, they are compared to the second rule, and so on, until a matching rule is located. If no rule is matched, the message is rejected. As configured in Section 0 on page 34, the routing rules use the configured IP Groups to denote the source and destination of the call. IP Group 1 represents IP PBX, and IP Group 2 represents Exchange Online UM.

For the interoperability test topology, the following IP-to-IP routing rules need to be configured to route calls between IP PBX (LAN) and Exchange Online UM (WAN):

- Calls from Exchange Online as a results of Directory Search option (Transfer calls)
- Calls from IP PBX to Exchange Online
- Calls from Exchange Online to IP PBX
- **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 route Transfer calls from Exchange Online
- 3. Click Add.
- 4. Click the **Rule** tab, and then configure the parameters as follows:

Parameter	Value
Index	1
Route Name	Transfer Calls (arbitrary descriptive name)
Destination Host	M1KMSBG.Audio-Codes.com (SBC FQDN name)
Call Trigger	REFER



Rule Action	
Index	1
Route Name	Transfer Calls
Source IP Group ID	-1
Source Username Prefix	*
Source Host	*
Destination Username Prefix	*
Destination Host	M1KMSBG.Audio-Codes.co
Request Type	All 👻
Message Condition	None 👻
ReRoute IP Group ID	-1
Call Trigger	REFER -
Call Setup Rules Set ID	-1
	Submit × Cancel

#### Figure 3-24: Configuring IP-to-IP Routing Rule for Transfer Calls – Rule tab

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

Parameter	Value
Destination Type	IP Group
Destination IP Group ID	1

Rule Action	
Index	1
Destination Type	IP Group 👻
Destination IP Group ID	1
Destination SRD ID	None 👻
Destination Address	
Destination Port	0
Destination Transport Type	•
Alternative Route Options	Route Row 👻
Group Policy	None 👻
Cost Group	None 👻
	Submit × Cancel

Figure 3-25: Configuring IP-to-IP Routing Rule for Transfer Calls – Action tab

#### **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 route calls from IP PBX to Exchange Online
- 3. Click Add.
- 4. Click the **Rule** tab, and then configure the parameters as follows:

Parameter	Value
Index	2
Route Name	<b>IP PBX to UM</b> (arbitrary descriptive name)
Source IP Group ID	1



Rule Action	
Index	2
Route Name	IP PBX to UM
Source IP Group ID	1
Source Username Prefix	*
Source Host	*
Destination Username Prefix	*
Destination Host	*
Request Type	All
Message Condition	None -
ReRoute IP Group ID	-1
Call Trigger	Any 👻
Call Setup Rules Set ID	-1
	Submit × Cancel

#### Figure 3-26: Configuring IP-to-IP Routing Rule for IP PBX to UM – Rule tab

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

Parameter	Value
Destination Type	IP Group
Destination IP Group ID	2
Destination SRD ID	2

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

#### Figure 3-27: Configuring IP-to-IP Routing Rule for IP PBX to UM – Action tab

- 6. Configure a rule to route calls from Exchange Online to IP PBX
- 7. Click Add.
- 8. Click the **Rule** tab, and then configure the parameters as follows:

Parameter	Value
Index	3
Route Name	<b>UM to IP PBX</b> (arbitrary descriptive name)
Source IP Group ID	2



Rule Action	
Index	3
Route Name	UM to IP PBX
Source IP Group ID	2
Source Username Prefix	*
Source Host	*
Destination Username Prefix	*
Destination Host	*
Request Type	All
Message Condition	None -
ReRoute IP Group ID	-1
Call Trigger	Any 👻
Call Setup Rules Set ID	-1
	Submit × Cancel

### Figure 3-28: Configuring IP-to-IP Routing Rule for UM to IP PBX – Rule tab

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

Parameter	Value
Destination Type	IP Group
Destination IP Group ID	1
Destination SRD ID	1

Figure 3-29: Configuring IP-to-IP Routing Rule for UM to IP PBX – Action tab

Rule Action	
Index	3
Destination Type	IP Group 👻
Destination IP Group ID	1
Destination SRD ID	1 •
Destination Address	
Destination Port	0
Destination Transport Type	▼
Alternative Route Options	Route Row 👻
Group Policy	None 👻
Cost Group	None 👻
	Submit × Cancel

The configured routing rules are shown in the figure below:

Figure 3-30: Configured IP-to-IP Routing Rules in IP-to-IP Routing Table

▼ 1P-L0	-IP Routing Ta	DIE								
Add +	Insert +	Edit 🧨	Delete 🍵 Up	t Down	L .					Show/Hide 🕒
Index	Route Name	Source Host	Destination Username	Destination Host	Message Condition	ReRoute IP Group ID	Call Trigger	Call Setup Rules Set ID	Destination Type	Destination SRD ID
			Prefix							
1		*	*	M1KMSBG.Aud	None	-1	REFER	-1	IP Group	None
2	IP PBX to UM	*	*	*	None	-1	Any	-1	IP Group	2
3	UM to IP PBX	*	*	*	None	-1	Any	-1	IP Group	1
	vo do Page 1 of 1 👐 ⊨ Show 10 🔻 records per page View 1 - 3 of 3									



**Note:** The routing configuration may change according to your specific deployment topology. If you have a more complex routing environment such as a hybrid Exchange, and you need to have call routing based on LDAP queries, refer to the SBC's *User's Manual*.

# 3.10 Configure Certificates

As described under Section 2 on page 11, communication between the SBC and Office 365 Exchange Online UM requires the use of a digital certificate signed by a Certificate Authority (CA). The SBC is supplied with a self-signed certificate, which cannot be used because it is not signed by a supported CA.

Before you configure certificates, ensure that the DNS (see Section 2.1 on page 11) and NTP (see Section 3.2 on page 26) settings have been configured correctly. If this is the case, proceed as follows.

### 3.10.1 Configure the Cryptographic Setting

- > To configure cryptographic settings:
- 1. Open the TLS Contexts table (Configuration tab > System menu > TLS Contexts).
- 2. Select the default TLS Context row (Index 0), and then click Edit.
- 3. In the 'Cipher Server' field, enter "ALL", as shown below:

Index	0
Name	default
TLS Version	0
Cipher Server	ALL
Cipher Client	ALL:IADH
OCSP Server	Disable 👻
Primary OCSP Server	
Secondary OCSP Server	
OCSP Port	2560
OCSP Default Response	Reject -

- 4. Click **Submit** to apply your settings.
- 5. Select the default TLS Context, and then click the **TLS Context Certificate** button, located below the table.
- 6. From the 'Private Key Size' drop-down list, select 2048 and then click Generate self-signed.

#### Figure 3-31: Cryptographic Configuration

Private Key Size	2048 🗸
Press the "Generate Private Key" button t Press the "Generate Self-Signed Certifica Note that the certificate will use the subje Important: generation of private key is may be affected.	to create new private key. te" button to create self-signed certificate. ct name configured in "Certificate Signing Request" box. s a lengthy operation during which the device servic
-	

7. Reset the device with a flash-to-burn to save your settings.

### 3.10.2 Generate a Certificate Signing Request (CSR)

- > To generate certificate signing requests:
- 1. Open the TLS Contexts page (Configuration tab > System menu > TLS Contexts).
- 2. Select the default TLS Context (index 0), and then click the **TLS Context Certificate** button, located below the table.
- 3. In the 'Subject Name' field, enter the DNS name assigned to your device (see Section 2.1 on page 11).
- 4. Fill in all other certificates details.
- 5. Click **Create CSR**; a text rendering of the certificate signing request is displayed:

Figure 3-32: Generating Certificate Signing Requests

Subject Name [CN]	m1kmsbg.audio-codes.com
Organizational Unit [OU] (optional)	Headquarters
Company name [O] (optional)	Corporate
Locality or city name [L] (optional)	Poughkeepsie
State [ST] (optional)	New York
Country code [C] (optional)	US
MILCyjCGADICAQAwgYQXIDAEBgNVBAMTF2QXa21zYmcuYXVkaW8tY29kZXHuY21 MILCyjCGADICAQAwgYQXIDAEBgNVBAMTF2QXa21zYmcuYXVkaW8tY29kZXHuY21 MRUMEwYDVQQLEwx1ZWFkcVMcnR1cnhxEjAQB3VBACTCUNVCnBvcmF0ZTEVMBA A1UEBsMUU99122hzYwvc211MREvwYDVQQ1Ewh0ZxCgWW9yaTELAkA8A1UEBh VVMwggEiAM80CSgG85D5D2DEBAQUA41BDwAwgGEKA0IBAQC1WV96ZFBH203A OmXM8ACICYk1jYXoKTMNAmrKu10A4UF0j8mei35PLDvv21vCHsnFyG7Ue51E24 ortcOua192K0E1H5rX8J5CuLne/jv088QYXU9m1b0XhcKjT15JiKt57Cx031 w0GQ//LHp9EE5jqQ1q5jXxxV015KrC80r561jGBXyRZ7DzONLpxEcRAj5AhF7	26 40 30 30 31 31 31 31 34 4 4 4 4 4
neoimoiroc (grandari (grigoor) roznovi m oormoronepovi oosnovi mini	
s1Tn3PHy925xsMgnxe6+5Liq21/2b1sB9GJaLa7Hh66fpzRaFu100R2++R0U vya7AqMBAAGgJADNGkqhki69wBAQGPAACAQEAh2GMe6ALv3Y6EDuuQPdHyy 5sKHqPlUWYXMMpxVkmLqxtUNY1TSK3nKLd/502gEriUVNzzLSojnqBo/6hdq9e	ap 1f Fr

6. Copy all the text of the certificate request (including the "BEGIN" and "END" sections and dashes) and send it to the Certificate Authority (CA) as part of their certificate generation process (see Section 2 on page 11).

### 3.10.3 Load the Certificate

You will receive the certificate from the Certification Authority (CA) as a text file (or in a form that can be saved as a text file). The AudioCodes devices use Privacy Enhanced Mail (PEM) format for individual keys and certificates. This is also known as Base64 encoded DER certificate and is a text format (ASCII) file. There are many other commonly used formats. Most are these formats are binary formats that are not compatible with AudioCodes devices. There are also other text formats that are not PEM. The best practice is to load the certificate using the procedure below. If the certificate loaded to the device is in the incorrect format, the loading operation will fail. In this case, follow the instruction for converting the certificate to the PEM (Base64 encoded DER) and then try to reload the certificate.

- > To load the certificate:
- 1. Open the TLS Contexts table (Configuration tab > System menu > TLS Contexts).
- 2. Select the default TLS Context (index 0), and then click the **TLS Context Certificate** button, located below the table.

#### Figure 3-33: Upload Certificate Files from your Computer

▼ Links	
TLS Context Certificate	
TLS Context Trusted Root Certificates	
O	

 In the Upload certificate files from your computer group, locate the text "Send Device Certificate file from your computer to the device". Click the Browse button below this text, navigate to the certificate file, and then click Send File.





**Note:** If the certificate file loaded to the device is not in the proper PEM format, the procedure may fail the first time you attempt to load this file to the device. A built in Microsoft application is available on most Windows computers which allows you to export most types of certificate files and convert them by specifying a Base64 encoded DER certificate.

#### 3.10.3.1 Convert Certificates to DER (PEM)

This procedure describes how to convert certificates to DER (PEM). This procedure is only applicable if you encountered an error loading the certificate file to the device. Such an error indicates that you have attempted to load an incompatible certificate file to the device. To makes your certificate file compatible, you need to convert the file to Base64 encoded DER (PEM).

- > To convert an incompatible certificate to Base64 encoded DER (PEM):
- 1. Make a copy of the original certificate file that you received from the CA in a working directory.
- 2. Double-click the copied certificate or open the file with the Windows Certificate application.
- 3. Select the **Details** tab and click the **Copy to File** button.

Certificate	×
General Details Certification	Path
Show <all></all>	-
Field	Value
📴 Version	V1
📴 Serial number	01 a5
📴 Signature algorithm	md5RSA 🗉
Signature hash algorithm	md5
🛅 Issuer	GTE CyberTrust Global R
Valid from	Wednesday, August 12, 1
Valid to	Monday, August 13, 2018
Subject	GTE CyberTrust Global R
Learn more about <u>certificate d</u>	Edit Properties Copy to File
	ОК

#### Figure 3-34: Copy to File

4. Use the export wizard to export the file into the Base-64 encoded X.509 format. Use a new name or extension, for example if the certificate has a CER extension it can be saved in the PEM format.



Certificate SIP Trunk Monitoring s
General Details Certification Path
Certificate Export Wizard
Export File Format Certificates can be exported in a variety of file formats.
Select the format you want to use:
DER encoded binary X.509 (.CER)
Base-64 encoded X.509 (.CER)
Cryptographic Message Syntax Standard - PKCS #7 Certificates (.P7B)
Include all certificates in the certification path if possible
Personal Information Exchange - PKCS #12 (.PFX)
Include all certificates in the certification path if possible
Export all extended properties
L O Microsoft Serialized Certificate Store (.SST)
Learn more about <u>certificate file formats</u>
< Back Next > Cancel

Figure 3-35: Certificate Export Wizard

5. Run the procedure above (described in Section 3.10.3) and ensure that you reset the SBC at the end of the procedure.

### 3.10.4 Intermediate and Trusted Root Certificates

In addition to the CA providing the requested device certificate, it also provides the certificates in its root chain. In some cases, these intermediate and root certificates may be referenced and downloaded in a separate part of the CA web site. The exact number and details of these files varies according to the CA.

In addition, the TLS Context Trusted Root Certificate store on the AudioCodes device must be populated with additional publically available MS Office 365 required certificates. If any of the CA Intermediate or Trusted Root Certificates are missing, the TLS connection will quickly be failed by Office 365 with an immediate socket closed log and Proxy Set failure on the AudioCodes device. The mandatory certificates required by Office 365 are as following:

- GTE CyberTrust Root CA (<u>www.digicert.com/digicert-root-certificates.htm</u>)
- Baltimore CyberTrust root CA (<u>www.digicert.com/digicert-root-certificates.htm</u>)

As described in Section 3.10.3 above, binary or non-PEM format certificates will need to be exported to Base-64 encoded (PEM).

#### > To load the Intermediate and Trusted Root certificates:

- 1. Open the TLS Contexts table (Configuration tab > System menu > TLS Contexts).
- 2. Select the default TLS Context (index 0), and then click the **TLS Context Trusted Root Certificates** button, located below the table.

#### Figure 3-36: TLS Context Certificate

↓ Links		
TLS Context Certificate		
TLS Context Trusted Root Certificates		
	Reside	

 Select the Import button, browse on your desktop and Add each file into the table of Trusted Certificates.

As stated above, the exact number and details of these files varies according to the CA. In the example below, the two mandatory CA entries are shown (GTE CyberTrust Root CA and Baltimore CyberTrust) as well as two other entries.

#### Figure 3-37: Trusted Certificates Table-Example

<u>ILS Co</u>	ntexts Table#0->Trusted Certificate	ß			
➡ Tru	sted Certificates				
Vie	View B		Import Ŧ	Export ±	Remove 🕯
Index	Subject	Issuer	Expires		
0	Go Daddy Secure Certificate Au	Go Daddy Root Certificate Auth	5/03/2031		
1	1 Go Daddy Root Certificate Auth The Go Daddy Group, Inc. 5/30/203		31		
2	Baltimore CyberTrust Root Baltimore CyberTrust Root		5/12/2025		
3	Cybertrust Global Root	Cybertrust Global Root	12/15/2021		
	TILS Co	TILS Contexts Table#0->Trusted Certificate         Trusted Certificates         View         Index       Subject         0       Go Daddy Secure Certificate Au         1       Go Daddy Root Certificate Auth         2       Baltimore CyberTrust Root         3       Cybertrust Global Root	Its Contexts Table #0-≥Trusted Certificates         ▼ Trusted Certificates         View D         Index       Subject       Issuer         0       Go Daddy Secure Certificate Au       Go Daddy Root Certificate Auth         1       Go Daddy Root Certificate Auth       The Go Daddy Group, Inc.         2       Baltimore CyberTrust Root       Baltimore CyberTrust Root         3       Cybertrust Global Root       Cybertrust Global Root	ILS Contexts Table #0->Trusted Certificates         View D       Import 7         Index       Subject       Issuer         0       Go Daddy Secure Certificate Au       Go Daddy Root Certificate Auth       5/03/203         1       Go Daddy Root Certificate Auth       The Go Daddy Group, Inc.       5/30/203         2       Baltimore CyberTrust Root       Baltimore CyberTrust Root       5/12/203         3       Cybertrust Global Root       Cybertrust Global Root       12/15/203	ILS Contexts Table #0-> Trusted Certificates         View D       Import T       Export ±         Index       Subject       Issuer       Expires         0       Go Daddy Secure Certificate Au       Go Daddy Root Certificate Auth       5/03/2031         1       Go Daddy Root Certificate Auth       The Go Daddy Group, Inc.       5/30/2031         2       Baltimore CyberTrust Root       Baltimore CyberTrust Root       5/12/2025         3       Cybertrust Global Root       Cybertrust Global Root       12/15/2021

# 3.11 Reset the SBC

After completing configuration of the SBC as shown in this section, save ("burn") the configuration to the 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 3-38: Resetting the SBC

✓ Reset Configuration	
Reset Board	Reset
Burn To FLASH	Yes 💌
Graceful Option	No
LOCK / UNLOCK	
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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# **Configuration Note**

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