Session Border Controllers (SBCs)

AudioCodes Mediant™ Series

Interoperability Lab

Configuration Note

Microsoft® Office 365 Exchange UM with IP PBXs using AudioCodes Mediant SBC

Microsoft Partner
Gold Communications

Microsoft® Office 365

AudioCodes

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

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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” .

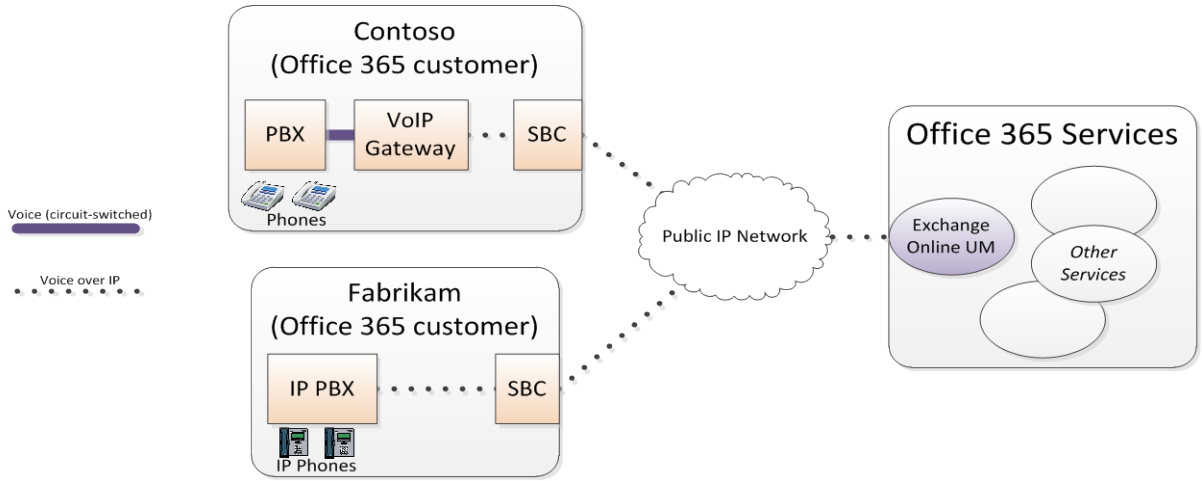
When making or receiving telephone calls, Exchange Online UM only communicates with voice-over-IP (VoIP) protocols. PBXs that support circuit-switched telephony protocols must be connected to Exchange Online UM with a suitable VoIP gateway. The gateway performs the necessary protocol conversion. VoIP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

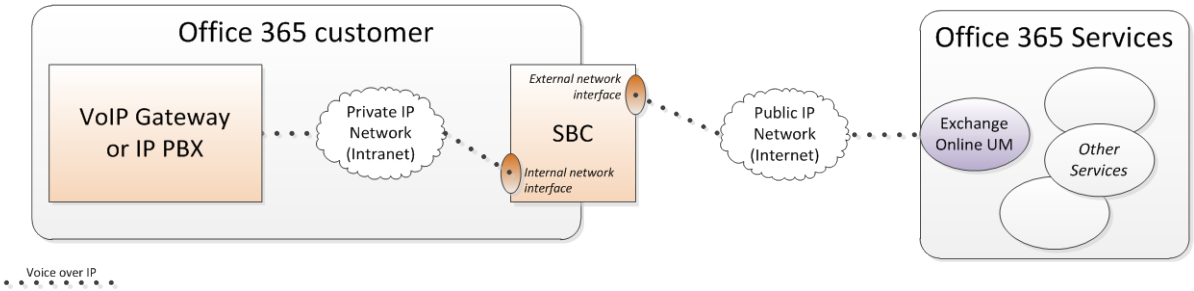
This guide describes the SBC configuration necessary to deploy it on an organization's network's edge for interoperability with Exchange Online UM.

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



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.

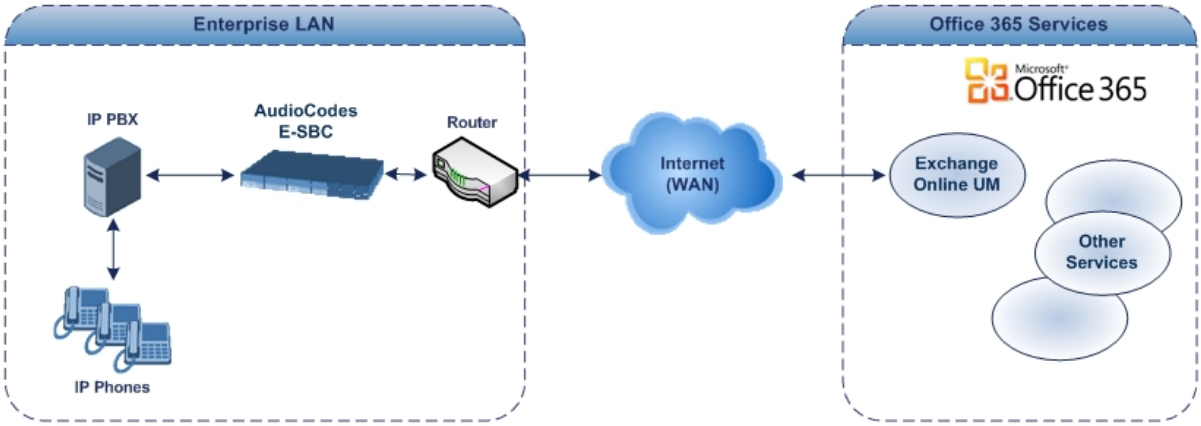
This guide focuses on AudioCodes SBC capabilities (the VoIP Gateway or the IP PBX are external devices) required for interoperability with Office 365 Exchange Online UM.

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 (http://www.audiocodes.com/mediant-sbc-configuration-wizard) 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 (http://www.digicert.com/)
- Entrust (http://www.entrust.com/)
- Geotrust (http://www.geotrust.com/)
- GoDaddy (http://www.godaddy.com/)
- GTE CyberTrust (http://www.verizonbusiness.com/Products/security/identity/ssl/)
- RSA Security (http://www.rsa.com/)
- Thawte (http://www.thawte.com/)
- Verisign (http://www.verisign.com/)

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

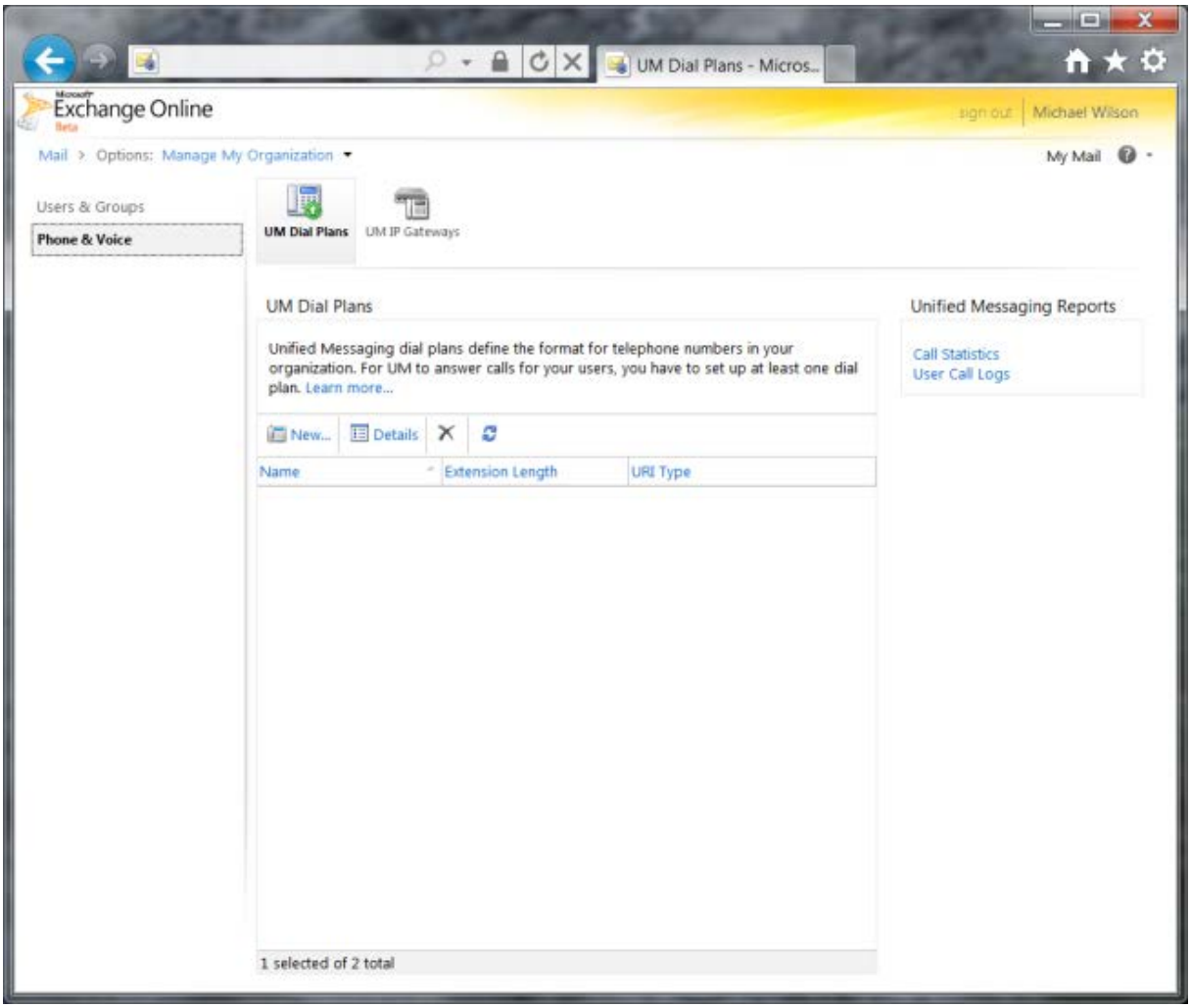
Before communication can be established from a telephony solution (via the SBC) to Office 365 Exchange Online UM, specific Exchange Online UM configuration must be performed. At a minimum, this consists of creating and configuring a UM Dial Plan and a UM IP Gateway. These are configuration objects that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

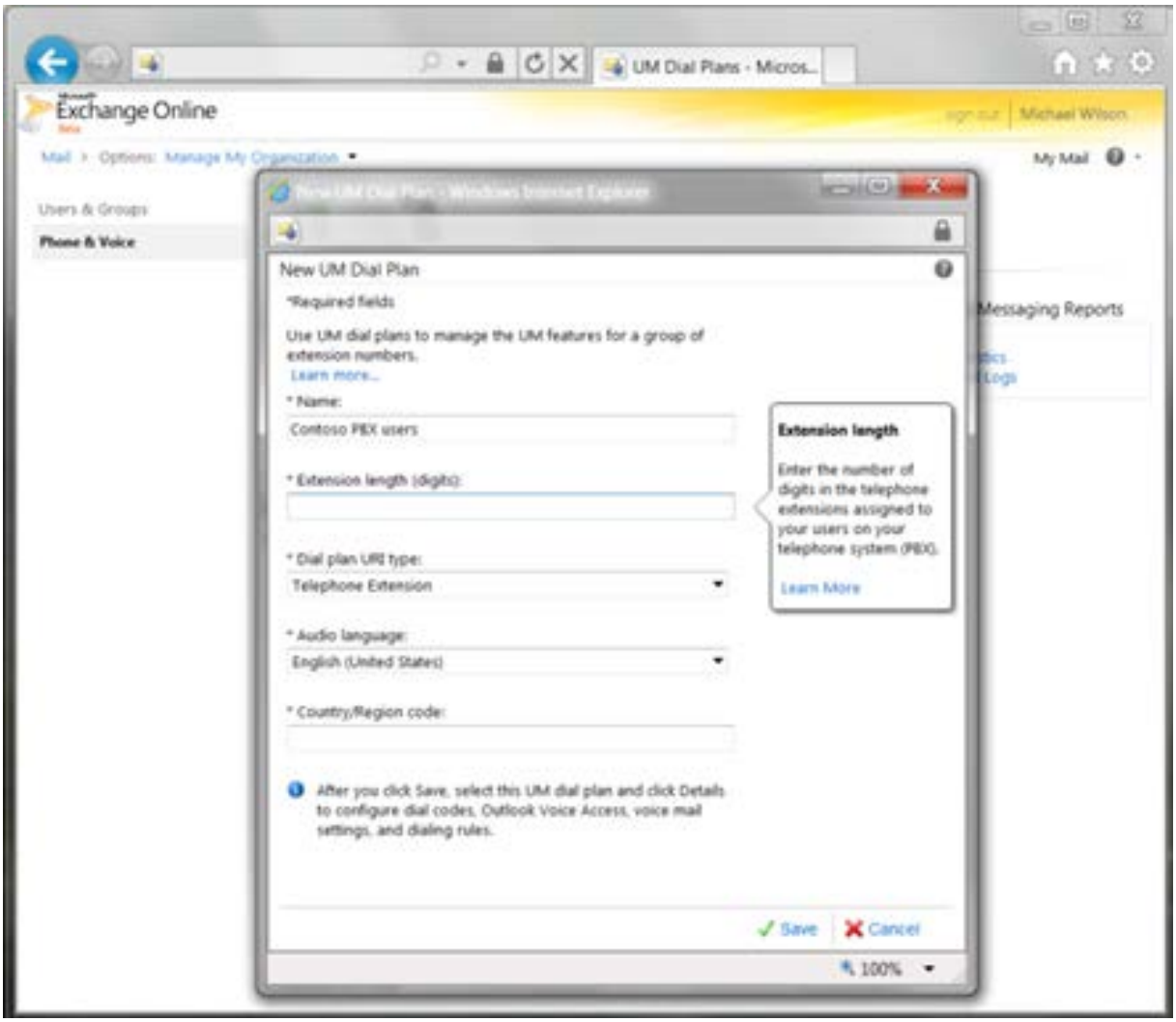
Figure 2-1: Initial (Empty) UM Dial Plans List in Exchange Control Panel



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.

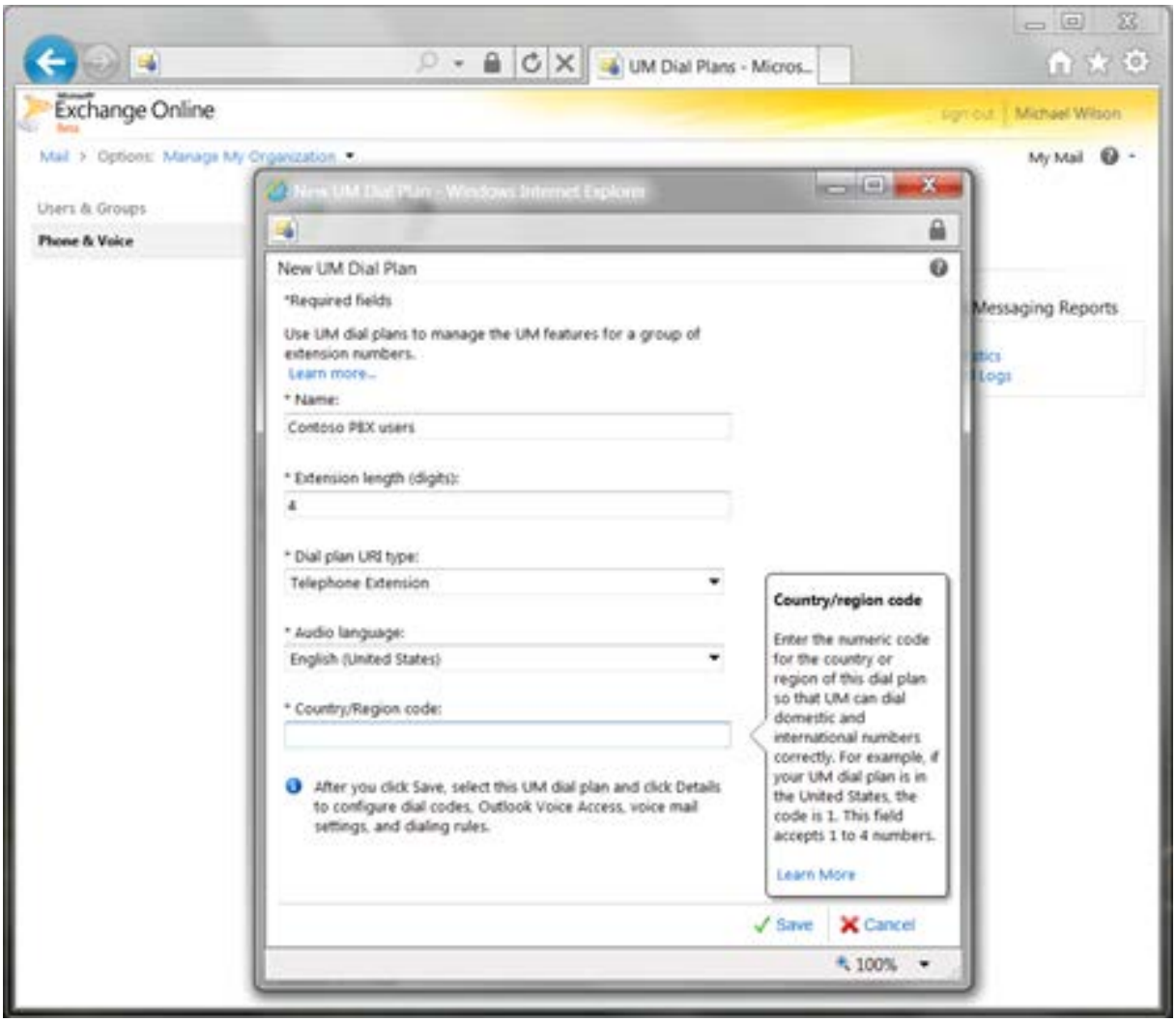
Figure 2-2: Specifying Properties for a New UM Dial Plan for a PBX or an IP PBX



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).

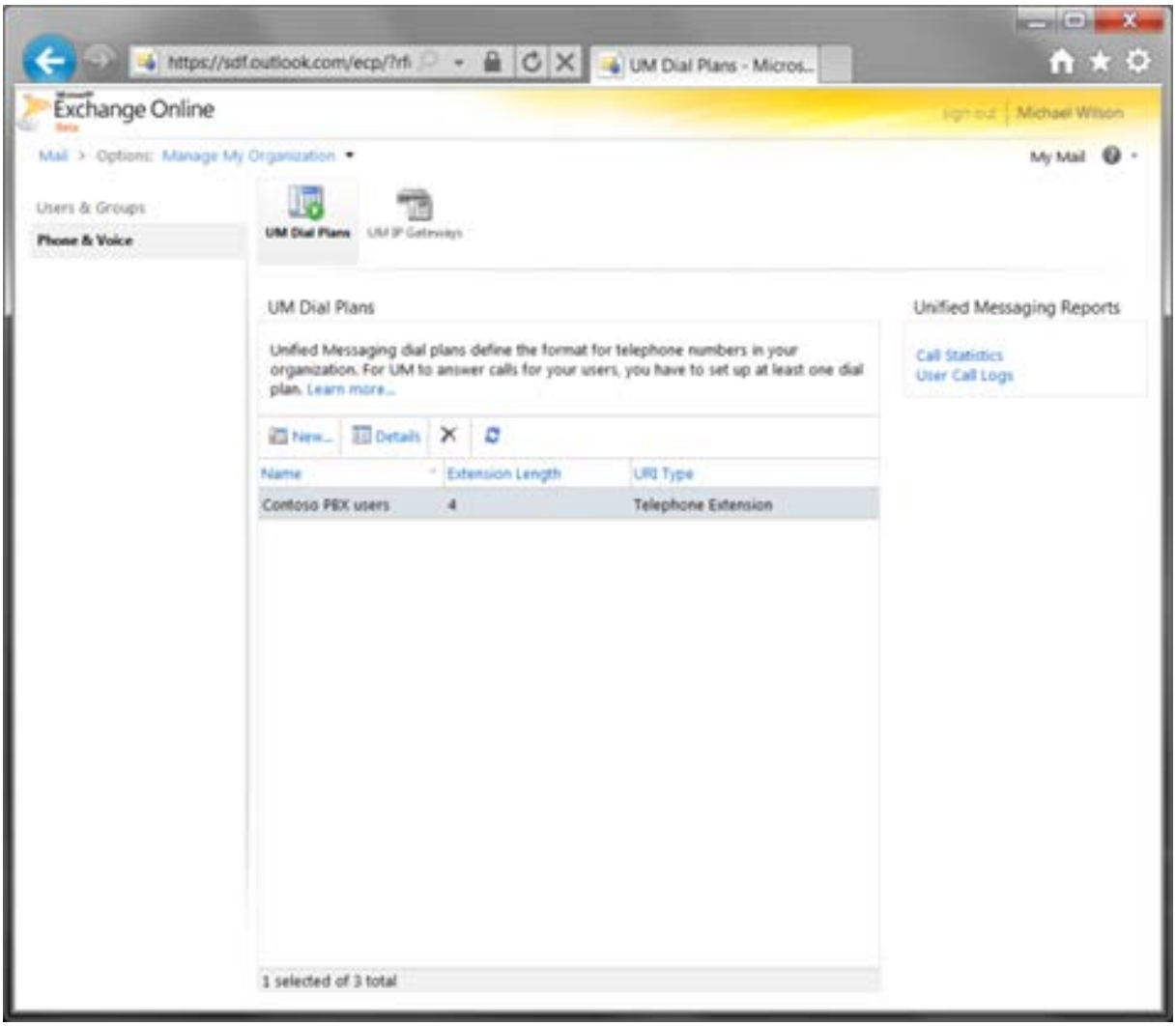
Figure 2-3: Specifying the Country Code for a New UM Dial Plan for PBX or an IP PBX



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.

Figure 2-4: List Showing one UM Dial Plan

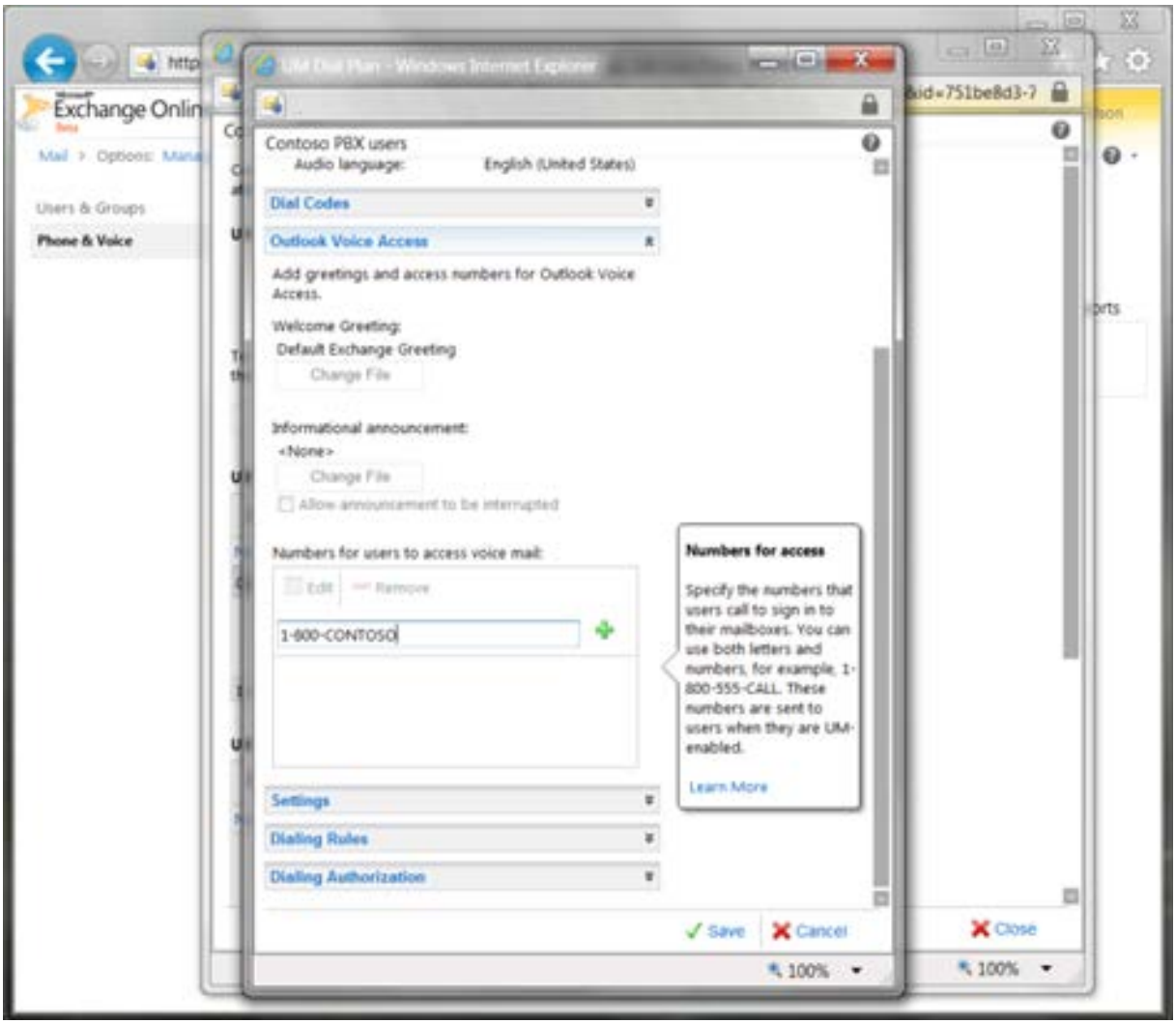


In the screen above:

- 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).

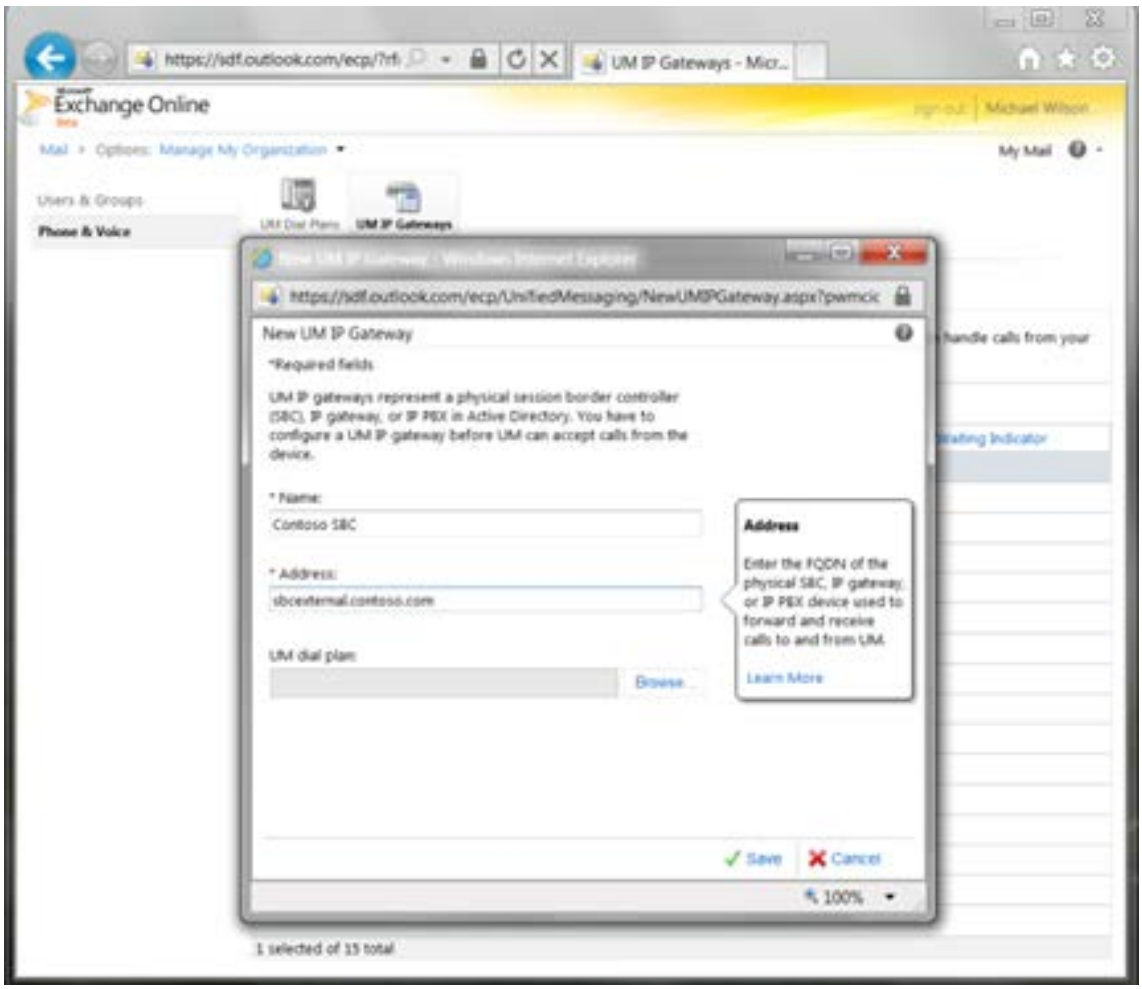
Figure 2-5: Editing the Display Access Numbers for a UM Dial Plan



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).

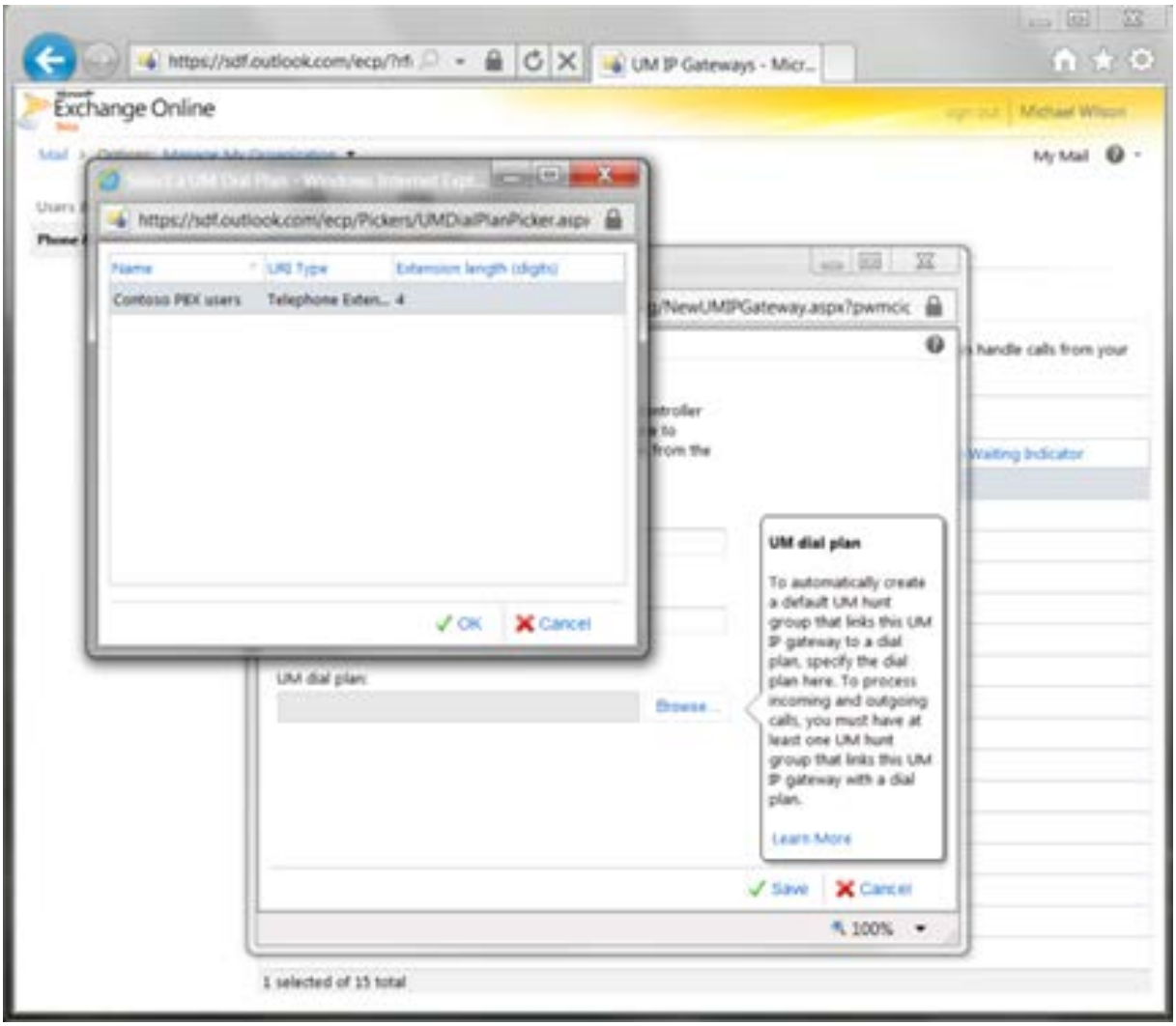
Figure 2-6: Creating a New UM IP Gateway to Represent an SBC on the Customer's Premises



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.

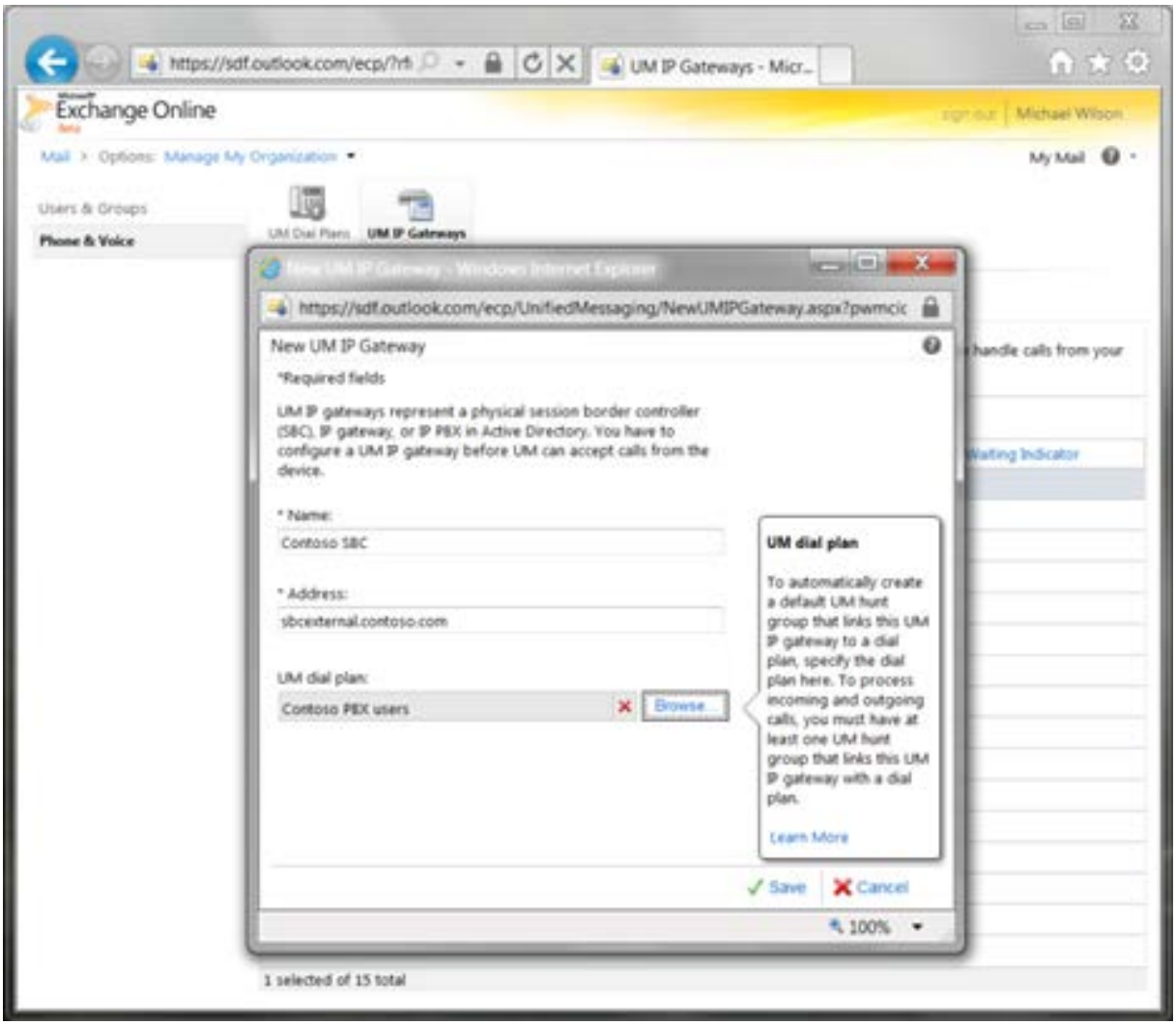
Figure 2-7: Associating the New UM IP Gateway with a UM Dial Plan



In the screen above:

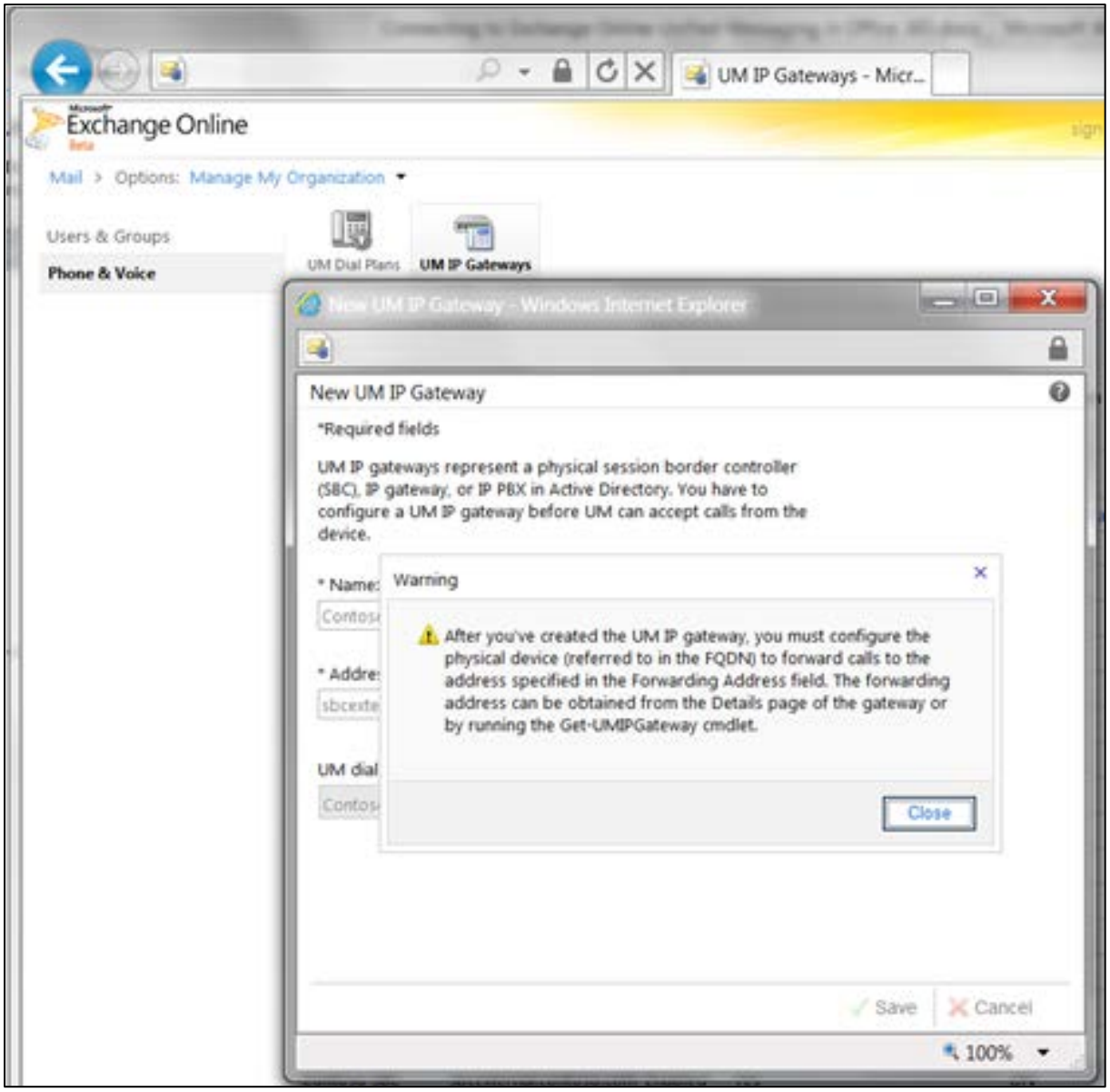
- The **Browse**… button on the UM IP Gateway details page displays a list of all the UM Dial Plans of type Telephone Extension. Select one of these and click **OK**.

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



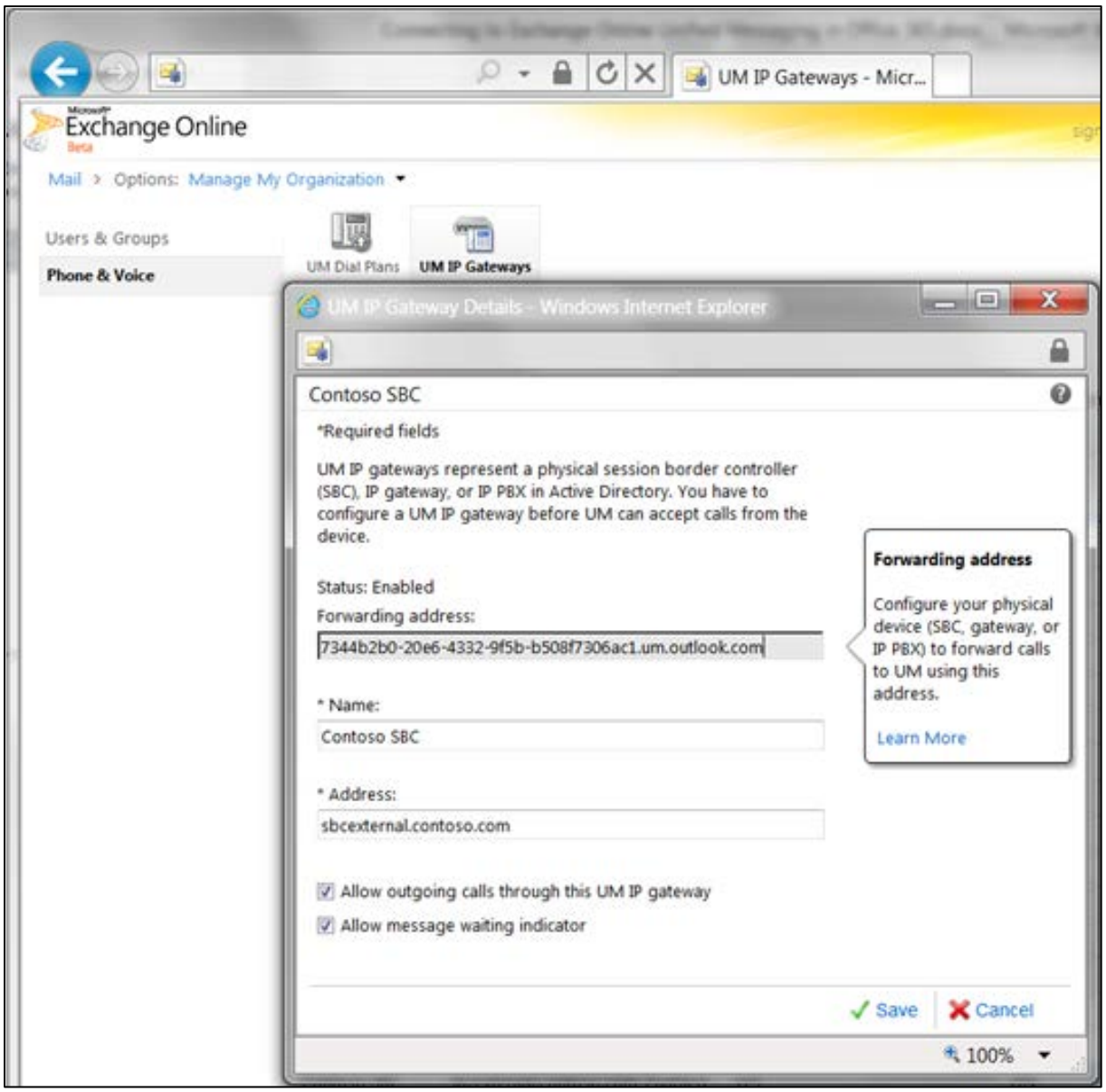
When you create the UM IP Gateway, it is automatically assigned a **Forwarding Address**. You're alerted to this when you save the gateway configuration (see the figure below).

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).

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.

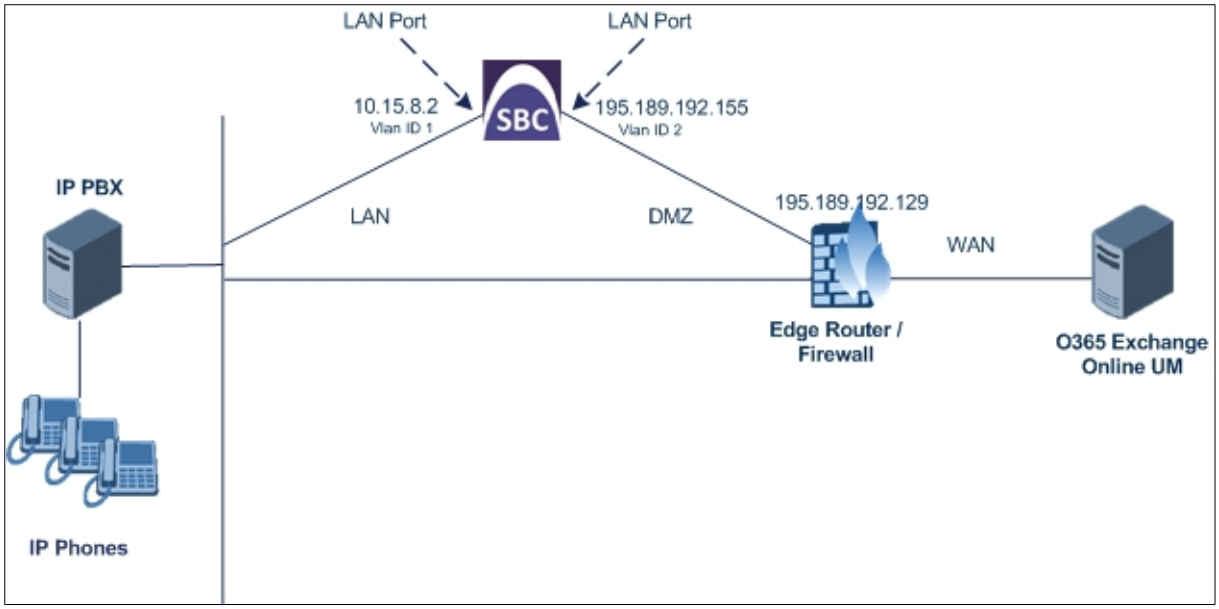
Use the **Full** navigation menu tree to perform SBC configuration.

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:

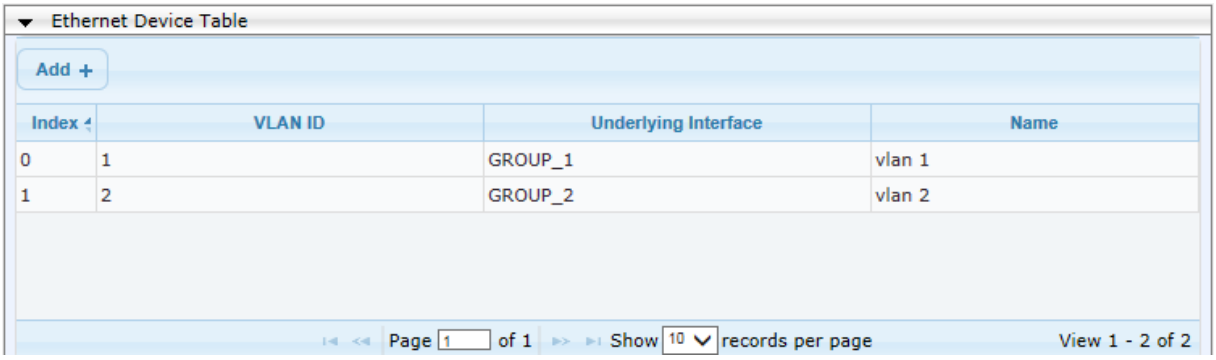
- LAN VoIP (assigned the name "Voice")
- WAN VoIP (assigned the name "WANSP")

➢ **To configure the VLANs:**

1. Open the Ethernet Device Table page (**Configuration** tab > **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**

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



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:**

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	**10.15.8.2** (IP address of the SBC)
Prefix Length	**16** (subnet mask in bits for 255.255.0.0)
Gateway	**10.15.0.1**

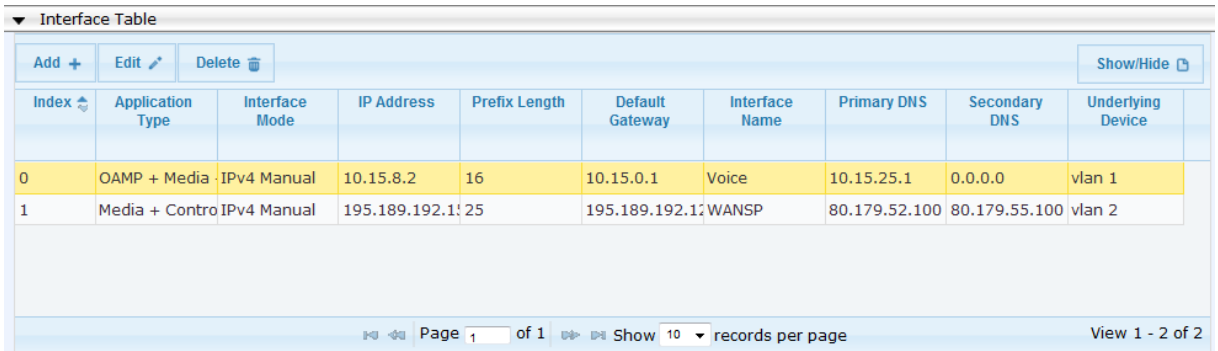
Parameter	Value
VLAN ID	**1**
Interface Name	**Voice** (arbitrary descriptive name)
Primary DNS Server IP Address	**10.15.25.1** (company DNS server)
Underlying Device	**vlan 1**

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	**25** (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**

4. Click **Apply**, and then **Done**; the configured IP network interfaces are shown below:

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



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:**

1. Open the Physical Ports Settings page (**Configuration** tab> **VoIP** 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".

Figure 3-4: Configured Port Native VLAN

Physical Ports Settings

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	GE_4_4	Enable	2	Auto Negotiation	User Port #3	GROUP_2	Redundant

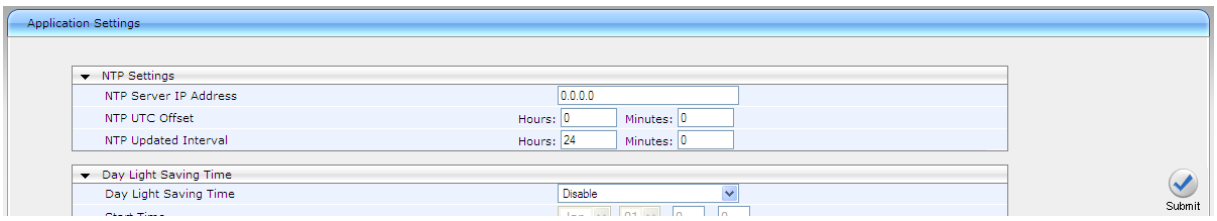
3.2 Configure the NTP Server IP Address

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

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

1. 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



3. Click **Submit**.

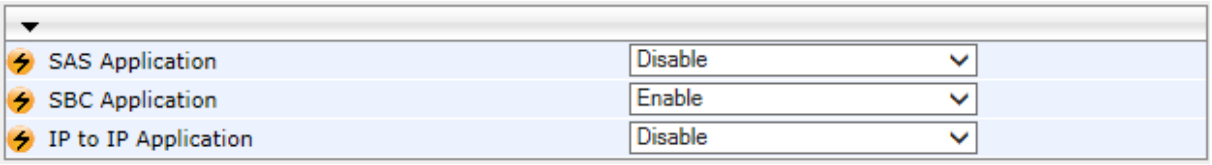
3.3 Enable SBC Functionality

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 3-6: Enabling SBC Application



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).

[1] 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

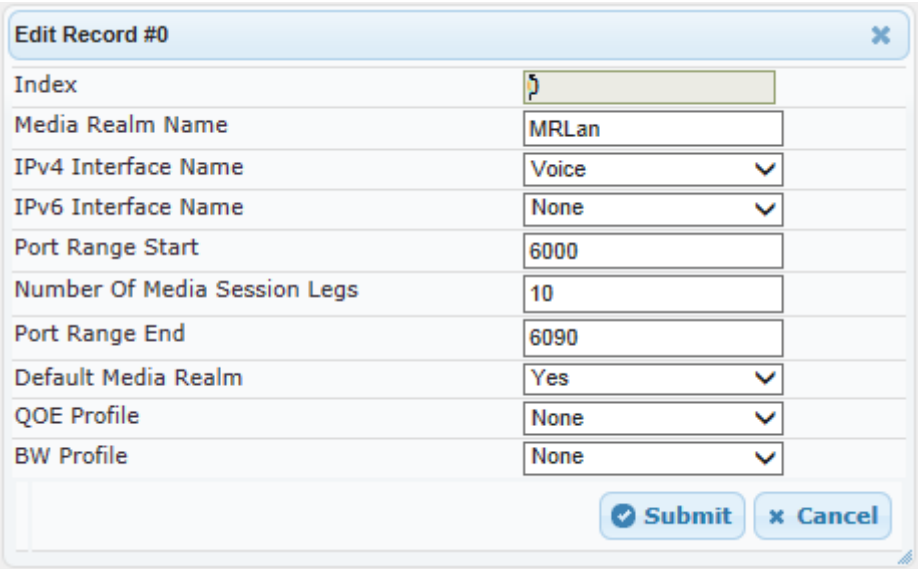
This step describes how to configure Media Realms. The simplest configuration is to create two Media Realms - one for internal (LAN) traffic and one for external (WAN) traffic.

➢ **To configure Media Realms:**

1. Open the Media Realm Table page (**Configuration** tab > **VoIP** menu > **VoIP 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	**6000** (represents lowest UDP port number used for media on LAN)
Number of Media Session Legs	**10** (media sessions assigned with port range)

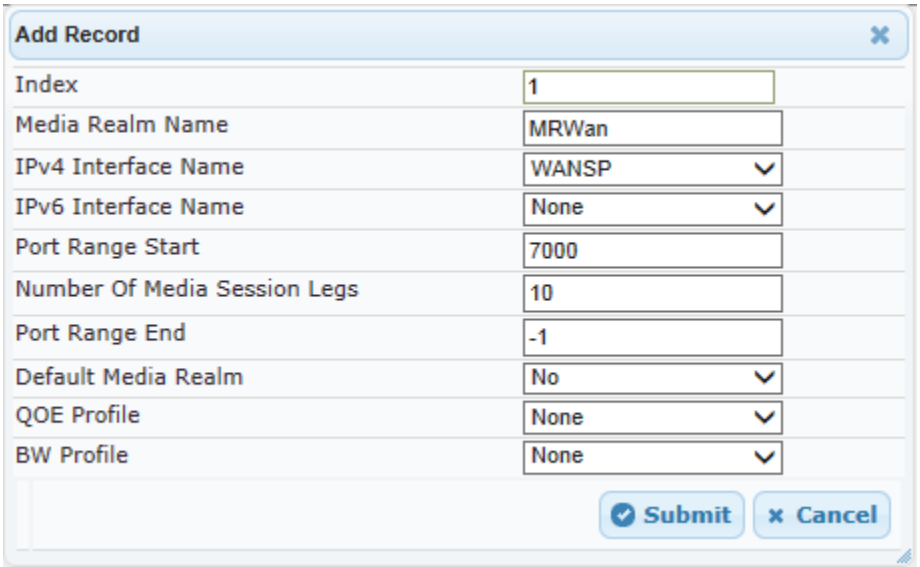
Figure 3-7: Configuring Media Realm for LAN



3. Configure a Media Realm for WAN traffic:

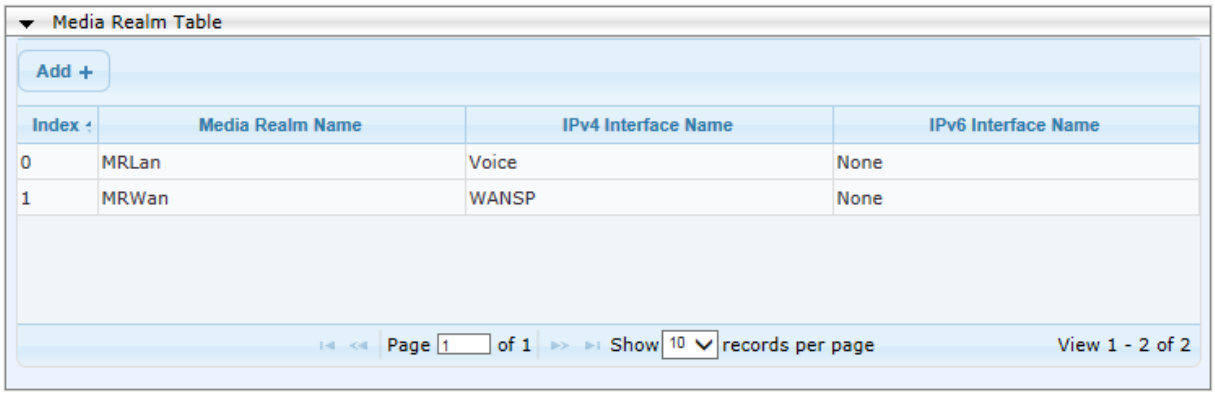
Parameter	Value
Index	**1**
Media Realm Name	**MRWan** (arbitrary name)
IPv4 Interface Name	**WANSP**
Port Range Start	**7000** (represents lowest UDP port number used for media on WAN)
Number of Media Session Legs	**10** (media sessions assigned with port range)

Figure 3-8: Configuring Media Realm for WAN



The configured Media Realms are shown in the figure below:

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



3.4.2 Step B: Configure SRDs

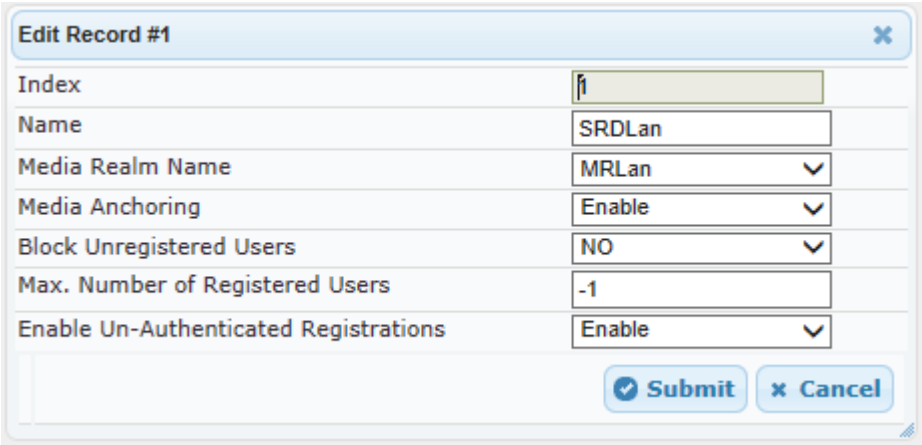
This step describes how to configure the SRDs.

➢ **To configure SRDs:**

1. 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



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

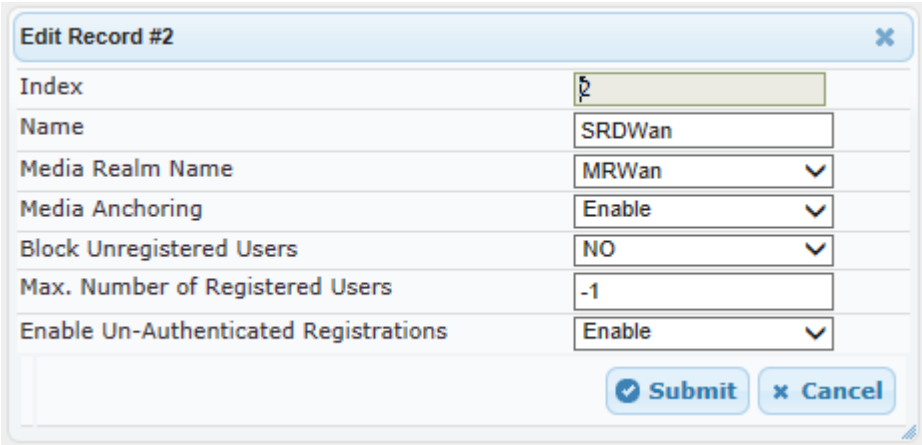
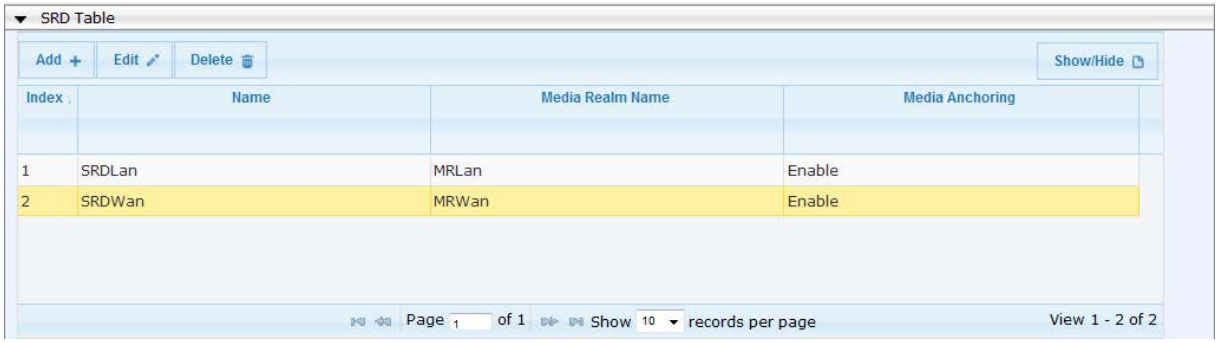


Figure 3-12: Configured SRD Table



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:**

1. Open the SIP Interface Table page (**Configuration** tab > **VoIP** menu > **VoIP Network** > **SIP Interface Table**).
2. Configure a SIP interface for the LAN:

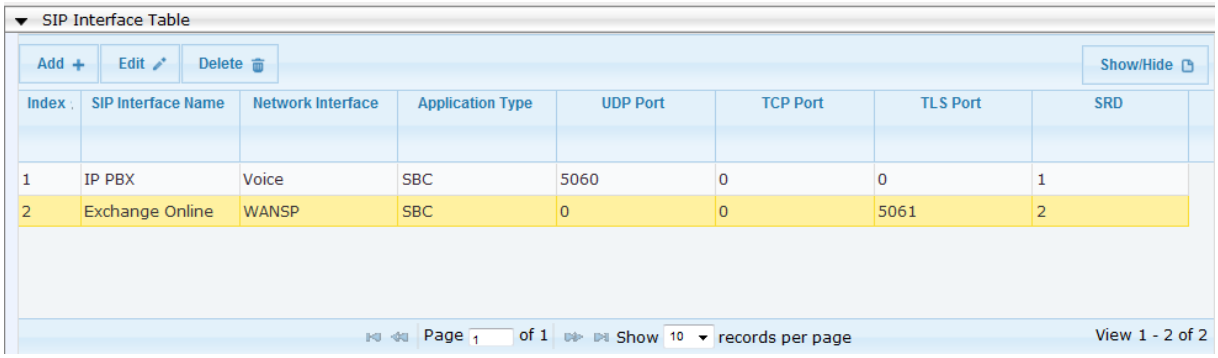
Parameter	Value
Index	**1**
Interface Name	**IP PBX** (arbitrary descriptive name)
Network Interface	**Voice**
Application Type	**SBC**
UDP Port	**5060**
TCP and TLS	**0**
SRD	**1**

3. Configure a SIP interface for the WAN:

Parameter	Value
Index	**2**
Interface Name	**Exchange Online** (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



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

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

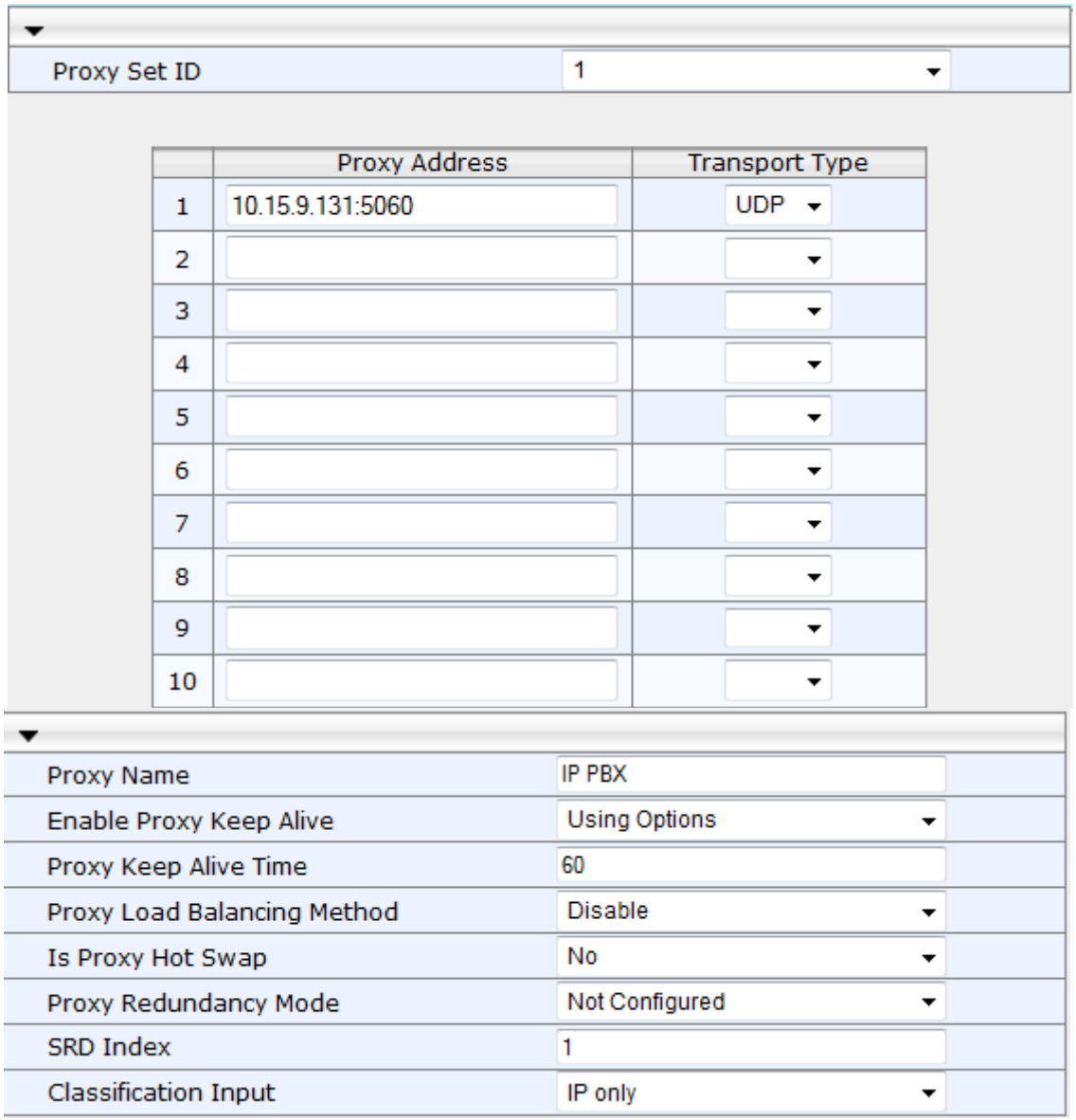
These Proxy Sets will later be associated with IP Groups.

➢ **To configure Proxy Sets:**

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

Figure 3-14: Configuring Proxy Set for IP PBX



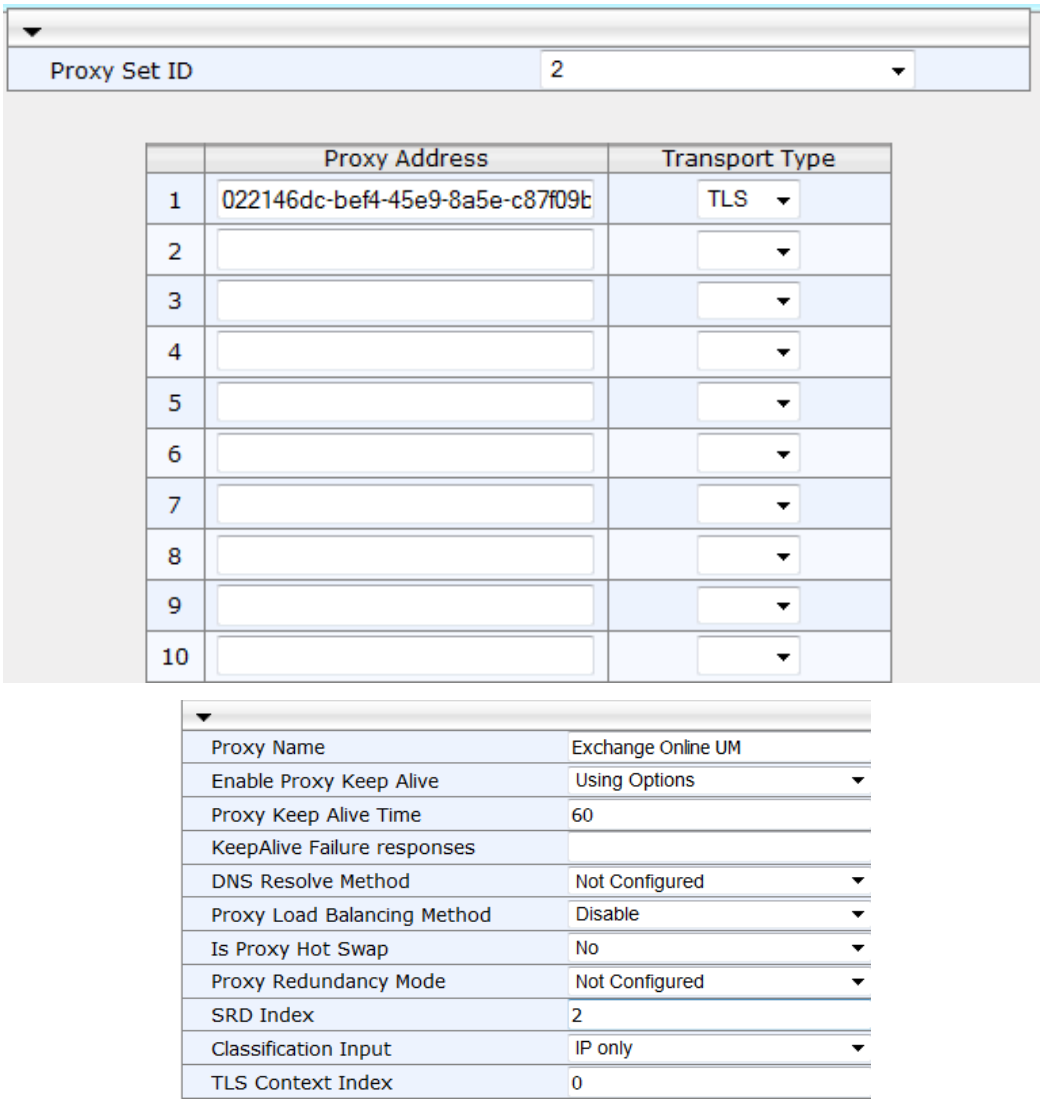
3. Click **Submit**.
4. Configure a Proxy Set for Exchange Online UM.

   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 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	**2** (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



[2] Port 5061 is used by Office 365 Exchange Online UM for all SIP/TLS traffic.

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

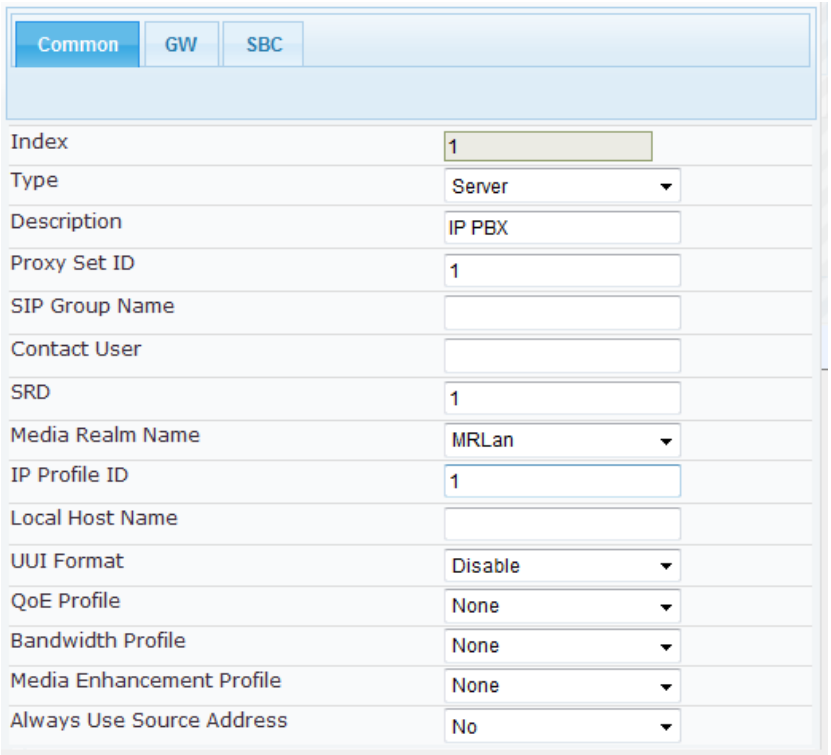
An SBC "IP Group" represents a SIP trunk or SIP-capable peer system. It is associated with a Signaling Routing Domain (SRD). You will need to define two IP Groups, one representing the internal SIP peer (i.e., IP PBX), and one representing Office 365 Exchange Online UM[3].

3.6.1 Configure an Internal IP Group

➢ **To configure an internal IP Group:**

1. 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).

Figure 3-16: Internal IP Group Configuration



9. Click **Submit**.

[3] 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.

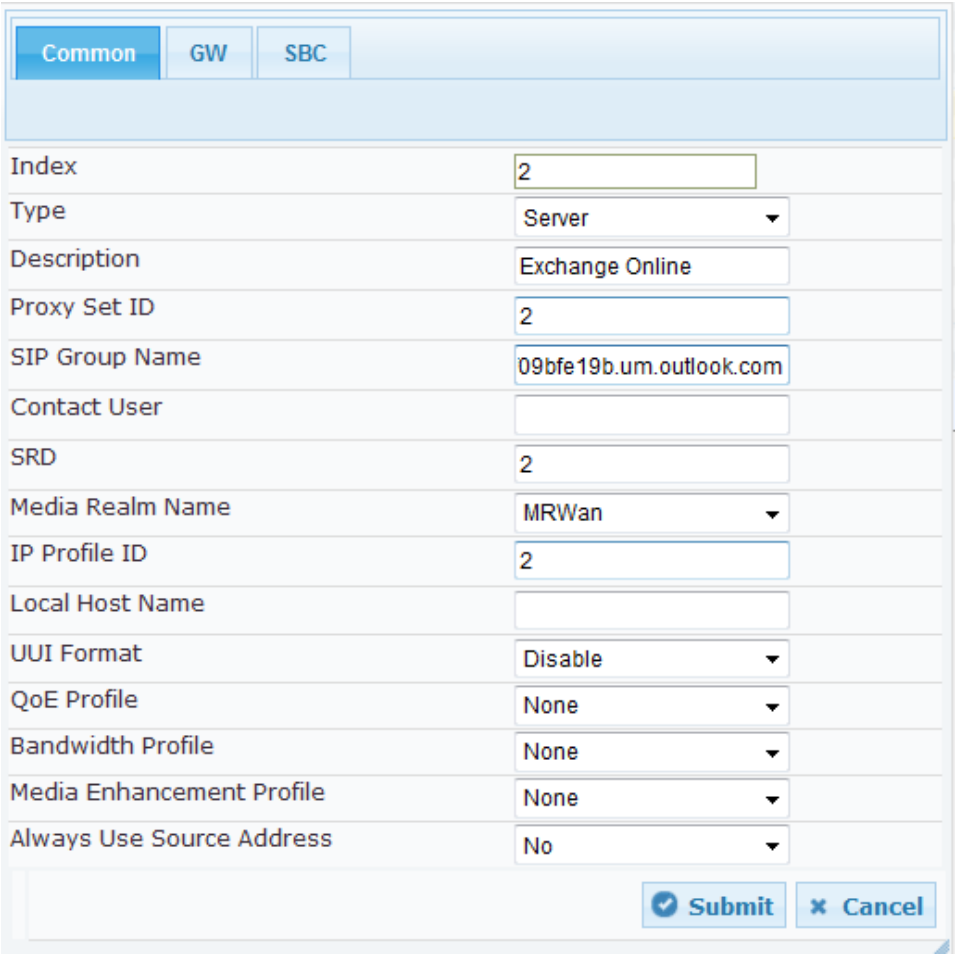
3.6.2 Configure an External IP Group

This section shows how to configure an external IP group.

➢ **To configure an external IP Group:**

1. 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.

Figure 3-17: External IP Group Configuration



10. Click **Submit**.

Figure 3-18: IP Group Table Configuration

IP Group Table

Add | Edit | Delete | Show/Hide

Index	Type	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

Page 1 of 1 Show 10 records per page View 1 - 2 of 2

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

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 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

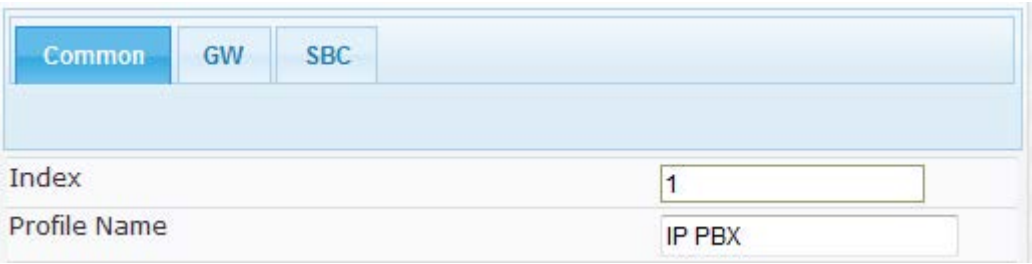
Note that the IP Profiles were assigned to these entities (i.e., IP Groups) in the step shown in Section 0 on page 34.

➢ **To configure IP Profiles:**

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**
Profile Name	**IP PBX** (arbitrary descriptive name)

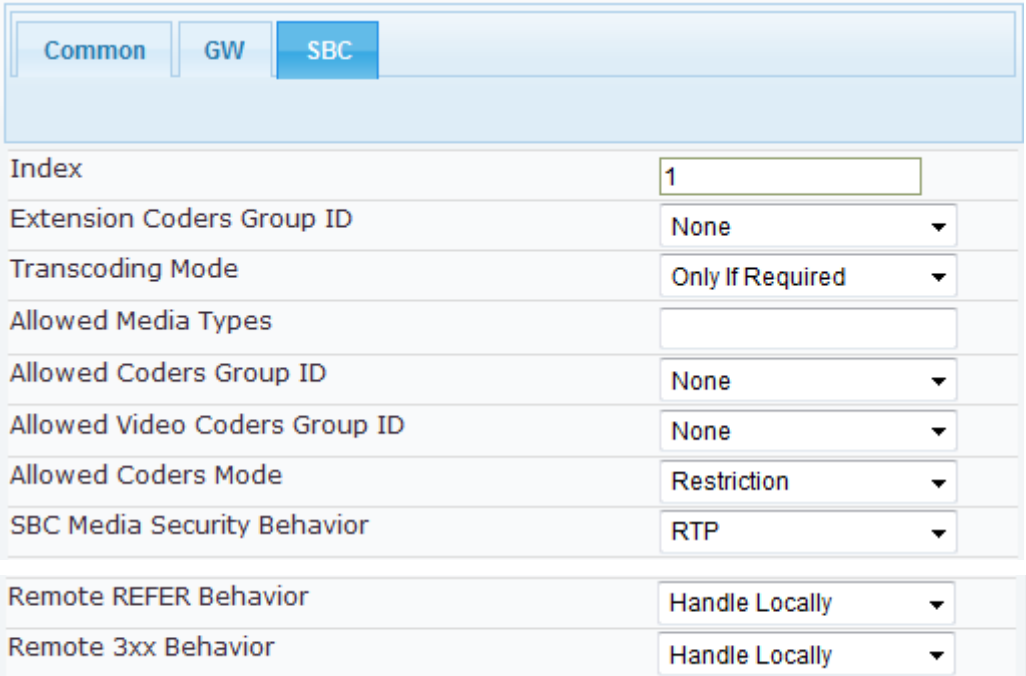
Figure 3-20: Configuring IP Profile for IP PBX – Common Tab



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

Parameter	Value
SBC Media Security Behavior	**RTP**

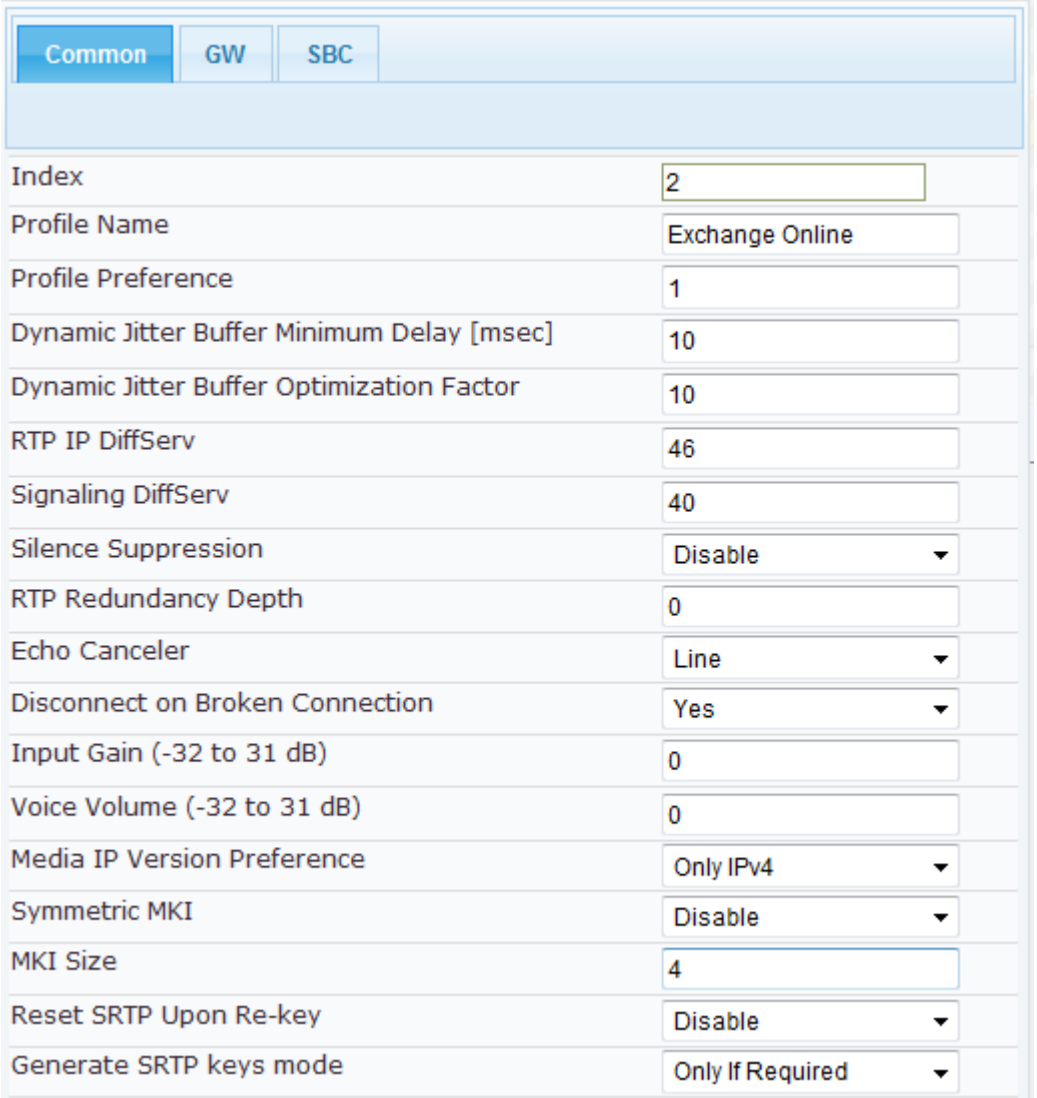
Figure 3-21: Configuring IP Profile for IP PBC – SBC Tab



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**

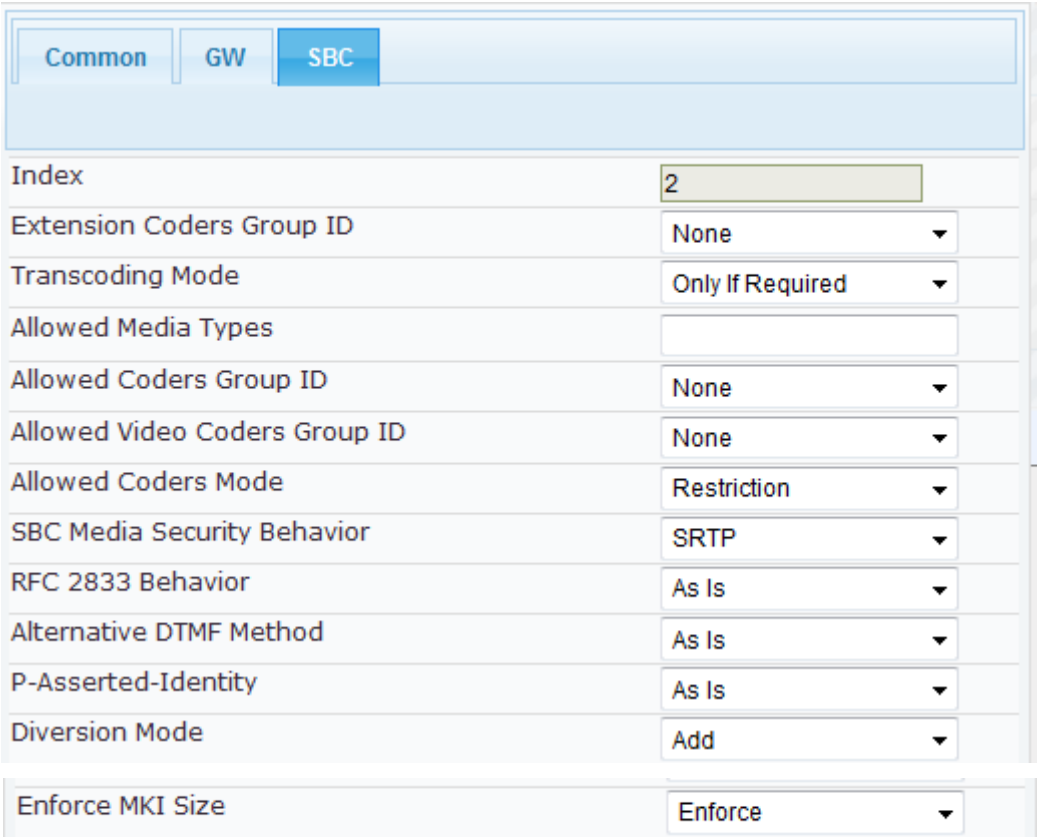
Figure 3-22: Configuring IP Profile for Exchange Online – Common Tab



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



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):

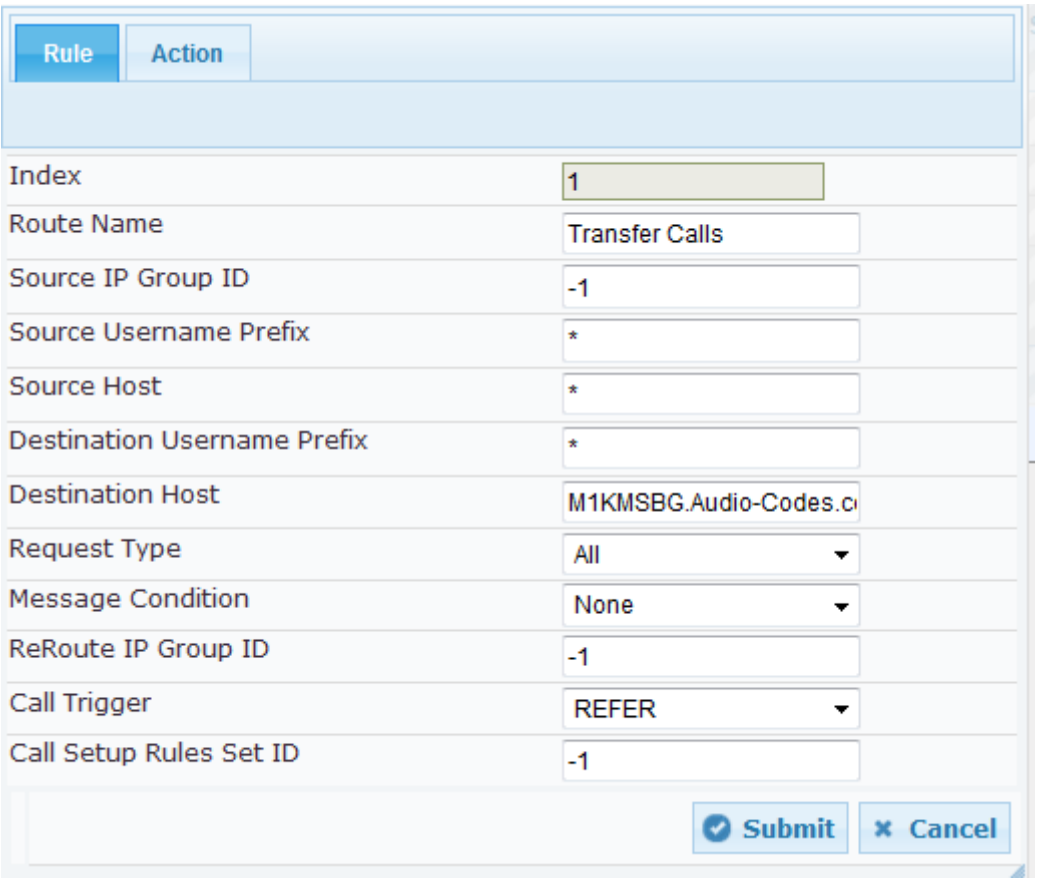
- Calls from Exchange Online as a results of Directory Search option (Transfer calls)
- Calls from IP PBX to Exchange Online
- Calls from Exchange Online to IP PBX

➢ **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**

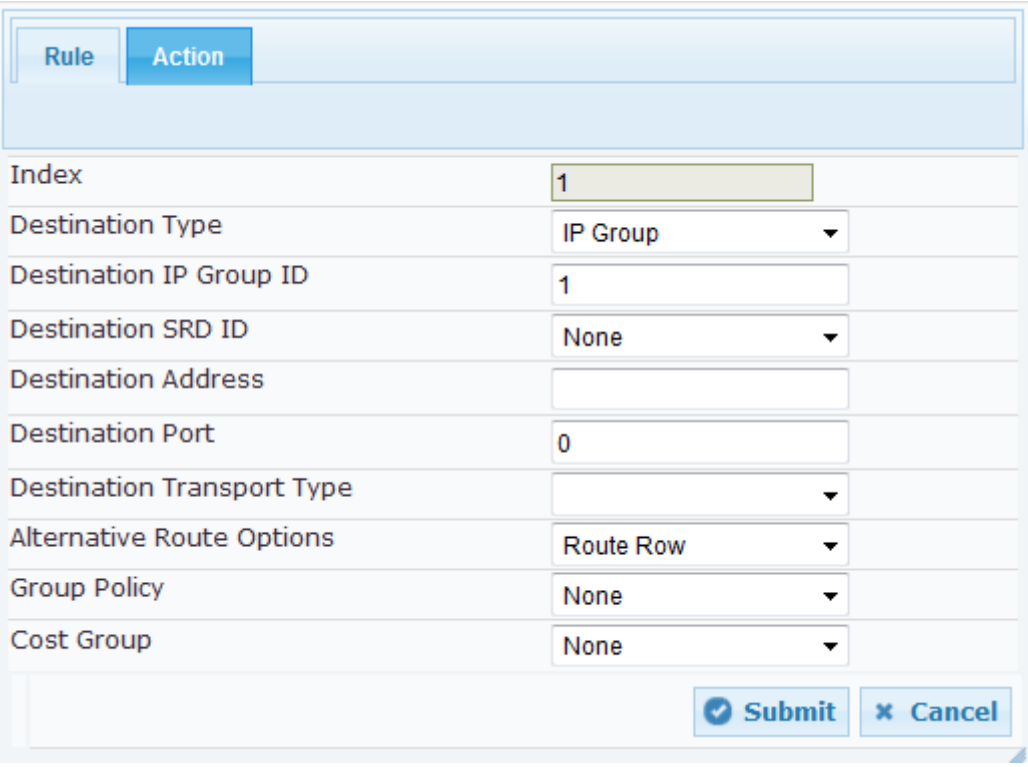
Figure 3-24: Configuring IP-to-IP Routing Rule for Transfer Calls – Rule tab



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

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

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

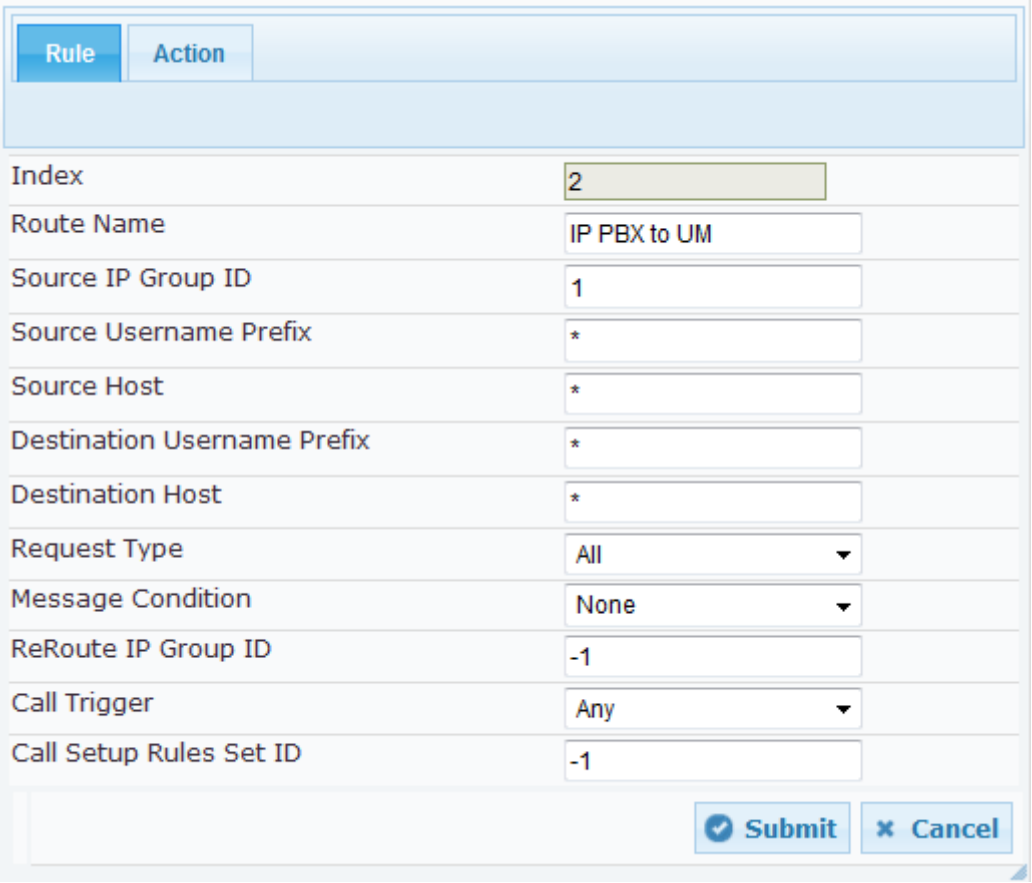


➢ **To configure IP-to-IP routing rules:**

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	**IP PBX to UM** (arbitrary descriptive name)
Source IP Group ID	**1**

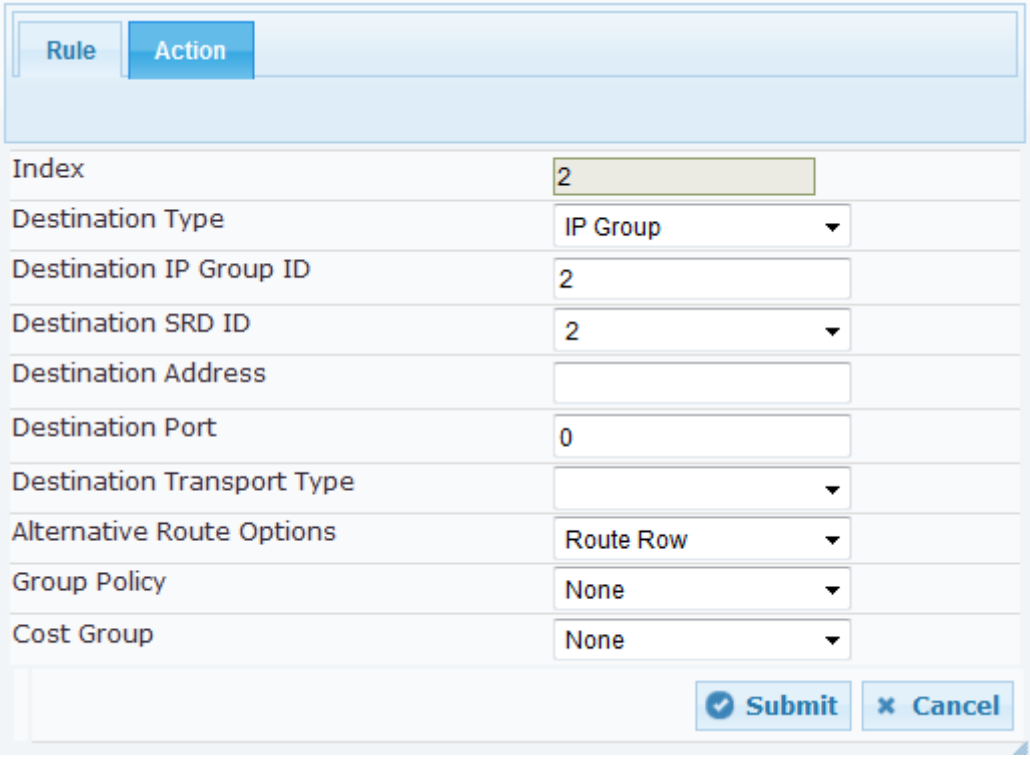
Figure 3-26: Configuring IP-to-IP Routing Rule for IP PBX to UM – Rule tab



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**

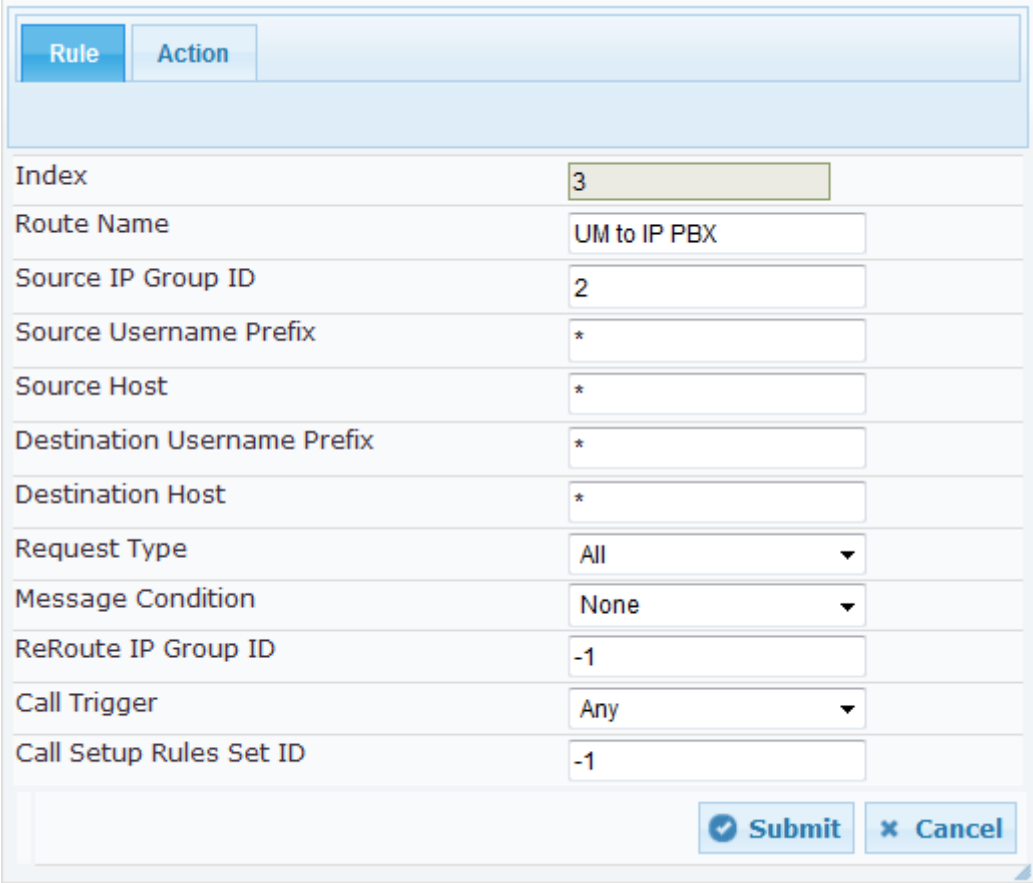
Figure 3-27: Configuring IP-to-IP Routing Rule for IP PBX to UM – Action tab



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	**UM to IP PBX** (arbitrary descriptive name)
Source IP Group ID	**2**

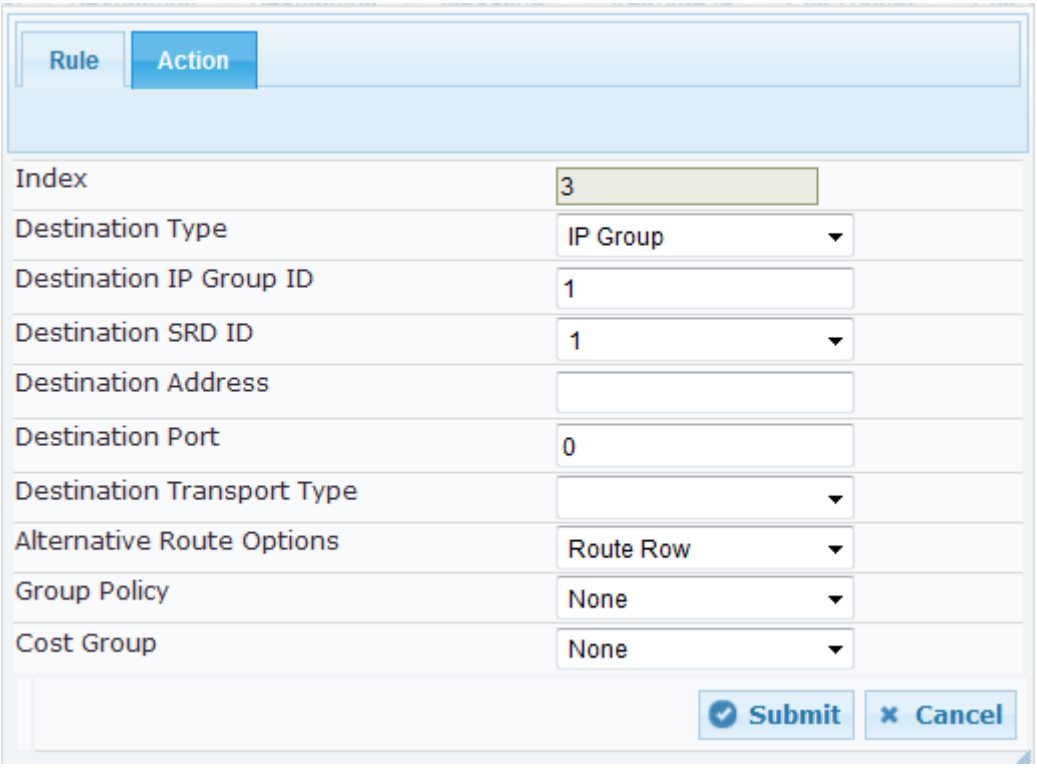
Figure 3-28: Configuring IP-to-IP Routing Rule for UM to IP PBX – Rule tab



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

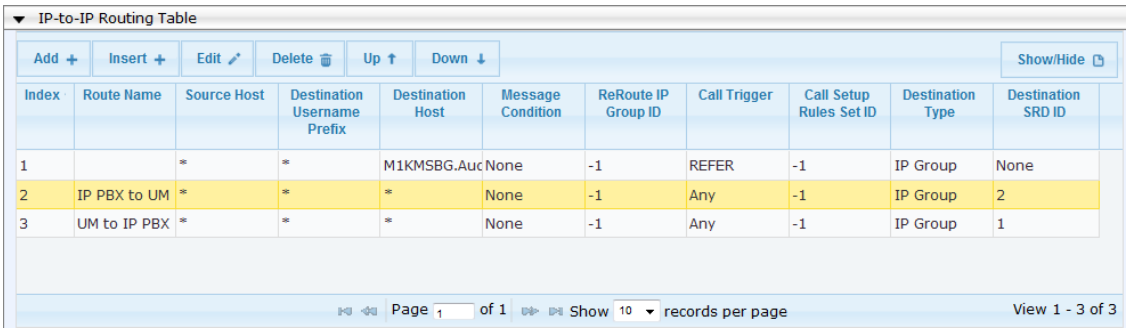
Parameter	Value
Destination Type	**IP Group**
Destination IP Group ID	**1**
Destination SRD ID	**1**

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



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



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

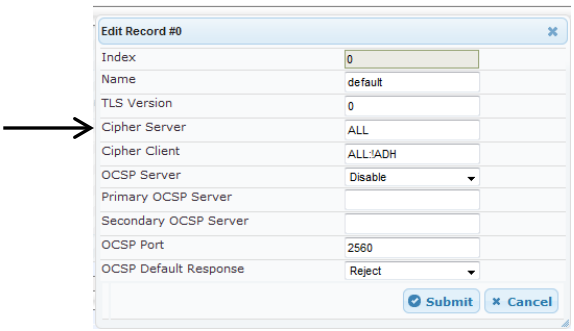
As described under Section 2 on page 11, communication between the SBC and Office 365 Exchange Online UM requires the use of a digital certificate signed by a Certificate Authority (CA). The SBC is supplied with a self-signed certificate, which cannot be used because it is not signed by a supported CA.

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

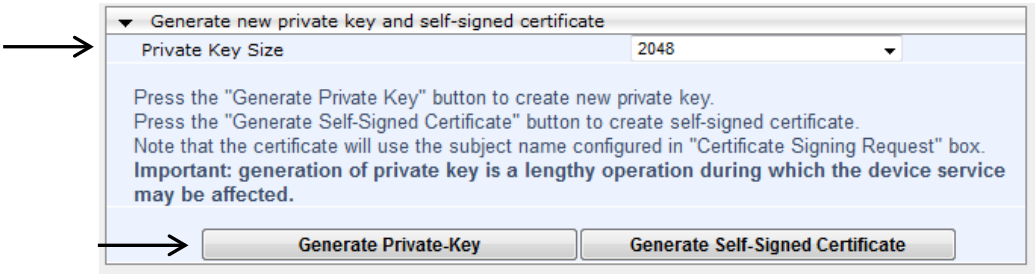
➢ **To configure cryptographic settings:**

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:



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



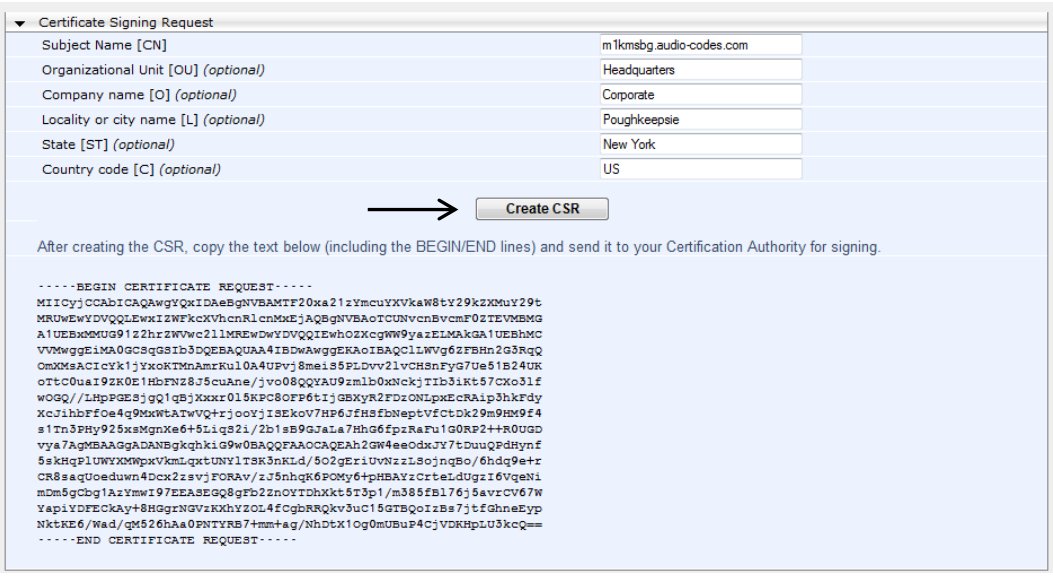
7. Reset the device with a flash-to-burn to save your settings.

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



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

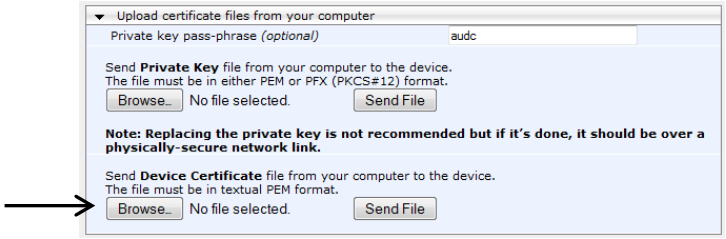
You will receive the certificate from the Certification Authority (CA) as a text file (or in a form that can be saved as a text file). The AudioCodes devices use Privacy Enhanced Mail (PEM) format for individual keys and certificates. This is also known as Base64 encoded DER certificate and is a text 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

3. 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.

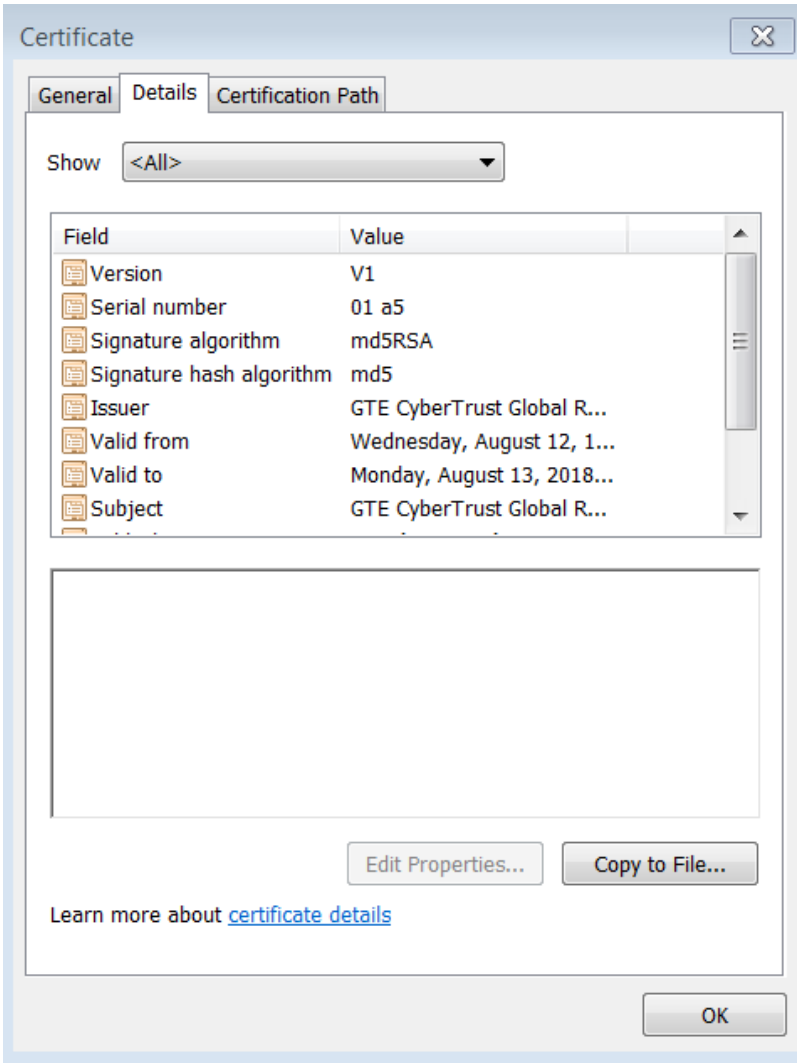
3.10.3.1 Convert Certificates to DER (PEM)

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):**

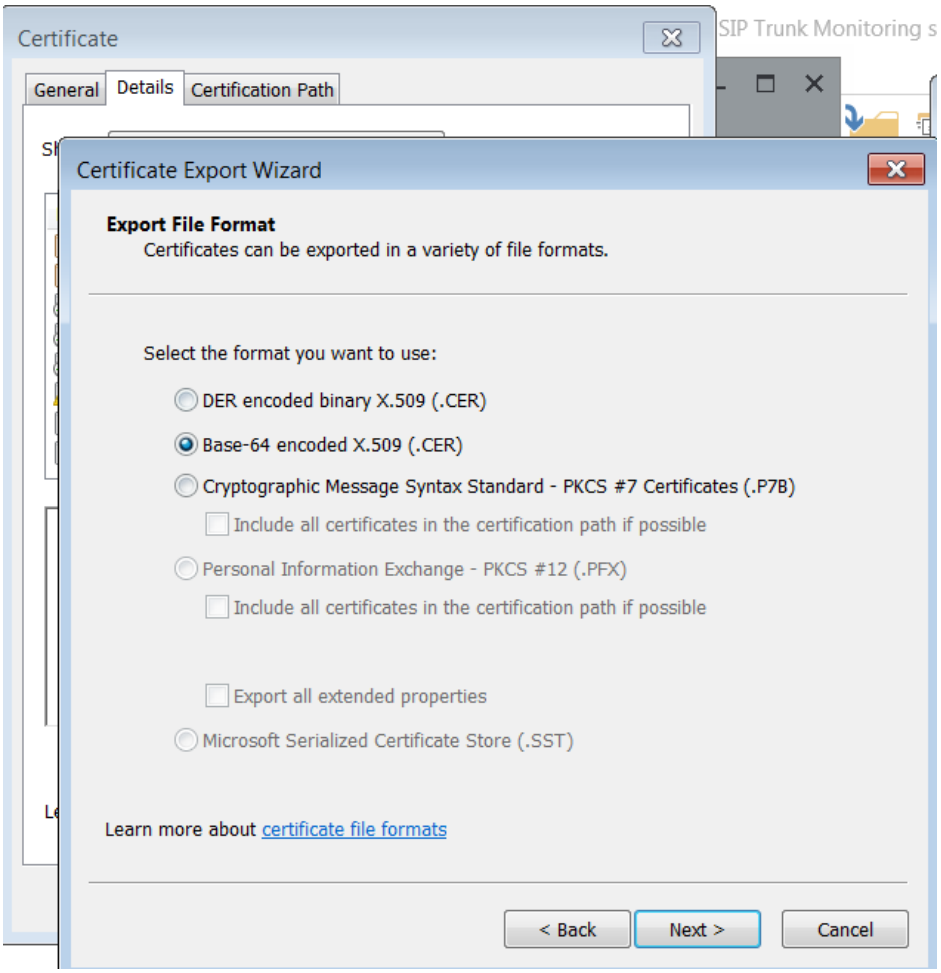
1. Make a copy of the original certificate file that you received from the CA in a working directory.
2. Double-click the copied certificate or open the file with the Windows **Certificate** application.
3. Select the **Details** tab and click the **Copy to File** button.

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.

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 (www.digicert.com/digicert-root-certificates.htm)
- Baltimore CyberTrust root CA (www.digicert.com/digicert-root-certificates.htm)

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

3. 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

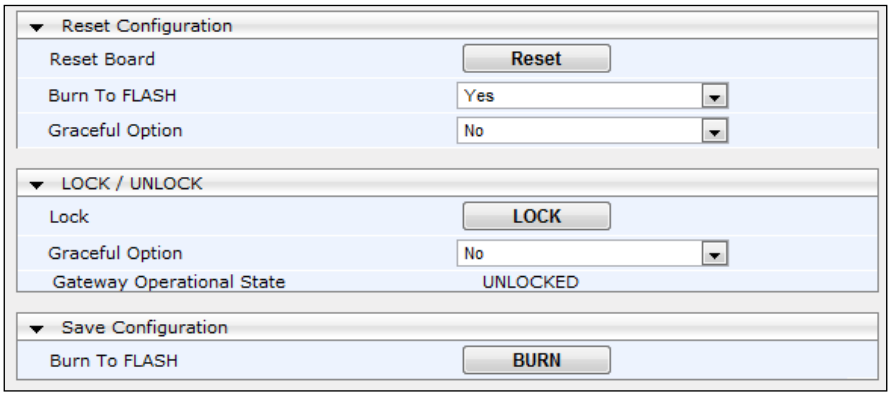
3.11 Reset the SBC

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



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

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AudioCodes

Configuration Note

www.audiocodes.com