

MiVoice MX-ONE

Integration of MiVoice MX-ONE and Skype for Business
Server 2019, Quick Setup Guide

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Introduction

The MiVoice MX-ONE communication system is based on an open software and hardware environment that uses standard servers with a Linux SUSE operating system. This open standards approach enables Mitel to offer our customers the choice of integrating MiVoice MX-ONE latest Microsoft UC products. We have worked with Microsoft to ensure that this possibility is workable.

MiVoice MX-ONE 5.0 is the first communications system (IP-PBX) to be fully Unified Communications Open Interoperability Program (UCOIP) qualified with Skype for Business Server 2019. The integration of MX-ONE with Microsoft products is a complete Direct SIP Integration, including security and media bypass, enabling customers to have both MX-ONE 5.0/6.x and Microsoft Lync 2019 co-exist in the same infrastructure and thereby derive the benefits from the best of both worlds. MX-ONE integrates with Microsoft UC solutions directly via a SIP connection to reduce the overall cost and complexity of the combined solution.

Refer to Microsoft's TechNet site for "Infrastructure Qualified for Microsoft Lync" for more information about the Microsoft Unified Communications Open Interoperability Program. <http://technet.microsoft.com/en-us/lync/gg131938>

General

Integration of MiVoice MX-ONE with Skype for Business Server 2019 is supported as a complementary solution providing end-user services, such as instant messaging and conferencing.

Microsoft Partner Program has certified the integration between MX-ONE communications system running the MX-ONE Service Node software 5.0 SP4 and Skype for Business Server 2019 through a Direct SIP connection. Also, later versions of MX-ONE can be integrated with Skype for Business Server 2019.

Scope

This guide describes the basic integration between MiVoice MX-ONE and Skype for Business Server 2019. The following sections describe the solution integration that has been certified through the Microsoft Partner Program and covers only the Direct SIP Integration. For more information about how this integration is set up and functions, refer to the relevant CPI documentation for MX-ONE, or go to the Microsoft UC product websites.

We recommend that you check the latest products documentation.

Integration Description

The integration of MiVoice MX-ONE and Skype for Business Server 2019 described in this guide is achieved via a Direct SIP that is specified by Microsoft. It means that a SIP trunk is used to connect MX-ONE and Skype for Business Server 2019 (Mediation Server). The SIP trunk connection between the systems can be deployed with or without encryption. MX-ONE supports TLS for signaling and SRTP for media encryption when connected with Mediation Server.



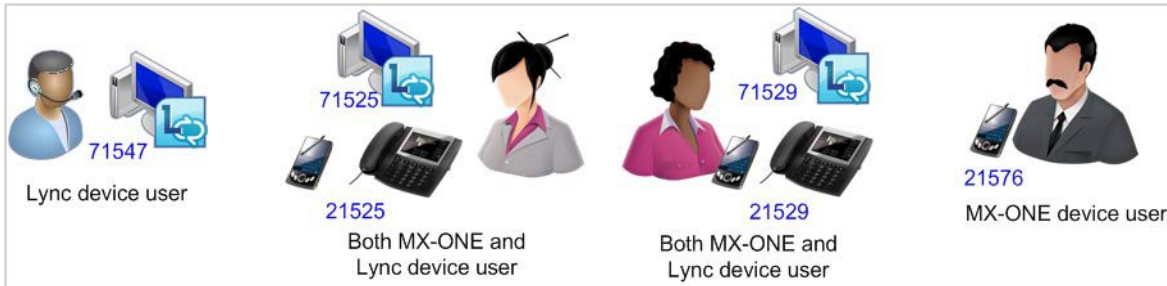
This guide covers only the components that are required in the integration between MX-ONE 5.0 SP4 or a later version, and Skype for Business Server 2019 via Direct SIP to offer the functionality required by the Microsoft UC Open Interoperability Program for enterprise telephony services and infrastructure.

At least the following Skype for Business Server 2019 components are required to support this integration:

- Server Infrastructure
 - Microsoft infrastructure (Domain Controller, Active Directory, DNS and so on)
 - Skype for Business Server 2019 Standard or Enterprise Edition
 - Microsoft Mediation Server
- Client
 - Microsoft Lync 2019

Direct SIP

In Direct SIP Integration, referred to as Enterprise Voice by Microsoft Lync 2019, users will have dedicated phone numbers that differ from those used in the MX-ONE.



This enables the Microsoft Lync 2019 client to make and receive external calls through a PC. The calls are routed from the Skype for Business Server 2019 by the SIP trunk to the MX-ONE and further to the PSTN and vice-versa. MX-ONE and Skype for Business Server 2019 will behave as networked PBXs, as typically is the case with all external trunks in the MX-ONE.

Direct SIP Signaling Overview

MiVoice MX-ONE supports SIP/TCP or SIP/TLS as the SIP transport mechanism when connected with Mediation Server.

The MX-ONE ports used for such connections are:

- SIP/TCP: 5060
- SIP/TLS: 5061

In addition to this, MX-ONE also supports media encryption (SRTP) when connected with Microsoft Lync 2019 Server when TLS is used. The media encryption is done between MX-ONE media gateway unit (MGU) and Microsoft Mediation Server or between MX-ONE media gateway unit (MGU) and Microsoft Lync client when Media Bypass is configured in Microsoft Lync 2019 Server.

Direct SIP Supported Features

During the certification process, the following Microsoft Lync features were validated with MX-ONE Service Node software 5.0 SP4.

- Basic Call services between MX-ONE and Lync end-points over SIP trunks:
 - Anonymous user calls
 - Caller ID on both ends
 - Decline call
 - Call forwarding and simultaneously ring feature
 - Inbound and outbound calls
- Media bypass (also known as direct media between MX-ONE and Microsoft Lync clients). Encryption (TLS and SRTP) is required for this functionality.
 - Inbound call from MX-ONE user device to Microsoft Lync client
 - Outbound call from Microsoft Lync client to MX-ONE user device
 - Outbound call: Call Forward All (CFA) to another Microsoft Lync client

- Outbound call from Microsoft Lync to another Lync user; with bypass enabled and CFA enabled
- Outbound call: PBX CFB (Call Forward on Busy) to another Microsoft Lync user
 - Outbound call from Microsoft Lync to another Lync user; with bypass enabled and CFB enabled
- Conference
- Failover (to secondary Mediation Server - Lync gateway)
- Security (support for TLS/SRTP encryption)

Prerequisites

For proper integration between MiVoice MX-ONE and Skype for Business Server using Direct SIP, there are some prerequisites on both sides that must be fulfilled.

MiVOICE MX-ONE Requirements

On the MiVoice MX-ONE side, at least one MX-ONE Service Node and one Media Gateway are required to interwork with Skype for Business Server 2019.

Main Components

At least, the following MX-ONE components are required:

- MX-ONE communications system
 - MX-ONE Service Node
 - 5.0 SP4 or a later version
- Supported media gateways with the latest firmware compatible with 5.0 SP4, or a later version, which can be:
 - MX-ONE Classic - 7U 19-inch chassis, MGU board, or
 - MX-ONE Lite - 3U 19-inch chassis, using MGU board
 - MX-ONE Slim – 1U 19-inch chassis, using MGU board
- Terminals
 - All current MX-ONE terminal types are supported with this integration: SIP, H.323, analog, digital, DECT, and mobile extension

Licenses

The MX-ONE licenses needed for this integration are:

- SIP trunk licenses—note that the quantity of licenses depend on how the system is deployed).
- Encryption licenses are required if encryption (TLS/SRTP) is used.

Always check with your Mitel partner that your system has the required licenses, before beginning the integration deployment.

Skype for Business Server 2019

A Microsoft environment needs to be in place in the customer site. Note that Microsoft Lync is not part of the MX-ONE offering. It is important that expertise of Microsoft-competent engineers are available for installation and integration according to the MX-ONE configuration guidelines for the interface between the systems.

Main Components

The main Microsoft components that are required to interconnect with MiVoice MX-ONE are Skype for Business Server 2019, Mediation Server, and Lync clients. The Lync requirements are described in the Microsoft Lync Serve documentation. See the chapter References at the end of this guide.

NOTE: In Mitel's lab validation, a single Skype for Business Server Standard Edition with a co-located Mediation Server was used. For testing load balancing and failover, two stand-alone Mediation Servers were added to the topology.

Licenses

Microsoft licenses needed for this integration are described as they are beyond the scope of this guide. Contact Microsoft or a qualified Microsoft partner to obtain the proper license requirements for each component of the Skype for Business Server solution.

Installation and Configuration

Installation

MiVoice MX-ONE Installation

Ensure that MX-ONE Service Node software 5.0 SP4 or a later version is installed in the customer environment. The system installation is not covered in this guide and must be performed by a qualified Mitel certified partner before the start of the integration work begins.

For Mitel MX-ONE installation, check the appropriate CPI documentation.

Microsoft Infrastructure

Ensure that Microsoft infrastructure and Skype for Business Server are installed in the customer environment by a qualified engineer.

For Microsoft infrastructure and Skype for Business Server requirements, check the appropriate Microsoft documentation.

Configuration

The following information was used in Mitel's laboratory setup during the validation of the solution. The setup may change depending of the customer specific needs.

NOTE: Fully Qualified Domain Name (FQDN) needs to be properly specified in the Domain Name System (DNS).

- MX-ONE 5.0 SP4 (or a later version)
 - Domain: lab.moon.galaxy Note that MX-ONE is part of a sub-domain
 - IP address: 192.168.222.10
 - FQDN: mx-one-lync.lab.moon.galaxy
- Microsoft Domain Controller, Active Directory, Certification Authority, and DNS Server
 - Domain: moon.galaxy
 - IP address: 192.168.222.2
 - FQDN: lync-infra.moon.galaxy
- Skype for Business Server Standard Edition and Mediation pool
 - Domain: moon.galaxy
 - IP address: 192.168.222.3
 - FQDN: lync-2019-se.moon.galaxy

NOTE: Mitel recommends that complex scenarios be validated in the partner labs before customer deployment.

Direct SIP Setup

A SIP trunk must be configured in MX-ONE and the access code for this route (a trunk towards Skype for business).

MX-ONE uses ports TCP 5060 and TLS 5061 to be interconnected with Skype for Business Server 2019.

NOTE: MX-ONE 5.0 SP4 (or a later version) works with predefined SIP profiles for certain SIP service providers. If used, the profile file will help you in configuring the right data for the type selected. Each profile file may contain a number of profiles. The profile will preconfigure settings such as "-register", "-trusted", and so on according to the requirements of telephony provider.

MX-ONE 5.0 SP4 (or a later version) has predefined SIP trunk profiles to be used with Microsoft Lync 2019. One of the following trunk profiles needs to be selected during the MX-ONE SIP trunk configuration.

- **Lync_TCP**

TCP is used as transport protocol; the listening port is 5068.

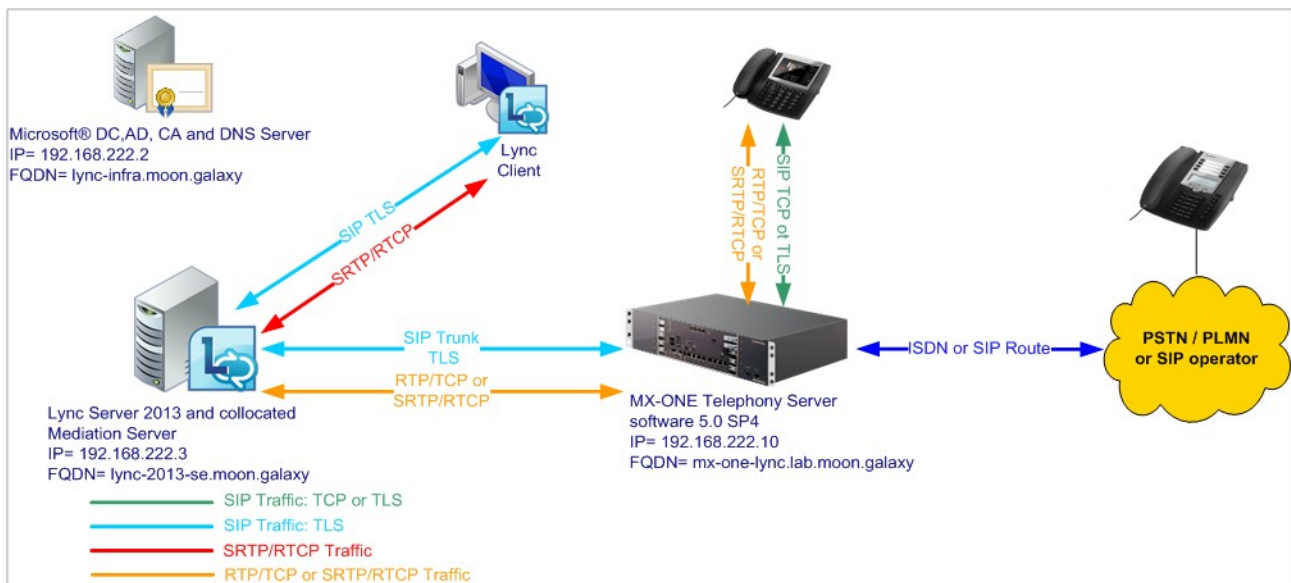
- **Lync_TLS_SRTP.** TCP is used as transport protocol; the listening port is 5067. SRTP is used to encrypt the media; it uses RTP/SAVP.

The following setup uses Lync_TCP where TCP is the transport protocol. In this case, the remote port is expected to be listening on port 5068.

To ensure a good interoperability between MiVoice MX-ONE and Skype for Business Server 2019, the SIP trunk profiles defined to Lync are “Forced Gateway”, at this guarantees the same behavior for all types of calls passing through MX-ONE and towards Skype for Business Server 2019.

MiVoice MX-ONE Direct SIP Setup - TCP

The following figure shows the Direct SIP Configuration used in this guide.



The following setup needs to be done in MX-ONE for configuring Direct SIP. Note that only SIP Route definitions are shown.

1. Use the following command to view more details regarding the SIP Profile Lync_TCP:

```
sip_route -print -profile Lync_TCP
```

2. Define SIP Route category:

```
ROCAI:ROU=99,SEL=7110000000000010,SIG=0111110000A0,TRAF=03151515,TRM=4,  
SERV=3100000001,BCAP=001100;
```

3. Define SIP Route data:

```
RODAI:ROU=99,TYPE=TL66,VARC=00000000,VARI=00000000,VARO=00000000;
```

4. Define SIP trunk data specific:

```
sip_route -set -route 1 -profile Lync_TLS_SRTP -uristring0 "sip:+?@skype.skypebusiness.com" -remote-  
port 5067 -accept REMOTE_IP -match "mxoneskype.skypebusiness.com,10.211.62.165,skype.sky-  
pebusiness.com,10.211.62.175" -codecs PCMA,PCMU -protocol tls -service PRIVATE;
```

5. Verify your configuration:

```
sip_route -print -route 99 -short
```

6. Define the SIP Route equipment initiate; for example:

```
ROEQI:ROU=99,TRU=1-1&&1-30;
```

7. Define external destination SIP Route data:

```
RODDI:ROU=99,DEST=99,ADC=0005000000000250000001010000,SRT=3;
```

Skype for Business Server 2019 Configuration -- TCP

To finalize the configuration between MX-ONE and Skype for Business Server 2019, do the following:

1. Enable TCP port for the Mediation pool (disabled by default).

Edit Properties

General
Next hop
PSTN gateway

General

FQDN: *
meds.moon.galaxy

Associations

☐ Associate Edge pool (for media components)

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

Next hop selection

Next hop pool:
ajantaskype.mxonebglman.com VWSKYPE

Mediation Server PSTN gateway

Listening ports: * TLS: 5067 - 5067 ICP: 5068 - 5068

☒ Enable TCP port

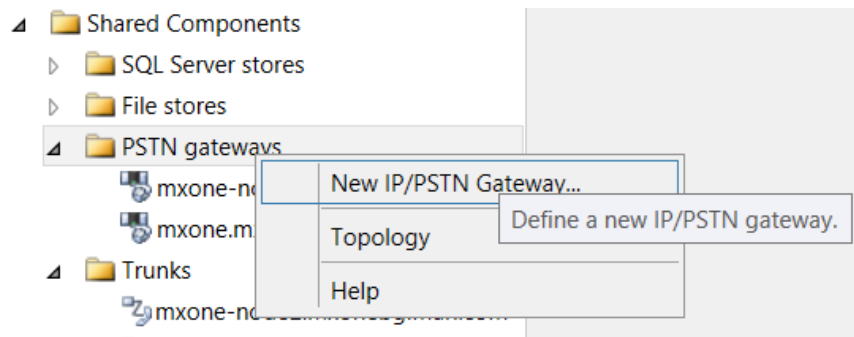
The following trunks are associated with this Mediation Server. Click Make Default to mark a trunk as default. A default trunk is required only when your topology contains Office Communications Server 2007 R2.

Trunk	Gateway	Site

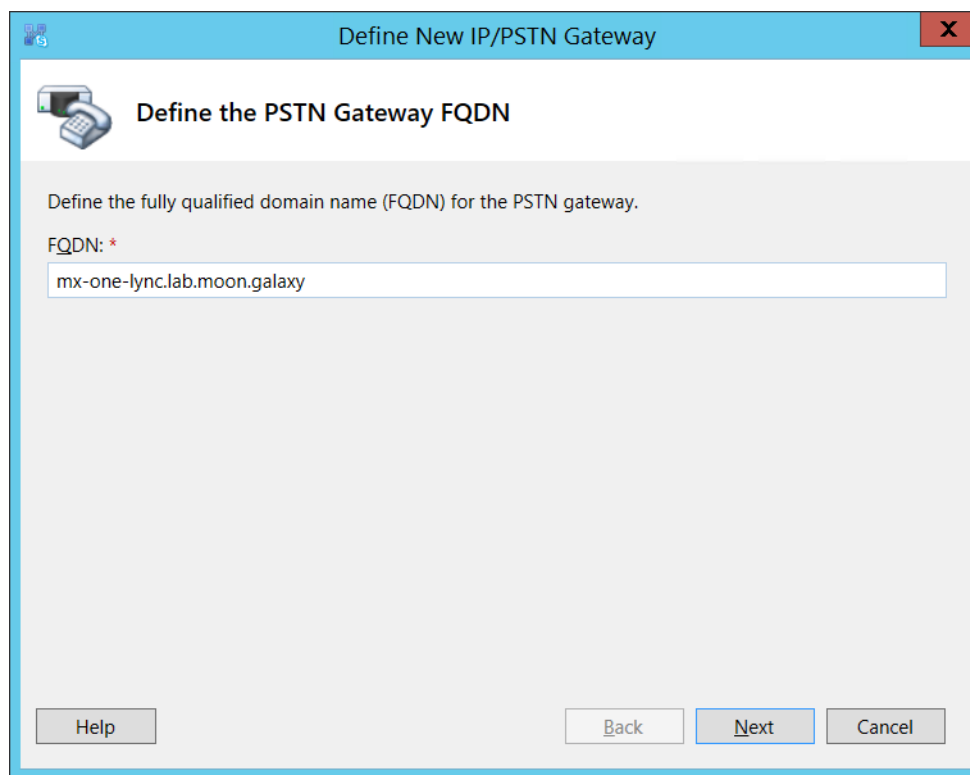
Help OK Cancel

Define PSTN Gateway in the Skype for Business Server 2019 Topology Builder

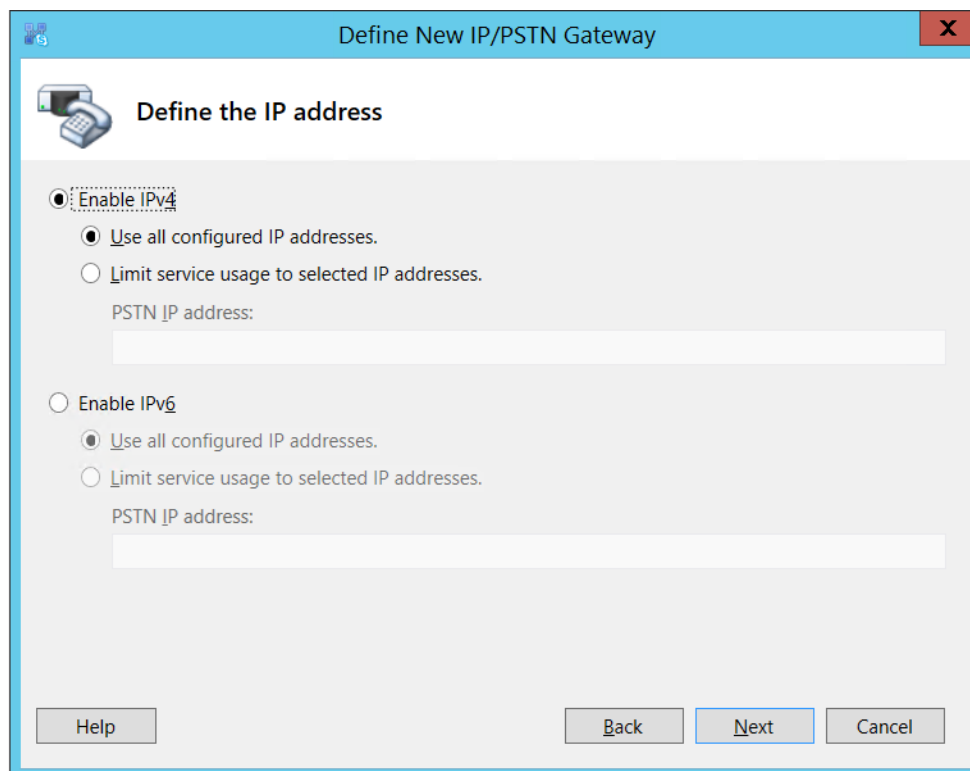
1. Open Skype for Business Server 2019, Topology Builder, and define a PSTN gateway to be used between Lync and MX-ONE.
2. To define the PSTN gateway, expand Shared Components, right-click **PSTN gateways** option.



3. Click **New IP/PSTN Gateway**. The dialog box opens the Gateway FQDN or IP Address. Specify the MX-ONE IP Address or **FQDN** and click **Next**.



4. Define the IP address: in this example, the default is retained. Click **Next**.

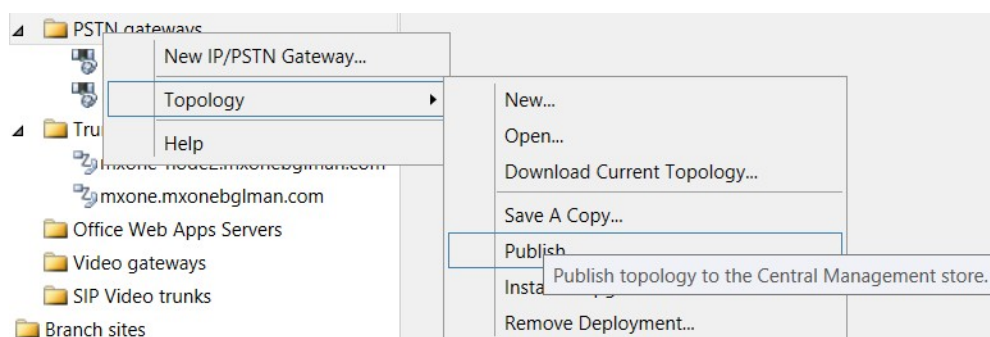


5. **Define the root trunk:**

- **Trunk name:** FQDN (MX-ONE FQDN)
- **Listening port for IP/PSTN gateway:** 5060 (MX-ONE SIP TCP port)
- **SIP Transport Protocol:** TCP
- **Associated Mediation Server:** lync-2019-se.moon.galaxy
- **Associated Mediation Server port:** 5068 (default)

6. Click **Next**.

7. Publish the **Topology**.



Define a Dial Plan

The **Dial Plan** configuration is required to allow Microsoft Lync users to dial to MX-ONE terminals and PSTN.

To define it, execute the following:

1. Open the Skype for Business Server Control Panel.
2. Click **Voice Routing** and choose **Dial Plan**.
3. Define Normalization rules that fits your organization needs. A rule for Lync users to dial to MX- ONE terminals and another to dial to PSTN (ensure that MX-ONE is connected to PSTN) are required. If needed, contact Microsoft for the appropriate setup for your requirement.

Figure 3.1: New Normalization Rule, five digits example

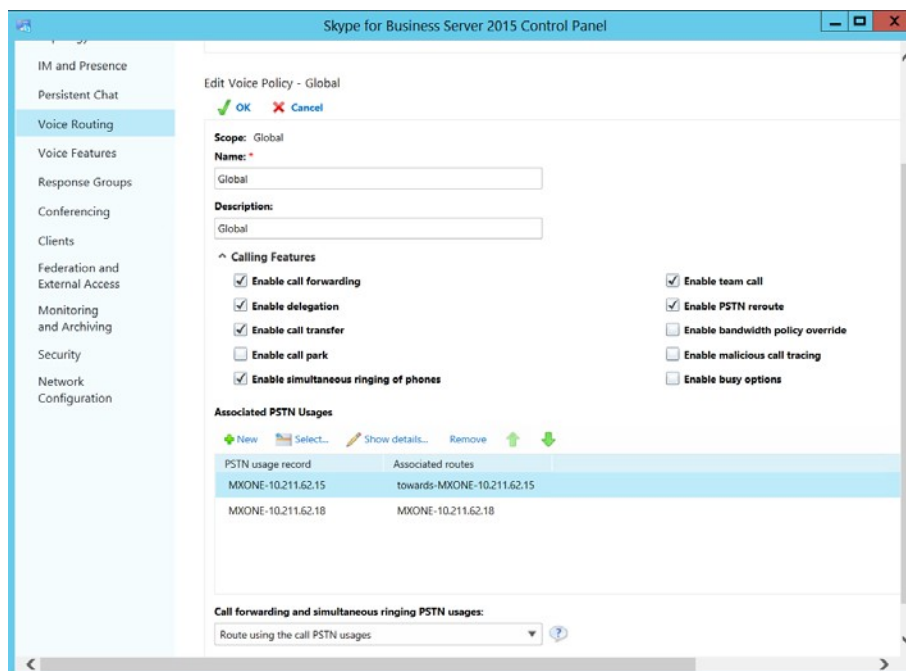
4. Commit the changes.

Define Voice Policy

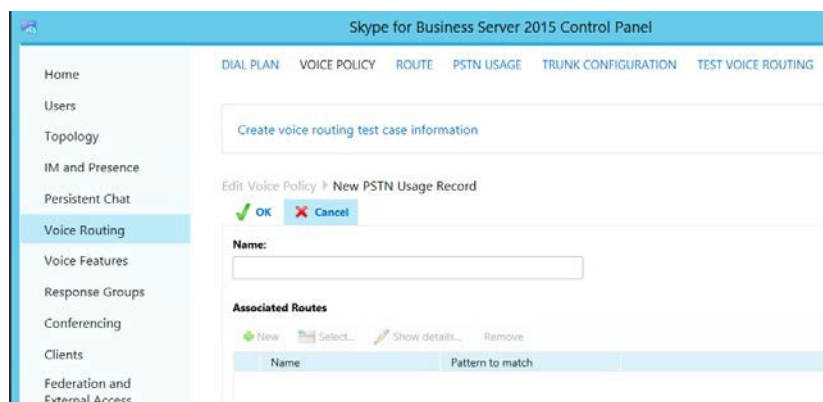
A voice policy is required to enable Microsoft Lync users to dial out via the Direct SIP connection using MX-ONE. Lync client users need to be assigned for this policy.

To Create the Voice Policy, do the following:

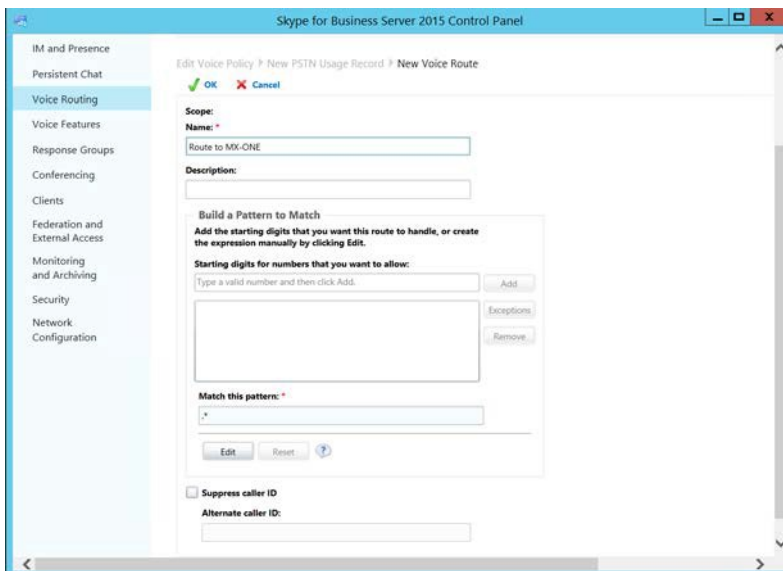
1. Click **Voice Routing** and choose **Voice Policy**.
2. Click **New** and choose the type of policy that is applicable for your company setup, site policy or user policy.
3. Enter a **Name** and a **Description** for the voice policy.



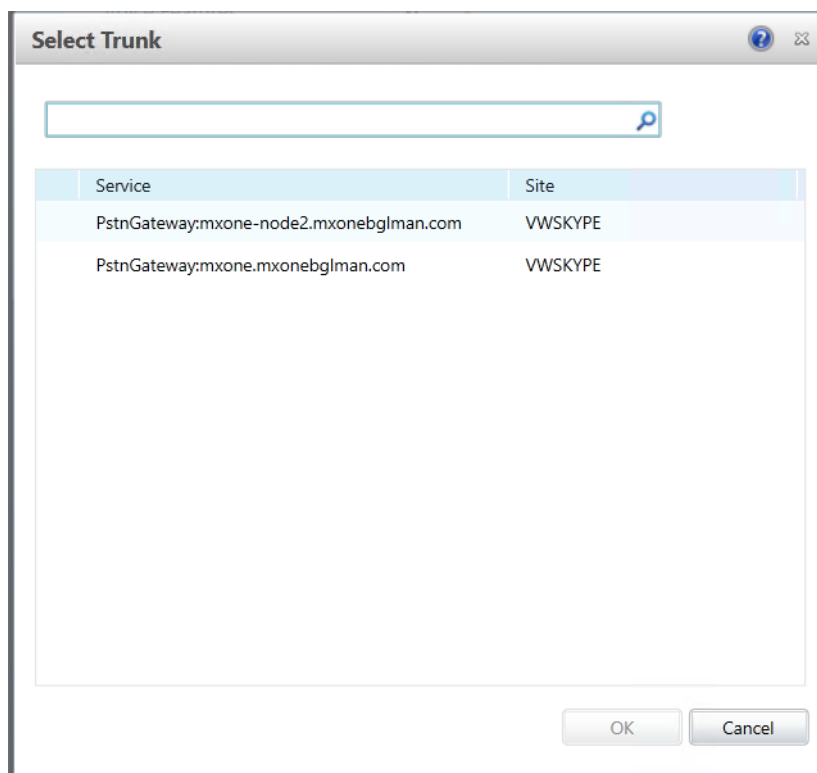
4. Associate a new PSTN for the policy and click **New**.
5. Enter a **Name** and a **Description** for the **New PSTN Usage Record**



6. Click **New** to associate a route with this PSTN usage record.
7. Enter a **Name** and a **Description** for the new Route.
8. Associate the MX-ONE gateway that you created earlier with the new **Route**. To do this, click **Add** in **Associated Gateways**.



9. In **Select Gateway**, select the MX-ONE gateway created previously.
10. Click **OK** for all the queries to retain the configurations made.
11. Commit all changes.



Define Trunk Configuration

To assign the MX-ONE gateway to a site or pool trunk, follow these steps:

1. Click **Voice Routing** and then click **Trunk Configuration**.
2. Click **New** and choose the type of trunk that is applicable for your company setup, site trunk, or pool trunk.

Skype for Business Server 2015 Control Panel

Administrator | Sign out
6.0.9319.259 | Privacy statement

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

DIAL PLAN VOICE POLICY ROUTE PSTN USAGE **TRUNK CONFIGURATION** TEST VOICE ROUTING

Create voice routing test case information

Edit Trunk Configuration - Global

OK Cancel

Scope: Global

Name: *
Global

Description:
Global

Maximum early dialogs supported:
20

Encryption support level:
Required

Refer support:
Enable sending refer to the gateway

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

^ Associated PSTN Usages

PSTN usage record	Associated routes
MXONE-10.211.62.18	MXONE-10.211.62.18
MXONE-10.211.62.22	MXONE-10.211.62.22
MXONE-10.211.62.15	towards-MXONE-10.211.62.15

3. Select the **Encryption support level**. In this case, it is **Not supported**.

Encryption support level:

Not supported
Required
Optional
Not supported

4. Commit all changes to complete the setup.

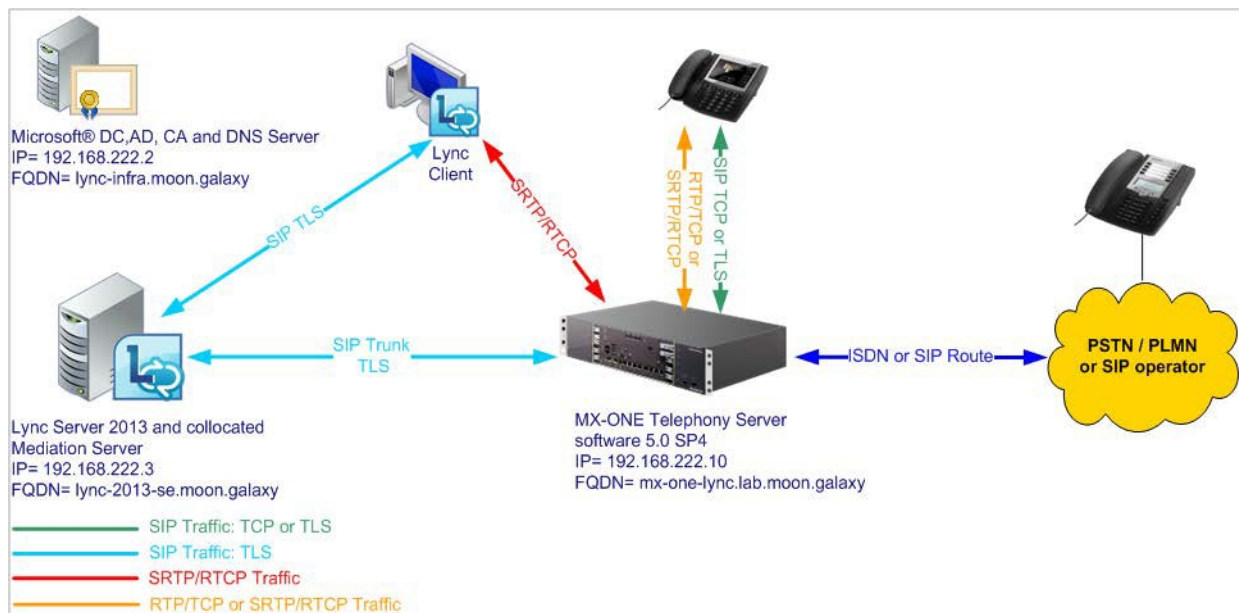
Conclusion

Now the setup is complete, assign users to the Policy created previously and test the integration by making calls between the systems.

See the topic Enable users for Enterprise Voice in Skype for business Server at the following link:
<http://technet.microsoft.com/en-us/library/gg413011.aspx>

Direct SIP with Security and Media Bypass Setup

The following figure shows the Direct SIP with security and Media Bypass configuration used in this guide.



MiVoice MX-ONE Direct SIP with Security and Media Bypass Setup

The following setup needs to be done in MX-ONE in order to configure Direct SIP with security (encryption). Note that only Route definitions are shown.

NOTE: MX-ONE FQDN needs to be properly defined in the DNS Server.

When using security, the appropriate certificate must be installed in MX-ONE in addition to the encryption licenses. Check Certificate Management on MX-ONE CPI documentation for more details regarding certificates.

NOTE: TLS/SRTP security is required for Media bypass functionality. It means that the proper encryptions licenses must be loaded in the MX-ONE system.

1. Use the following command to view more details regarding the SIP Profile Lync_TLS_SRTP:

```
sip_route -print -profile Lync_TLS_SRTP
```

2. Define SIP Route category:

```
ROCAI:ROU=98,SEL=7110000000000010,SIG=0111110000A0,TRAF=03151515,TRM=4,  
SERV=3100000001,BCAP=001100;
```

3. Define SIP Route data:

```
RODA I:ROU=98,TYPE=TL66,VARC=00000000,VARI=00000000,VARO=00000000;
```

4. Define SIP trunk data specific:

```
sip_route -set -route 1 -profile Lync_TLS_S RTP -uristring0 "sip:+?@skype.skypebusiness.com" -remote-  
port 5067 -accept REMOTE_IP -match "mxoneskype.skypebusiness.com,10.211.62.165,skype.sky-  
pebusiness.com,10.211.62.175" -codecs PCMA,PCMU -protocol tls -service PRIVATE;
```

5. Verify your configuration:

```
sip_route -print -route 98 -short
```

6. Define the SIP Route equipment initiate: ROEQI:ROU=98,TRU=1-1;

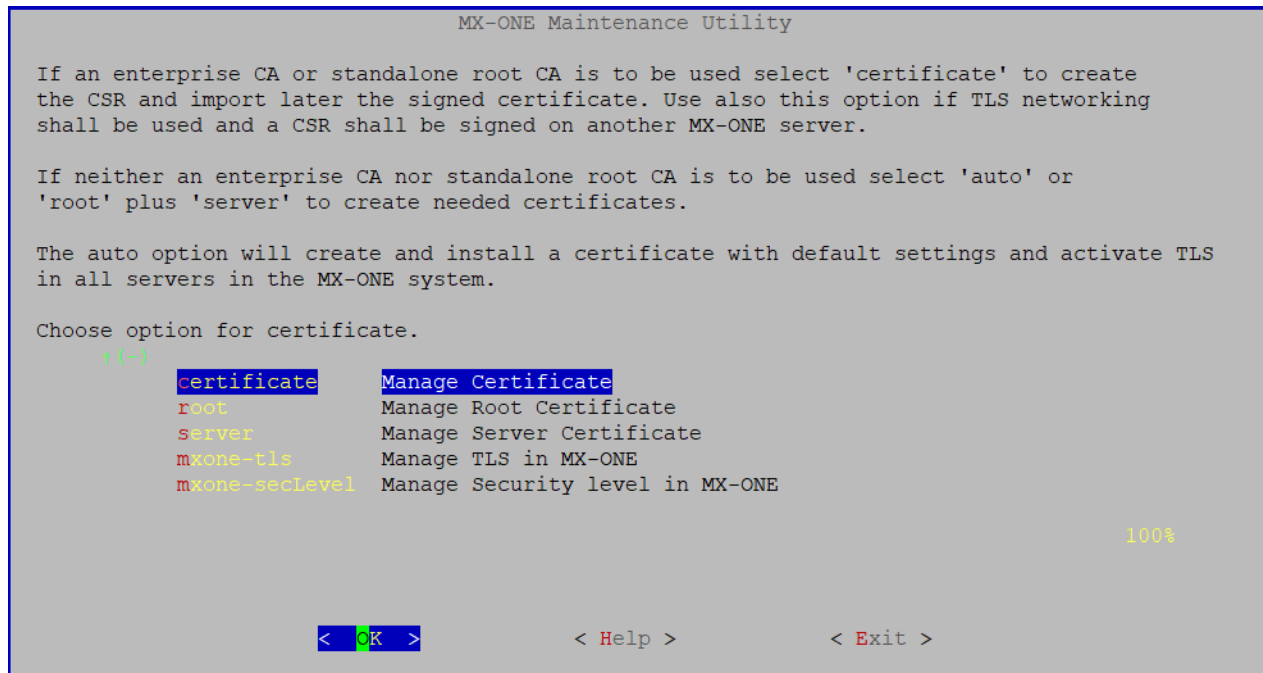
7. Define external destination SIP Route data:

```
RODDI:ROU=98,DEST=98,ADC=0005000000000250000001010000,SRT=3;
```

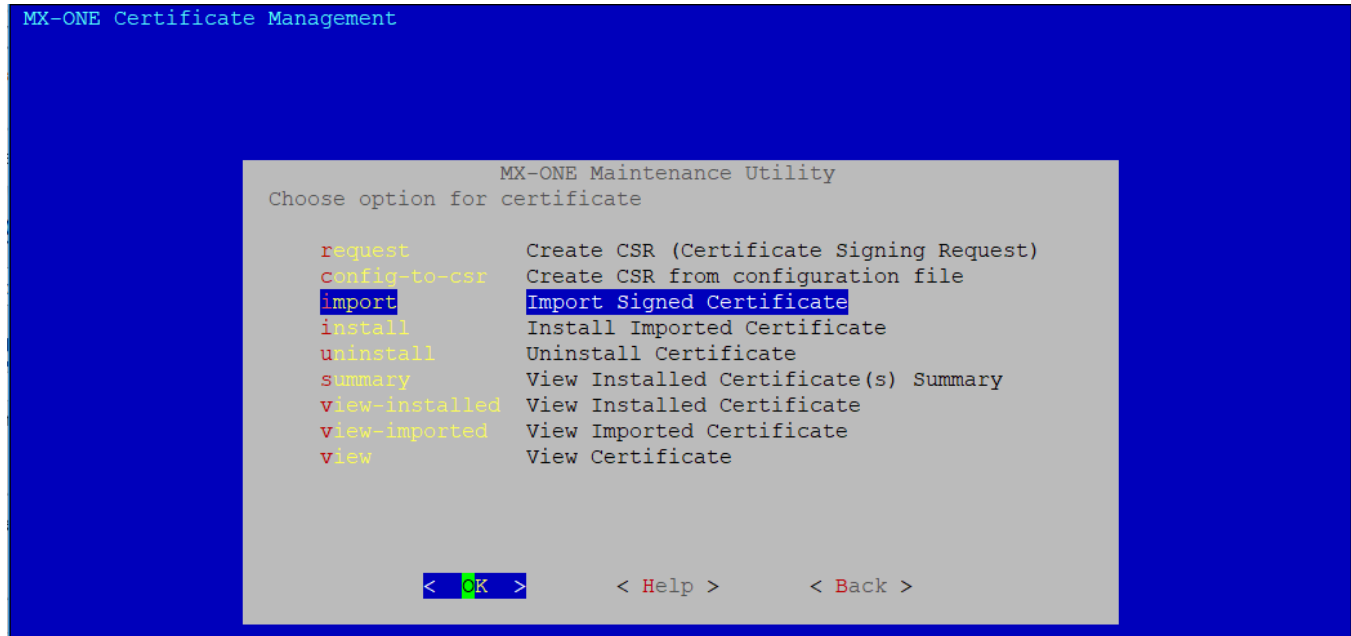
Import the Certificate to MX-ONE Service Node

Import the server certificate mx-one-certificate.pfx to MX-ONE Service Node.

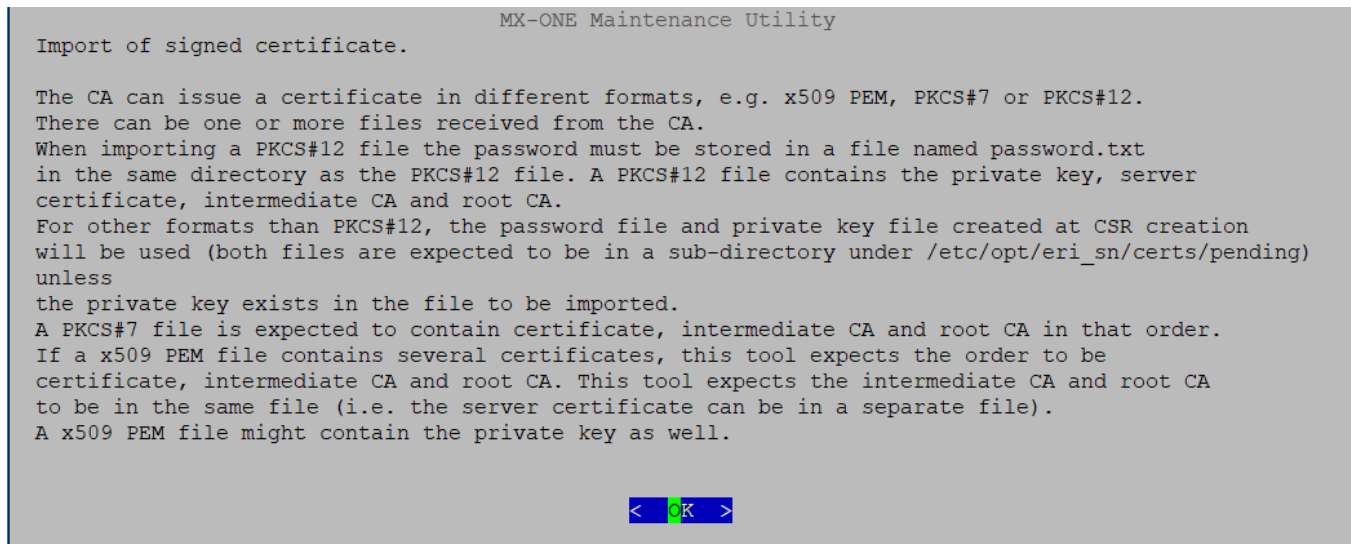
1. Install the certificate in the MX-ONE Service Node 1.
2. Run the mxone_certificate as root and press **Enter** button. The following screen appears.



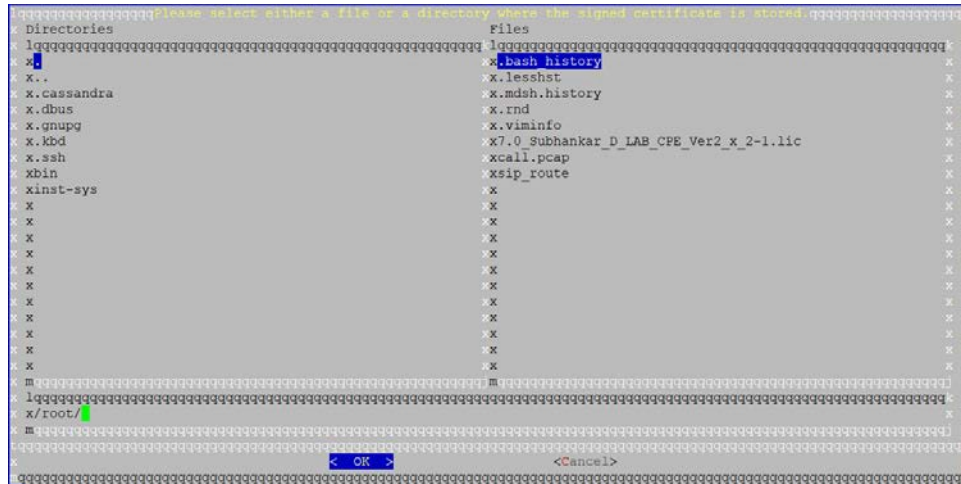
3. Select **certificate** and click **OK**. The following screen appears.



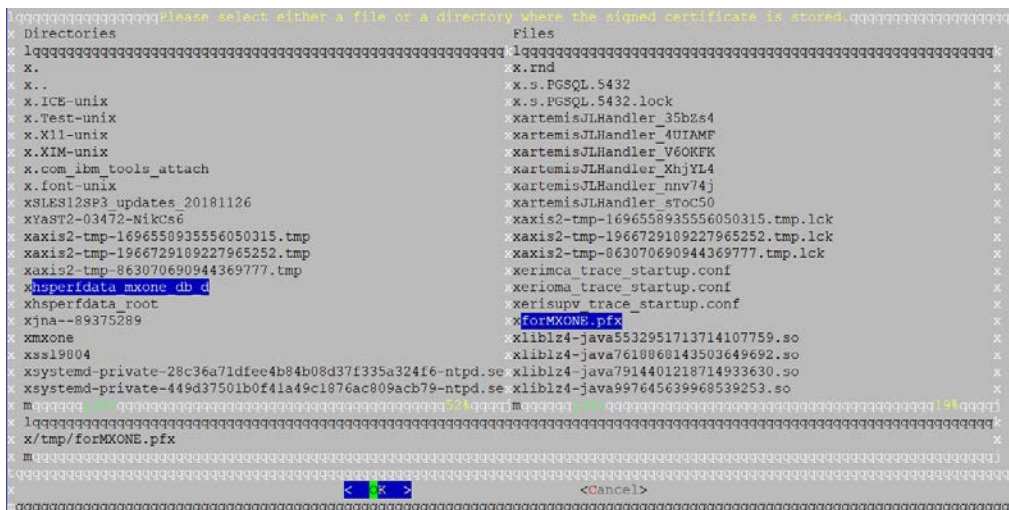
4. Select **import** and click **OK**. The following screen appears.



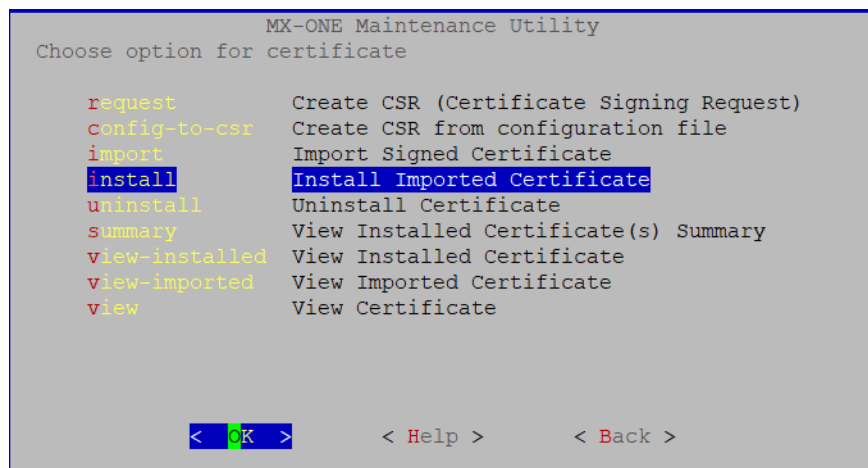
5. Click **OK**. The following screen appears to select a file or directory where the signed certificate is stored.



6. Specify the path where the **forMXONE.pfx** certificate is stored as shown in the following screen.



7. Click **OK** to store the imported certificate. Next, you install the certificate that you have imported and click **OK**.




```

MX-ONE Maintenance Utility
No imported certificate found.

To install root/server certificate (not the imported) do the following:

To install the root certificate, select root and then install and select not to
use imported root certificate.

To install the server certificate, select server and then install and select not
to use imported server certificate.

< OK >

```

8. Enable the TLS in MX-ONE > Manage TLS in MX-ONE -> Configure MX-ONE to use TLS. Refer to the 132/154 31-ANF 901 14 document for more detail.

9. Enable Media Encryption in the route:

```

media_encryption_enable -type route
media_encryption_enable -type extension
media_encryption_enable -type intermgw
media_encryption_print

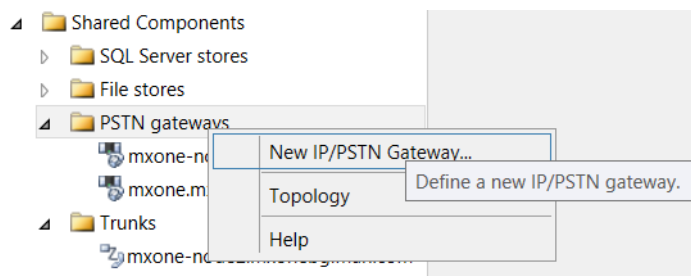
```

Lync Configuration with Security and Media Bypass Setup

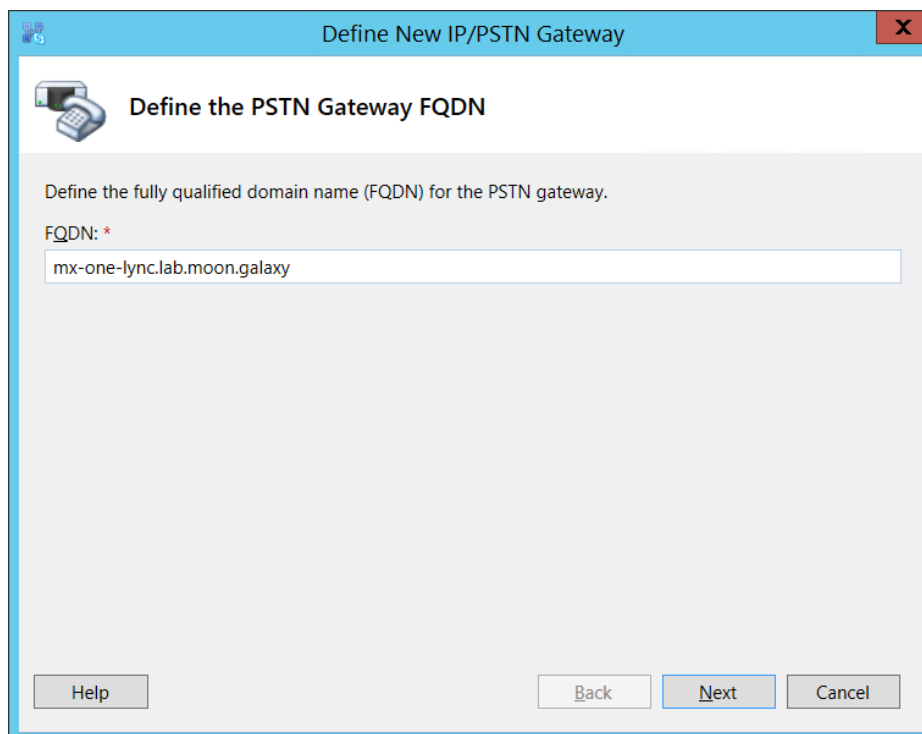
You must do the following to finalize the configuration between Mitel MX-ONE and Skype for Business Server 2019 the following needs to be done:

Define PSTN Gateway in the Skype for Business Server 2019 Topology Builder

1. Open the Skype for Business Server 2019, Topology Builder, and define a PSTN gateway be used between Lync and MX-ONE.

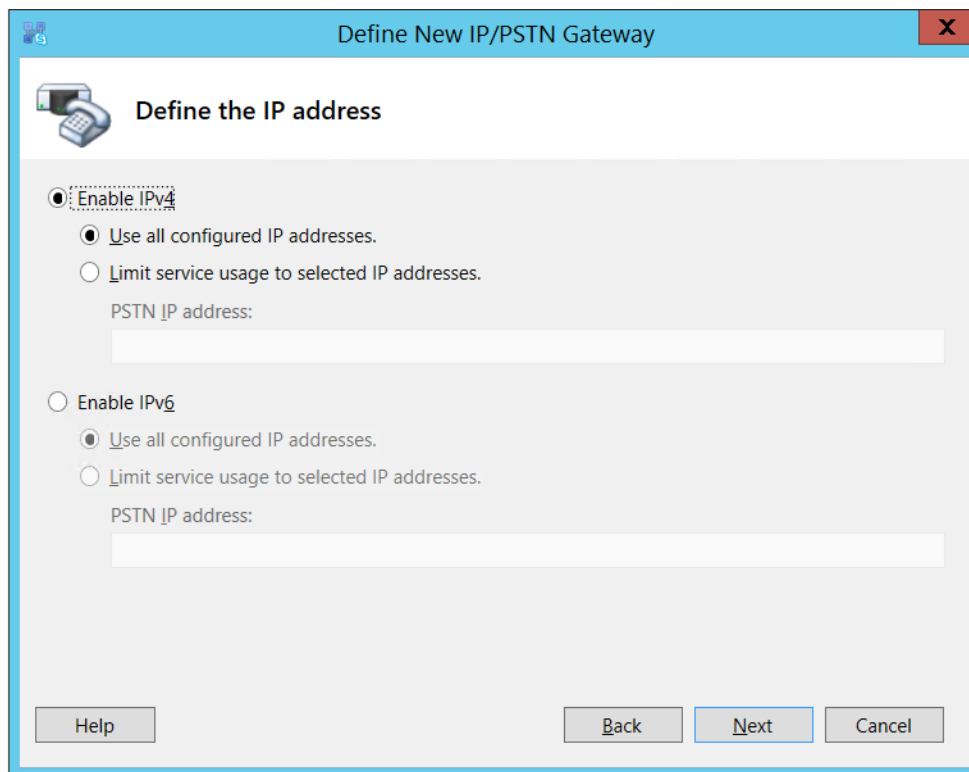


2. To define the **PSTN gateway**, expand **Shared Components** and right-click the **PSTN gateway**.
3. Click **New IP/PSTN Gateway**. The **Define the PSTN Gateway FQDN** dialog box appears.



The screenshot shows a Windows-style dialog box titled "Define New IP/PSTN Gateway". The main heading is "Define the PSTN Gateway FQDN" with a telephone icon. Below the heading, it says "Define the fully qualified domain name (FQDN) for the PSTN gateway." There is a label "FQDN: *" followed by a text input field containing "mx-one-lync.lab.moon.galaxy". At the bottom, there are three buttons: "Help", "Back", and "Next" (which is highlighted in blue), and a "Cancel" button.

4. Enter the FQDN or the IP address: specify the MX-ONE IP Address or FQDN and click **Next**.
5. Define the IP address: in this example, the default is retained. Click **Next**.



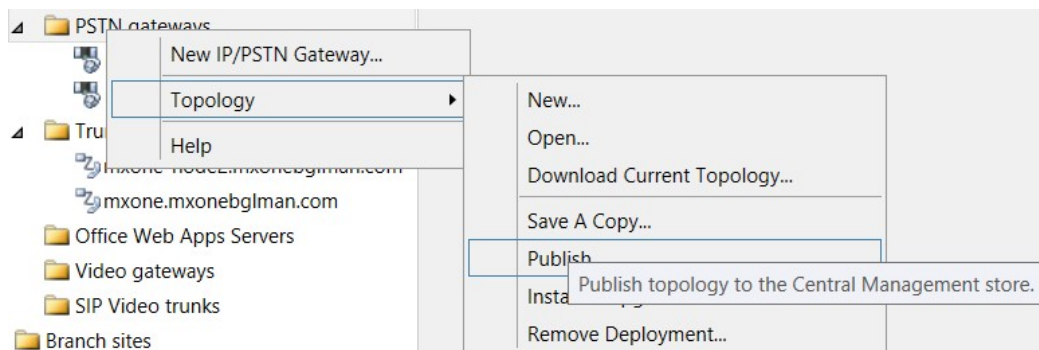
The screenshot shows the same dialog box, but now at the "Define the IP address" step. It has a heading "Define the IP address" with a telephone icon. There are two main radio button options: "Enable IPv4" (which is selected) and "Enable IPv6". Under "Enable IPv4", there are two sub-options: "Use all configured IP addresses." (selected) and "Limit service usage to selected IP addresses." (unselected). Below these is a text input field labeled "PSTN IP address:". The "Enable IPv6" section has identical sub-options and a text input field. At the bottom, there are three buttons: "Help", "Back", and "Next" (highlighted in blue), and a "Cancel" button.

6. Define the root trunk:

- **Trunk name:** FQDN (MX-ONE FQDN)
- **Listening port for IP/PSTN gateway:** 5061 (MX-ONE SIP TCP port)
- **SIP Transport Protocol:** TCP
- **Associated Mediation Server:** lync-2019-se.moon.galaxy
- **Associated Mediation Server port:** 5067 (default)

7. Click **Next**.

8. Publish the **Topology**



Define Dial Plan and Voice Policy

Define the [Define a Dial Plan](#) and the [Define Voice Policy](#) as explained previously in this guide.

Define Trunk Configuration

To assign the MX-ONE gateway to a site or a pool trunk, and follow these steps:

1. Click **Voice Routing**, and then click **Trunk Configuration**.
2. Click **New** and choose the type of trunk that is applicable for your company setup, site trunk, or pool trunk.
3. Select **Enable media bypass**.

The screenshot shows the 'Skype for Business Server 2015 Control Panel' window. On the left is a navigation pane with the following items: Users, Topology, IM and Presence, Persistent Chat, Voice Routing (highlighted), Voice Features, Response Groups, Conferencing, Clients, Federation and External Access, Monitoring and Archiving, Security, Network, and Configuration. The main content area is titled 'Edit Dial Plan > Edit Normalization Rule - MXONE-10.211.62.15'. At the top of this area is a link 'Create voice routing test case information'. Below the title are 'OK' and 'Cancel' buttons. The configuration fields are as follows:

- Name:** MXONE-10.211.62.15
- Description:** MXONE-10.211.62.15
- Build a Normalization Rule** (Section Header)
- Fill in the fields that you want to use, or create the rule manually by clicking Edit.** (Instruction)
- Starting digits:** 4
- Length:** Exactly (dropdown), 4 (spin box)
- Digits to remove:** 0 (spin box)
- Digits to add:** (empty text box)
- Pattern to match:** `^(4\d{3})$`
- Translation rule:** `$1`

At the bottom of the configuration area are 'Edit', 'Reset', and a help icon (?) buttons.

4. Keep the default Encryption support level, which in this case is **Required**.

Now that the setup is concluded, assign users with the policy created previously and test the integration making calls between the systems.

Load Balancing and Failover Setup

Load Balancing

Mitel MX-ONE 5.0 and later versions support load balancing setup when connected with more than one Mediation Server. In such scenario, the Microsoft DNS Load Balancing functionality can be used.

MX-ONE 5.0 and later versions support DNS SRV and multiple A-record query where a list with multiple entries can be used. When properly configured, MX-ONE will attempt to send an INVITE to the entries in the list until the call is successful. No answer or 503 Service Unavailable from one entry will trigger MX-ONE to try the next entry.

For more details, see MX-ONE `SIP Route` command description in CPI or `sip_route -help`, parameter `remote port`.

Failover

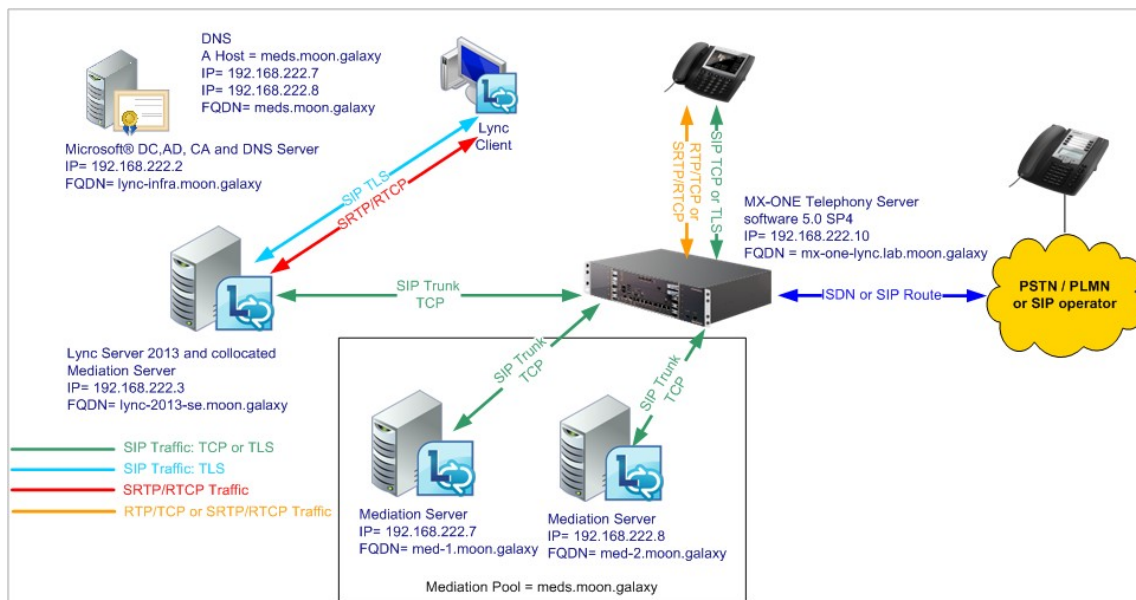
The failover feature also uses the Microsoft DNS Load Balancing functionality. When integrating MX-ONE and Mediation Server, the same configuration is valid for both failover and load balancing.

In a scenario, where two Mediation servers are used and if one of the servers is unavailable, then the first call will be attempted to set up to the first server, but it will be redirected after a few seconds and answered; and all subsequent calls will be redirected and answered in the second Mediation Server.

The reason it takes some seconds before getting an answer from the second server, is that after the INVITE is sent to the first server, the system waits four seconds for an answer, and if no answer is received, the host is grey-listed for 32 seconds and an INVITE is sent to the second server after this.

For additional details, see the MX-ONE `SIP Route` command description in CPI or `sip_route - help`, parameter `remote port`.

The following is a description of the setup that was verified in Mitel's lab.



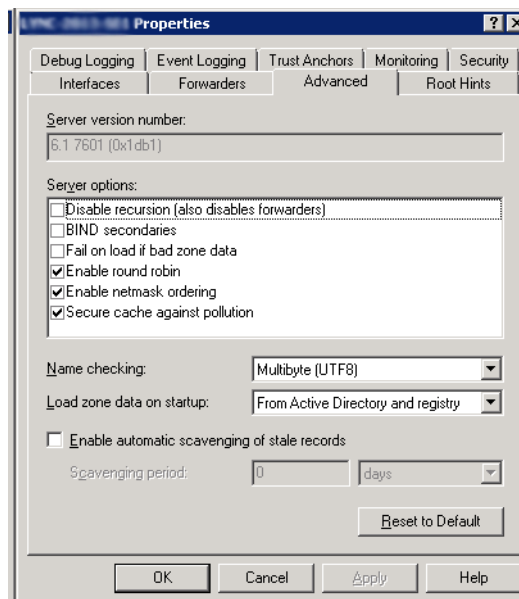
For this scenario, two standalone Mediation servers are used. In the MX-ONE side, only one MX-ONE Service Node is used, and it is configured with the Mediation Pool entry.

DNS Setup

Microsoft DNS needs to be configured to support Round Robin as described in the TechNet article “Configure DNS for Load Balancing”. Follow the link and see the item “To enable round robin for Windows Server”.

<http://technet.microsoft.com/en-us/library/gg398251.aspx>

The following figure shows the setup when Round Robin option is enabled.



DNS Multiple A record setup – Mediation Servers

To set up DNS Host (A) records for the two Mediation servers, the following must be configured. In the DNS Manager Tool, create the entries as shown in the following table.

NOTE: For more information about creating the DNS Host A records, refer to <http://technet.microsoft.com/en-us/library/gg398593>.

FQDN	TYPE	IP ADDRESS
med.moon.galaxy	Host (A)	192.168.222.7
med.moon.galaxy	Host (A)	192.168.222.8

To test your configuration, use the command `ping` to check the setup.

```

Administrator: C:\Windows\system32\cmd.exe
C:\Users\Administrator.AAS>ping meds

Pinging meds [192.168.1.7] with 32 bytes of data:
Reply from 192.168.1.7: bytes=32 time=35ms TTL=128
Reply from 192.168.1.7: bytes=32 time=21ms TTL=128
Reply from 192.168.1.7: bytes=32 time<1ms TTL=128
Reply from 192.168.1.7: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.7:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 35ms, Average = 14ms

C:\Users\Administrator.AAS>ping meds

Pinging meds [192.168.1.8] with 32 bytes of data:
Reply from 192.168.1.8: bytes=32 time=1ms TTL=128
Reply from 192.168.1.8: bytes=32 time=1ms TTL=128
Reply from 192.168.1.8: bytes=32 time=1ms TTL=128
Reply from 192.168.1.8: bytes=32 time=1ms TTL=128

Ping statistics for 192.168.1.8:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\Users\Administrator.AAS>ping meds

Pinging meds [192.168.1.8] with 32 bytes of data:
Reply from 192.168.1.8: bytes=32 time=1ms TTL=128
Reply from 192.168.1.8: bytes=32 time=1ms TTL=128
Reply from 192.168.1.8: bytes=32 time=1ms TTL=128
Reply from 192.168.1.8: bytes=32 time=1ms TTL=128

Ping statistics for 192.168.1.8:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\Users\Administrator.AAS>ping meds

Pinging meds [192.168.1.7] with 32 bytes of data:
Reply from 192.168.1.7: bytes=32 time<1ms TTL=128
Reply from 192.168.1.7: bytes=32 time<1ms TTL=128
Reply from 192.168.1.7: bytes=32 time<1ms TTL=128
Reply from 192.168.1.7: bytes=32 time=10ms TTL=128

Ping statistics for 192.168.1.7:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 10ms, Average = 2ms

C:\Users\Administrator.AAS>

```

MX-ONE Direct SIP with Load Balancing and Failover Setup - TCP

The following setup needs to be done in MX-ONE for configuring Direct SIP with load balancing and failover setup. Note that only Route definitions are shown.

NOTE: MX-ONE FQDN needs to be properly defined in the DNS Server.

1. Use the following command to view more details regarding the Profile Lync_TCP:

```
sip_route -print -profile Lync_TCP
```

2. Define SIP Route category:

RO-

```
CAI:ROU=97,SEL=711000000000010,SIG=0111110000A0,TRAF=03151515,TRM=4,SERV=3100
0000 01,BCAP=00110;
```

3. Define SIP Route data:

```
RODAI:ROU=97,TYPE=TL66,VARC=00000000,VARI=00000000,VARO=00000000;
```

4. Define SIP trunk data specific:

```
sip_route -set -route 1 -profile Lync_TLS_SRTP -uristring0 "sip:+?@skype.skypebusiness.com" -remote-
port 5067 -accept REMOTE_IP -match "mxoneskype.skypebusiness.com,10.211.62.165,skype.sky-
pebusiness.com,10.211.62.175" -codecs PCMA,PCMU -protocol tls -service PRIVATE;
```

5. Verify the configuration:

```
sip_route -print -route 97 -short
```

6. Define the SIP Route equipment initiate:

```
ROEQI:ROU=97,TRU=1-1;
```

7. Define external destination SIP Route data:

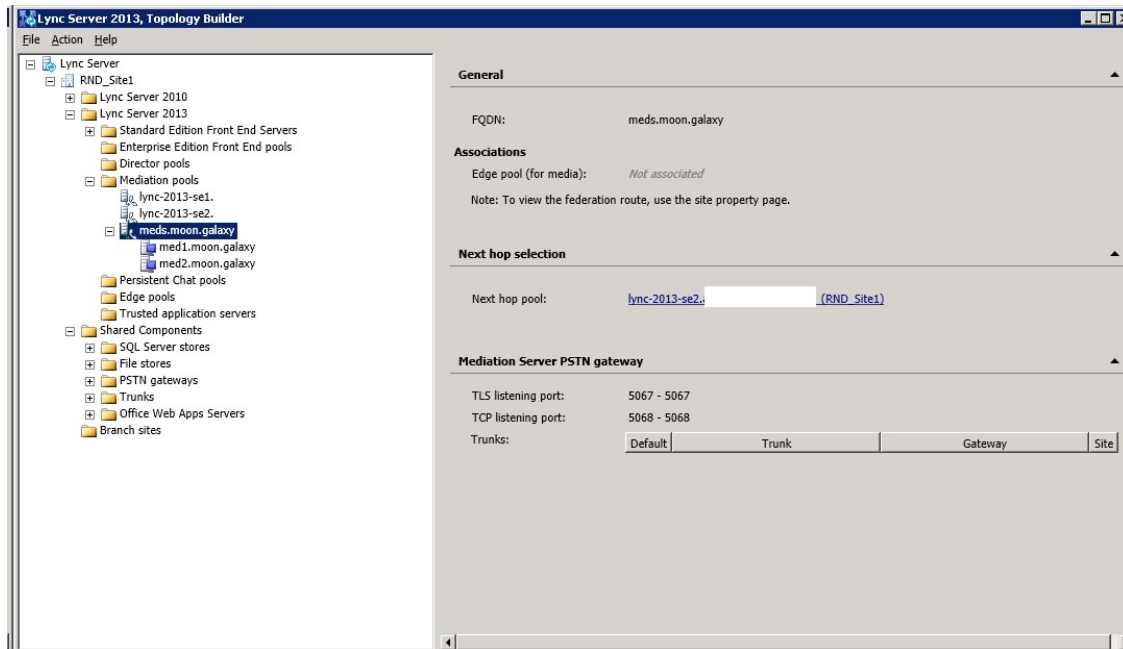
RODDI:ROU=97,DEST=97,ADC=0005000000000250000001010000,SRT=3;

Lync Configuration with Load Balancing and Failover Setup – TCP

Define a Mediation pool in the Skype for Business Server 2019 Topology Builder.

In the test validation, a Mediation pool named med1.moon.galaxy was created with two standalone Mediation servers.

Mediation Pool FQDN=meds.moon.galaxy Mediation Server 1 FQDN= med-1.moon.galaxy Mediation Server 2 FQDN= med-2.moon.galaxy



To set up the PSTN gateways, refer the Skype for Business Server 2019 configuration - TCP.

Execute calls between MX-ONE and Microsoft Lync and check that the calls are distributed between the systems.

MX-ONE Direct SIP with Load Balancing and Failover Setup - TLS

The following setup needs to be done in MX-ONE in order to configure Direct SIP with load balancing and failover setup, please note that only Route definitions are showed.

NOTE: MX-ONE FQDN needs to be properly defined in the DNS Server.

1. Use the following command to check more details regarding SIP Profile Lync_TLS sip_route -print -profile Lync_TLS
2. Define SIP Route category:

ROCAI:ROU=96,SEL=7110000000000010,SIG=0111110000A0,TRAF=03151515,TRM=4,
SERV=3100000001,BCAP=00110;

3. Define SIP Route data:

RODAI: ROU=96,TYPE=TL66,VARC=00000000,VARI=00000000,VARO=00000000;

4. Define SIP trunk data specific:

```
sip_route -set -route 1 -profile Lync_TLS_SRTP -uristring0 "sip:+?@skype.skypebusiness.com" -remote-  
port 5067 -accept REMOTE_IP -match "mxoneskype.skypebusiness.com,10.211.62.165,skype.sky-  
pebusiness.com,10.211.62.175" -codecs PCMA,PCMU -protocol tls -service PRIVATE;
```

5. Verify your configuration:

```
sip_route -print -route 96 -short
```

6. Define the SIP Route equipment initiate:

```
ROEQI:ROU=96,TRU=1-1;
```

7. Define external destination SIP Route data:

```
RODDI: ROU=96,DEST=96,ADC=0005000000000250000001010000,SRT=3;
```

Import the Certificate to MX-ONE Service Node

Import the server certificate `mx-one-certificate.pfx` to MX-ONE Service Node. On the access Server, for example, MX-ONE Service Node 1 runs the following command:

1. Install the certificate in the MX-ONE Service Node 1: `mxone_certificate`, and select the certificate `mx-one-certificate.pfx`
2. Enable Media Encryption in the route: `media_encryption_enable -type route`

Lync Configuration with Load Balancing and Failover Setup – TLS

Define a Mediation pool in the Skype for Business Server 2019 Topology Builder.

In the test validation, a Mediation pool named `meds.moon.galaxy` was created with two standalone Mediation servers.

```
Mediation Pool FQDN=meds.moon.galaxy Mediation Server 1 FQDN= med-1.moon.galaxy Mediation  
Server 2 FQDN= med-2.moon.galaxy
```

To set up the PSTN gateways, refer the Lync configuration with security and Media Bypass setup section. Execute calls between MX-ONE and Microsoft Lync and check that the calls are distributed between the systems.

Integration Notes

The latest software and firmware versions of MX-ONE components must be used.

NOTE: Mitel recommends that complex scenarios shall be validated in the partner labs before to customer deployment.

References

Always check the latest documentation. The links below are the ones available for reference. Mitel CPI Documentation – Mitel MX-ONE 5.0 SP4 or a later version.

Skype for Business Server Deploying Enterprise Voice

Enable Users for Enterprise Voice

Revision History

DOCUMENT VERSION	COMMENTT	DATE
A	First release	2015-11-19
B	Minor corrections	2014-03-28
C	Updated with Mitel template	2015-06-08
D	Updated in 4.2.3.7, cert_install_local replaced by mxone_certificate. MX-ONE version information also corrected.	2015-10-27
D3	Spelling correction	2017-04-05
D4	2013 old screens replaced with 2015 screens	2019-04-24
D5	Server 2015 is changed to server 2019	2019-10-17

