



## **CCS-UC-1**

# Crestron Mercury™ Tabletop Conference System with Microsoft® Skype® for Business

Configuration Guide

Crestron Electronics, Inc.

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# CCS-UC-1: Crestron Mercury™ Tabletop Conference System with Microsoft® Skype® for Business

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## Introduction

This configuration guide describes the necessary procedure to configure the Crestron Mercury™ devices to register to Microsoft® Skype® for Business (SfB) as a basic SIP endpoint.

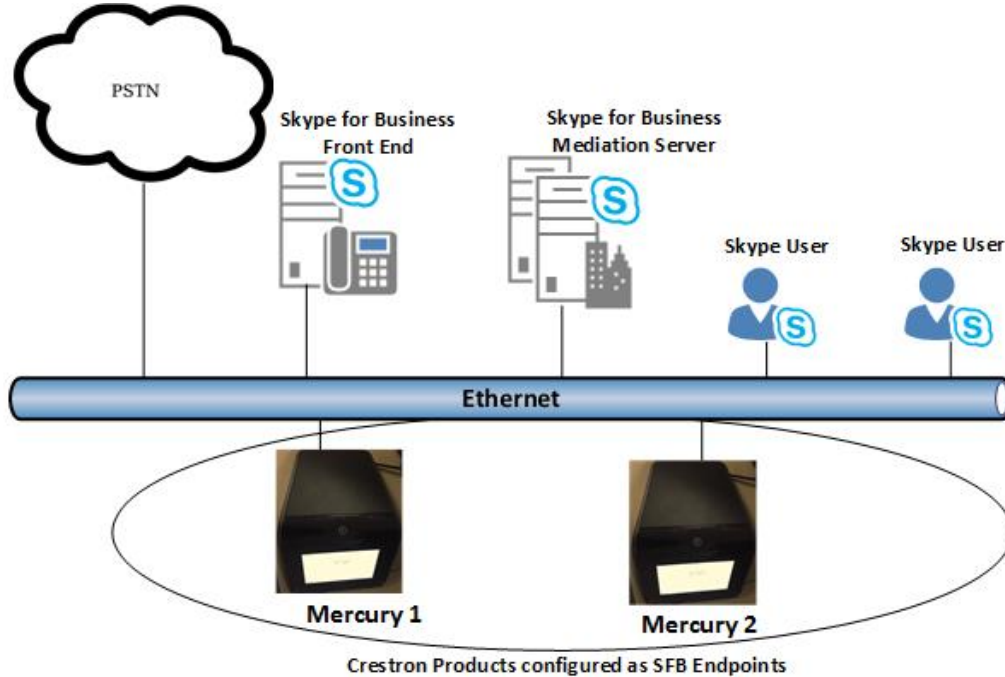
### Audience

This document is intended for users attempting to configure and use the Crestron Mercury devices as SIP Endpoints registering to SfB.

## Topology

The network topology for the Crestron Mercury endpoint to interop with SfB is as shown below.

### *SIP Endpoint Integration with SfB - Reference Network*



The lab network consists of the following components:

- SfB cluster for voice features
- Skype desktop clients
- Crestron Mercury as the SfB Endpoints

## Software Requirements

- Skype for Business 6.0.9319.259
- Mercury devices v 1.3553.14230.002

## Hardware Requirements

- Windows Server with SfB
- Cisco 3845 as PSTN Gateway
- SfB desktop client 15.0.4885.1000
- Crestron Mercury devices (2)

## Product Description

The Crestron Mercury device is a complete solution for conference rooms. It acts as an all-in-one touch screen, speakerphone, and AirMedia® product for conference rooms that provide microphones and speakers integrated into the user interface at the table.

Crestron Toolbox™ software is used to discover and control all Crestron devices on the network.

The Crestron Mercury web interface is used to control the Crestron Mercury devices on the network.

## Summary

The Crestron Mercury devices were configured on SfB as SIP endpoints. The devices successfully registered to SfB with digest authentication.

With critical failures on basic calls originating from Mercury, this topology is recommended for field deployments.

## Features Supported

- Registration with digest authentication
- Basic calls with G711u and G711a codecs
- Caller ID
- DTMF support
- Early media support
- Retrieval of a parked call
- Conference participant
- Call hold and resume
- Call waiting

## Features Not Supported

- Caller ID presentation with name and number display
- Call forwarding on the device
- Conference
- Initiating attended call transfer
- Initiating semi-attended call transfer
- Initiating Blind Call Transfer
- Configuration of Shared Line on device
- Initiating Call Park

## Known Issues and Limitations

- The Crestron Mercury device fails to register with SfB when the internal server or external server is configured on the device.
- The Crestron Mercury device handles a transfer with two-way audio, but after the transfer is complete, it drops the call.
- An attempt to add a PBX endpoint to a conference when the Crestron Mercury device is already in a call with PSTN fails with an error informing that the PBX endpoint is either unavailable or offline.
- The Crestron Mercury device does not play appropriate tones when it receives an error code.
- The Crestron Mercury device is able to retrieve the call parked by the Skype desktop client and there is two-way audio. However, after retrieving the parked call, the call control options disappear from the Crestron Mercury device's display.
- A hunt group call fails when the Crestron Mercury device answers the call (the hunt group call succeeds when the SfB desktop client answers).
- No music on hold is heard on the PBX endpoint when the Crestron Mercury device places the call on hold.
- The Crestron Mercury device handles call waiting, but it does not provide an option to put the current call on hold to answer a second incoming call. The Crestron Mercury device has to hang-up the ongoing first call to answer the second call, or it can reject the incoming second call.
- When media bypass is enabled on the PBX, media is not being anchored on the Crestron Mercury device. Instead, the mediation server anchors the media.



# Crestron Mercury Configuration

## Setup

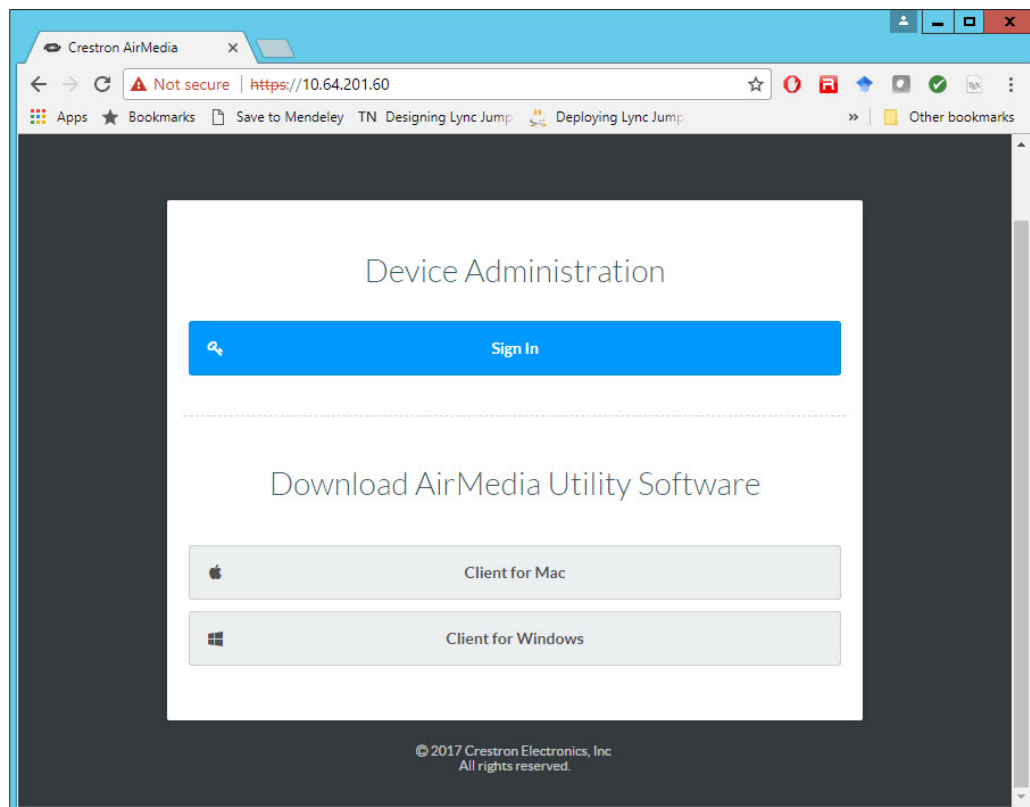
The LAN port of the Crestron Mercury device needs to be connected to one POE+ port to power it up and be connected to the network for reachability to SfB. The PoE+ switch that is used should have the LLDP functionality enabled for the device to power up and be completely functional. By default, the “poeplus” configuration is set to Off on the device.

## Configure the Device

To configure the Crestron Mercury device, follow this procedure:

1. Access the web GUI for the device by using an http session with the device's IP address. The device IP address used in this example was 10.64.201.60

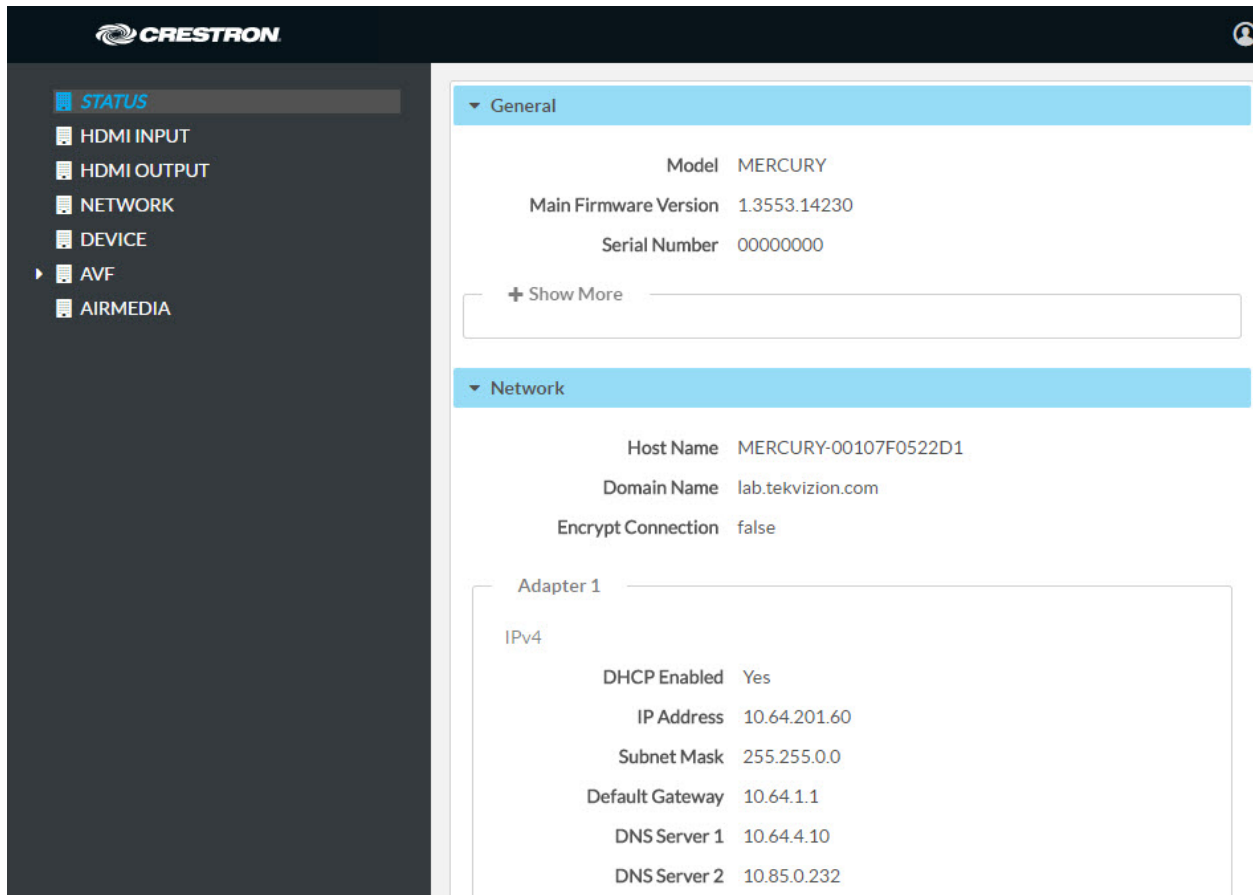
### *Crestron Mercury: Login to Web GUI*



2. Click **Sign In** and log in to the device. For information on device administration, refer to the CCS-UC-1 Supplemental Guide (Doc. 7844) at [www.crestron.com/manuals](http://www.crestron.com/manuals).

The Status screen that appears displays basic information on the device.

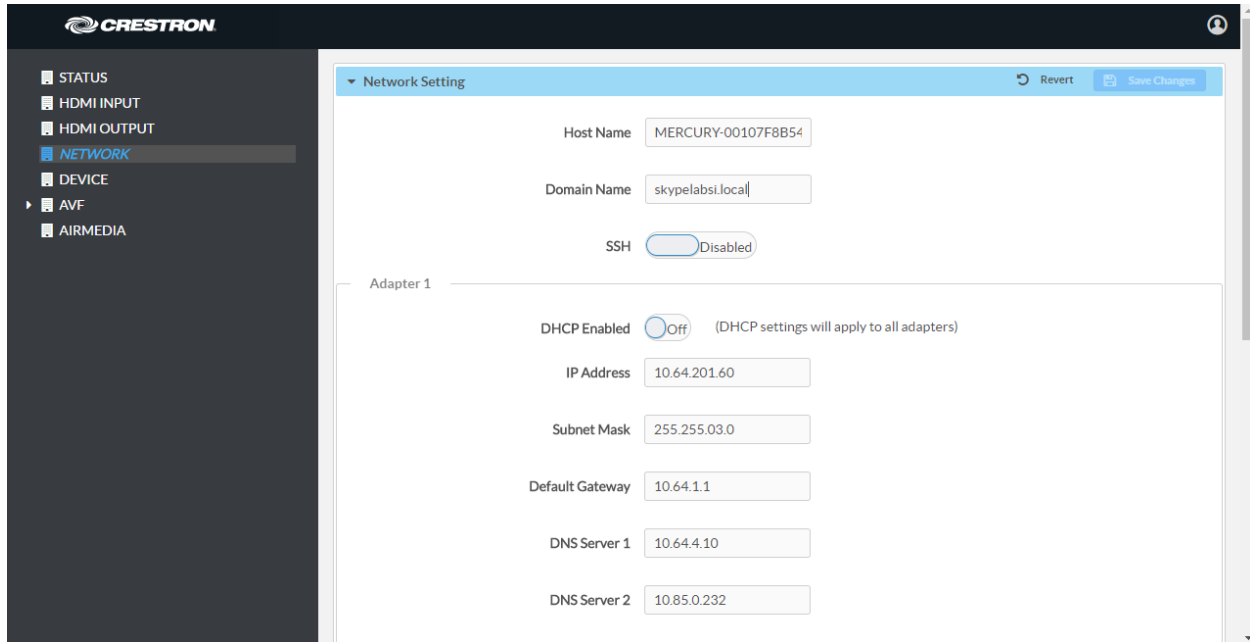
*Crestron Mercury: Status*



The device can be configured from the **Network** page.

3. On the web GUI, navigate to **Network**.

*Crestron Mercury Configuration: Network Setting: DHCP Off: Static IP Configured*



4. Enter the following parameters in the **Adapter 1** section to configure the Crestron Mercury device.
  - **Domain Name:** *skypelabsj.local* was used in this example
  - **DHCP Enabled:** Choose either of the following:
    - Obtain an IP address automatically (**On**)
    - Use the following IP address (**Off**)For the example, a dynamic IP was configured.

---

**NOTE:** The DNS Server 1 entry should be the DNS server where all the SfB and Crestron Mercury A & SRV records are configured. In this example, the DNS server on the domain controller is used: *10.64.1.3* was used in this example.

---

5. Click **Save Changes**.

### *Configure the SfB Parameters*

To configure the SfB parameters, follow this procedure:

1. On the web GUI, navigate to **Device > SIP Calling**.
2. Set **Enable SIP** to **Off**, and click **Save Changes**.
3. On the web GUI, navigate to **Device > Skype for Business**.
4. Set **Enable** to **Enabled**.
5. Configure the **Username**: Enter the SIP URI of the Skype for Business user.
6. Configure the **Password**: Enter the password of the SFB user.

7. Configure the **SIP Address**: Enter the SIP URI of the Skype for Business user.
8. Click **Save Changes**.

When SfB is enabled, the Crestron Mercury device displays a Skype logo on its **Make a Call** screen. The logo is greyed out until the device registers with SfB.

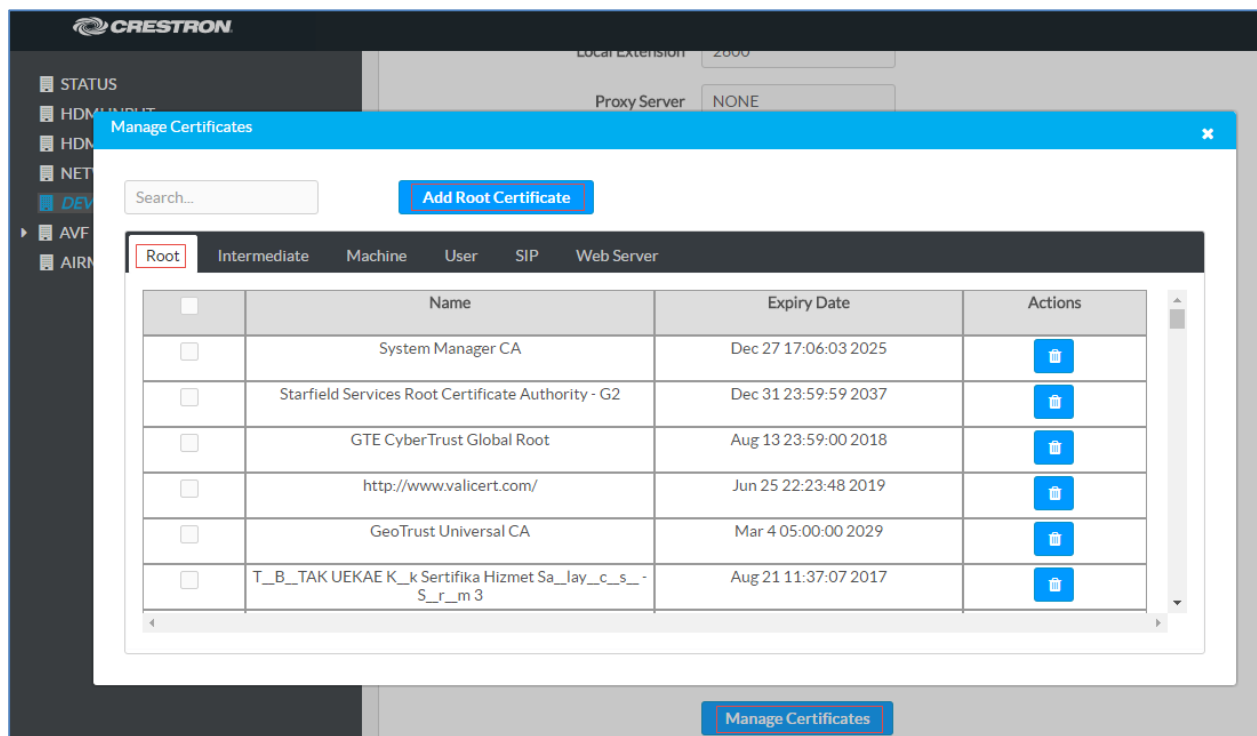
### *Add Certificates*

For a successful TLS handshake between the Crestron Mercury device and SfB, a root certificate needs to be added to the Crestron Mercury device. This can be downloaded from the certificate authority that serves SfB.

To upload certificates to the Crestron Mercury device, follow this procedure:

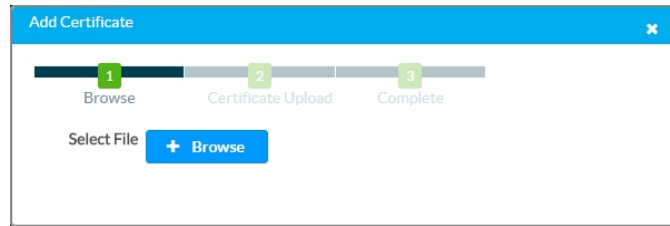
1. Navigate to **Device > Skype for Business**.
2. Click **Manage Certificates**.

#### *Mercury: UI: Manage Certificates Screen: Add Root Certificate*



3. Click **Add Root Certificate**. The **Add Certificate** screen is displayed.
  - a. Click to delete a certificate from the list of certificates.
  - b. Click **Add Root Certificate**. The **Add Certificate** screen is displayed.

### *Add Certificate Screen*



- c. Click **Browse**, select the root\_cer.cer file to be loaded, and click **Open**.
- d. Click **Load** to upload the certificate to the CCS-UC-1. A message confirming the upload is displayed.
- e. Click **OK** to close the **Add Certificate** screen. The certificate authority from where the root-cer certificate was downloaded appears in the list of trusted certificate authorities.
- f. Navigate to **SIP Calling > Select Trusted Certificate Authorities** and select the certificate authority (from where the root\_cer.cer certificate was downloaded) from the list of certificate authorities.

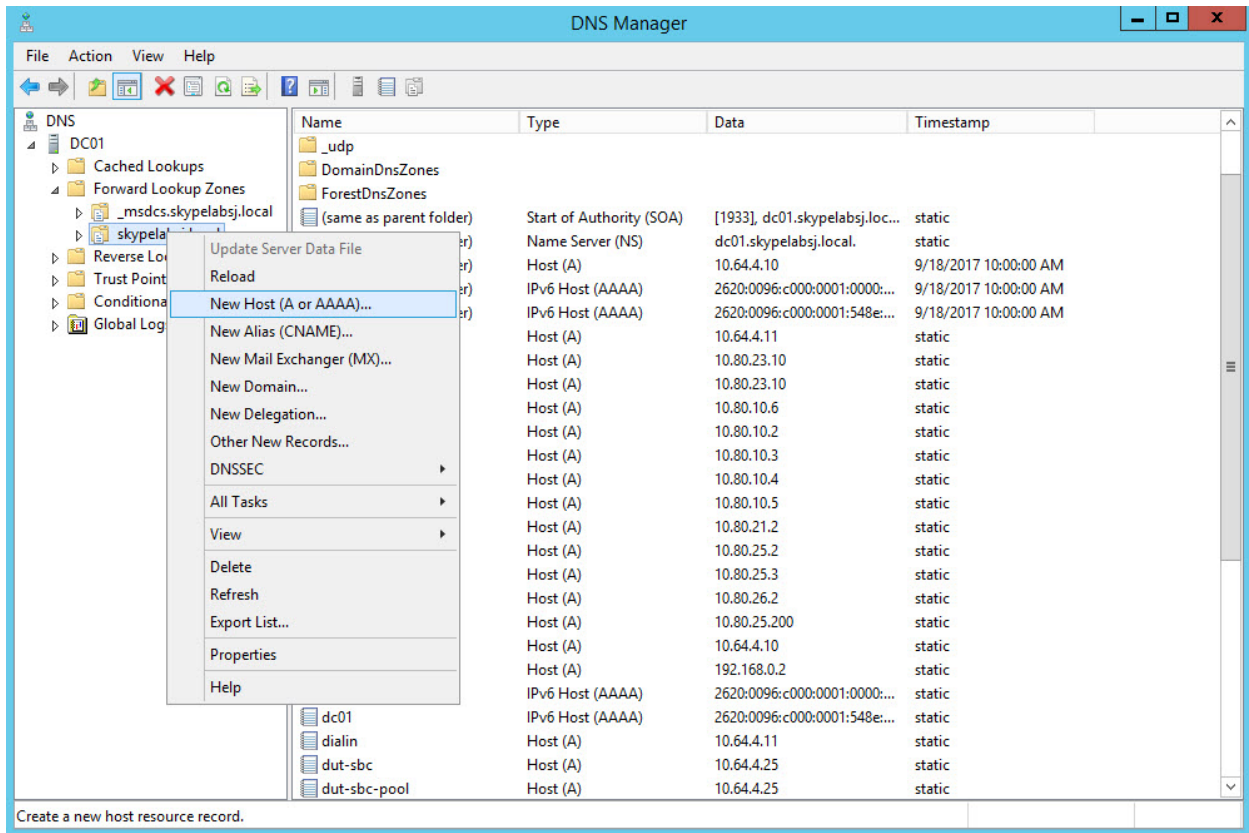
# Skype for Business Configuration

This section describes the SFB configuration necessary to integrate the Crestron device as a SFB Endpoint. It is assumed that the general installation and basic SFB configuration has already been administered.

## Configure Host A Record

Configure an A record in the DNS server for “lyncdiscoverinternal.<domain>.com” that points to the front end server’s IP Address.

### Configure Host A Record



*Lyncdiscoverinternal Properties Window*

The image shows a Windows dialog box titled "lyncdiscoverinternal Properties" with a "Security" tab selected. The dialog contains several input fields and checkboxes. The "Host" field is set to "lyncdiscoverinternal". The "Fully qualified domain name (FQDN)" field is set to "lyncdiscoverinternal.skypeabsj.local". The "IP address" field is set to "10.64.4.11". There are two checkboxes: "Update associated pointer (PTR) record" which is checked, and "Delete this record when it becomes stale" which is unchecked. Below the second checkbox is a "Record time stamp" field. At the bottom, the "Time to live (TTL)" is set to "0 :1 :0 :0" in the format (DDDD:HH.MM.SS). The dialog has "OK", "Cancel", and "Apply" buttons at the bottom.

Host (A)	Security
Host (uses parent domain if left blank):	lyncdiscoverinternal
Fully qualified domain name (FQDN):	lyncdiscoverinternal.skypeabsj.local
IP address:	10.64.4.11
<input checked="" type="checkbox"/> Update associated pointer (PTR) record	
<input type="checkbox"/> Delete this record when it becomes stale	
Record time stamp:	
Time to live (TTL):	0 :1 :0 :0 (DDDD:HH.MM.SS)
OK Cancel Apply	

# Configure a Crestron Mercury SfB User

Configure a user in the SfB Control Panel.

**NOTE:** A user has to be configured in the Active Directory prior to this configuration.

## Skype for Business, User Configuration

The screenshot shows the 'Edit Skype for Business Server User - SFB2 User2' configuration page. On the left is a navigation menu with options: 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, and Configuration. The main area is titled 'USER SEARCH' and 'Edit Skype for Business Server User - SFB2 User2'. At the top of the main area are 'Commit' and 'Cancel' buttons. The configuration fields are as follows:

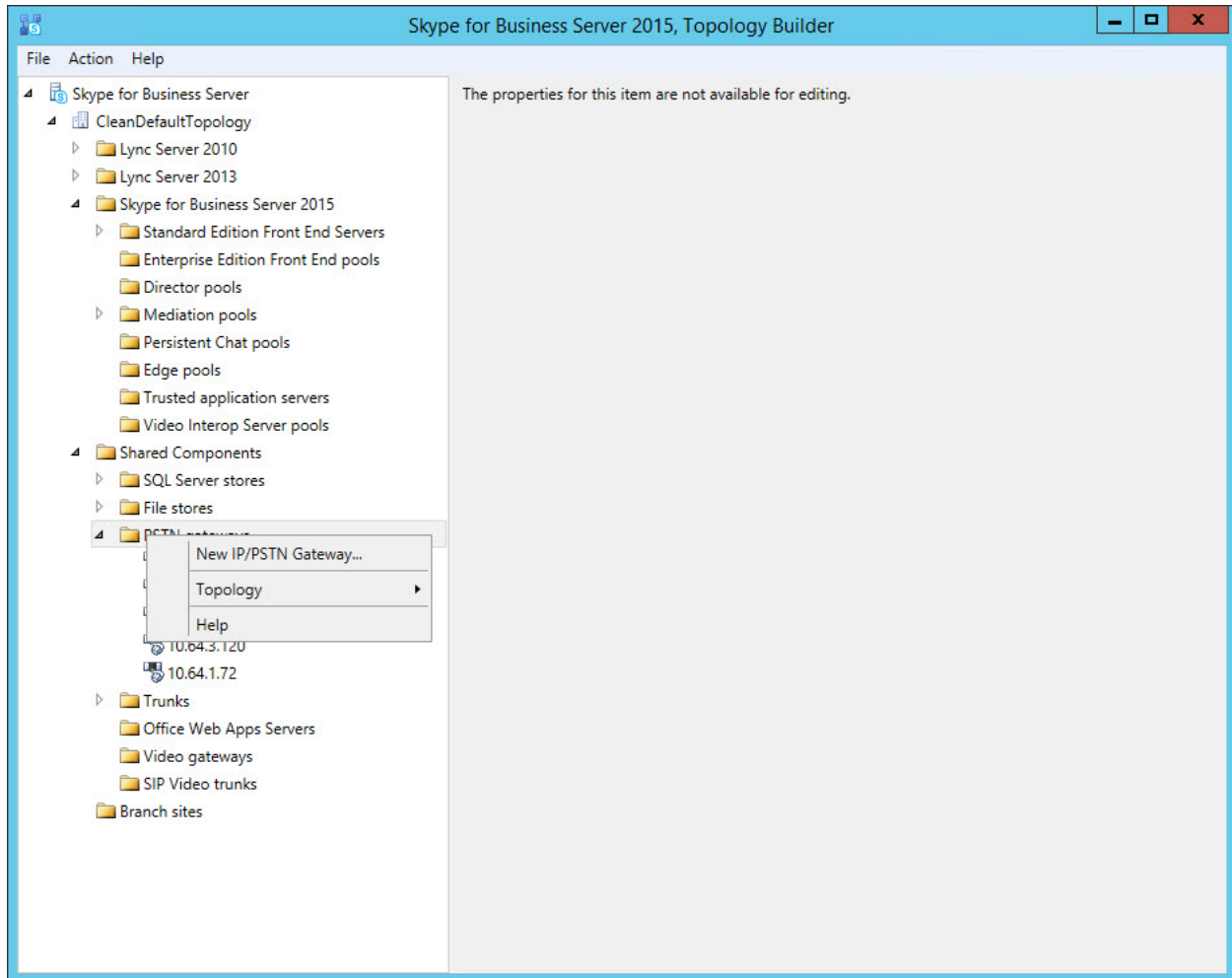
- Display name:** SFB2 User2
- Enabled for Skype for Business Server**
- SIP address:** sip:SFBUser2 @ skype.labsj.local
- Registrar pool:** FE01.skype.labsj.local
- Telephony:** Enterprise Voice
- Line URI:** tel:+19722657278
- Dial plan policy:** <Automatic> (View...)
- Voice policy:** OutboundCalling (View...)
- Conferencing policy:** <Automatic> (View...)
- Client version policy:** <Automatic> (View...)
- PIN policy:** <Automatic> (View...)
- External access policy:** <Automatic> (View...)
- Archiving policy:** <Automatic> (View...)
- Location policy:** <Automatic> (View...)
- Mobility policy:** <Automatic> (View...)
- Persistent Chat policy:** <Automatic> (View...)
- Client policy:** <Automatic>



## Configure the PSTN Gateway

Configure a PSTN Gateway on Skype for Business for PSTN calls.

*Skype for Business Server 2015, Topology Builder*



*Define New IP/PSTN Gateway, Define the PSTN Gateway FQDN*

The screenshot shows a window titled "Define New IP/PSTN Gateway" with a close button (X) in the top right corner. The main heading is "Define the PSTN Gateway FQDN" with a telephone icon. Below the heading, the text reads "Define the fully qualified domain name (FQDN) for the PSTN gateway." There is a label "FQDN: \*" followed by a text input field containing "10.64.1.72". At the bottom of the window, there are four buttons: "Help", "Back", "Next" (highlighted in blue), and "Cancel".

*Define New IP/PSTN Gateway, Define the IP Address*

The screenshot shows a window titled "Define New IP/PSTN Gateway" with a close button (X) in the top right corner. The main heading is "Define the IP address" with a telephone icon. Below the heading, there are two radio button options: "Enable IPv4" (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." Below these are two text input fields labeled "PSTN IP address:". The "Enable IPv6" section has the same sub-options and input fields. At the bottom of the window, there are four buttons: "Help", "Back", "Next" (highlighted in blue), and "Cancel".

*Define New IP/PSTN Gateway, Define the Root Trunk*

The screenshot shows a configuration window titled "Define New IP/PSTN Gateway" with a sub-header "Define the root trunk". The window contains several input fields and dropdown menus:

- Trunk name:** \* 10.64.1.72
- Listening port for IP/PSTN gateway:** \* 5060
- SIP Transport Protocol:** TCP
- Associated Mediation Server:** FE01.skypelabsj.local CleanDefaultTopology
- Associated Mediation Server port:** \* 5060

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

# Configure the Dial Plan

Configure dial plan and normalization rules for number translation.

## Skype for Business, Voice Routing, Dial Plan Configuration

- 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 Dial Plan - Global

OK Cancel

Scope: Global

Name: \*  
Global

Simple name: \*  
DefaultProfile

Description:

Dial-in conferencing region:

External access prefix:

Associated Normalization Rules

New Copy Paste Select... Show details... Remove Up Down

Normalization rule	State	Pattern to match	Translation pattern
All	Committed	^\(d+\)\$	\$1

Dialed number to test:

Go ?

## Dial Plan Configuration, Edit Normalization Rule

Edit Dial Plan ▶ Edit Normalization Rule - All

**Name: \***

**Description:**

**Build a Normalization Rule**  
Fill in the fields that you want to use, or create the rule manually by clicking Edit.

**Starting digits:**


**Length:**  
At least


**Digits to remove:**

**Digits to add:**

**Pattern to match: \***

**Translation rule: \***



**Internal extension** 

## Configure Voice Policy

Configure voice policy with required calling features. This voice policy has to be assigned to the user manually if it is a user scoped voice policy.

### Skype for Business, Voice Routing, Voice Policy Configuration

- 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 Voice Policy - OutboundCalling

OK  Cancel

**Scope:** User

**Name:** \*

OutboundCalling

**Description:**

**Calling Features**

- Enable call forwarding
- Enable delegation
- Enable call transfer
- Enable call park
- Enable simultaneous ringing of phones
- Enable team call
- Enable PSTN reroute
- Enable bandwidth policy override
- Enable malicious call tracing
- Enable busy options

**Associated PSTN Usages**

[New](#) [Select...](#) [Show details...](#) [Remove](#) [↑](#) [↓](#)

PSTN usage record	Associated routes
PSTN_outbound	1064Corp

**Call forwarding and simultaneous ringing PSTN usages:**

Route using the call PSTN usages [?](#)

**Translated number to test:**

## Configure PSTN Usage

A PSTN usage is configured to the above voice policy. This configuration dictates if a user can have access to outbound PSTN calls.

### *Configure a PSTN Usage*

Edit Voice Policy ▸ Edit PSTN Usage Record - PSTN\_outbound

**Name:**

PSTN\_outbound

**Associated Routes**

Name	Pattern to match
1064Corp	.*

## Configure a Route

A route is configured for the above configured PSTN usage. This route configuration is associated with the PSTN trunks and number patterns to allow. The below example allows all numbers on the associated trunk.

### Configure Voice Route

Edit Voice Policy ▶ Edit PSTN Usage Record ▶ Edit Voice Route - 1064Corp

✓ OK ✗ Cancel

**Name: \***  
1064Corp

**Description:**

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

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

**Match this pattern: \***  
.\*  
Edit Reset ?

**Suppress caller ID**  
**Alternate caller ID:**

**Associated trunks:**  
PstnGateway:10.64.1.72 Add..  
Remove

**Translated number to test:**  
Go



## Configure a Trunk

Configure the trunk to PSTN gateway. In this configuration REFER is turned off and media bypass is disabled.

### Skype for Business, Voice Routing, Trunk Configuration

The screenshot displays the Skype for Business administration console. On the left is a navigation menu with the following items: Home, Users, Topology, IM and Presence, Persistent Chat, Voice Routing (highlighted), Voice Features, Response Groups, Conferencing, Clients, Federation and External Access, Monitoring and Archiving, Security, and Network Configuration. The main content area has a breadcrumb trail: DIAL PLAN > VOICE POLICY > ROUTE > PSTN USAGE > TRUNK CONFIGURATION > TEST VOICE ROUTING. Below the breadcrumb is a button labeled 'Create voice routing test case information'. The main configuration area is titled 'Edit Trunk Configuration - PstnGateway:10.64.1.72' and includes 'OK' and 'Cancel' buttons. The configuration fields are as follows:

- Scope:** Pool
- Name:** PstnGateway:10.64.1.72
- Description:** (empty text box)
- Maximum early dialogs supported:** 20
- Encryption support level:** Optional
- Refer support:** None
- Enable media bypass
- Centralized media processing
- Enable RTP latching
- Enable forward call history
- Enable forward P-Asserted-Identity data
- Enable outbound routing failover timer

## Trunk Configuration, Details

### Voice Features

Response Groups

Conferencing

Clients

Federation and External Access

Monitoring and Archiving

Security

Network

Configuration

Network

Configuration

#### ^ Associated PSTN Usages






 Select...  Remove  

PSTN usage record	Associated routes
-------------------	-------------------

Translated number to test:

#### ^ Associated translation rules

##### Calling number translation rules

 New  Copy  Paste  Select...  Show details...  Remove  

Translation rule	State	Pattern to match	Translation pattern
------------------	-------	------------------	---------------------

##### Called number translation rules

 New  Copy  Paste  Select...  Show details...  Remove  

Translation rule	State	Pattern to match	Translation pattern
------------------	-------	------------------	---------------------

Phone number to test:

Calling number  Called number

This page is intentionally left blank.

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**Configuration Guide – DOC. 8256A**  
**(2050540)**  
**12.17**  
Specifications subject to  
change without notice.