DSP-1282 & DSP-1283 Crestron Avia™ DSP with ShoreTel® Connect Client Software 21.80.7840.0

Configuration Guide

Crestron Electronics, Inc.

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DSP-1282 & DSP-1283: SIP Endpoint with ShoreTel® Connect Client Software 21.80.7840.0

Introduction

This configuration guide describes the procedures required to configure Crestron Avia™ Digital Signal Processor (DSP) devices. The devices operate on the ShoreTel® Director web-based interface as basic Session Initiation Protocol (SIP) users.

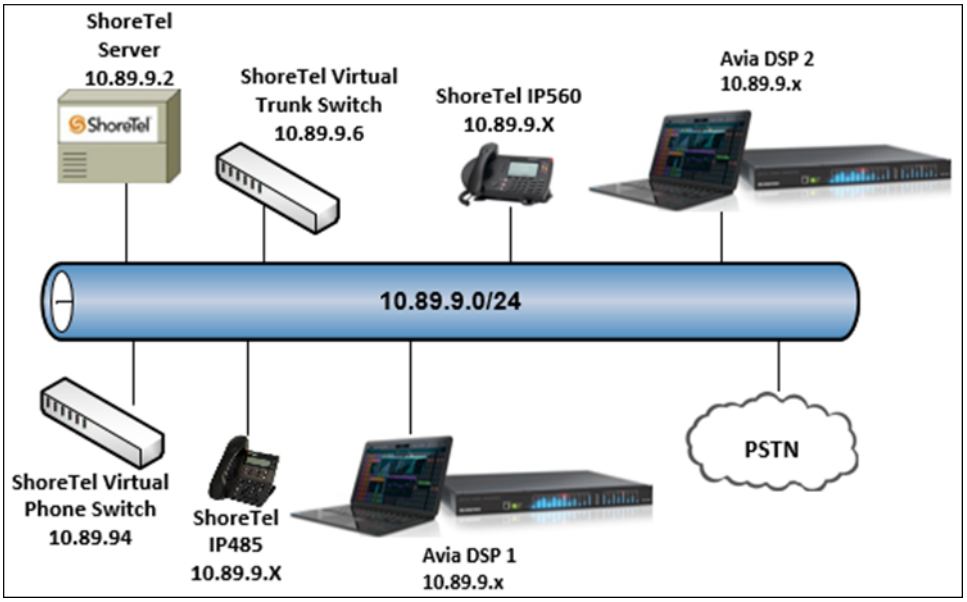
Audience

The intended audience includes those attempting to configure and use Crestron Avia DSP devices as SIP endpoints registered to the ShoreTel Connect client.

Topology

The diagram below shows the network topology for integration of a Crestron Avia DSP endpoint with the ShoreTel Director. ShoreTel Director runs within the ShoreTel Connect client.

SIP Endpoint Integration with ShoreTel Connect - Reference Network



The lab network consists of the following components:

- ShoreTel Server/Director
- ShoreTel virtual phone switch
- ShoreTel virtual trunk switch
- ShoreTel phones
- Crestron Avia DSP as the SIP users

Software Requirements

- ShoreTel Connect: 21.80.7840.0
- Crestron Avia DSP: v1.00.121

Hardware Requirements

- ShoreTel Connect either in a virtual environment or with a separate server
  - ShoreTel Director
  - ShoreTel virtual phone switch
  - ShoreTel virtual trunk switch
- Public Switched Telephone Network (PSTN) gateway
- ShoreTel phones
- Crestron Avia DSP devices (2)

Product Description

The Crestron Avia DSP products (DSP-1282 and DSP-1283, specifically) consist of a family of programmable digital audio signal processors intended for the commercial sound market. Each version provides 12 analog mic/line inputs and eight analog line outputs. The devices include a Local Area Network (LAN) connection and a Universal Serial Bus (USB) connection for programming and control. The programmable signal flow is a fixed topology with user-configurable input and output processing chains using a library of preset signal-specific DSP blocks.

Use the Crestron Avia tool to control and configure the Crestron Avia DSP devices on the network.

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

Summary

This document describes how to configure the Crestron Avia DSP devices as SIP users. It also depicts how to register devices to the ShoreTel Director with digest authentication.

Supported features include:

- Registration with digest authentication
- Basic calls with G711u and G711a codecs
- Dual-Tone Multi-Frequency (DTMF) support
- Early media support
- Retrieval of a parked call
- Transferee in a call transfer
- Conference participant
- Member of hunt group
- DND (Do Not Disturb)

Unsupported features include:

- Caller ID presentation
- Call hold and resume
- Call forwarding on the device (forwarding can be configured on the Private Branch Exchange (PBX) for the Domain Name (DN) assigned to the endpoint)
- Call waiting
- Initiating conference
- Initiating an attended call transfer
- Initiating an early attended call transfer
- Initiating a blind call transfer
- Shared line (configuration of shared line on device)
- Initiating call park
- Message Waiting Indicator (MWI)

Known issues and limitations include:

- No support for caller ID on the Crestron Avia DSP. (This issue was tracked via Bugzilla™ software defect: 115708.
- The DSP does not support Music on Hold when integrated with the Avaya Aura PBX. This issue was tracked via Bugzilla defect: 116049.
- No support for MWI on the Crestron Avia DSP. (this issue was tracked via Bugzilla defect: 118991.
- The DSP fails to play a reorder tone when a call from the DSP to a PBX extension eventually times out after the called party does not answer. this issue was tracked via Bugzilla defect: 120378.

Crestron Avia DSP Configuration

This section provides the following details:

- How to set up connections to the amplifier and speaker
- How to access the DSP on the network (once powered)
- How to configure the DSP for registration and integration with the ShoreTel Director

Connections

Make the following connections:

- Connect microphone to DSP MIC/LINE INPUTS port 1
- Connect DSP LINE OUTPUTS port 1 to "Audio In" on amplifier
- Connect "Audio Out" of amplifier to speaker
- Connect LAN port to network
- Connect VOIP port to network

Device Discovery/Access

Use the Crestron Toolbox and the Crestron Avia tool to discover and access the connected LAN and/or VOIP ports) DSP devices.

Use the Help menu to assist when performing the discovery and configuration procedure.

Device Configuration

The basic setup for a phone call requires:

- An analog input (such as from a microphone) routed out through the phone line
- Audio coming in from the phone line routed to an analog output (such as to an amplifier or speaker)

Configure the DSP Device

Use the Crestron Avia tool to select and configure the DSP device.

Input Configuration

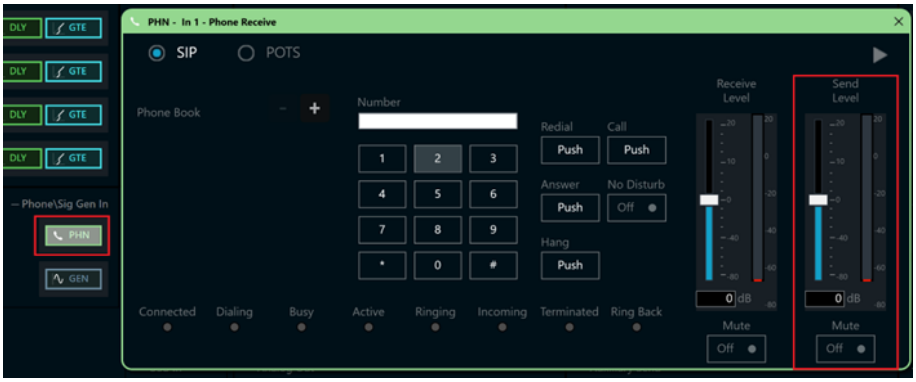
To configure the analog input:

1. Click **Signal**.
   Crestron Avia tool: Audio Input Configuration (1/4)

2. Under **Analog In 1** (first row), double click **Gain**. In the new window set the following:
   a. Click **Mute** to **Off**.
   b. Select **33** for the **Analog Gain**.
   c. If a condenser microphone is being used, click **+48V** (phantom power) to **On**.
   Crestron Avia Tool: Audio Input Configuration (2/4)

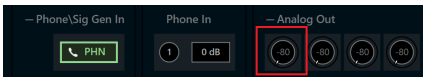
3. Under **Analog In 1** (first row), click **Ref/Phone Out** (right-most column) and enter **0** as the decibel value.
   Crestron Avia Tool: Audio Input Configuration (3/4)

4. Under **Phone\Sig Gen In**, click **PHN**. In the new window set the following:
   a. Move the **Send Level** slider to **0 db**.
   b. Click **Mute** to **Off**.
   Crestron Avia Tool: Audio Input Configuration (4/4)



Output Configuration

To configure the analog output:

1. Under **Phone In 1** (first row), click **Analog Out** (left-most column) and enter **0** as the decibel value.
   Crestron Avia Tool: Audio Output Configuration (1/3)
   

2. Under **Analog Out 1**, double click **LVL**. In the new window set the following:
   a. Move the **Level** slider to **0 db**.
   b. Click **Mute** to **Off**.
   Crestron Avia Tool: Audio Output Configuration (2/3)

3. Under **Phone\Sig Gen In**, click **PHN**. In the new window set the following:
   a. Move the **Receive Level** slider to **0 db**.
   b. Click **Mute** to **Off**.
   Crestron Avia Tool: Audio Output Configuration (3/3)

Configure the SIP Parameters

From the open **PHN - In 1 - Phone Receive** window, select and configure the SIP parameters.

1. With **SIP** selected, click the chevron at the right top corner to expand the window.
   Crestron Avia Tool: Phone Dialer, SIP Parameters Configuration

2. Enter the extension configured on ShoreTel for the **Local Extension** for this device. This example uses **160**.
3. Enter the ShoreTel Director for the **SIP Server IP Address**. This example uses **10.89.9.4**.
4. Enter the SIP server port (**5060**) for the **Port**.
5. Enter the same end user name configured for the ShoreTel Director with the digest authentication credentials for the **SIP Server User Name**..
6. Enter the same password as configured for the ShoreTel Director end user digest credentials for the **SIP Server Password**.

ShoreTel Director Configuration

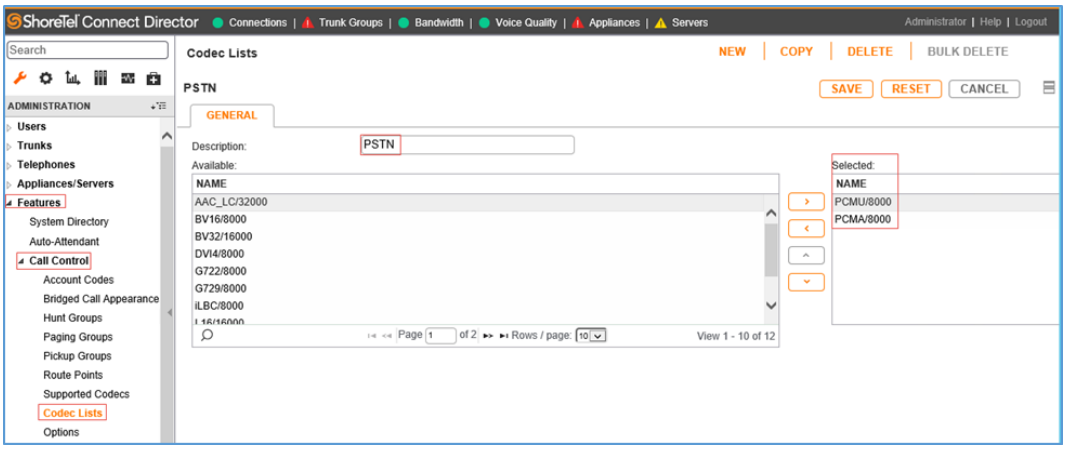
This section describes the ShoreTel Director configuration necessary to support registration of the Crestron device and connectivity to the PSTN.

NOTE: Confirm that the general installation and basic ShoreTel configuration have been administered.

Configure Custom Codec List

To configure a custom codec list:

1. Click **Features** > **Call Control** > **Codec Lists**.
2. Click **NEW**.
   ShoreTel Connect Director: Configure Codec List



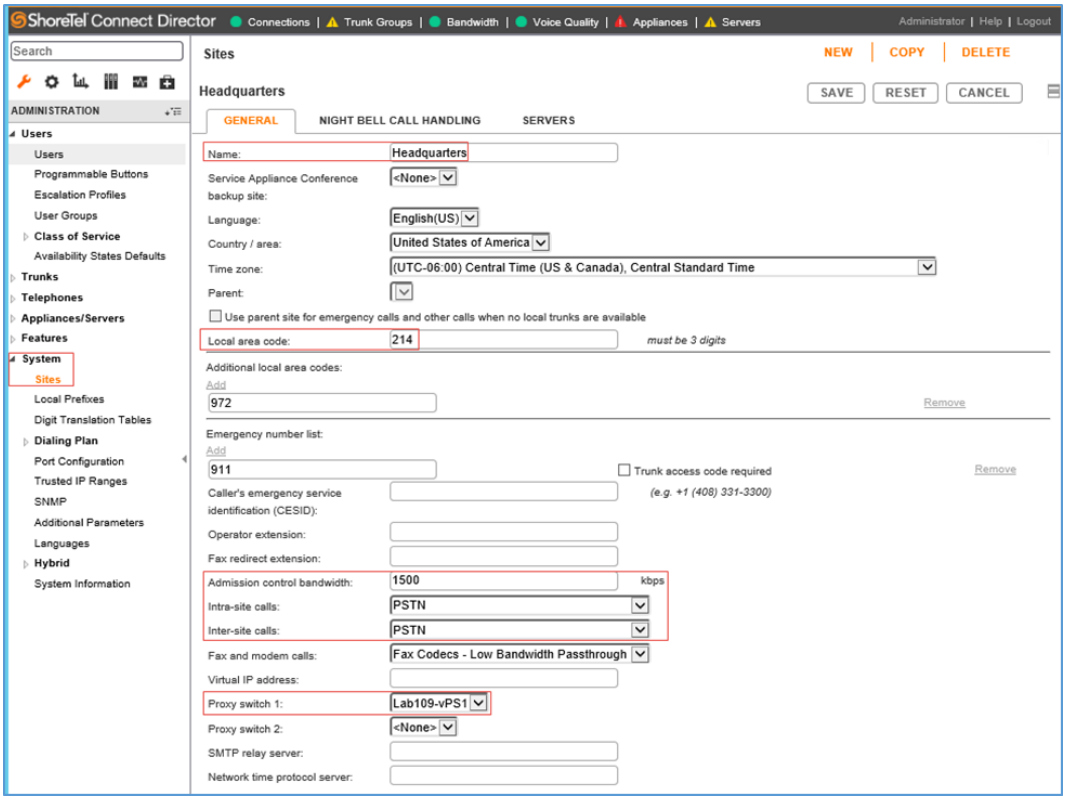
3. Enter **PSTN** for the **Description** (for this example).
4. Transfer codecs between the two lists:
   a. In the **Available** list, select the **PCMU/8000** and **PCMA/8000** codecs (for this example).
   b. Click **>** (between the two lists) to move the codecs to the **Selected** list.
5. Click **SAVE**.

Configure Custom Sites

To configure a custom site:

1. Click **System** > **Sites**.

ShoreTel Connect Director: Configure Site



2. Enter **Headquarters** for the **Name** (for this example).
3. Enter **214** for the **Local area code** (for this example).
4. Select **PSTN** for **Intra-site calls**. This newly-created coded drop-down menu contains only G711 codecs.
5. Select **PSTN** for **Inter-site calls**.
6. Leave all other fields at the default values.
7. Click **SAVE**.

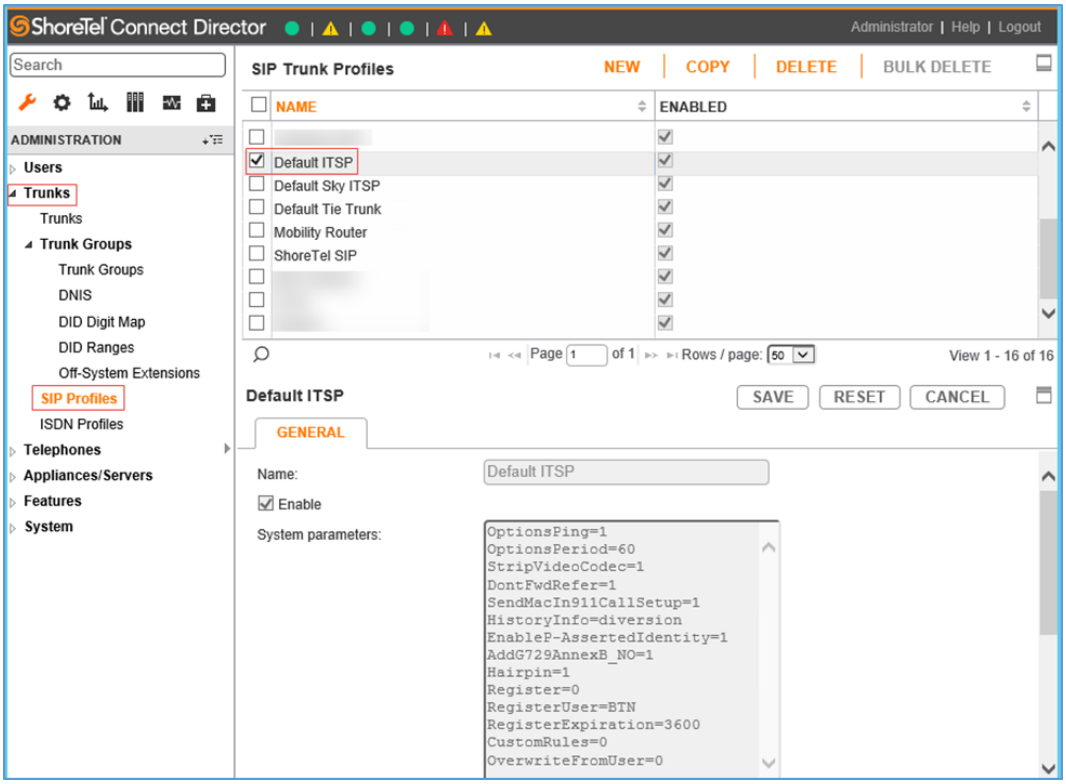
Configure SIP Trunk Profile

A SIP trunk toward the PSTN routes calls to PSTN numbers.

To configure a SIP trunk profile:

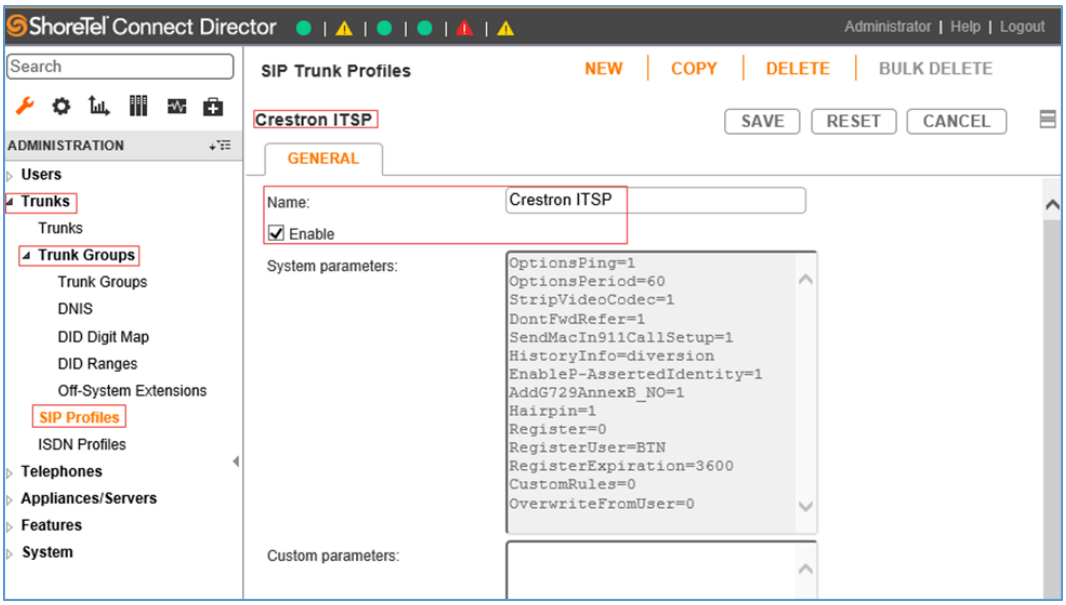
1. Click **Trunks** > **SIP Profiles**.

ShoreTel Connect Director: Custom SIP Trunk Profile (1/2)



2. In the **NAME** column, check **Default ITSP**.
3. Click **COPY**.

ShoreTel Connect Director: Custom SIP Trunk Profile (2/2)

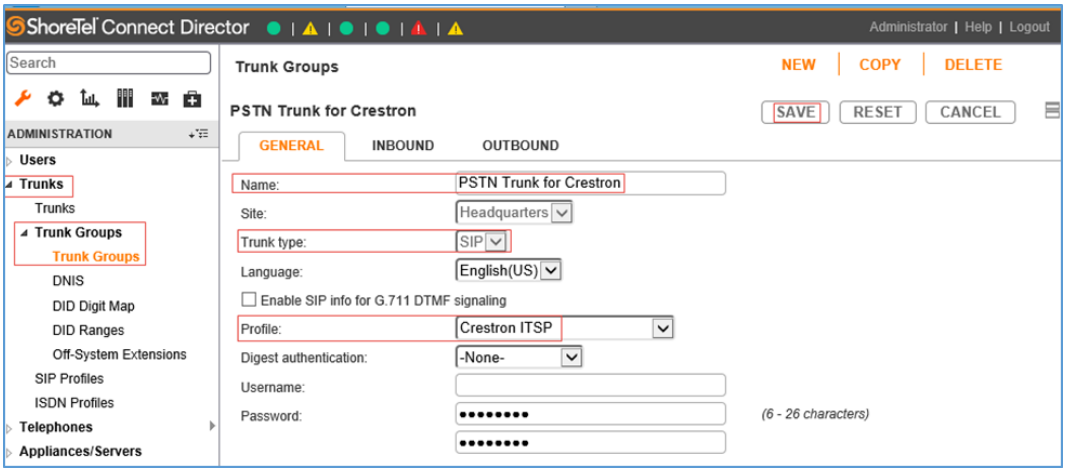


4. Change the **Name** from **Default ITSP** to **Crestron_ITSP**.
5. Include **Custom parameters** if required. This example has none configured.
6. Click **SAVE**.

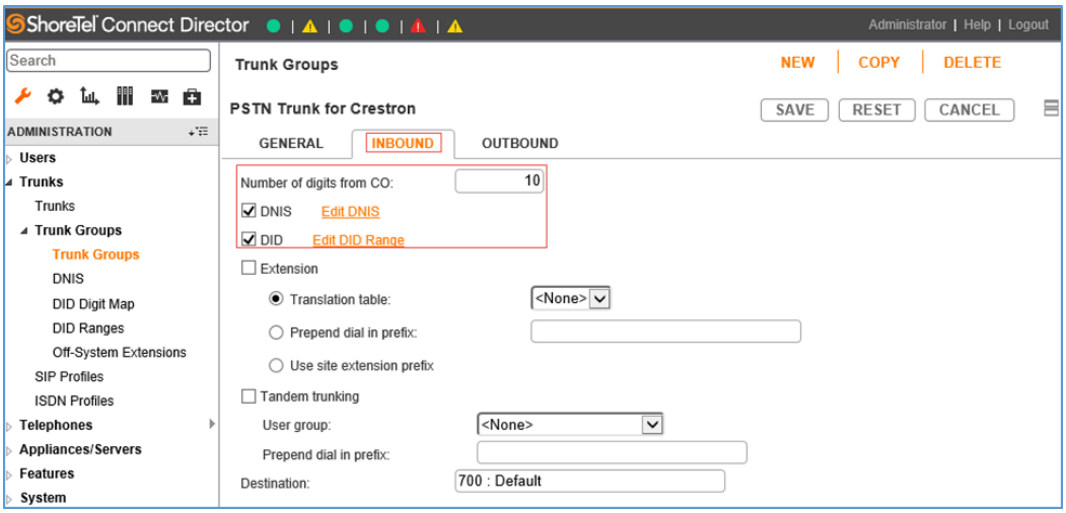
Add Trunk Group

To add a trunk group:

1. Click **Trunks** > **Trunk Groups** > **Trunk Groups**.
   ShoreTel Connect Director: Add Trunk Group

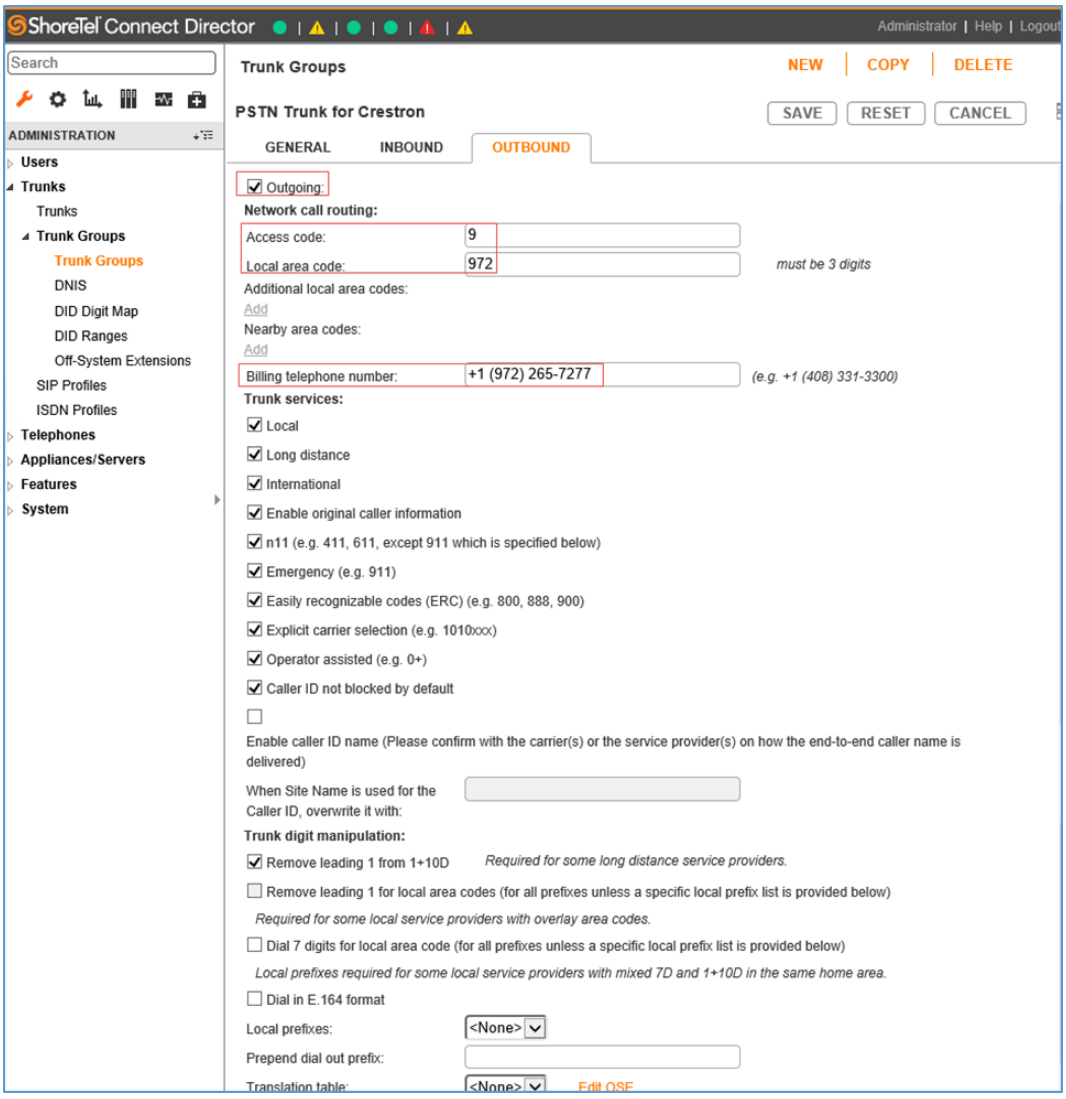


2. Click the **GENERAL** tab.
3. Enter **PSTN Trunk for Crestron** for the **Name** (for this example).
4. Select **SIP** for the **Trunk type**.
5. Select **Crestron_ITSP** for the **Profile** (created in a previous section).
6. Click **SAVE**.
7. Click the **INBOUND** tab.
   ShoreTel Connect Director: Add Trunk Group - INBOUND



8. Enter **10** for the **Number of digits from CO** (for this example).
9. Check **DNS**.
10. Check **DID**.
11. Click the **OUTBOUND** tab.

ShoreTel Connect Director: Add Trunk Group - OUTBOUND

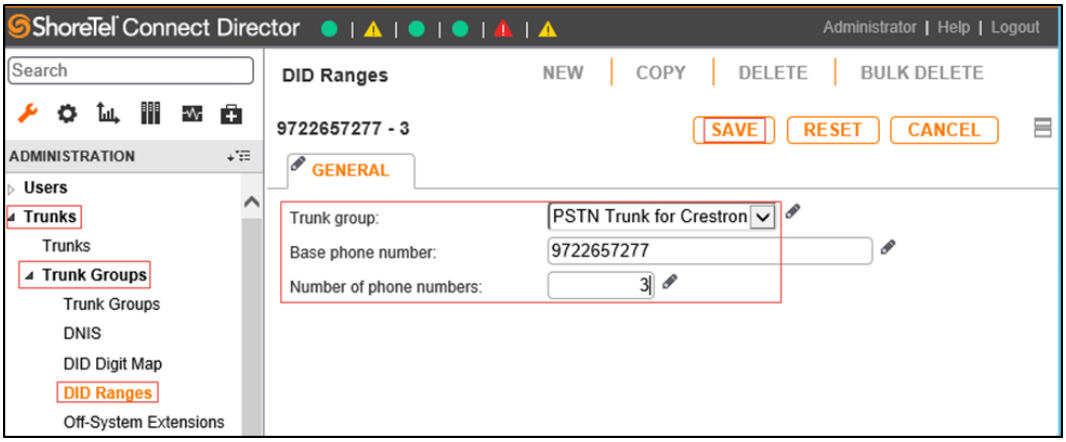


12. Check **Outgoing**.
13. Enter **9** for the **Access code** (for this example).
14. Enter **972** for the **Local area code** (for this example).
15. Enter any DID (Direct Inward Dialing) for the **Billing telephone number**. This is typically a billing number from the service provider. This example uses **(972)265-7277** even though it is not required.
16. Check **Caller ID not blocked by default**.
17. Uncheck **Dial 7 digits for local area code**.
18. Leave all other fields at the default values.
19. Click **SAVE**.

Configure DID Ranges

To configure the DID ranges:

1. Click **Trunks** > **Trunk Groups** > **DID Ranges**.
2. Click **NEW**.
   ShoreTel Connect Director: Configure DID Ranges

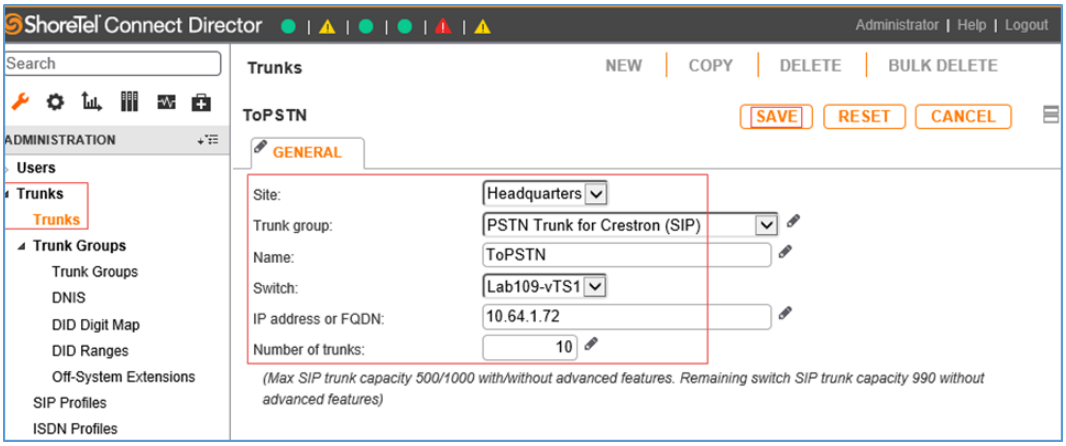


3. Select **PSTN Trunk for Crestron** for the **Trunk group** (for this example).
4. Enter **9722657277** for the **Base phone number** (for this example).
5. Enter **3** for the **Number of phone numbers** (for this example).
6. Click **SAVE**.

Configure Trunks

To configure trunks:

1. Click **Trunks** > **Trunks**.
2. Click **NEW**.
   ShoreTel Connect Director: Configure Trunks

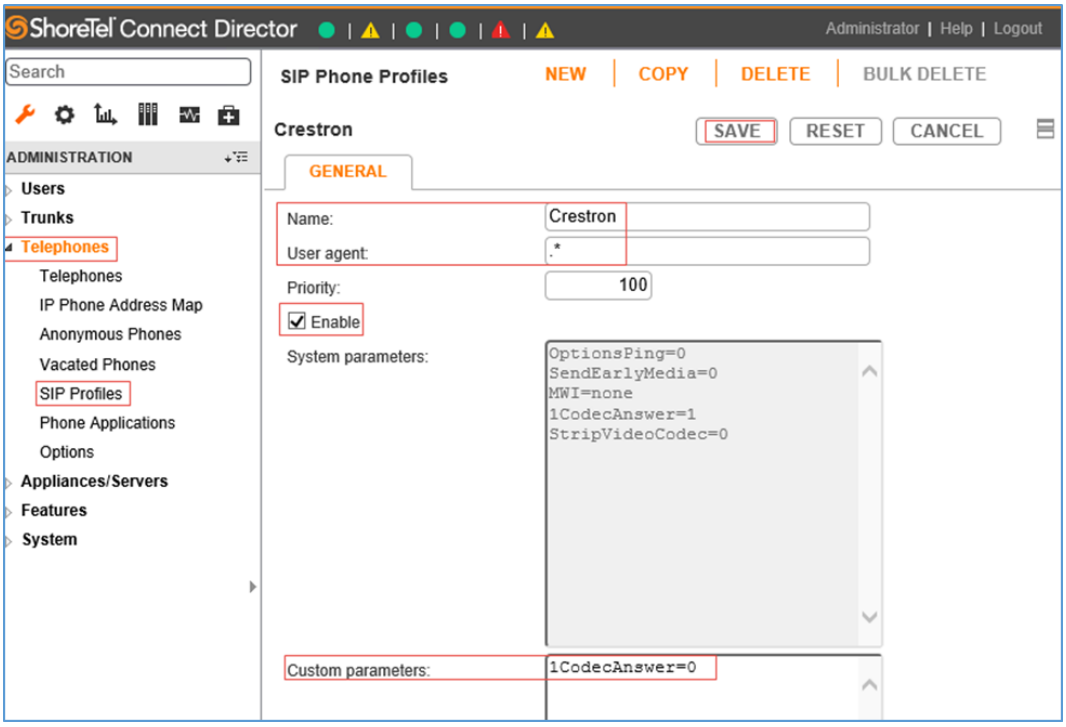


3. Select **Headquarters** for the **Site**.
4. Select **PSTN Trunk for Crestron (SIP)** for the **Trunk group**.
5. Enter **ToPSTN** for the **Name** (for this example).
6. Select **Lab109-vTS1** for the **Switch**.
7. Enter **10.64.1.72** (the LAN IP address of the PSTN gateway for this example) for the **IP address or FQDN**.
8. Enter **10** for the **Number of trunks**.
9. Click **SAVE**.

Configure a SIP Profile for Phones/Devices

To configure a SIP profile for phones/devices:

1. Click **Telephones** > **SIP Profiles**.
2. Click **NEW**.
   ShoreTel Connect Director: Configure SIP Profile for Phones/Devices



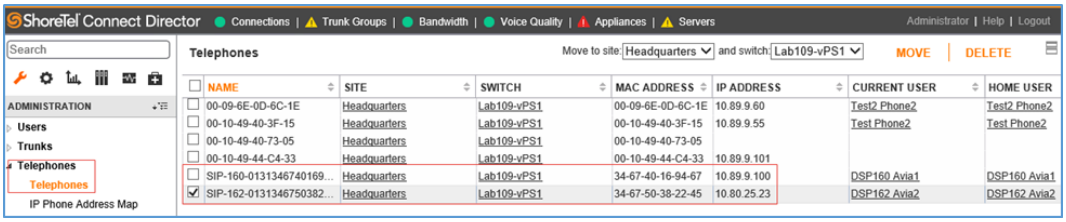
3. Enter **Crestron** for the **Name** (for this example).
4. Enter **.*** for the **User agent**.
5. Check **Enable**.
6. Select **1CodecAnswer=0** for the **Custom parameters** to enable mid-call codec negotiations to occur by offering multiple codecs (for this example).
7. Click **SAVE**.

Configure User for Each Device/Phone

For this example, configure a user for each phone and Crestron device. After basic network configuration on the DSP (such as the IP, mask, and default router), devices appear on the **Telephones** listing of the ShoreTel Director.

> **NOTE:** This example configures two Crestron Avia devices: one with a static IP (10.89.9.100) and the other with an IP acquired via DHCP (10.80.25.23).

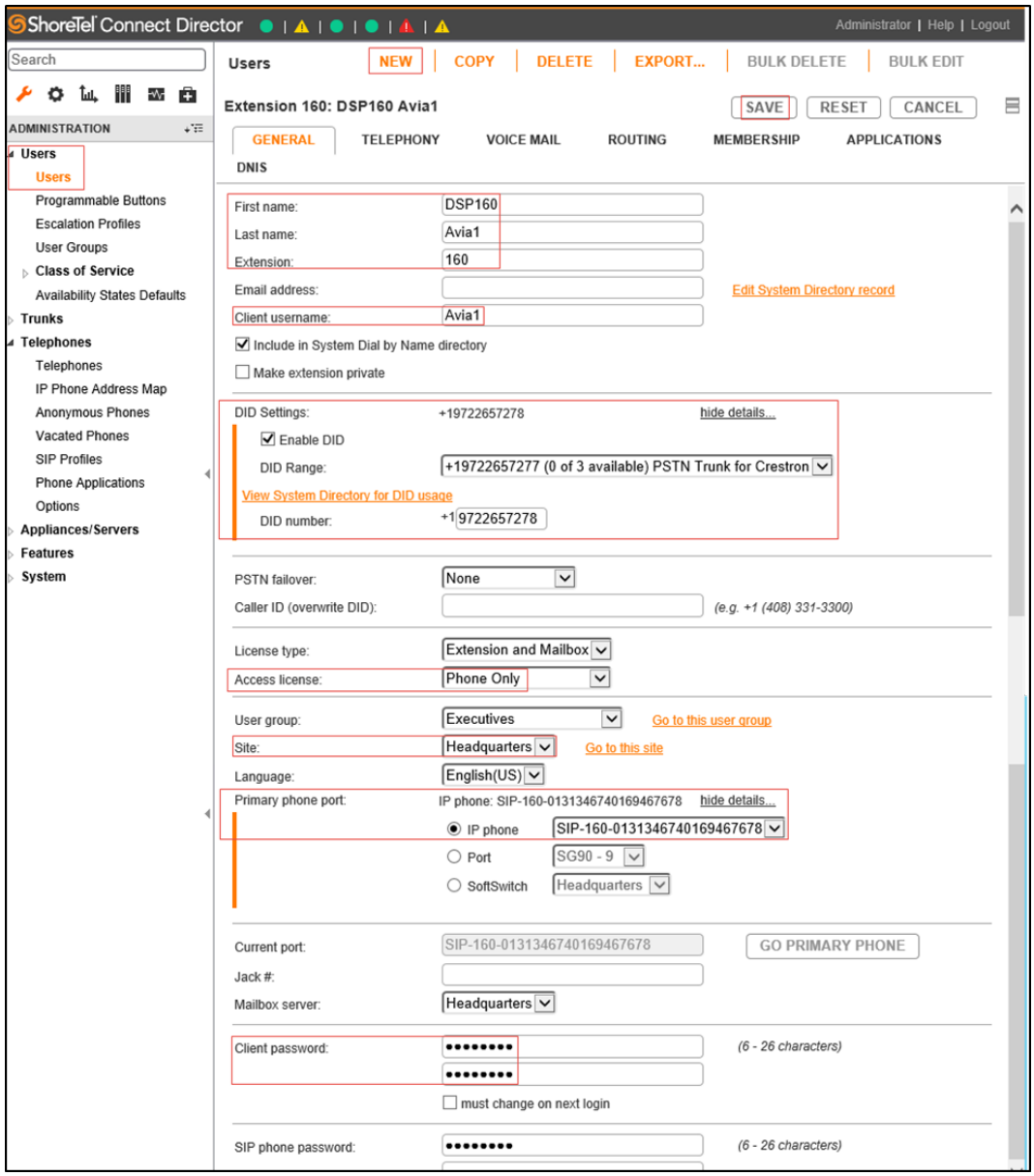
ShoreTel Connect Director: Telephones



To configure a user for each device/phone:

1. Click **Users** > **Users**.
2. Click **NEW**.

ShoreTel Connect Director: Configure User



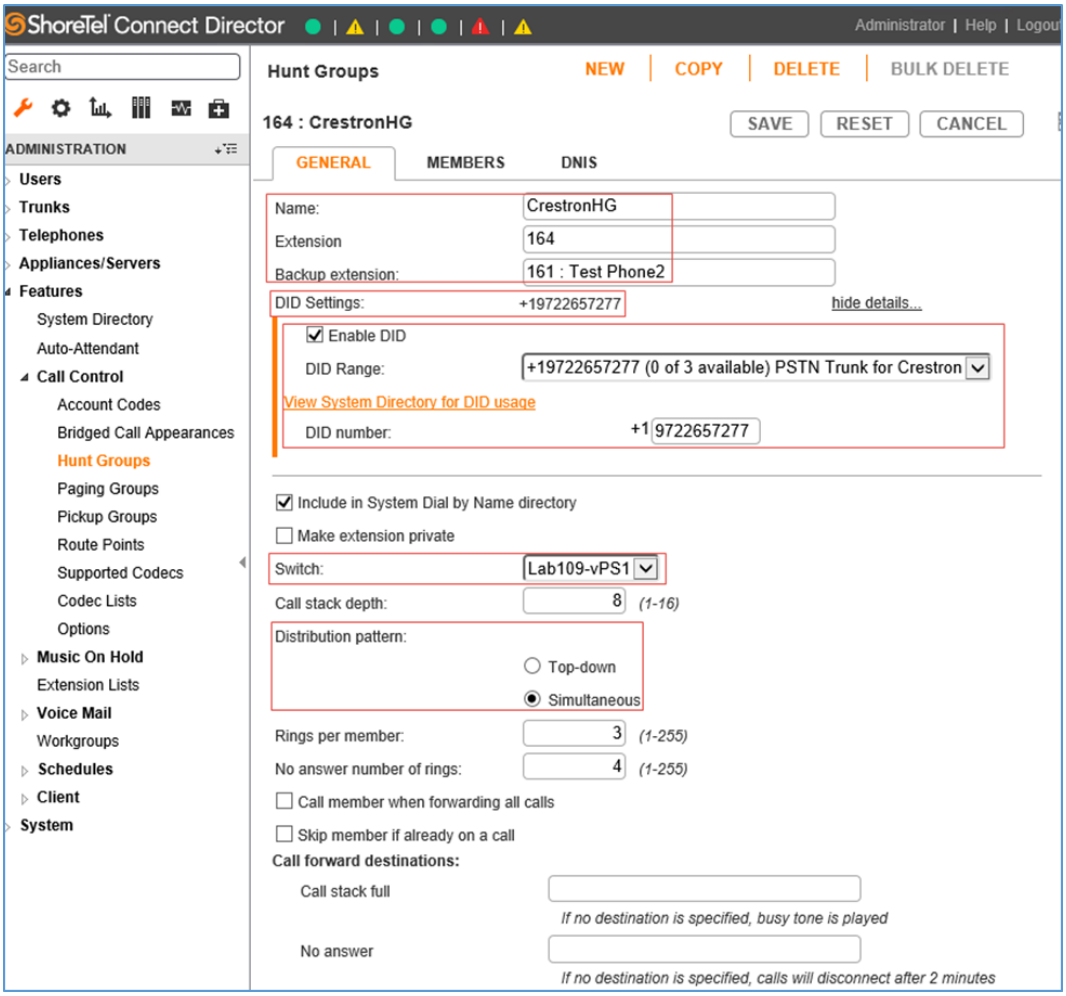
3. Enter **DSP160** for the **First name** (for this example).
4. Enter **Avia1** for the **Last name** (for this example).
5. Enter **160** for the **Extension** (for this example).
6. Enter **Avia1** (for this example, configured against the SIP server user name in the Avia DSP SIP configuration) for the **Client username**.

7. In the **DID Settings** section, do the following:
    a. Check **Enable DID**.
    b. Select the DID range corresponding to the PSTN trunk configured earlier for the **DID Range**.
    c. Enter the next available number in the DID range list for the **DID number**.
8. Select **Phone Only** for the **Access license** (for this example).
9. Check **IP phone** and select the desired device listed under **Telephones** for the **Primary phone port**.
10. Enter **123456** for the **Client password** (for this example).
11. Click **SAVE**.

Configure the Hunt Group

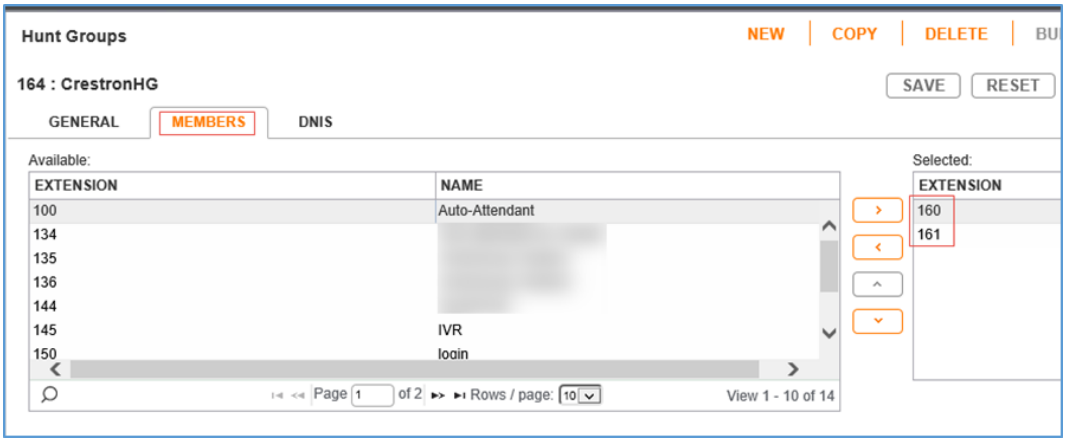
To configure the hunt group:

1. Click **Features** > **Call Control** > **Hunt Groups**.
2. Click **NEW**.
   ShoreTel Connect Director: Configure Hunt Group



3. Enter **CrestronHG** for the **Name** (for this example).
4. Enter **164** (the default extension provided from list of available numbers for this example) for the **Extension**.
5. Enter **161 : Test Phone2** for the **Backup extension**. (This can be any ShoreTel phone or Crestron device extension.)

6. In the **DID Settings** section, do the following:
    a. Click **Change Settings**.
    b. Check **Enable DID**.
    c. Select the DID range corresponding to the PSTN trunk configured earlier for the **DID Range**.
    d. Enter the next available number in the DID range list for the **DID number**.
7. Select **Lab109-vPS1** for the **Switch** (virtual phone switch, for this example).
8. Click **Simultaneous** for the **Distribution pattern**.
9. Leave all other fields at the default values.
10. Click the **MEMBERS** tab.
ShoreTel Connect Director: Configure Hunt Group Members



11. Transfer extensions that need to be part of the hunt group.
    a. In the **Available** list, select extensions **160** and **161** (for this example).
    b. Click **>** (between the two lists) to move the extensions to the **Selected** list.

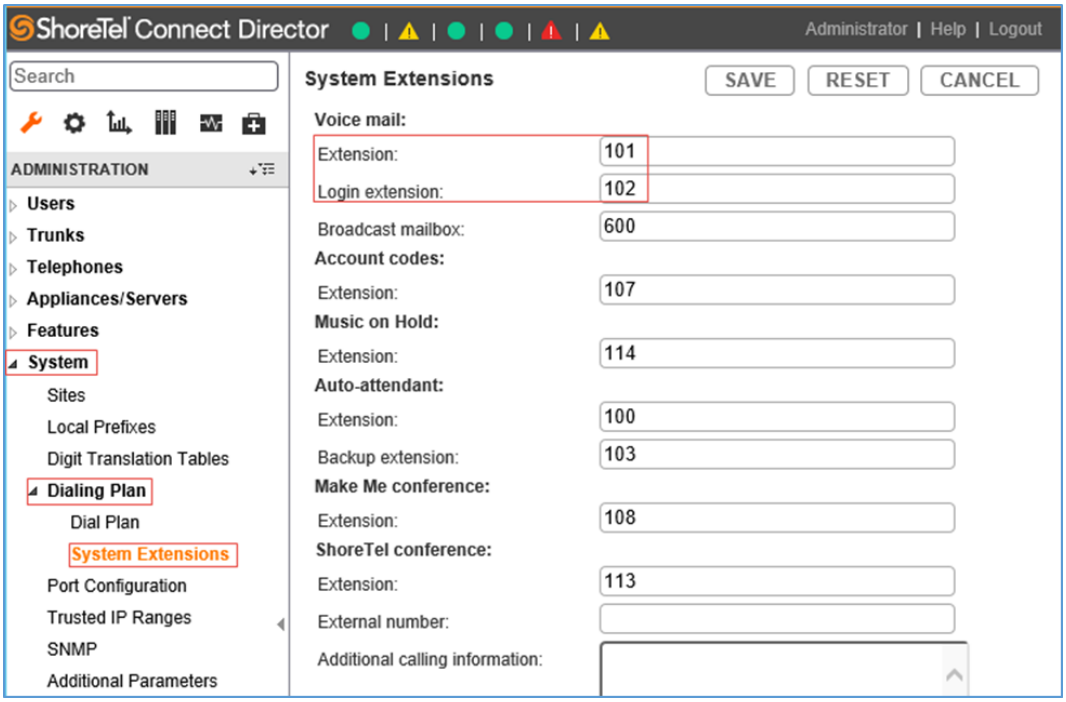
Configure Voice Mail Extensions

ShoreTel Connect has embedded voice mail.

To configure the voice mail extensions:

1. Click **System** > **Dialing Plan** > **System Extensions** > **Voice mail**.

ShoreTel Connect Director: Configure Voice Mail Extensions



2. Enter **101** for the **Extension** (for this example).
3. Enter **102** for the **Login extension** (for this example).
4. Click **SAVE**.

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Specifications subject to
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