CCS-UC-1

SIP Endpoint with Mitel® MiVoice Business System 8.0PR3

Configuration Guide

Crestron Electronics, Inc.

This document was written by the Technical Publications department at Crestron.

Contents

CCS-UC-1: SIP Endpoint with Mitel MiVoice Business System 8.0PR3

Introduction

This configuration guide describes the necessary procedure to configure the Crestron Mercury™ devices to register to the MiVoice Business (Mitel PBX) as a basic SIP endpoint.

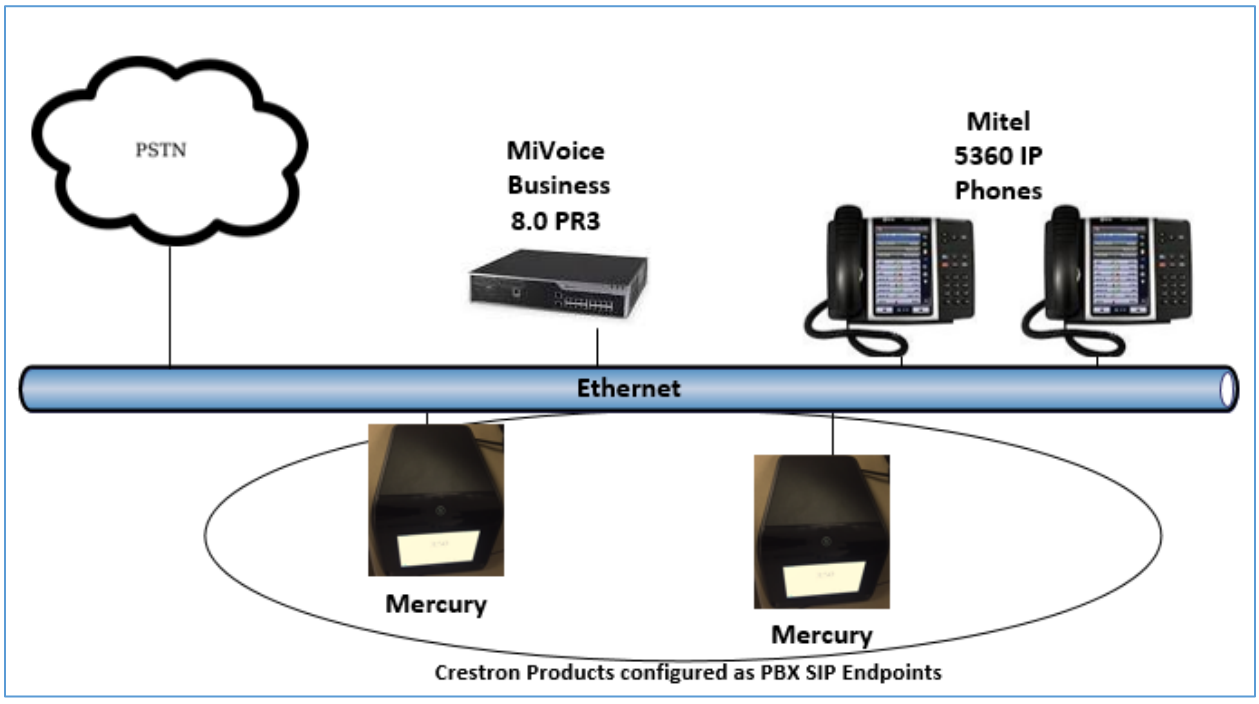
Audience

This document is intended for users attempting to configure and use the Crestron Mercury devices as SIP endpoints registering to MiVoice Business (Mitel PBX).

Topology

The network topology for the Crestron Mercury endpoint to interop with the MiVoice Business (Mitel PBX) is shown below.

SIP Endpoint Integration with MiVoice Business (Mitel PBX) - Reference Network



The lab network consists of the following components:

- Mitel PBX
- Mitel phones
- Crestron Mercury devices as the SIP endpoints

Software Requirements

- MiVoice Business (Mitel PBX): 8.0 PR3
- Crestron Mercury device v 1.3318.00019

Hardware Requirements

- MiVoice Business (Mitel PBX) either in a virtual environment or hardware server
- PSTN Gateway
- Mitel IP phone model 5360
- 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 integrate microphones and speakers 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 are configured on the Mitel as SIP users that successfully register to the Mitel PBX with digest authentication.

Features Supported

- Registration with digest authentication
- Basic calls with G711u ,G711a, G722, and G729 codecs
- DTMF support
- Early media support
- Retrieval of a parked call
- Transferee in a call transfer
- Conference participant
- Member of hunt group
- Voice mail access and interaction

Features Not Supported

- Caller ID presentation
- Call hold and resume
- Call forwarding on the device (Forwarding can be configured on the PBX for the DN assigned to the endpoint.)
- Call waiting
- Conference
- Attended call transfer
- Early attended call transfer
- Blind call transfer
- Shared line (configuration of shared line on device)
- Call park (Initiating call park)
- Message waiting Indicator
- Do Not Disturb (DND)

Known Issues and Limitations

- While on an active call, if the Crestron Mercury device is power cycled, the first call to the device fails even though it is online. The subsequent calls, however, are successful. This issue is tracked via Crestron's Bugzilla™ software Defect: 126101.
- In a Mitel environment, a call declined by Crestron Mercury device doesn't provide appropriate treatment to the calling party. This issue is tracked via Crestron's Bugzilla software Defect: 127043.
- Caller ID is not supported on the Crestron Mercury device. Currently only the calling party number is displayed as the caller ID. This issue is tracked via Crestron's Bugzilla software Defect: 119006.
- The active call timer on the Crestron Mercury device does not reflect the correct call duration. The active call duration includes the time for which the unit was being alerted also. This issue is tracked via Crestron's Bugzilla software Defect: 124001.
- The first ringback heard on the Crestron Mercury device is stuttered. It resembles a mix of local and remote ringback. This issue is tracked via Crestron's Bugzilla software Defect: 122421.
- On the Crestron Mercury web user interface, there is currently no notification provided to the user when certain mandatory configurations are missing. This issue is tracked via Crestron's Bugzilla software Defect: 125193.
- On the Crestron Mercury web user interface, a configuration of DHCP OFF on the Network configuration page mandates configuration of both the adapters. The user is unable to save changes unless both the adapters are configured and is notified of an invalid IP against the default of 0.0.0.0 for an unused adapter. This issue is tracked via Crestron's Bugzilla software Defect: 126236.
- On the Crestron Mercury device, for certain called numbers that cannot be reached or are invalid, the user only hears a reorder tone and does not have the option to disconnect the call except by pressing the call button again. This issue is tracked via Crestron's Bugzilla software Defect: 122633.

- Message Waiting Indicator (MWI) is not supported on the Crestron Mercury device. This issue is tracked via Crestron's Bugzilla software Defect: 116290.

Crestron Mercury Configuration

Setup

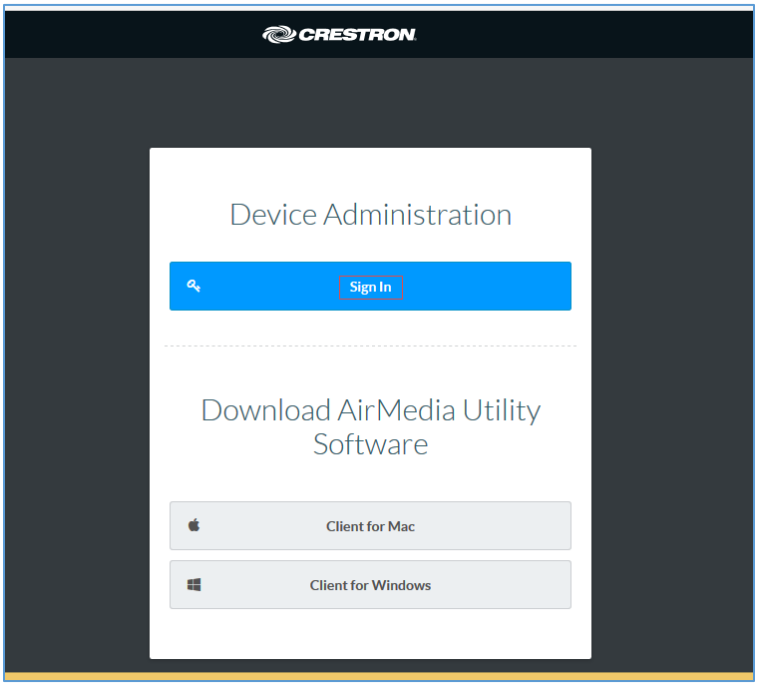
The LAN port of the Crestron Mercury device needs to be connected to one PoE+ port to power it up and network for connectivity with the Mitel PBX. The PoE+ switch that is used should have the LLDP functionality enabled for the device to power up and be completely functional. By default, the "poeplus"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

Configuring 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 *10.35.32.18*.

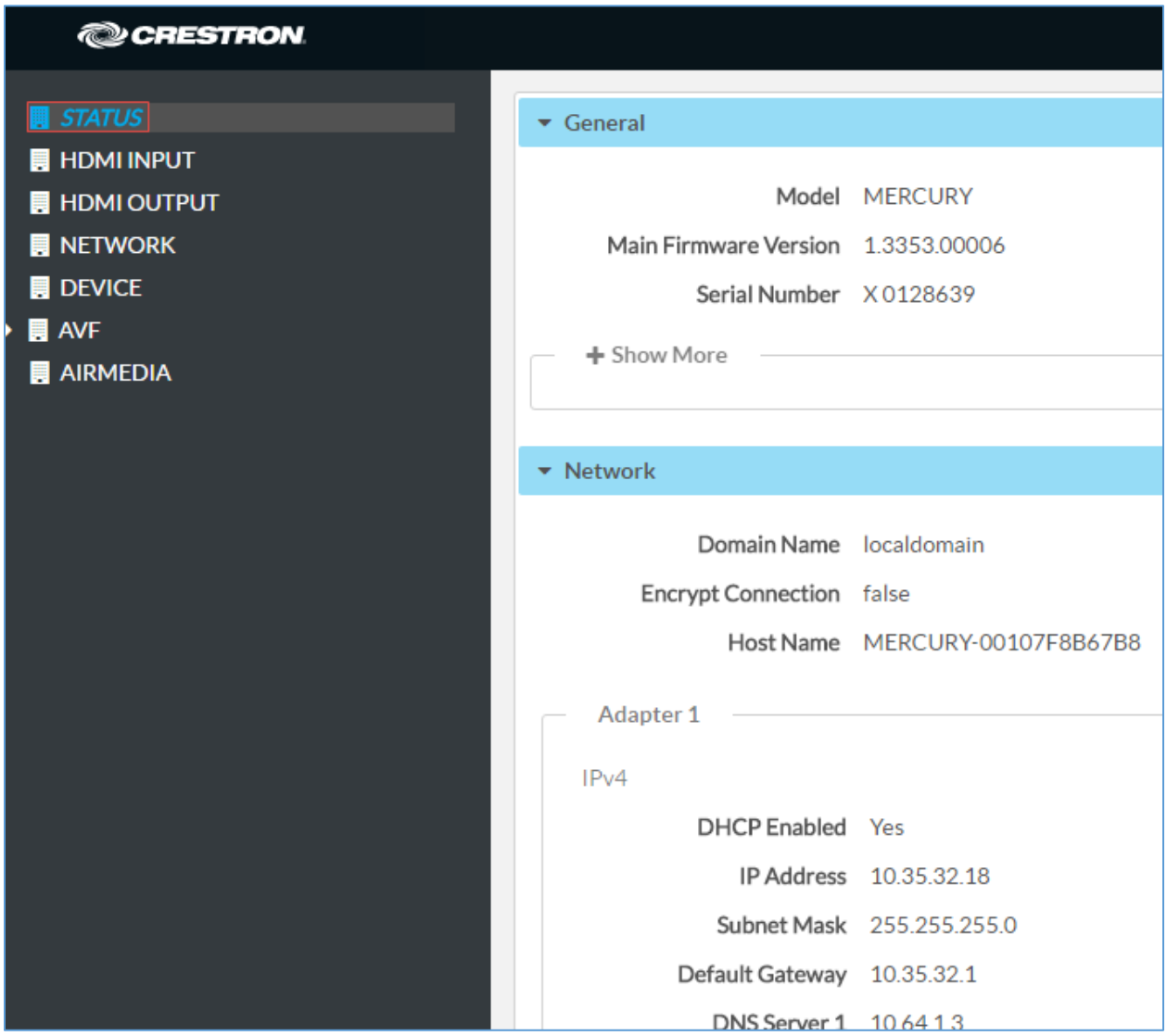
   Crestron Mercury Configuration: Login to Web GUI



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.

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

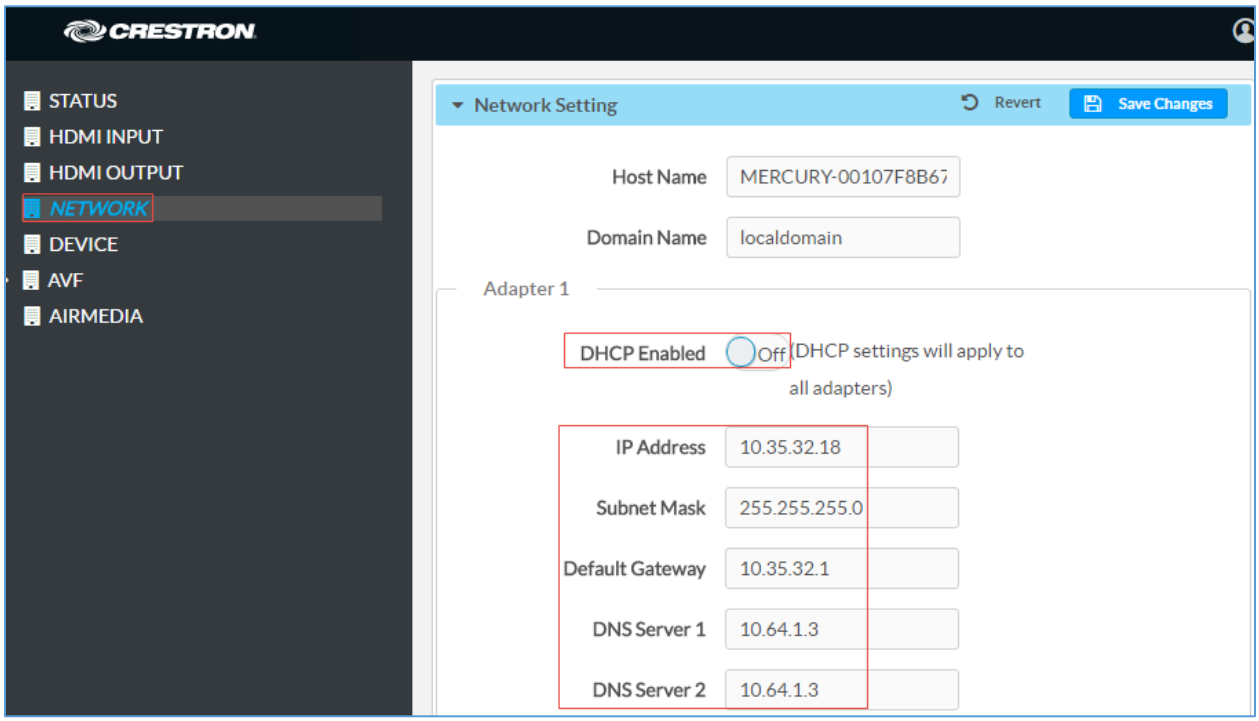
Crestron Mercury: Status



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**: *lab.tekvizion.com* was used in this example.
   - **DHCP**: Choose either of the following:
     - Obtain an IP address automatically.
     - Use the following IP address.

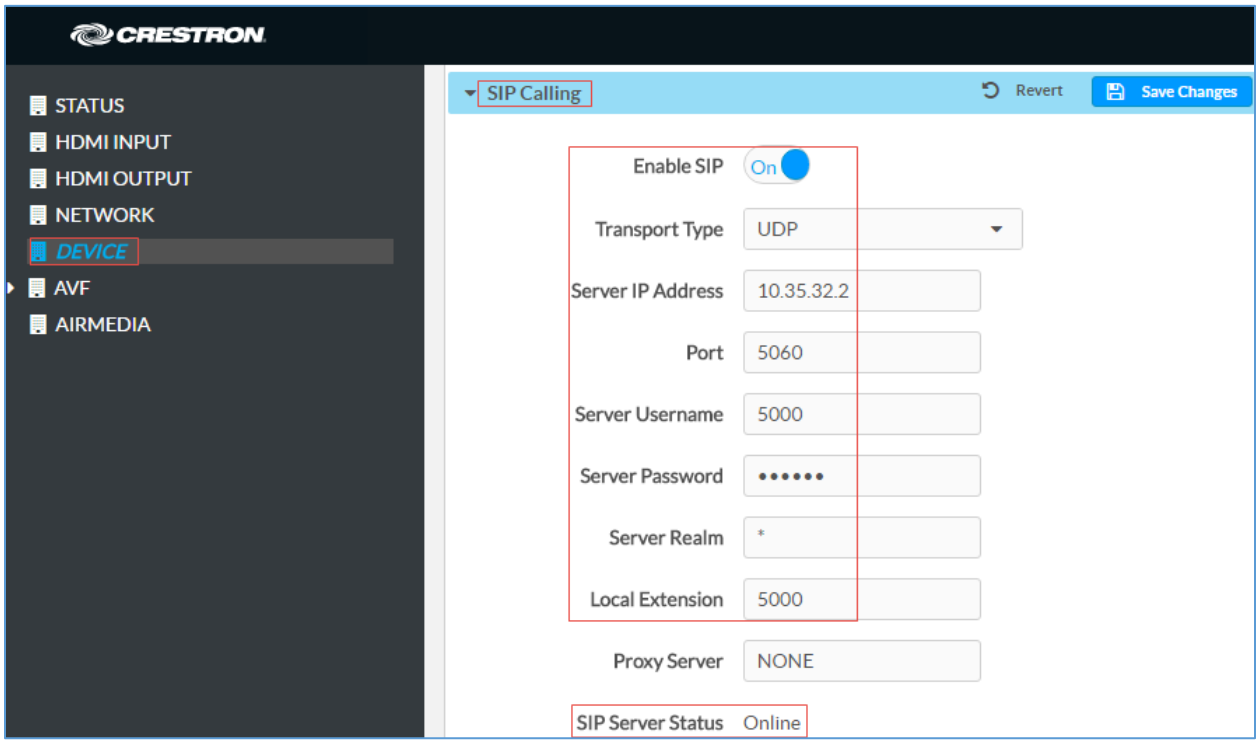
       For this example, a static IP was configured-
       - **IP Address**: *10.35.32.18* was used in this example.
       - **Subnet Mask**: *255.255.255.0* was used in this example.
       - **Default Gateway**: *10.35.32.1* was used in this example.
       - **DNS Servers**: *10.64.1.3* was used in this example.
5. Click **Save Changes**.

Configuring the SIP Parameters

To configure the SIP parameters, follow this procedure:

1. On the web GUI, navigate to **Device** > **SIP Calling**.

Crestron Mercury: Device Configuration: SIP Calling Parameters



2. Enable the check box for **Enable SIP**.
3. Configure the **Server IP Address**. Enter the IP Address of the MiVoice Business (Mitel PBX). *10.35.32.2* was used in this example.
4. Configure the **Port**. *5060* was used in this example.
5. Configure the **Server Username**. Enter the end user configured on MiVoice Business (Mitel PBX) for this device. *5000* (and *5005*) was used in this example.
6. Configure the **Server Password**. Enter the password as configured on MiVoice Business (Mitel PBX) for this end user.
7. Configure the **Local Extension**. Enter the directory number that was configured for this device on MiVoice Business (Mitel PBX). 5000 (and 5005) was used in this example.
8. Retain all other default configurations.
9. Click **Save Changes**.

Once the device successfully registers with the Mitel PBX, the **SIP Server Status** updates its status to show *Online*.

Mitel Configuration

This section describes the configuration necessary on the MiVoice Business system (Mitel PBX) to support registration of the Crestron Mercury devices and connectivity to PSTN.

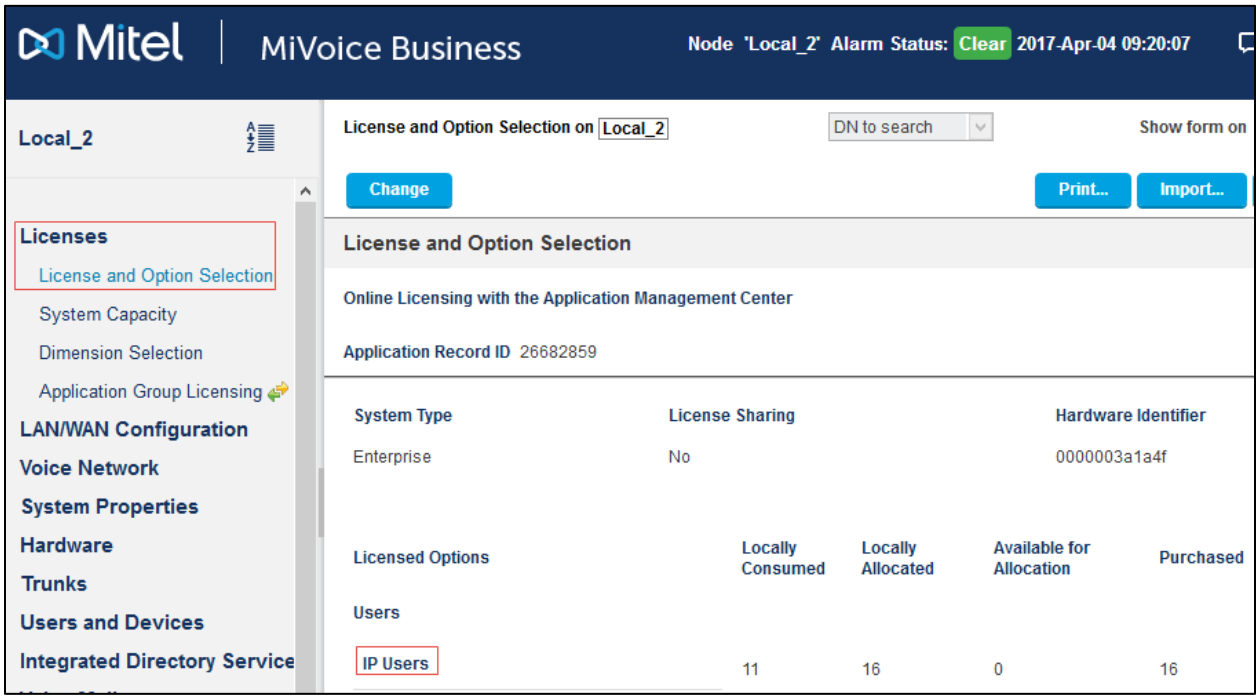
NOTE: It is assumed that the general installation and basic Mitel configuration have already been administered.

Verify Licenses

Ensure that adequate licenses are available in the MiVoice Business system to support the Mitel Phones and Crestron Devices.

To verify that licenses are available, navigate to Licenses > License and Option Selection in the MiVoice Business controller. Each Crestron device will consume one IP Users license.

Mitel: License Verification

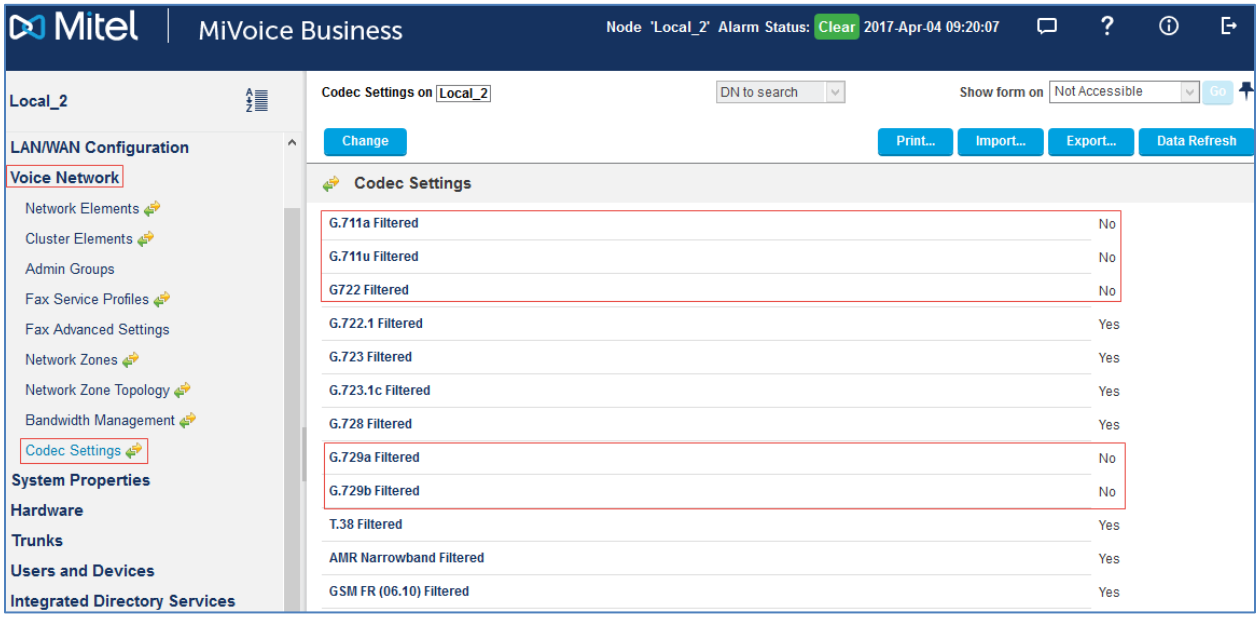


Configure Codec Settings and Network Zones

Codec Settings are configured to allow the G711u, G711A, G722, and G729 codecs to be negotiated during this example. To change the codec settings, follow this procedure:

1. Navigate to **Voice Network** > **Codec Settings**.
2. Configure the Codec filtering.

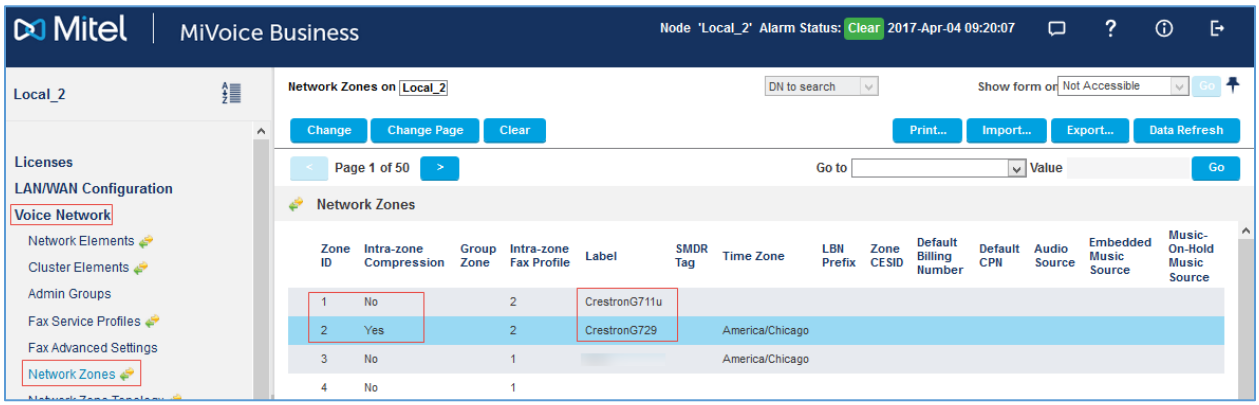
Mitel: Codec Settings



Network Zones 1 and 2 were configured to offer preferred codecs as G711u and G729 respectively.

3. Navigate to **Voice Network** > **Network Zones**.

Mitel: Configure Network Zones



4. Select a zone to modify: *2* was used for this example.
5. Set the **Intra-zone compression** to *Yes*.

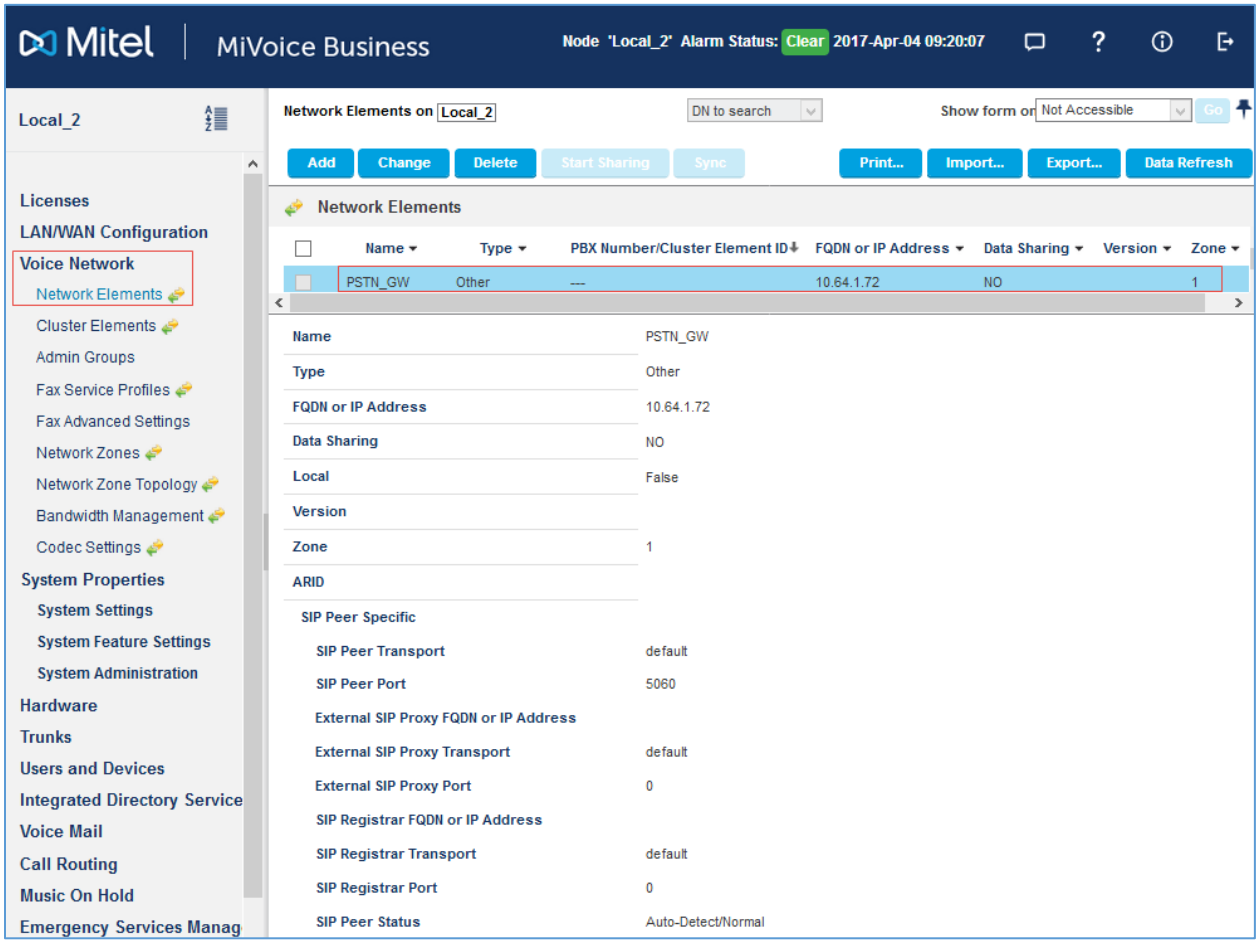
NOTE: Zone 2 was used when G729 was required as the preferred codec. By default, Zone 1 was used, which negotiated G711u as the preferred codec.

Configure Network Element

Create a network element for the PSTN GW. This is done in the Network Element assignment form.

1. Navigate to **Voice Network** > **Network Elements**.
2. Click **Add**.

Mitel: Configure Network Elements



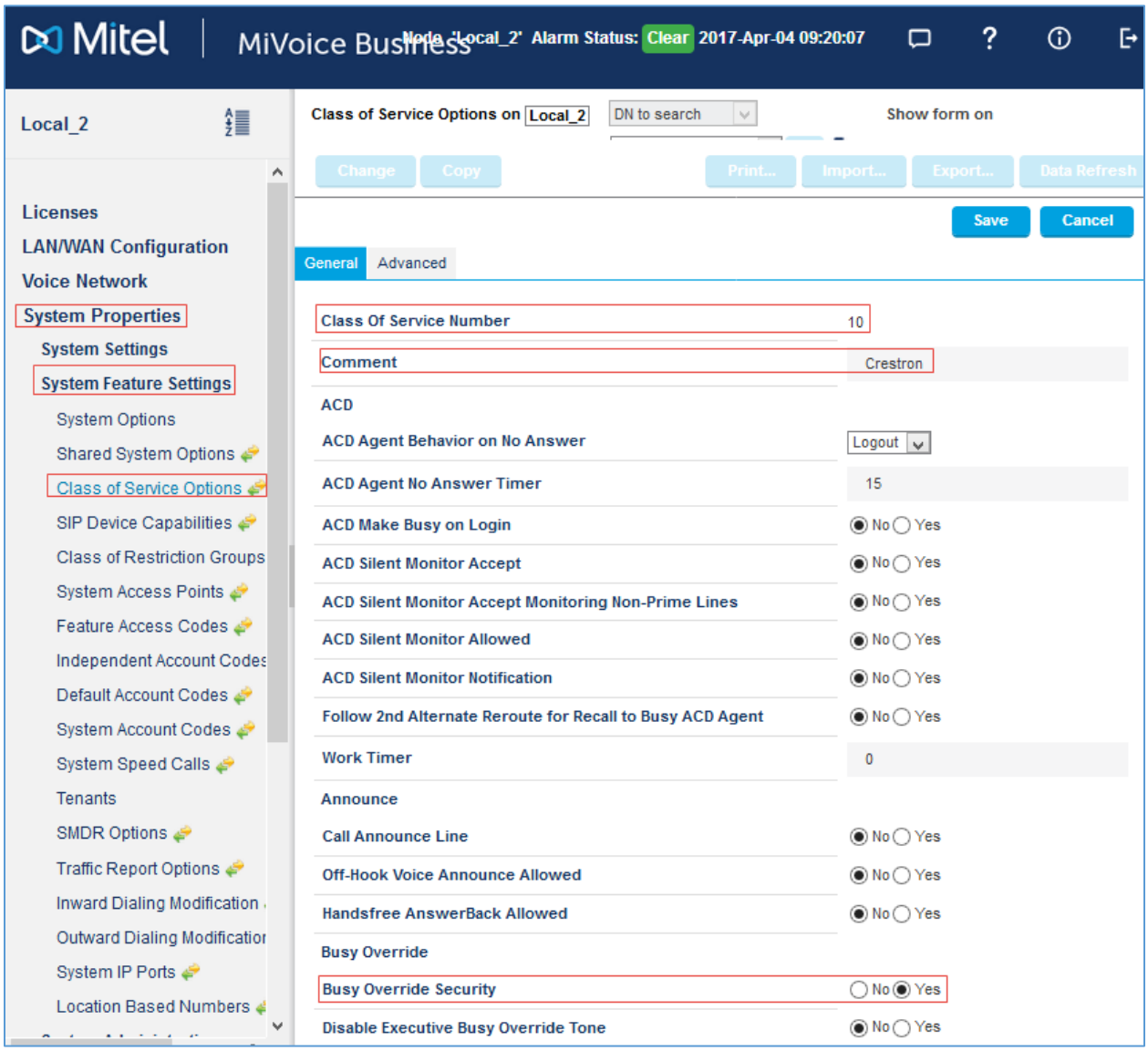
3. Set **Name**. *PSTN_GW* was used in this example.
4. Set **Type**: *Other*.
5. Set **FQDN or IP Address**: *10.64.1.72* was used in this example. This is the IP address of the PSTN GW.
6. Set **Zone**: *1* was used in this example. This setting ensures a codec of G711. To change it to G729, modify the network zone to *2*.
7. Check the **SIP Peer** check box.
8. Set the **SIP Peer Transport**: *Default* was used in this example.
9. Set the **SIP Peer Port**: *5060* was used in this example.
10. Retain all other default configurations.
11. Click **Save**.

Configure Class of Service

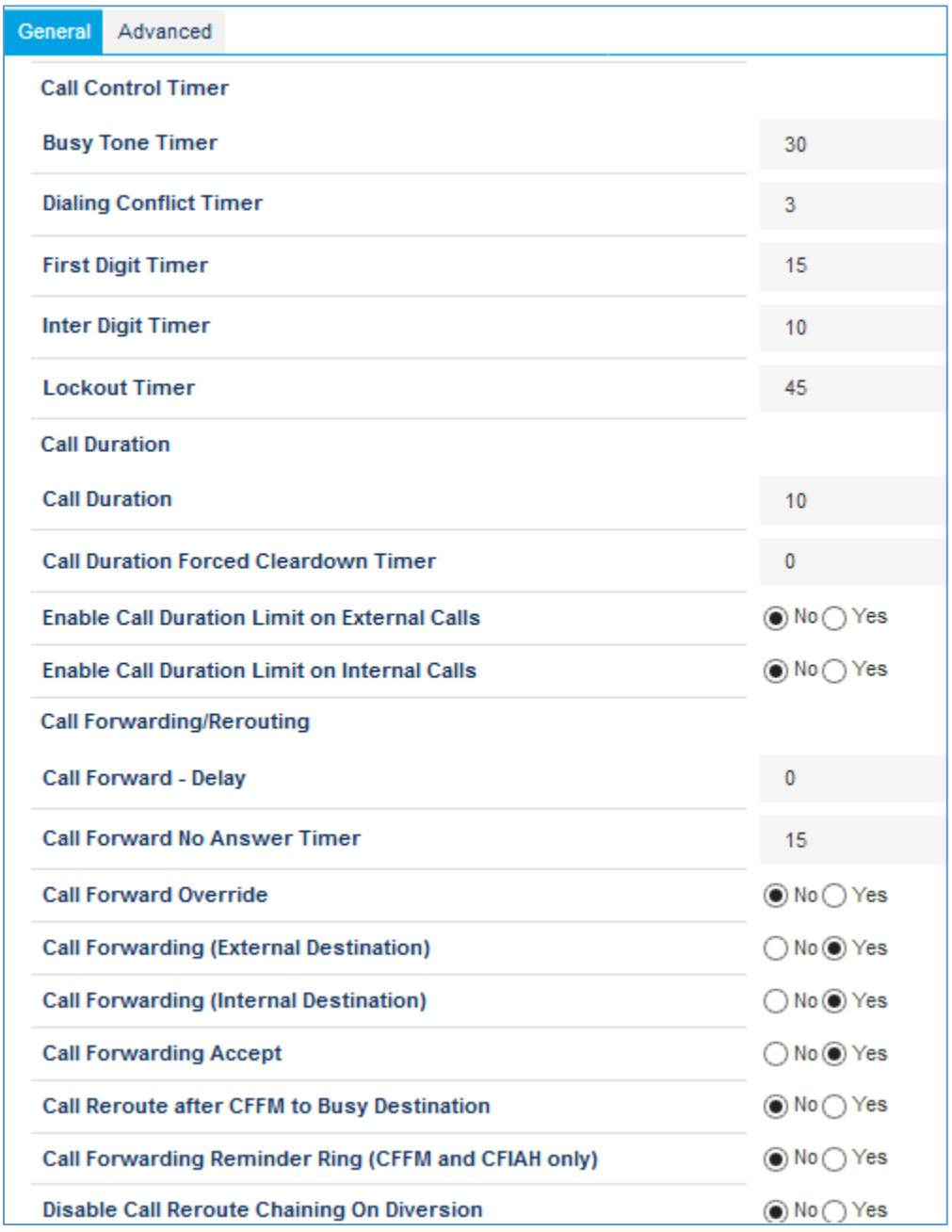
To configure the class of service, follow this procedure:

1. Navigate to **System Properties** > **System Feature Settings** > **Class of Service Options**.

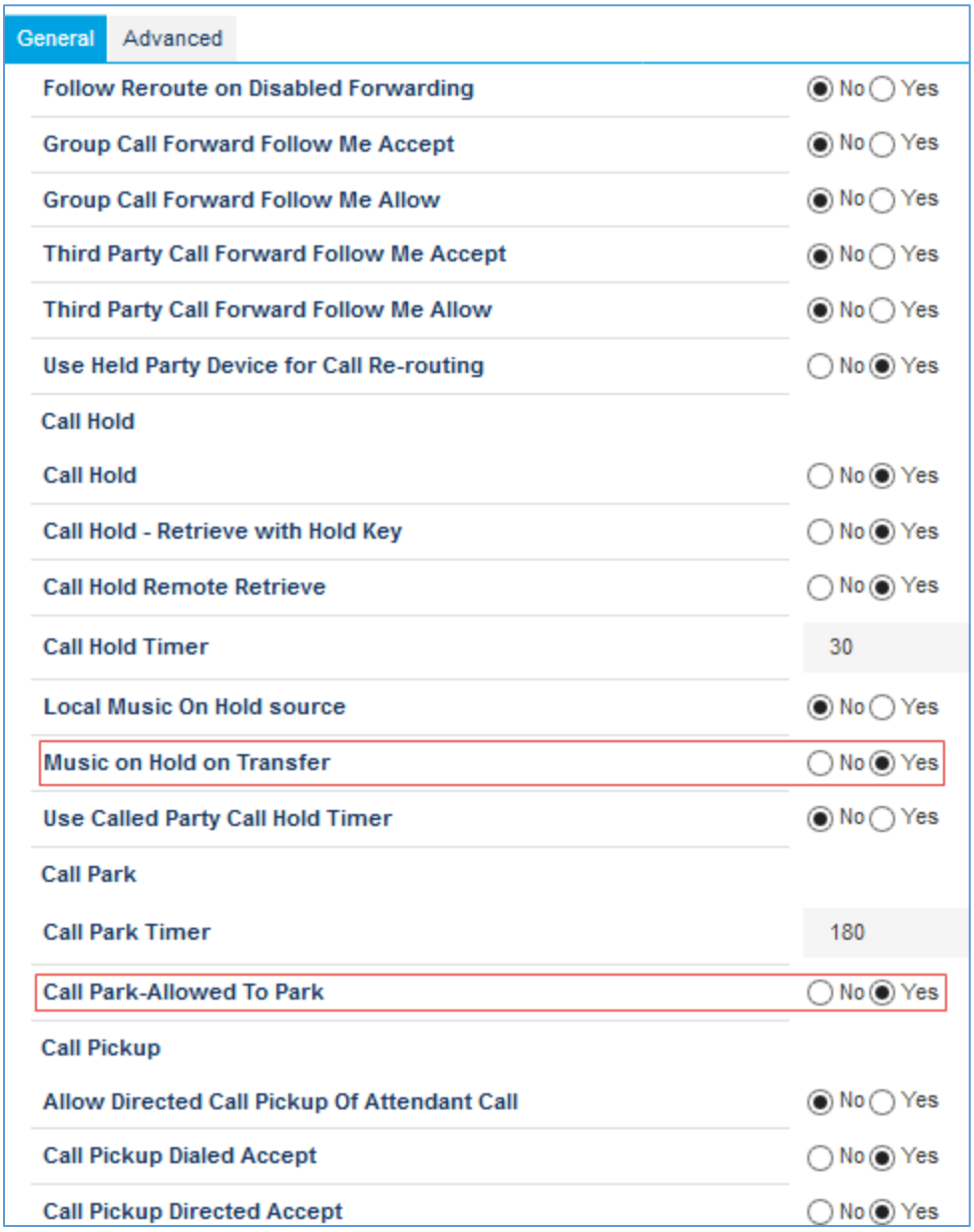
Mitel: Class of Service Options (1/9)



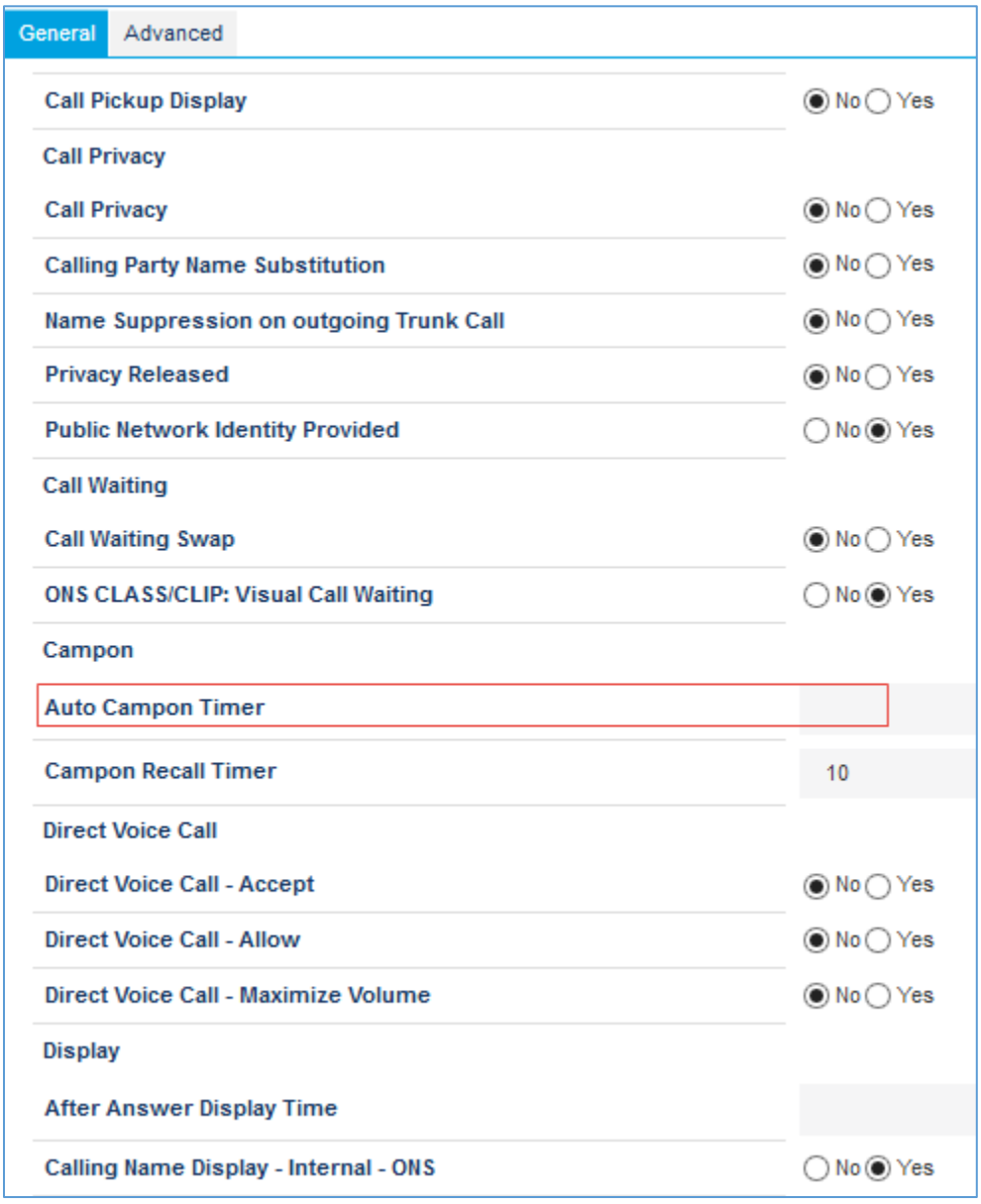
Mitel: Class of Service Options (2/9)



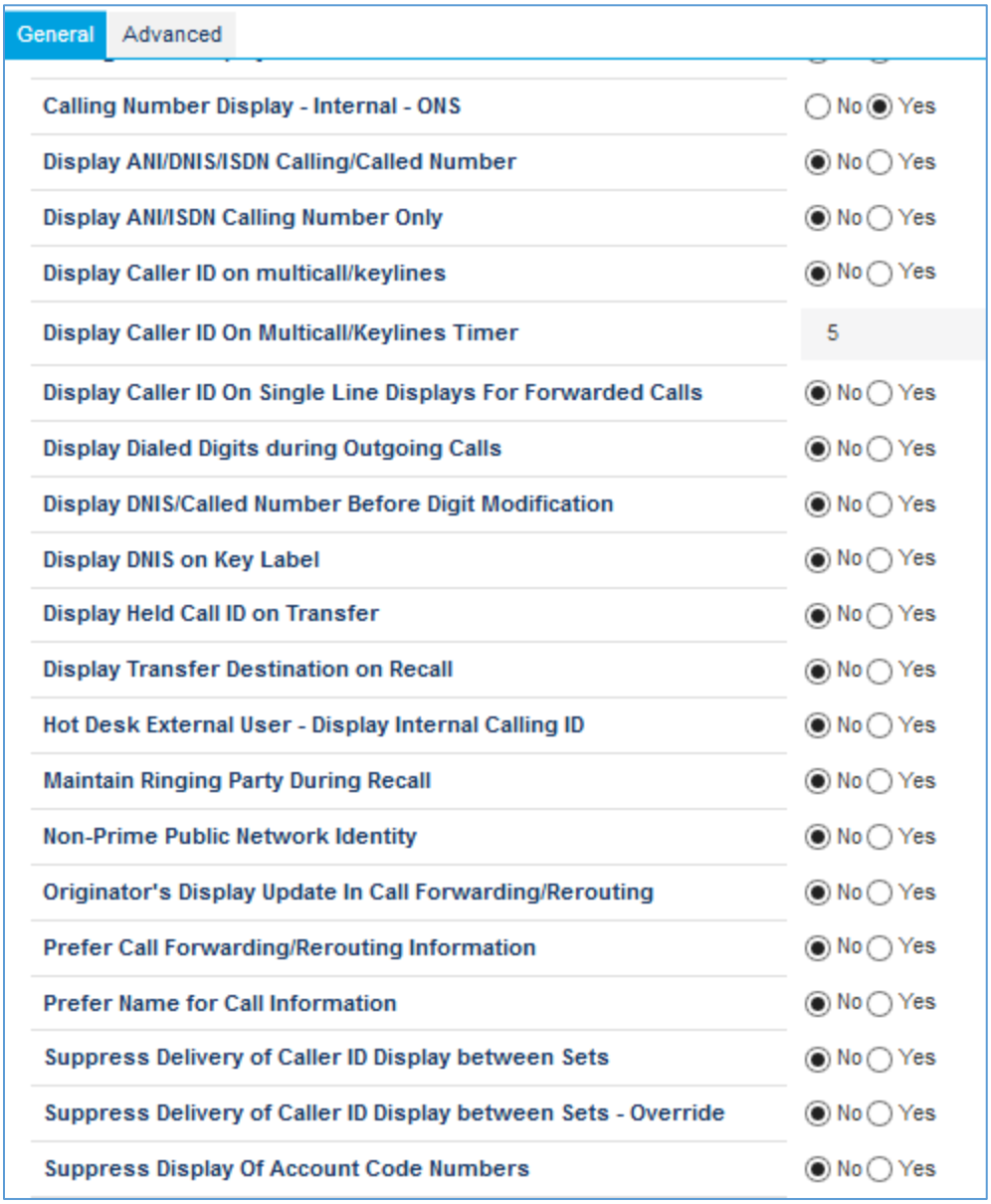
Mitel: Class of Service Options (3/9)



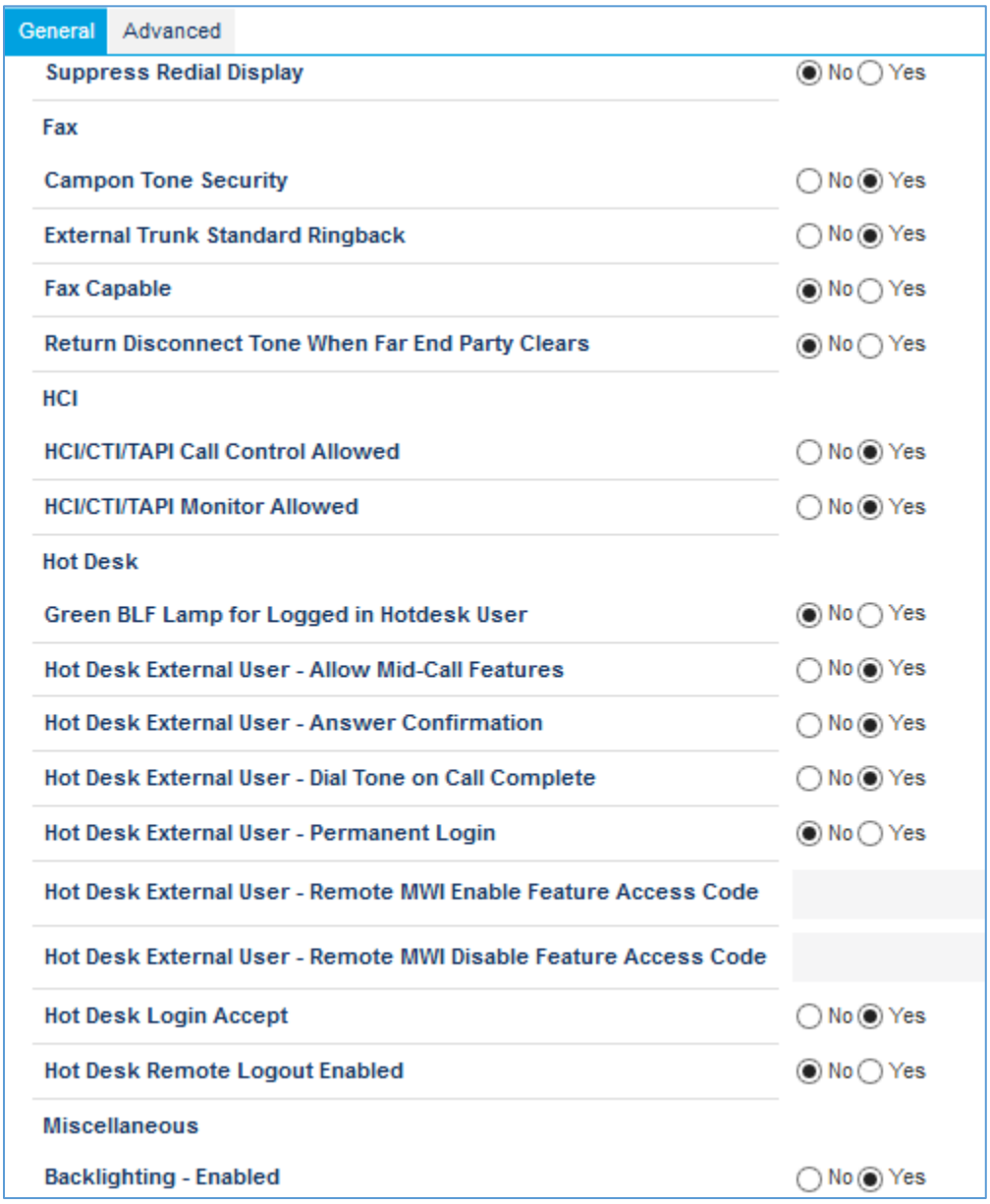
Mitel: Class of Service Options (4/9)



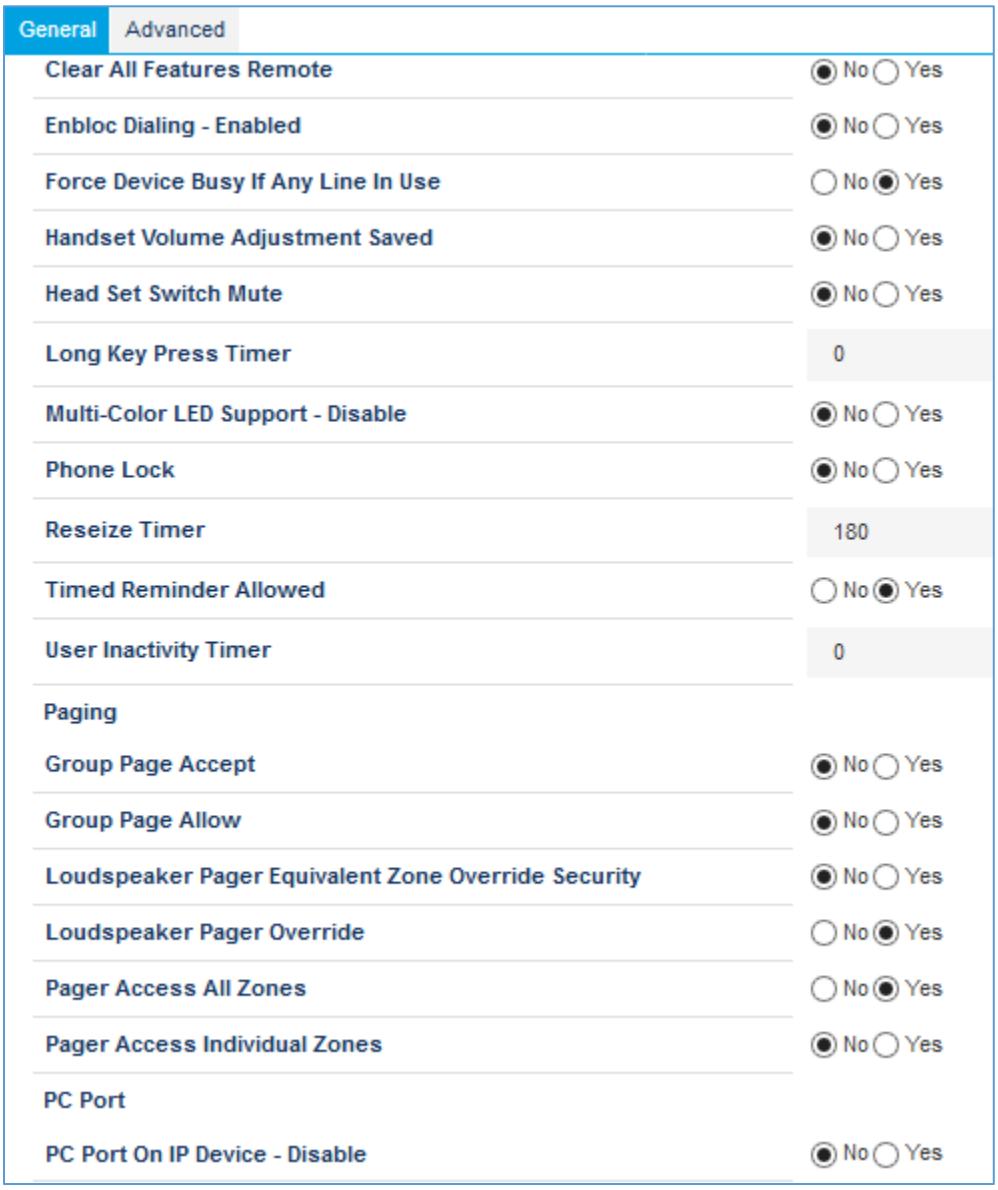
Mitel: Class of Service Options (5/9)



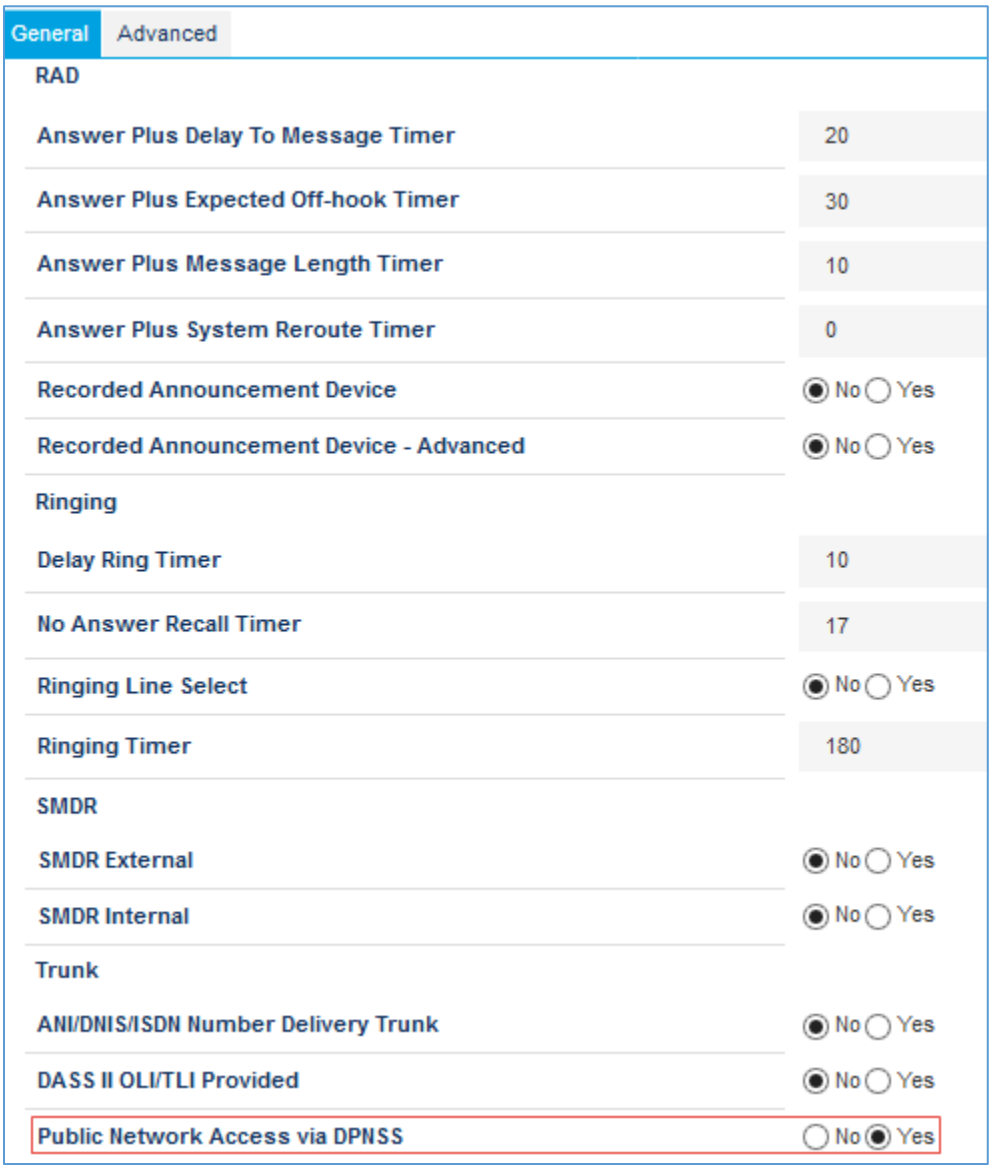
Mitel: Class of Service Options (6/9)



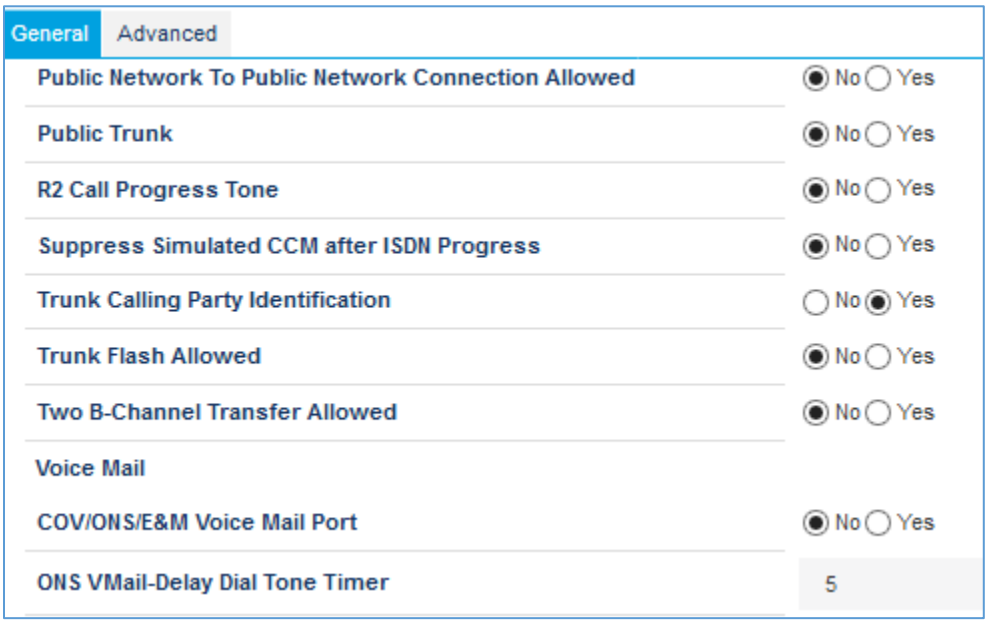
Mitel: Class of Service Options (7/9)



Mitel: Class of Service Options (8/9)



Mitel: Class of Service Options (9/9)



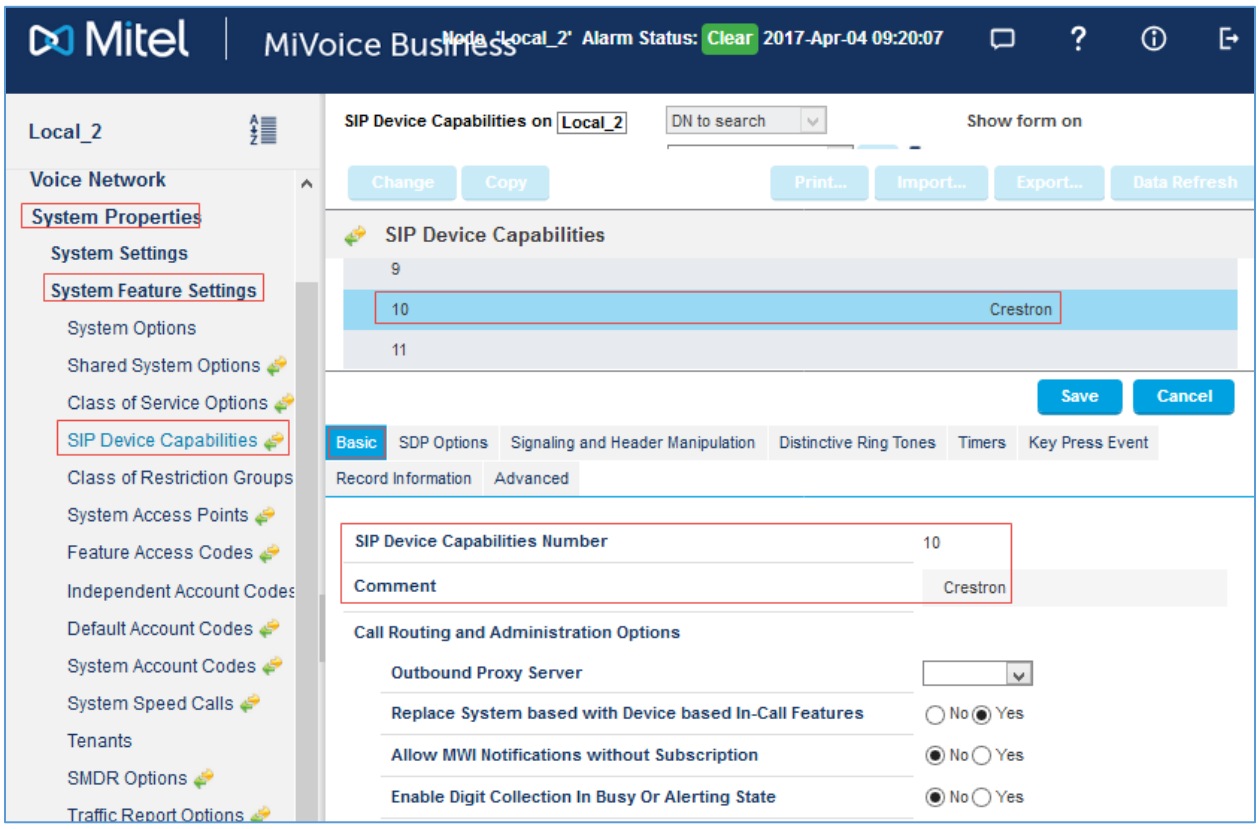
2. Select the Class of Service number: *10* was used in this example.
3. Click Change.
4. In the General tab, change the following options:
   - Public Network Access via DPNSS: Select *Yes.*
   - Auto Campon Timer: Clear the value.
   - Busy Override Security: Select *Yes.*
   - Call Park- Allowed to Park: Select *Yes.*
   - Music on Hold on transfer: Select *Yes.*
5. Retain all other default configurations.
6. Click Save.

Configure SIP Device Capabilities

The SIP Device Capabilities form allows customization of the features and options that the Mitel MiVoice System uses and accepts when communicating with the Crestron Mercury devices. To configure the SIP device capabilities, follow this procedure.

1. Navigate to **System Properties** > **System Feature Settings** > **SIP Device Capabilities**.
2. Select **SIP Device Capabilities:** *10.*
3. Click **Change**.
4. Configure the **Basic** tab:

Mitel: SIP Device Capabilities: Basic Tab



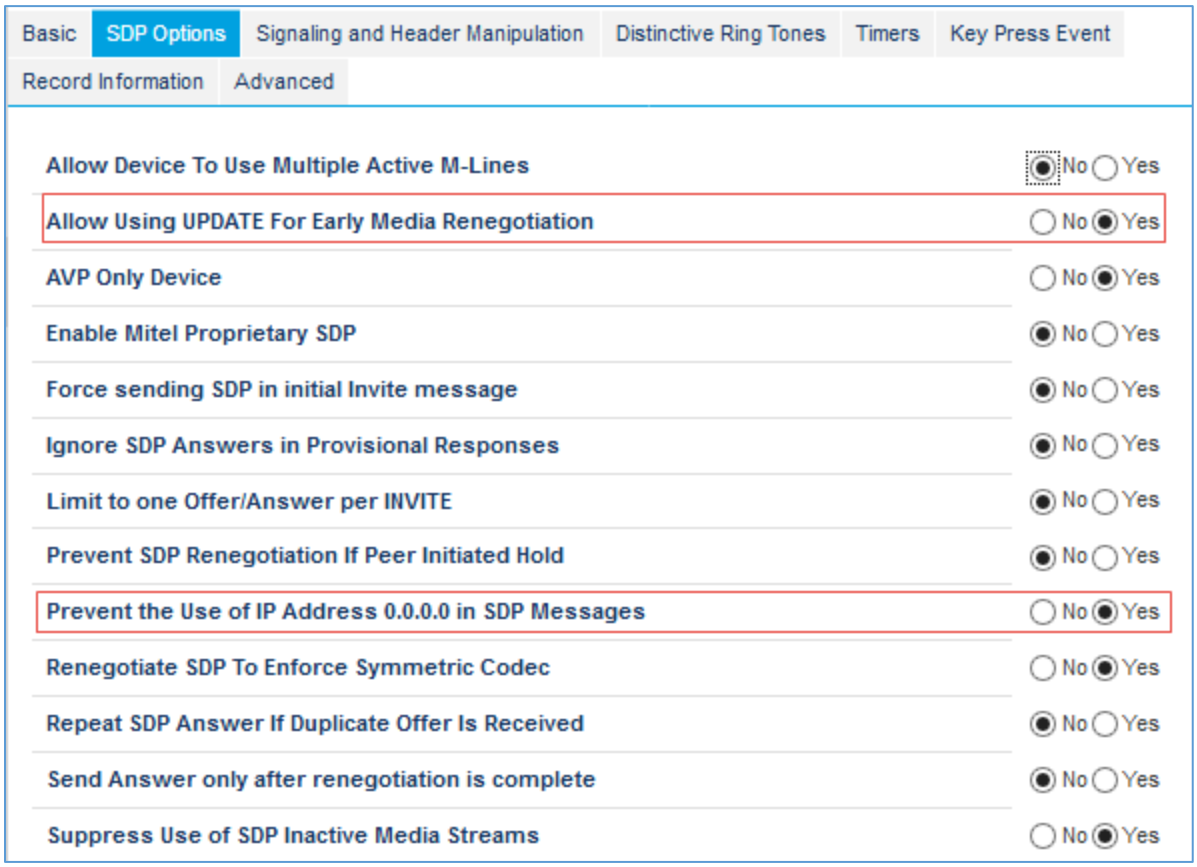
a. Configure **Comment**: Provide any name. *Crestron* was used in this example.

b. Set the **Replace System based with Device based In-Call Features**: *Yes*.

c. Retain all other default configurations.

5. Configure the **SDP Options** tab:

Mitel: SIP Device Capabilities: SDP Options Tab



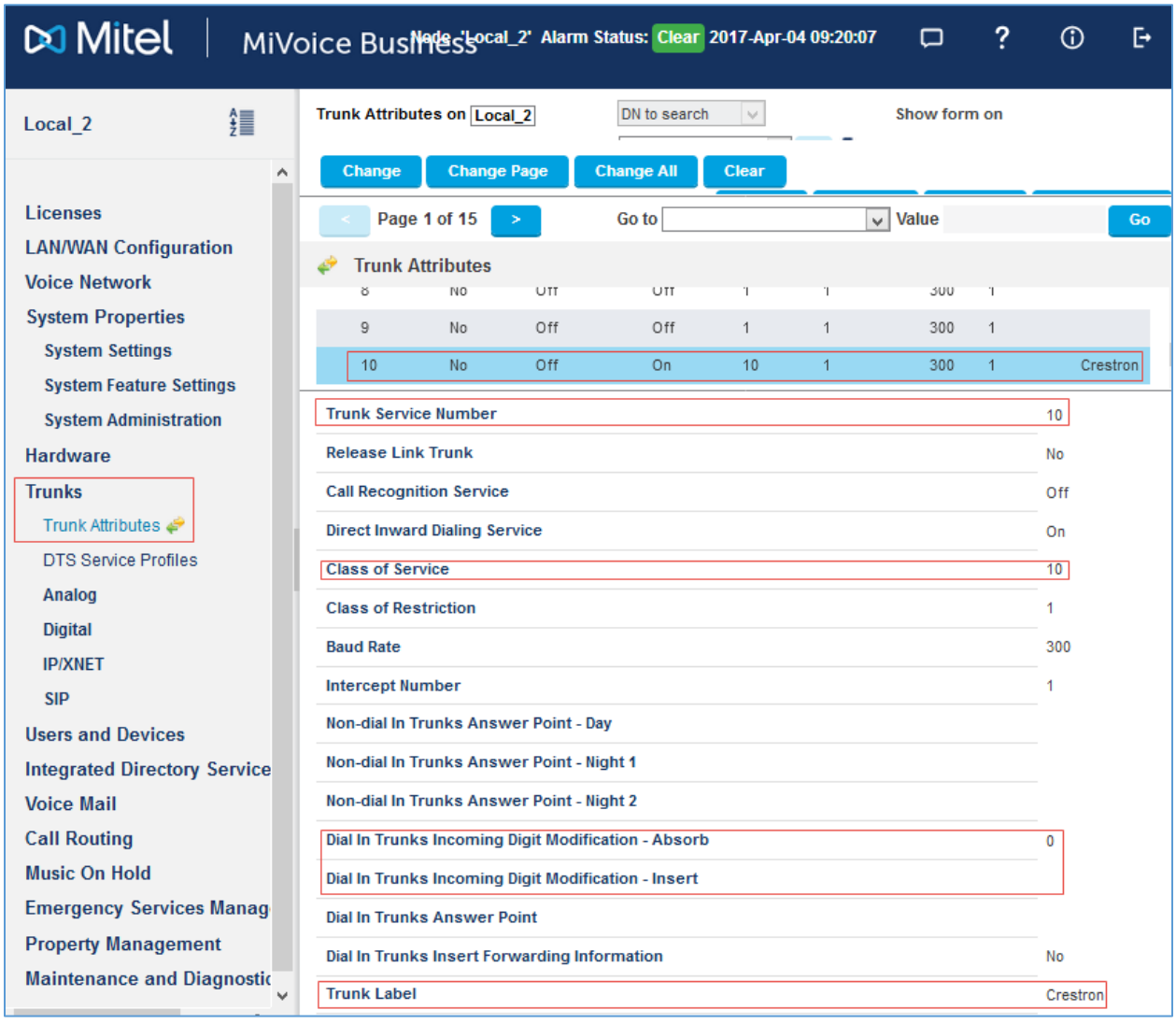
   a. Set the **Allow Using UPDATE for Early Media Renegotiation**: *Yes.*
   b. Set the **Prevent the Use of IP Address 0.0.0.0 in SDP Messages**: *Yes.*
   c. Set the **Renegotiate SDP to Enforce Symmetric Codec**: *Yes.*
6. Retain all other default configurations.
7. Click **Save**.

Configure Trunk Attributes

Trunk attributes must be defined for the trunk used for PSTN calls. To define a trunk attribute, follow this procedure:

1. Navigate to **Trunks** > **Trunk Attributes**.
2. Select **Trunk Service Number**: *10* was used in this example.
3. Click **Change**.
4. Assign the **Trunk Label**: *Crestron* was used in this example.
5. Set **Class of Service**: *10* (configured earlier) was used in this example.
6. Set **Dial In Trunks Incoming Digit Modification - Absorb**: *0* was used in this example. (The Mitel absorbs none of the incoming digits on an incoming PSTN call to reach the desired PBX extension based on the translation configured.)
7. Set **Dial In Trunks Incoming Digit Modification - Insert**: Leave blank.

Mitel: Configure Trunk Attributes

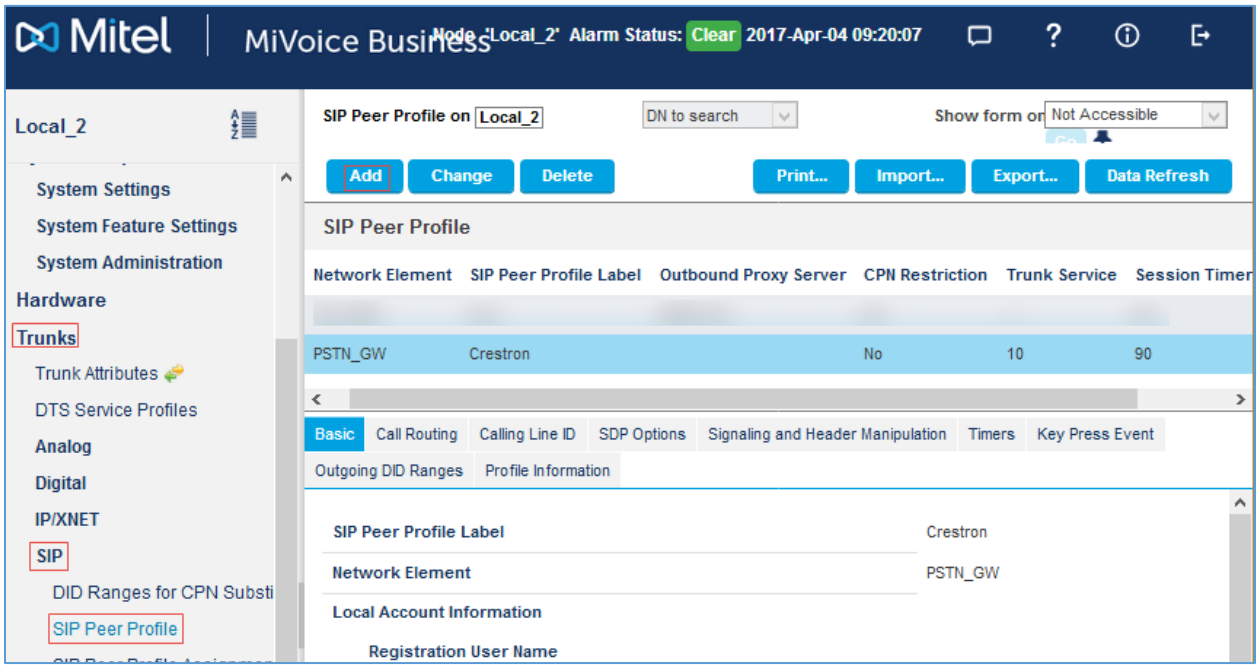


Configure SIP Peer Profile

To configure the SIP peer profile, follow this procedure.

1. Navigate to **Trunks** > **SIP** > **SIP Peer Profile**.

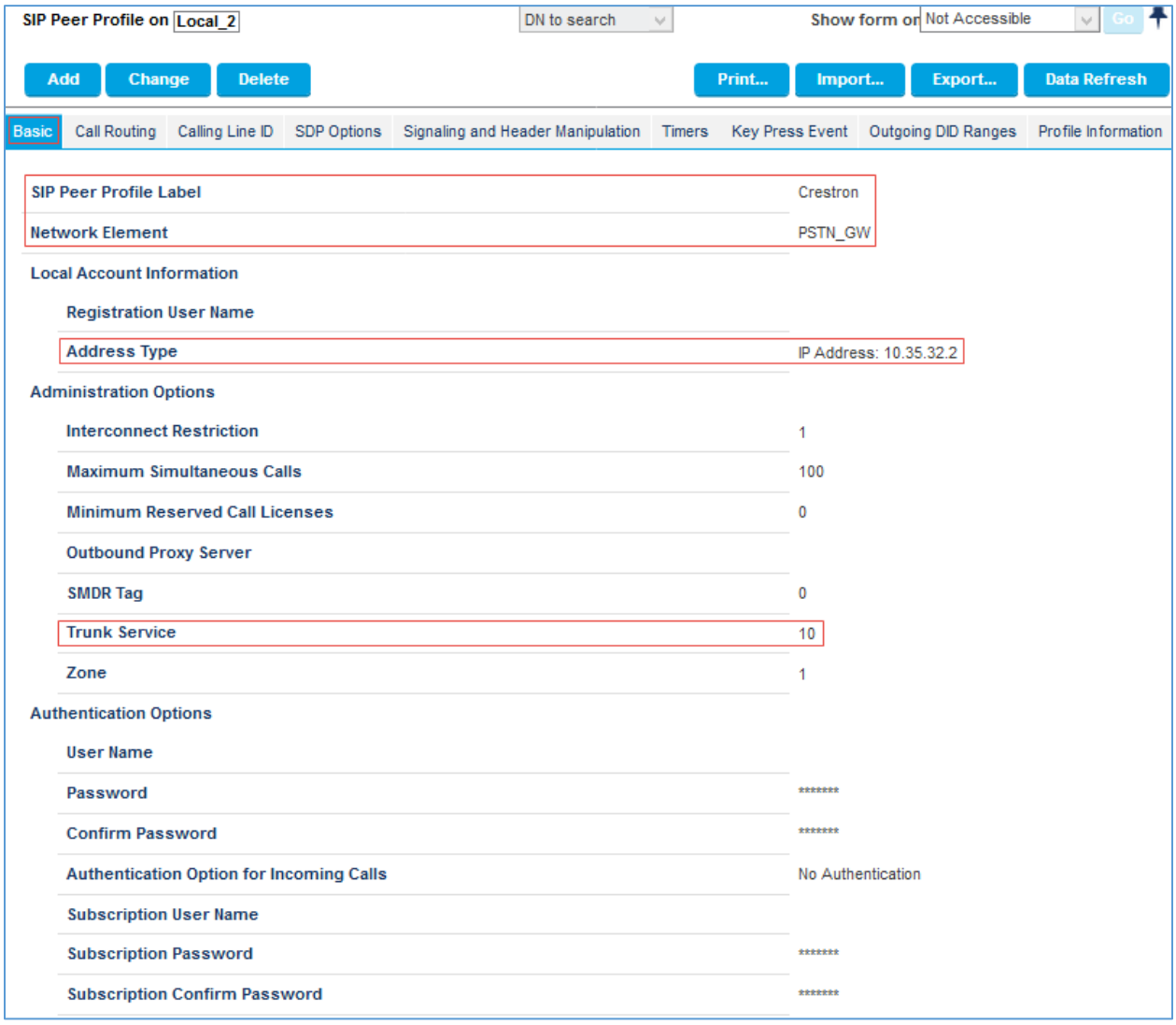
Mitel: Add SIP Peer Profile



2. Click **Add**.

3. Configure the **Basic** tab:

Mitel: SIP Peer Profile: Basic Tab



a. Enter a descriptive name for SIP Peer Profile Label: *Crestron* was used in this example.

b. Select **Network Element**: *PSTN_GW* was used in this example.

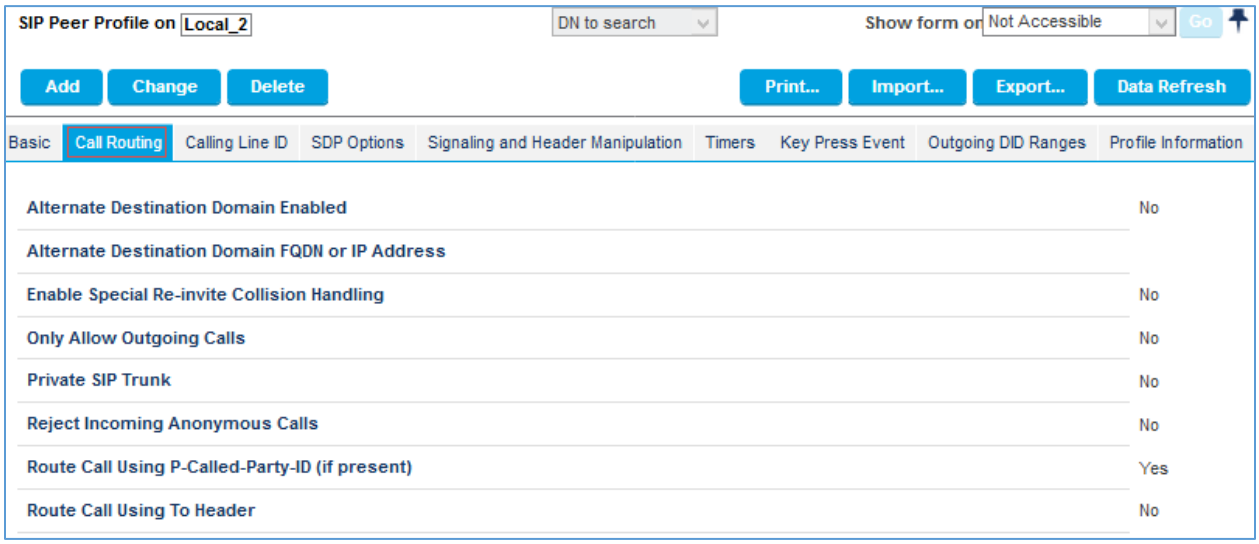
c. **Local Account Information-Address Type**: IP Address: Select *10.35.32.2*.

d. Configure **Trunk Service**: *10* (as configured earlier as Trunk Group) was used in this example.

e. Retain all other default configurations.

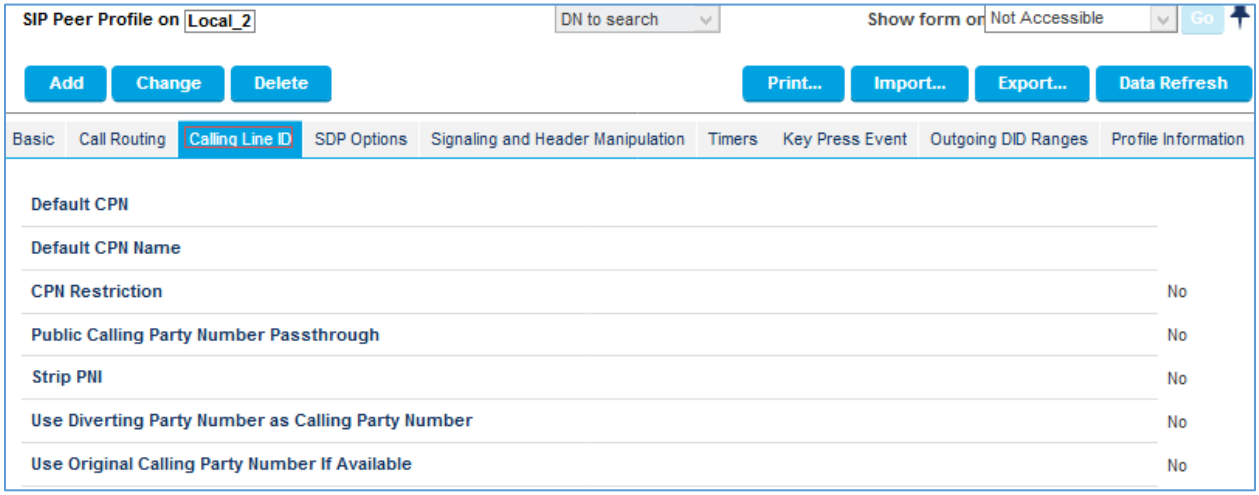
4. On the **Call Routing** tab, retain all default values.

Mitel: SIP Peer Profile: Call Routing Tab



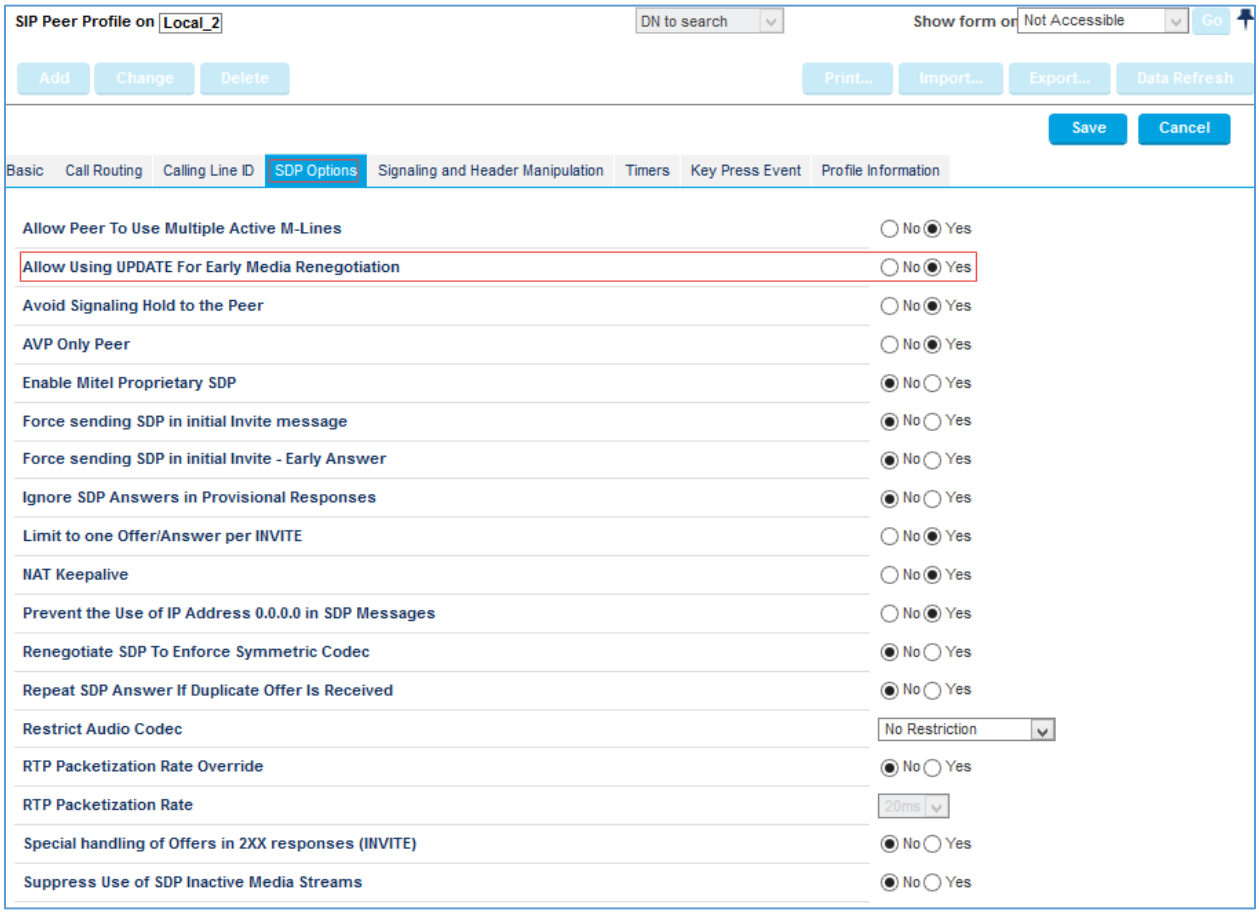
5. On the Calling Line ID tab, retain all default values.

Mitel: SIP Peer Profile: Calling Line ID Tab



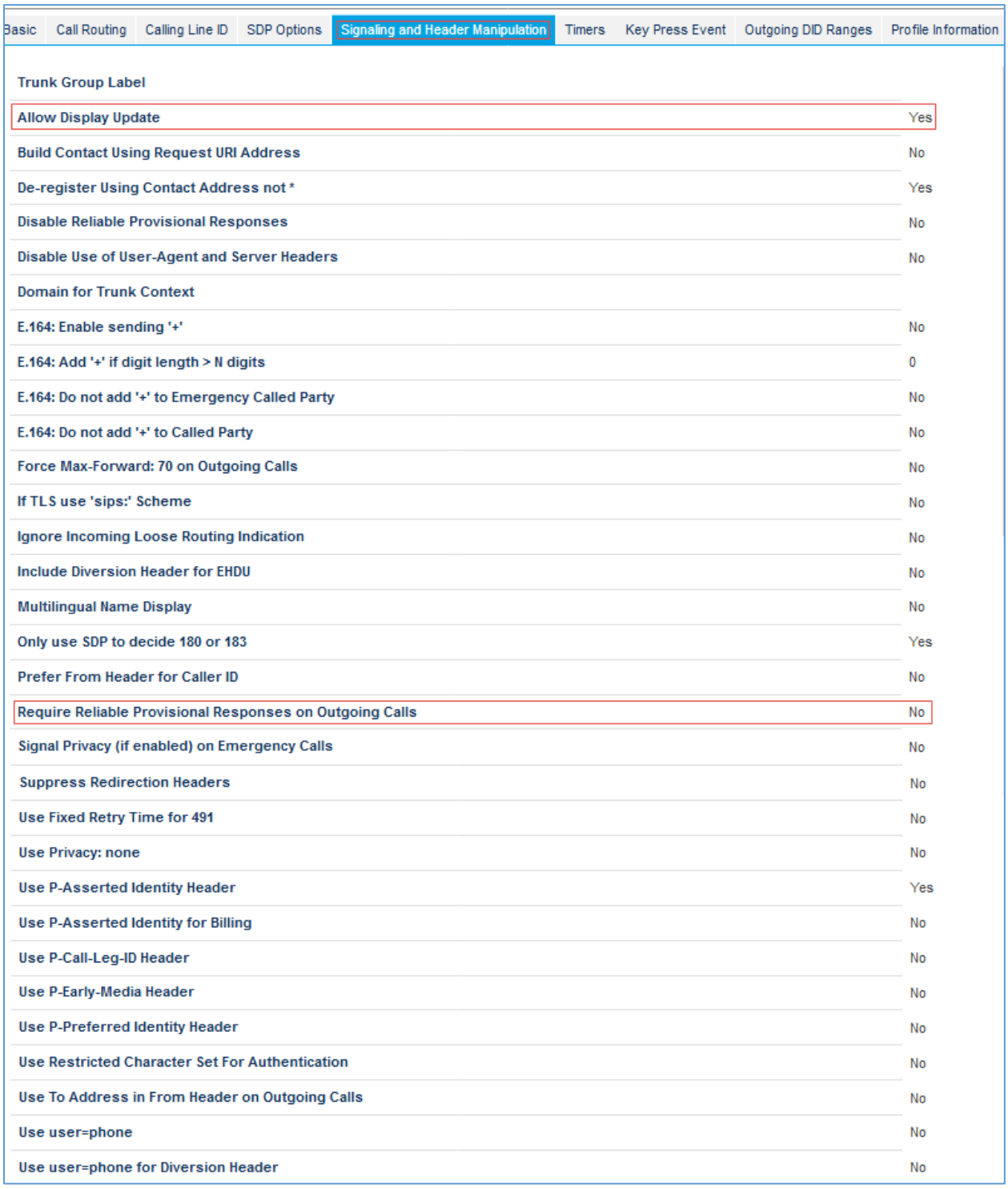
6. On the **SDP Options** tab, set **Allow Using UPDATE for Early Media Renegotiation** to *Yes*.

Mitel: SIP Peer Profile: SDP Options Tab



7. Configure the **Signaling and Header Manipulation** tab:

Mitel: SIP Peer Profile: Signaling and Header Manipulation Tab



a. Set **Allow Display Update**: *Yes*.

b. Set **Require Reliable Provisional Responses on Outgoing Calls**: *No*.

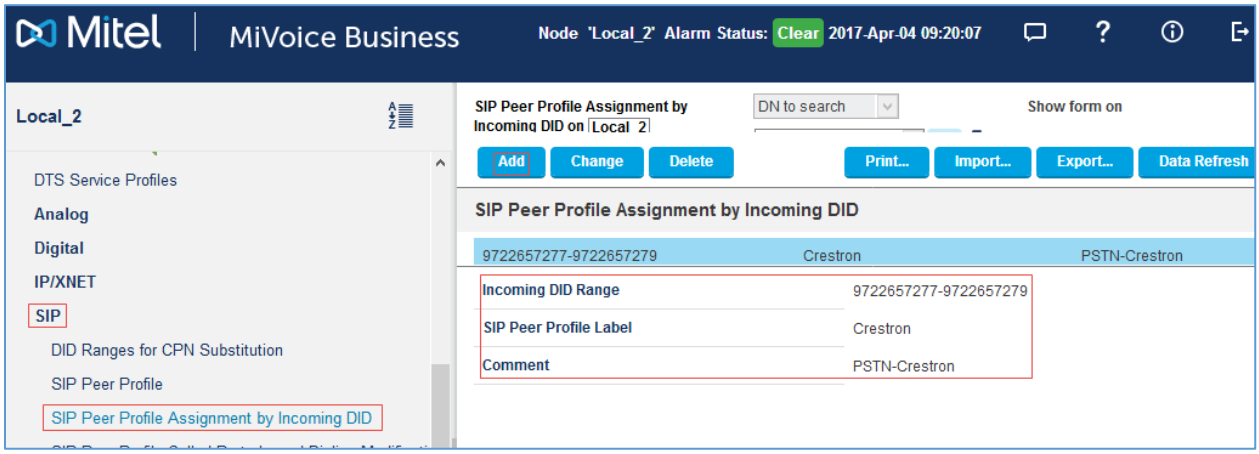
8. Retain all other default configurations.

SIP Peer Profile Assignment by Incoming DID

This form is used to assign incoming digits from the PSTN to the Mitel. To configure a SIP peer profile assignment, follow this procedure:

1. Navigate to **Trunks** > **SIP** > **SIP Peer Profile by Incoming DID**.

Mitel: SIP Peer Profile Assignment by Incoming DID



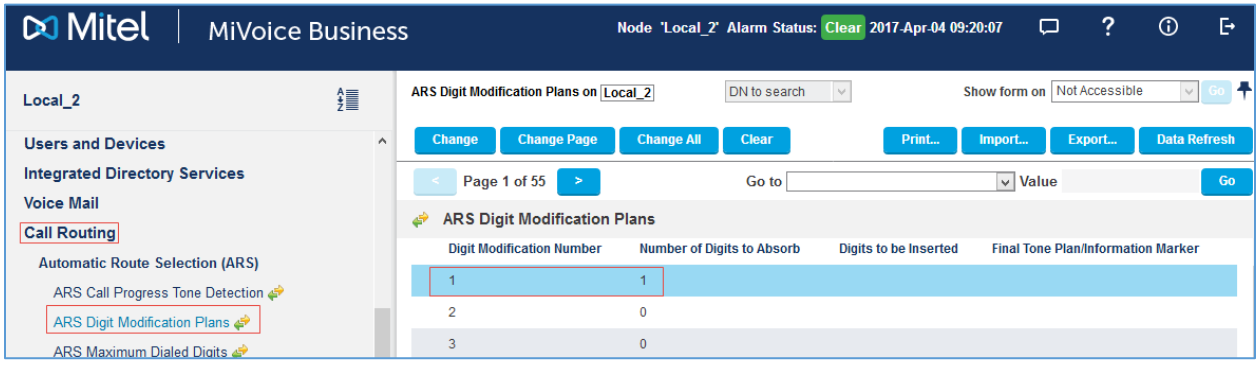
2. Click **Add**.
3. Configure the **Incoming DID Range**: *9722657277-9722657279* was used for this example.
4. Select the **SIP Peer Profile Label**: *Crestron* was used in this example.
5. Provide a **Comment** (optional): *PSTN-Crestron* was used in this example.

ARS Digit Modification Number

Digit Modification for outgoing calls on the SIP trunk to PSTN is configured to absorb or inject additional digits according to the dialing plan chosen. In the current example, one (1) digit was absorbed. To configure digit modification, follow this procedure:

1. Navigate to **Call Routing** > **Automatic Route Selection (ARS)** > **ARS Digit Modification Plans**.

Mitel: ARS Digit Modification Number



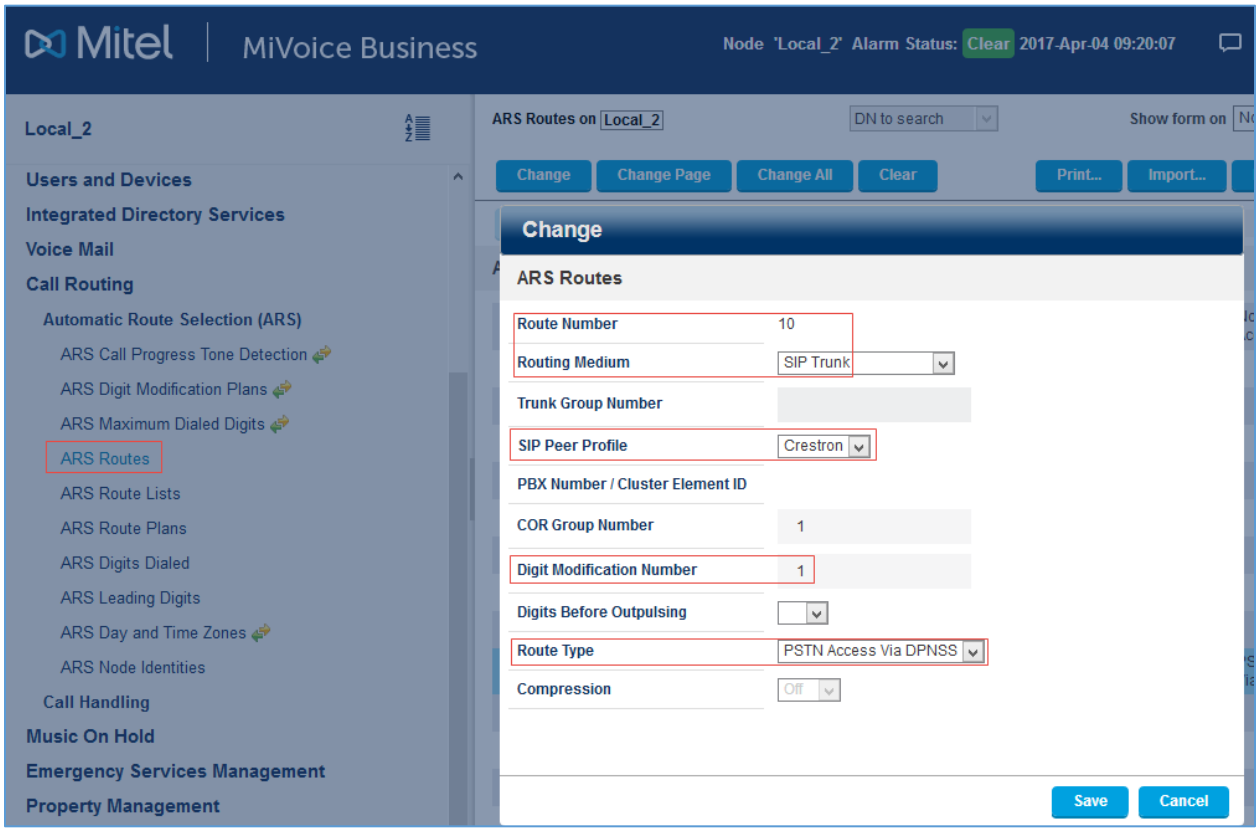
2. Modify **Digit Modification Number:** *1*, to absorb one digit while dialing out to PSTN.
3. Click **Save**.

ARS Routes

To configure a route for SIP trunk connectivity to PSTN, follow this procedure:

1. Navigate to **Call Routing** > **Automatic Route Selection (ARS)** > **ARS Routes**

Mitel: ARS Routes



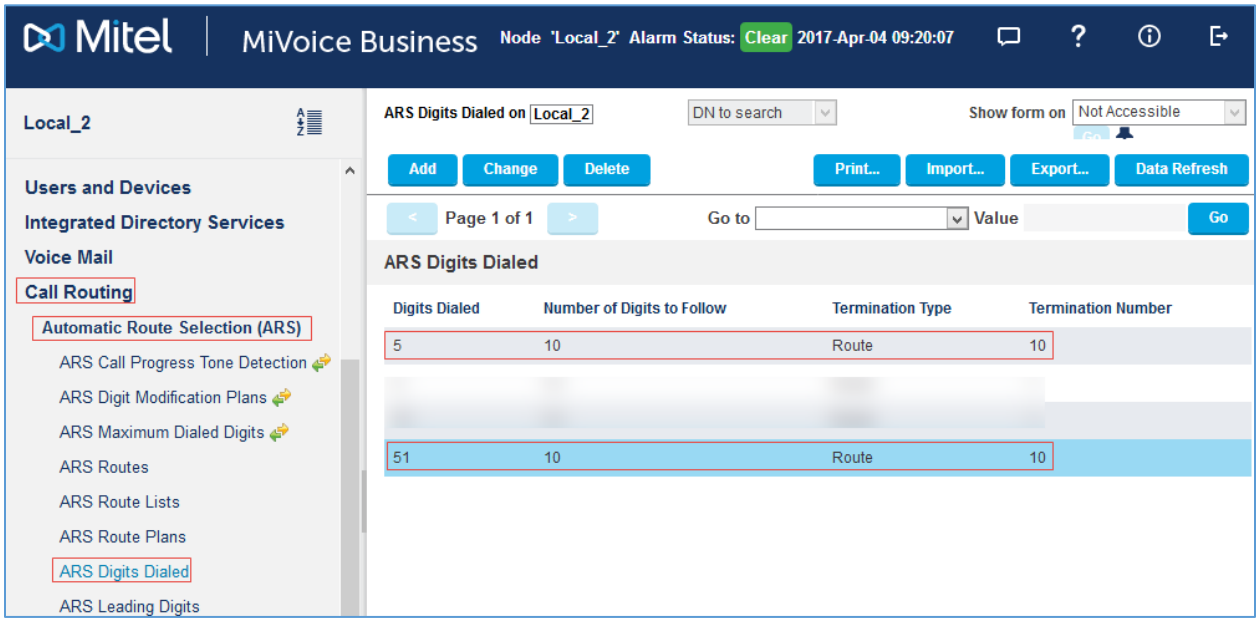
2. Select a route number that is not in use. *10* was used in this example.
3. Click **Change**.
4. Select **Routing Medium**: *SIP Trunk*.
5. Select **SIP Peer Profile**: *Crestron* was used in this example.
6. Configure **Digit Modification Number**: *1* was used in this example.
7. Choose **Route Type**: *PSTN Access Via DPNSS* was used in this example.
8. Click **Save**.

ARS Digits Dialed

ARS initiates the routing of trunk calls when certain digits are dialed from a station. In this example, the prefix 5 was used to route calls towards PSTN using the Route 10. To configure ARS digits, follow this procedure:

1. Navigate to **Call Routing** > **Automatic Route Selection (ARS)** > **ARS Digits Dialed**.

Mitel: ARS Digits Dialed



2. Click **Add**.
3. Enter the number of records to add: *1*.
4. Configure **Digits Dialed**: *5* was used in this example.
5. Configure **Number of Digits to Follow**: *10*.
6. Configure **Termination Type**: *Route*.
7. Configure **Termination Number**: *10* was used in this example.

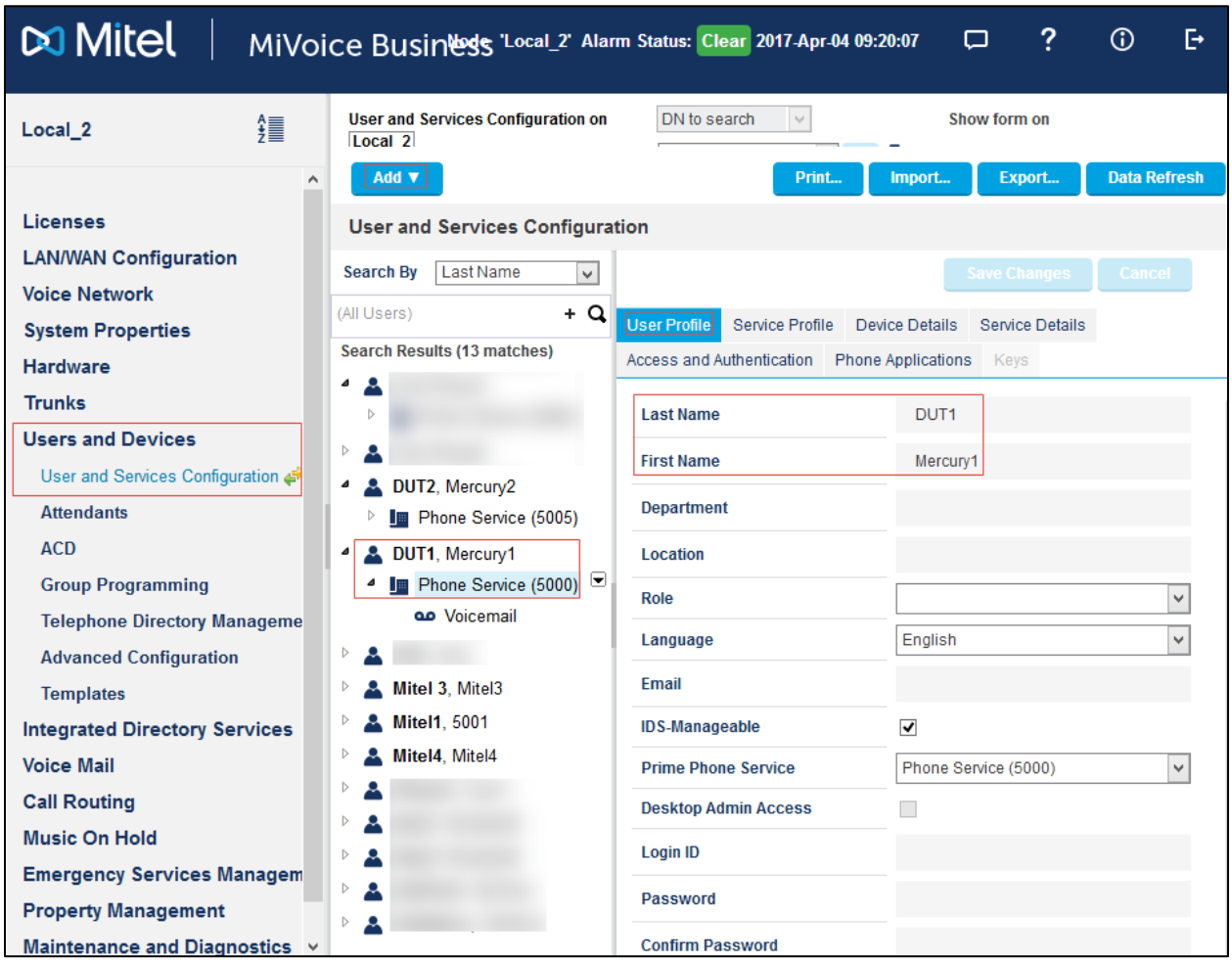
Similarly, another entry for starting digits *51* was added.

Configuring User for Each Device/Phone

The Crestron Mercury Device was configured as a Generic SIP phone that registers to the Mitel PBX. A user was configured for each phone and Crestron Mercury device used in the example. To configure a user, follow this procedure.

1. Navigate to **Users and Devices** > **User and Devices Configuration**.
2. Click **Add** > **Default User and Device**.
3. Configure the **User Profile** tab as follows:

Mitel: Add User: User Profile Tab

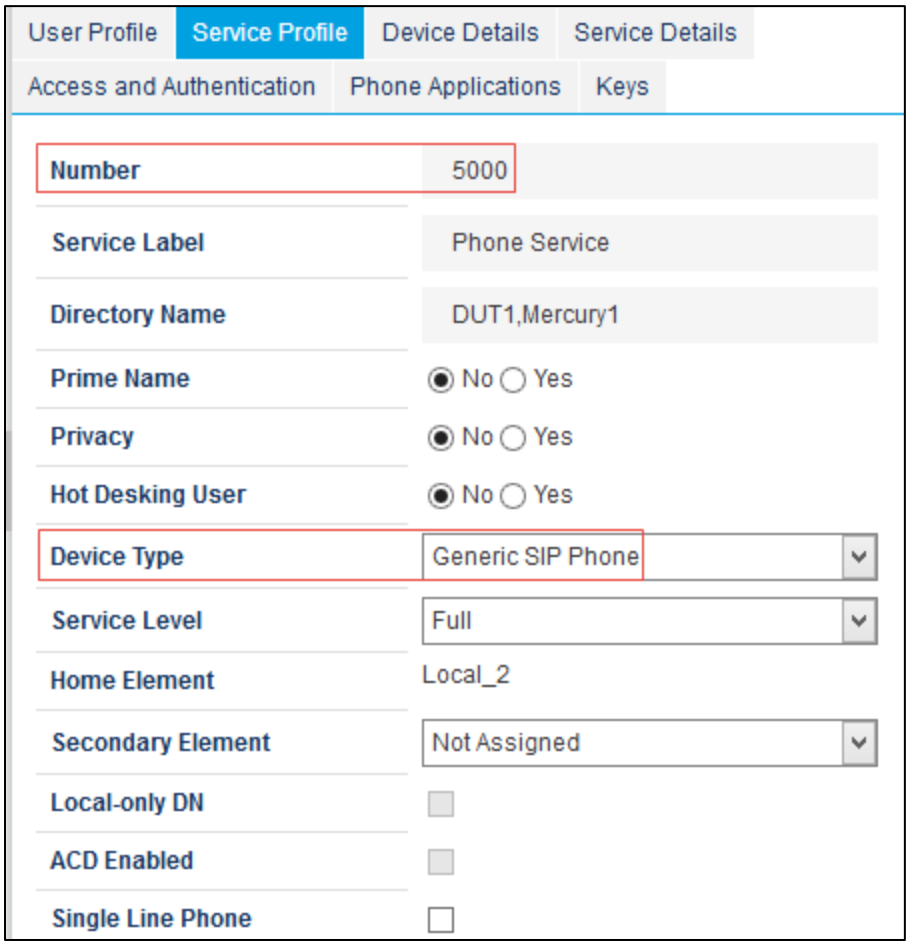


a. Enter **Last Name:** *DUT1* was used in this example.

b. Enter **First Name**: *Mercury1* was used in this example.

4. Configure the **Service Profile** tab:

Mitel: Add User: Service Profile Tab

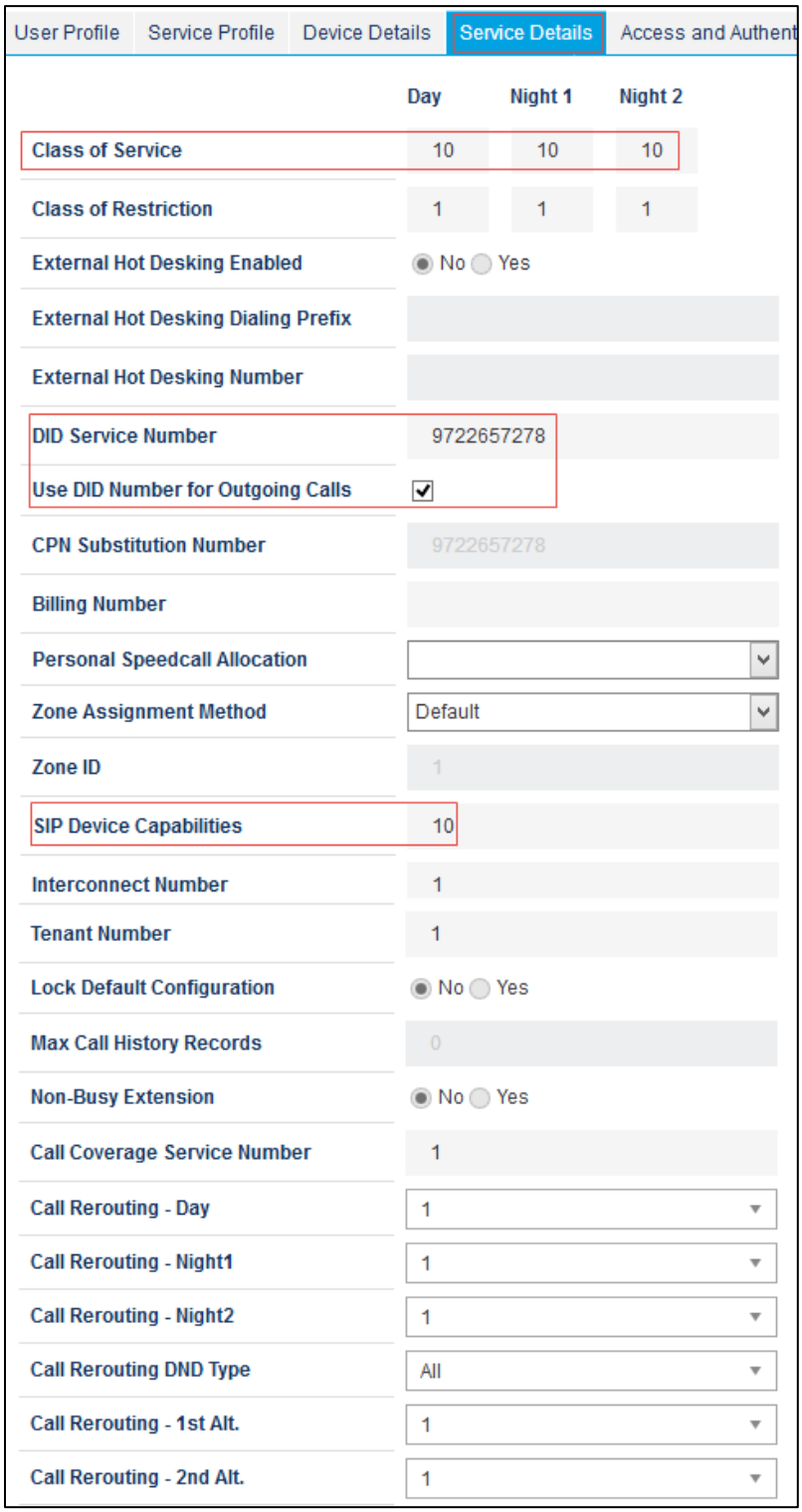


a. Enter Number: *5000* (available DN) was used in this example.

b. Enter **Device Type**: *Generic SIP Phone* was used in this example.

5. Configure the **Service Details** tab:

Mitel: Add User: Service Details Tab



a. Enter **Class of Service:** *10* was used in this example.

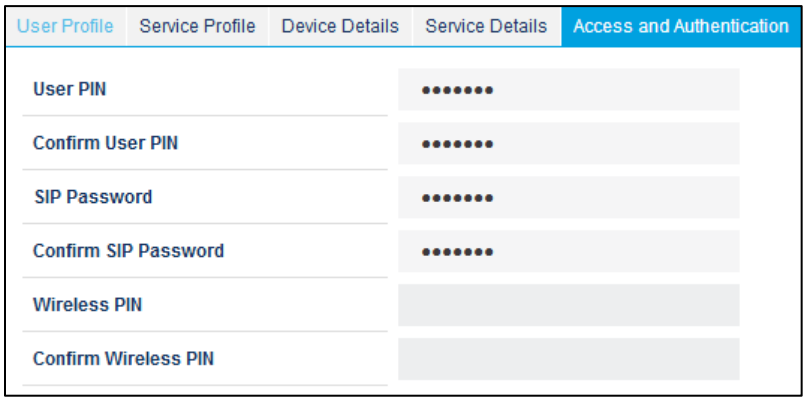
b. Enter **DID Service Number:** *9722657278* was used in this example.

c. **Use DID Number for Outgoing Calls**: *Checked*

d. Enter **SIP Device Capabilities**: *10* was used in this example.

6. Configure the **Access and Authentication** tab as follows:

Mitel: Add User: Access and Authentication Tab

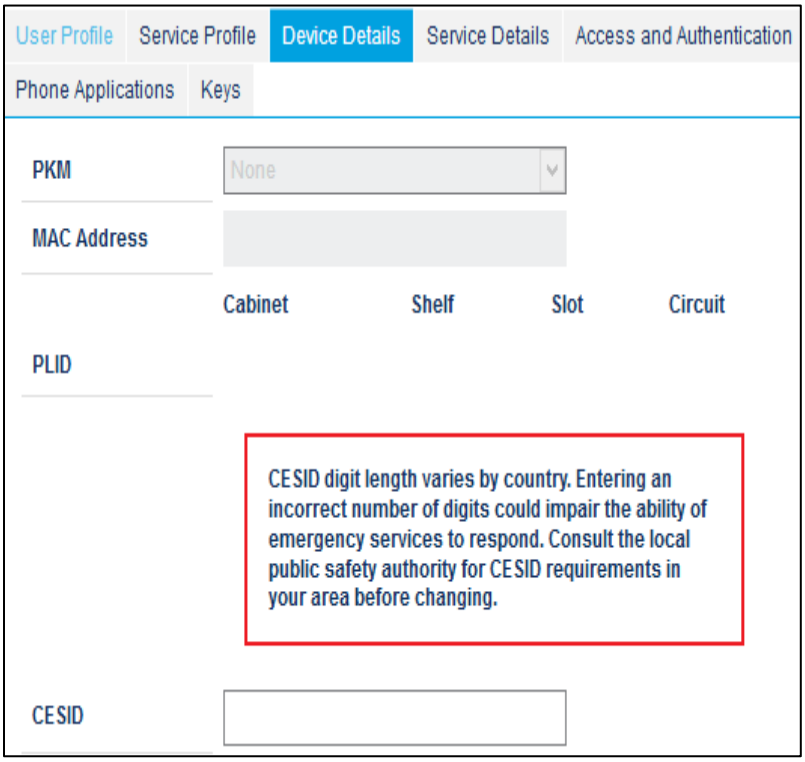


a. Enter **SIP Password**: *123456* was used in this example.

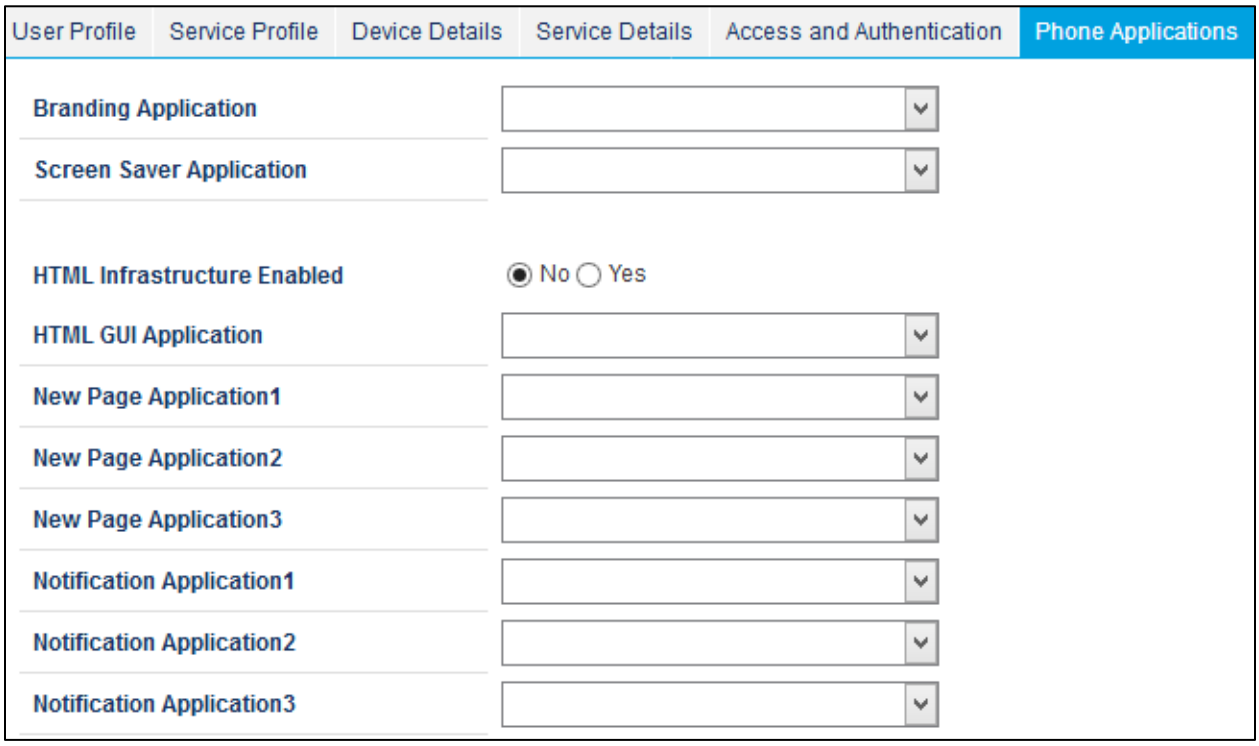
b. **Confirm Password**: Same password as above was entered.

7. Retain all other default configurations. on all tabs.

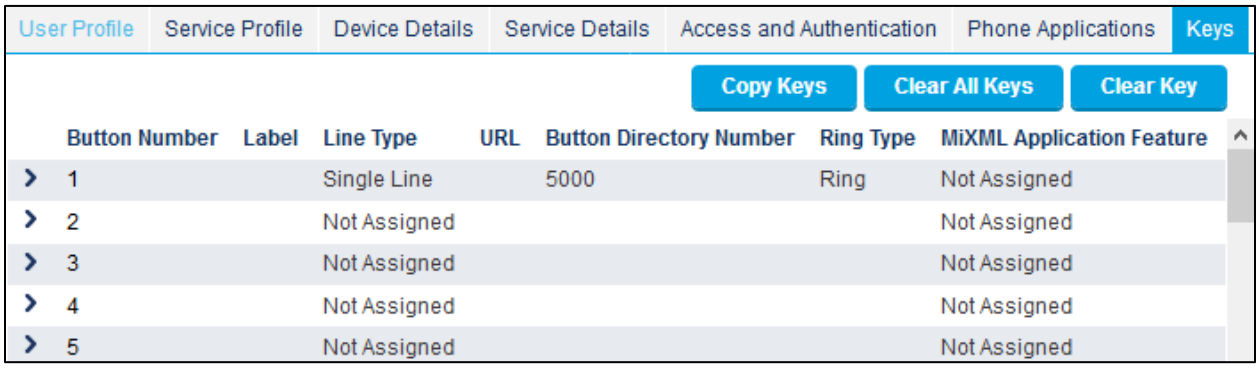
Mitel: Add User: Device Details Tab



Mitel: Add User: Phone Applications Tab



Mitel: Add User: Keys Tab



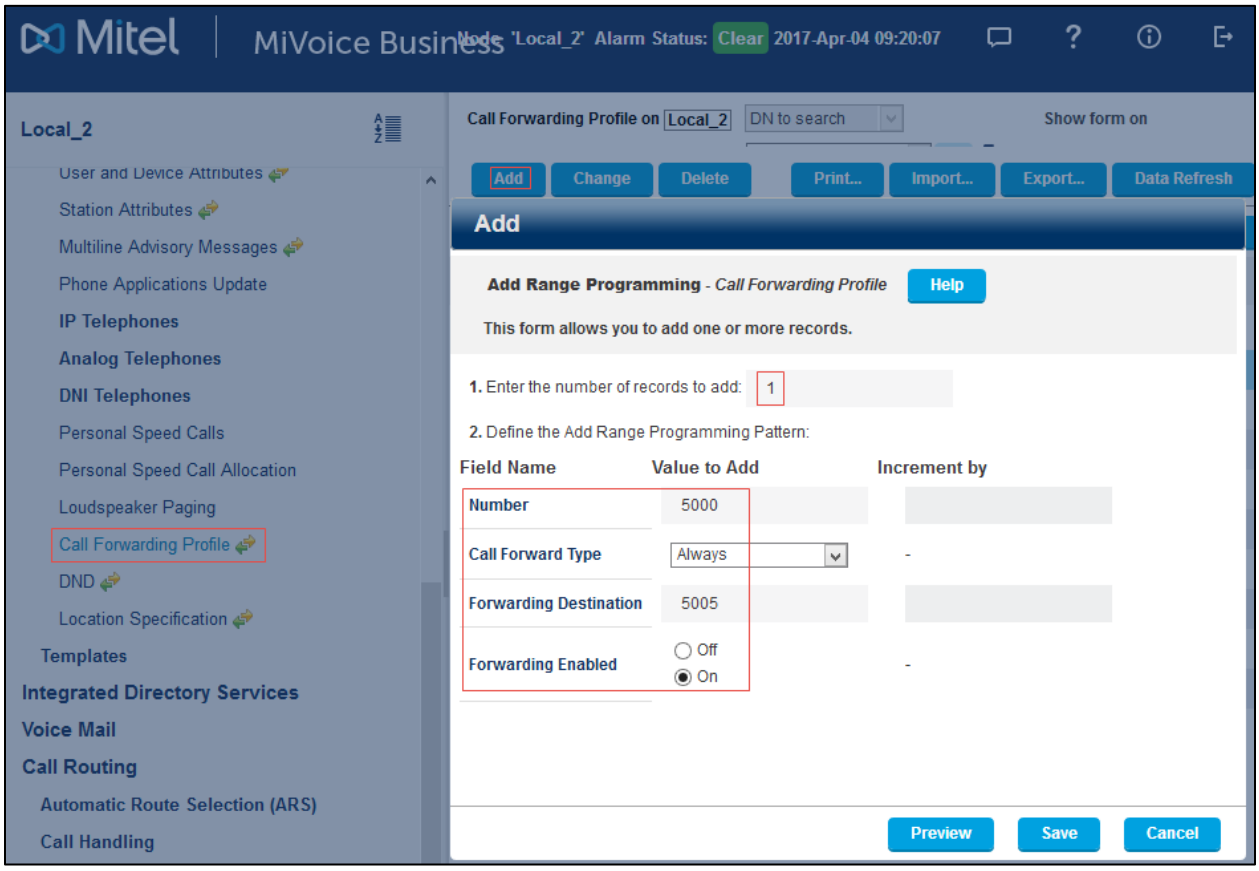
Similarly, another user with DN 5005 was configured for this example.

Call Forwarding Profile

Call forwarding on the devices can be configured via the Call Forwarding profile. To configure a Call Forward Always from DN 5000 to DN 5005, follow this procedure:

1. Navigate to **User and Devices** > **Advanced Configuration** > **Call Forwarding Profile**.

Mitel: Call Forwarding Profile



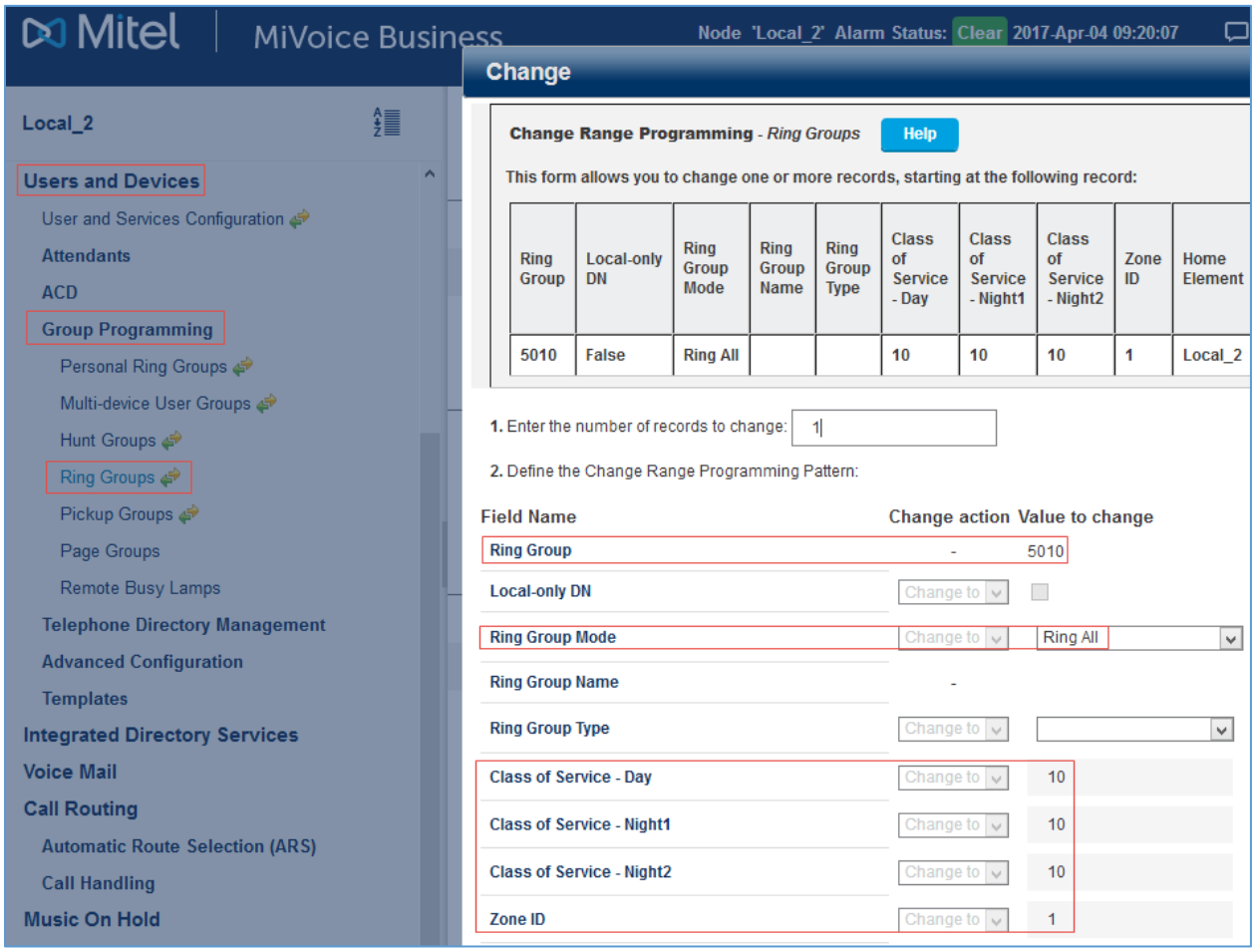
2. Click **Add**.
3. **Enter the number of records to add**: *1*
4. Configure the **Define the Add Range Programming Pattern**:
    a. **Number**: *5000.*
    b. **Call Forward Type**: *Always* was used in this example. It can be set to *Busy Internal/External* or *No Answer Internal/External*.
    c. **Forwarding Destination**: *5005.*
    d. **Forwarding Enabled**: *On.*
5. Click **Save**.

Ring Group

To create a ring group, follow this procedure:

1. Navigate to **Users and Devices** > **Group Programming** > **Ring Groups**.

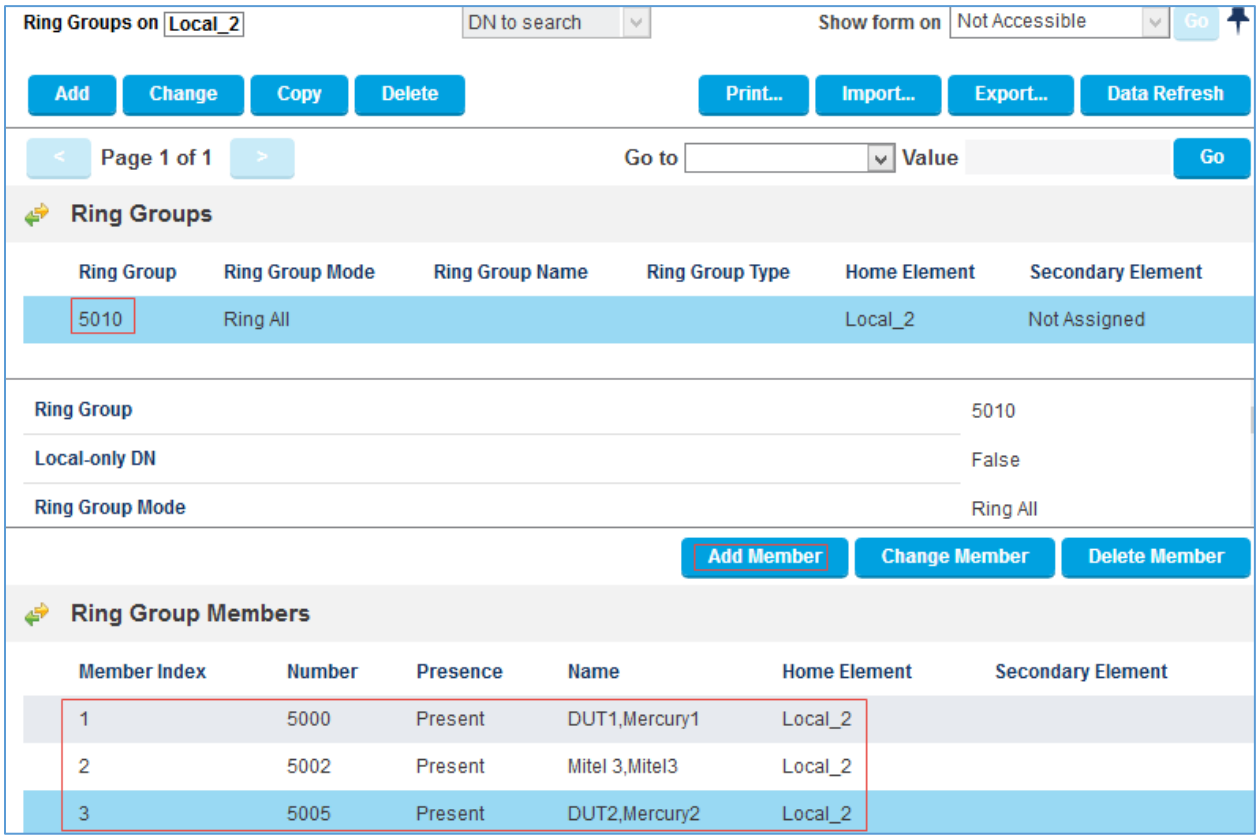
Mitel: Add Ring Group



2. Click **Add**.
3. **Enter the number of records to add**: *1*
4. Configure **Define the Add Range Programming Pattern**:
    a. **Ring Group**: *5010* was used in this example.
    b. **Ring Group Mode**: *Ring All* was used in this example.
    c. **Class of Service -Day/-Night1/-Night2**: *10* was used in these examples.
    d. **Zone ID**: 1 was used in this example.
    e. Retain all other default configurations.
    f. Click **Save**.

5. Click **Add Member**.

Mitel: Add Members to Ring Group



a. **Enter the number of records to add**: *1*

b. Enter **Define the Add Range Programming Pattern**:

   i. **Number**: *5000.*

   ii. **Presence**: *Present.*

6. Click **Save**.

Similarly add other members. For this example, 5000, 5002 and 5005 were added as members.

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Configuration Guide – DOC. 7994A
(2048861)
05.17
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