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Avaya Solution & Interoperability Test Lab

Application Notes for DuVoice with Avaya IP Office Server Edition 9.1 – Issue 1.0

Abstract

These Application Notes describe the configuration steps required for the DuVoice hospitality messaging system to interoperate with Avaya IP Office Server Edition 9.1. In the compliance testing, DuVoice provided automated attendant, Property Management System feature such as check-in, check-out guest, voicemail, wake-up call, do not disturb, name and user profile template change and room clean status.

The Avaya IP Office Server Edition configuration consisted of two Avaya IP Office systems, a primary Linux server at the Main site and an expansion IP500V2 at the Remote site that were connected via Small Community Network trunks. In the compliance testing, DuVoice emulated four SIP users on Avaya IP Office primary server. The four SIP users were registered with Avaya IP Office primary server, and configured as members of a hospitality hunt group. Incoming calls to the hospitality hunt group were delivered over an available virtual SIP user to DuVoice. DuVoice used DevLink and Web Service from the local Avaya IP Office system to provide hospitality features such as wake-up call, check-in, check-out guest, change name, and update room's cleanness and using short code to turn on and off Message Waiting Indicator, and Do Not Disturb on the Avaya IP Deskphones.

Readers should pay attention **to Section 2**, in particular the scope of testing as outlined in Section 2.1 as well as the observations noted in **Section 2.2**, to ensure that their own use cases are adequately covered by this scope and results.

Information in these Application Notes has been obtained through DevConnect compliance testing and additional technical discussions. Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

These Application Notes describe the configuration steps required for the DuVoice hospitality messaging system to interoperate with Avaya IP Office Server Edition 9.1. In the compliance testing, DuVoice used the SIP User, DevLink, and Configuration Web Service interfaces from Avaya IP Office to provide automated attendant, check in, check out guest, voicemail, wake-up call, do not disturb, name and user profile template change and room clean status.

The Avaya IP Office Server Edition configuration consisted of two Avaya IP Office systems, a primary Linux server at the Main site and an expansion IP500V2 at the Remote site that were connected via Small Community Network (SCN) trunks.

In the compliance testing, one DuVoice for server was deployed. The SIP User interfaces were used by DuVoice to provide basic hospitality features such as automated attendant, voicemail, wake-up call, and room clean status indication. DuVoice emulated four virtual SIP users on Avaya IP Office. Four virtual SIP users were registered on primary IP Office, and configured as members of a hospitality hunt group. Incoming calls to the hospitality hunt group were delivered over an available virtual SIP user to DuVoice. DuVoice used the SIP packets to determine the type of call and hence the service to provide, such as automated attendant for incoming trunk calls, voicemail coverage for redirected call, voicemail, room clean status, and wake-up call scheduling for internal calls. DuVoice used DevLink and Configuration Web Service interfaces with the primary IP Office system to monitor users at the Main site, and the DevLink interface with the expansion IP Office system to monitor users at the Remote site.

For the voicemail coverage scenarios, voicemail messages were recorded and saved on DuVoice. The short codes were used to activate/deactivate the Message Waiting Indicator (MWI), and to set the divert setting for Do Not Disturb when requested manually by the guests.

DuVoice provide Property Management System (PMS) features via a Hospitality Tester windows application and a InnerDesk web-based interface. In the compliance testing, Hosptality tester and InnerDesk were used to initiate hospitality requests such as check-in and check-out, set up wake up call. Two user rights templates were set up on Avaya IP Office for use with check-in and check-out guests, and DuVoice used the Configuration Web Service to send updates to Avaya IP Office on guest name and user rights template as part of the check-in and check-out process.

2. General Test Approach and Test Results

The feature test cases were performed manually. Calls were made from a simulated PSTN and from local users to the hospitality hunt group, with different options selected for extension transfer, voice message retrieval, and wake-up call schedule. The DuVoice Hospitality Tester and InnerDesk were used to manually initiate check-in and check-out requests, to monitor the room and wake-up call status, and to set Do Not Disturb.

The serviceability test cases were performed manually by disconnecting and reconnecting the Ethernet connection to DuVoice.

DevConnect Compliance Testing is conducted jointly by Avaya and DevConnect members. The jointly-defined test plan focuses on exercising APIs and/or standards-based interfaces pertinent to the interoperability of the tested products and their functionalities. DevConnect Compliance Testing is not intended to substitute full product performance or feature testing performed by DevConnect members, nor is it to be construed as an endorsement by Avaya of the suitability or completeness of a DevConnect member's solution.

2.1. Interoperability Compliance Testing

The interoperability compliance test included feature and serviceability testing.

The feature testing focused on verifying the following on DuVoice:

- Registration of SIP users.

- Automated attendant navigation for incoming trunk calls, such as transfer to guests and staff.

- Voicemail recording, logging, and retrieval, with proper message waiting lamp activation/deactivation for users with digital, and IP telephone types.

- Activate and de-activate Do Not Disturb feature for guests using short codes on Hospitality tester application.

- Scheduling and delivering of wake-up call requests, including retried attempts and escalation to staff.

- Handling of maid codes as indication of room clean status from hospitality hunt group calls.

- Use of Configuration Web Service, DevLink to update guest name and user rights template associated with check-in, check-out, and move requests from InnerDesk/Hospitality tester.

The serviceability testing focused on verifying the ability of DuVoice to recover from adverse conditions, such as disconnecting and reconnecting the Ethernet connection to DuVoice.

2.2. Test Results

All test cases were executed with the following observation:
- There is no announcement about caller ID in voice message since there is no information about caller in the log.

2.3. Support

Technical support on DuVoice can be obtained through the following:

- **Phone:** (425) 250-2393
- **Email:** support@duvoice.com

3. Reference Configuration

The IP Office Server Edition configuration used in the compliance testing consisted of a primary Linux server at the Main site, and an expansion IP500V2 at the Remote site, with SCN trunks for connectivity between the two systems. Each IP Office system has connectivity to the PSTN, for testing cross systems PSTN scenarios.

As shown in **Figure 1** below, one DuVoice server was deployed with SIP Users and a Web Service connection to the primary IP Office system, and DevLink connections to primary and expansion IP Office system. In the compliance testing, varieties of Avaya IP Deskphones are used for Staff, Front Desk and Guest as shown below.
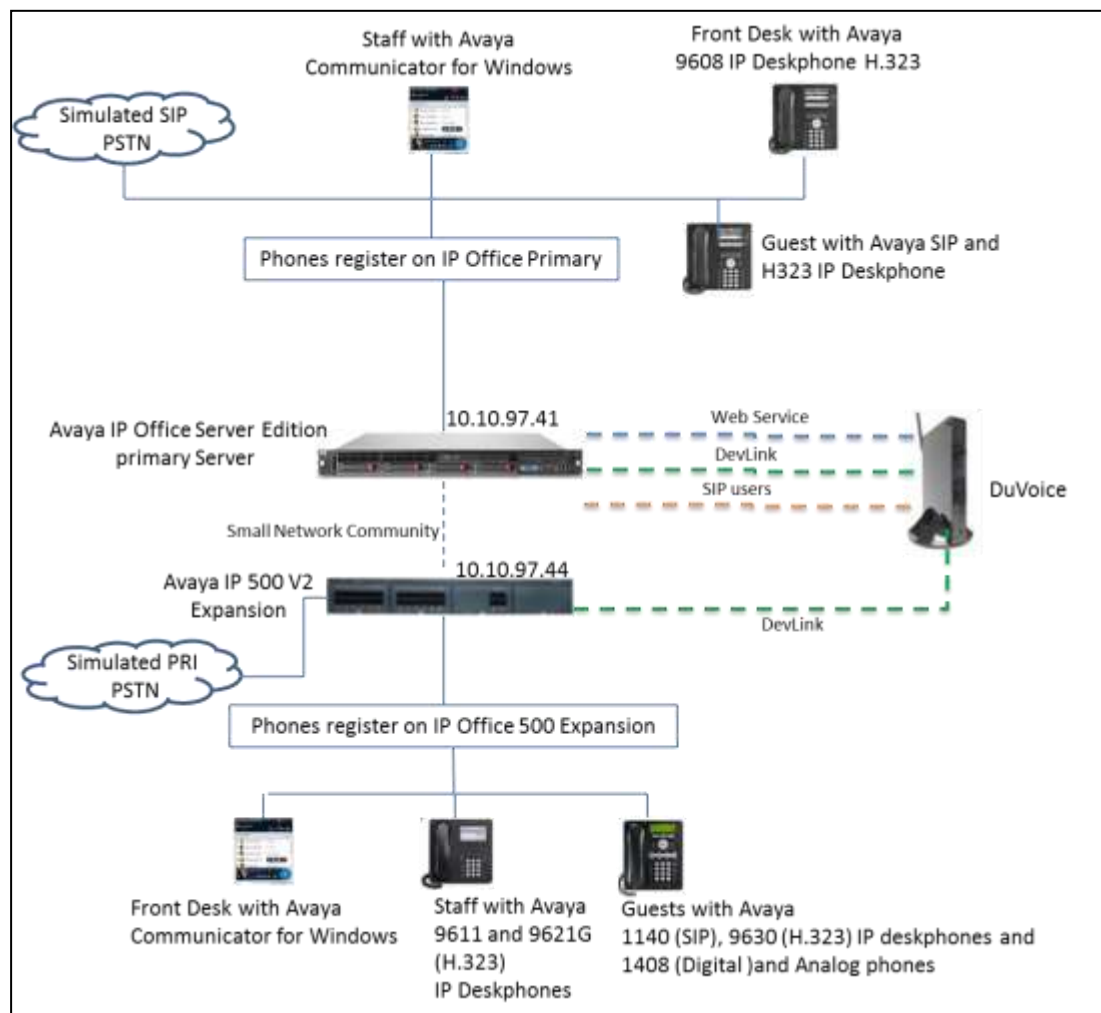
Figure 1: DuVoice with IP Office Server Edition Primary Linux Server and 500 V2 Expansion Compliance Testing Configuration

4. Equipment and Software Validated

The following equipment and software were used for the sample configuration provided:

Equipment	Software
Avaya IP Office Primary Server (Linux based)	9.1 SP 7
Avaya IP Office on IP500 V2 Expansion	9.1 SP7
Avaya 9608, 9611 and 9621G (H323)	6.6
Avaya Communicator for Windows (SIP)	2.1.2.75
Avaya 9630 (H323)	3.22
Avaya 1140E SIP	4.4.25
Avaya 1408 Digital Deskphone	R45
DuVoice for Server	5.30.8

5. Configure Avaya IP Office

This section provides the procedures for configuring IP Office system on Avaya IP office Manager.

5.1. Security Settings

This section describes the steps to update security settings which are required for Name and User Rights changes. Using Avaya IP Office Manager, select **File** → **Advance** → **Security Settings** …

In **Security Setting**s tree, select **Services** → **Configuration**. Select **Unsecure + Secure** for **Service Security Level** as show in below, click **OK** to save changes.
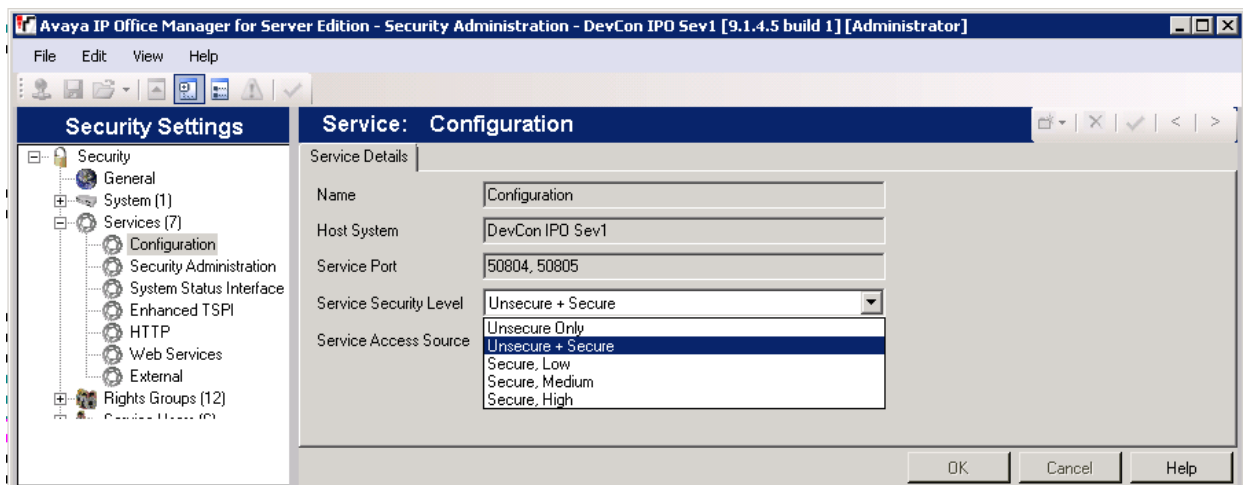
Select **System**; click on **Unsecured Interfaces** tab, verify that **DevLink** is enabled as shown below:

Click on **Certificates** tab, an click on the **View** button to open certificate detail. Check the expiration date. In this example, it is Feb 15, 2022 as shown below:

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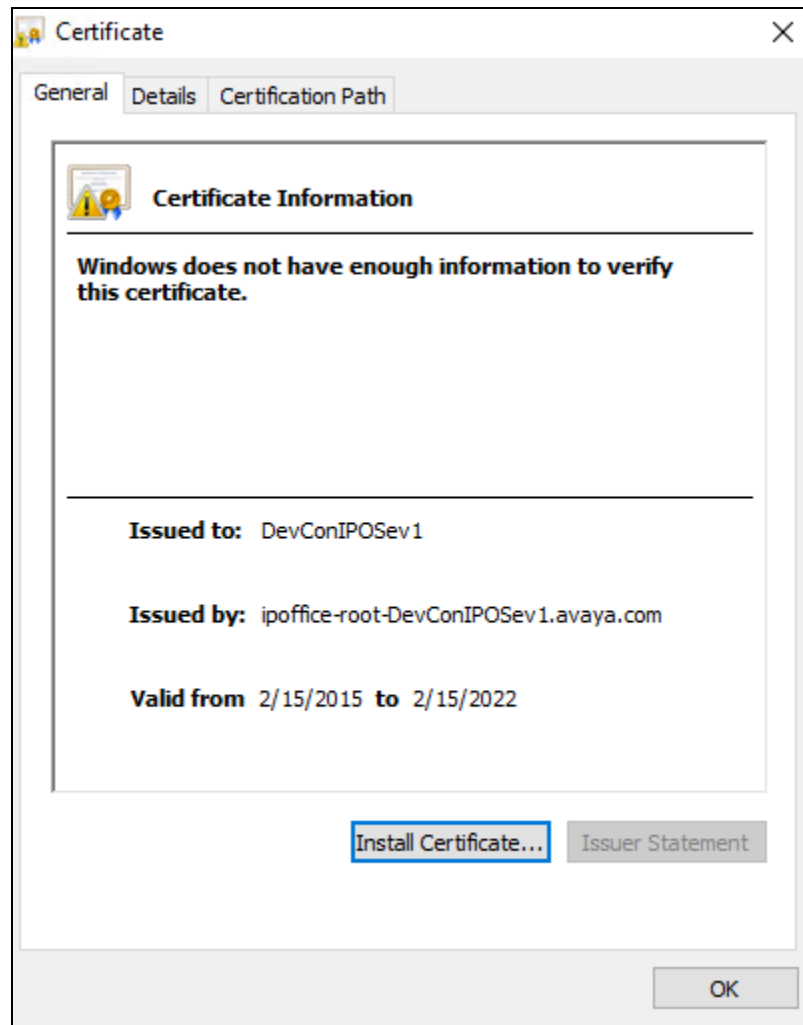
5.2. Obtain LAN IP Address

From the configuration tree in the left pane, select **System** to display the screen in the right pane, where **DevCon IPO Sev1** is the name of the IP Office system.

Select the **LAN1** tab, followed by the **LAN Settings** sub-tab in the right pane. Make a note of the **IP Address**, which will be used later to configure DuVoice. Note that IP Office can support SIP on the LAN1 and/or LAN2 interfaces, and the compliance testing used the LAN1 interface.
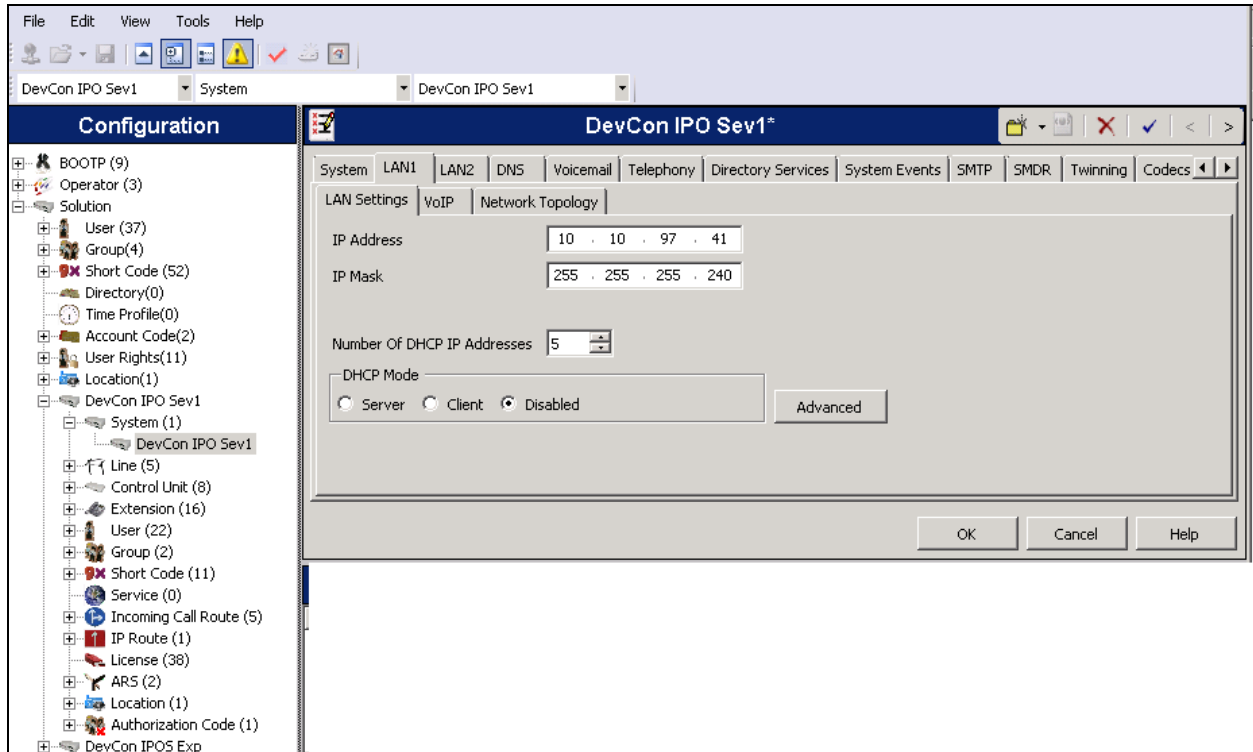
5.3. Administer SIP Registrar

Select the **VoIP** sub-tab. Make certain that **SIP Registrar Enable** is checked, as shown below. and Enter a valid **Domain Name** for SIP endpoints to use for registration with IP Office. In the compliance testing, the **Domain Name** was left blank, so the LAN IP address was used for registration. Also, ensure that depending on the setup either **UDP** or **TCP** is enabled.

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5.4. Administer SIP Extensions for DuVoice

From the configuration tree in the left pane, browse to IP Office primary server **DevCon IPO Sev1**, right-click on **Extension**, and select **New → SIP Extension** from the pop-up list to add a new SIP extension. Under the **Extn** tab, enter the desired digits for **Base Extension**, and uncheck **Force Authorization**, as shown below. Retain the default values in the remaining fields.

Repeat this section to add the desired number of SIP extensions. In the compliance testing, four SIP extensions with base extensions of "26010", "26011", 26012" and "26013" were created.

Select the **VoIP** tab. For **Codec Selection,** select **Custom** and move **G.711 ULAW 64K** and **G.711 ALAW 64K** to **Selected** box, as shown in the screen capture. Set the **DTMF Support** to **RFC2833/RFC4733**.
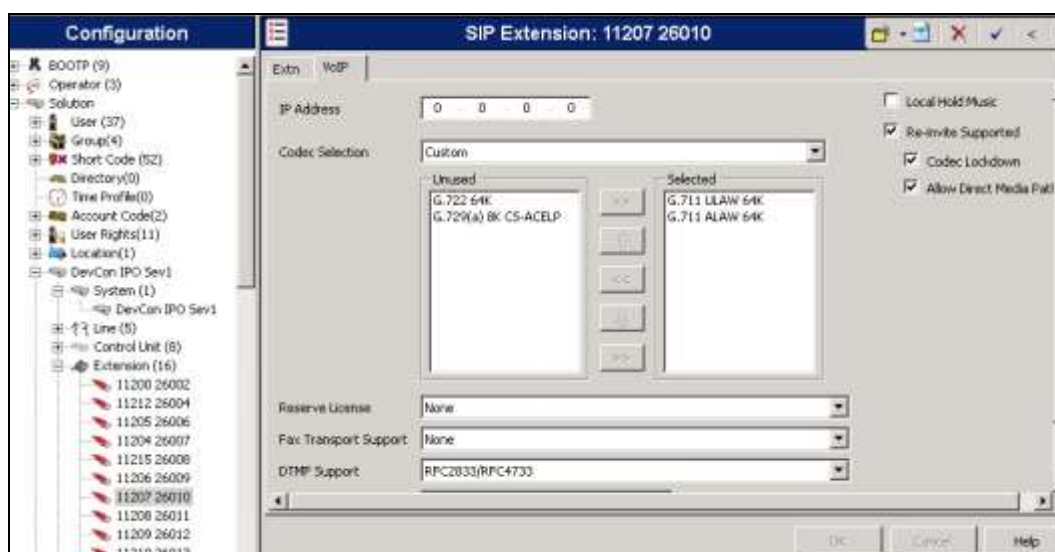
5.5. Administer SIP Users for DuVoice

From the configuration tree in the left pane, right click on **User**, and select **New** from the pop-up list to add a new user. Enter desired values for **Name** and **Full Name**; leave **Password** field blank for DuVoice user. For **Extension**, enter the first SIP base extension from **Section 5.4**. Retain the default values in the remaining fields.

Select the **Voicemail** tab, and uncheck **Voicemail On**, as shown below.

Select the **Telephony** tab, followed by the **Call Settings** sub-tab. Check **Call Waiting On**, as shown below. Retain the default values in the remaining fields.

Select the **Button Programming** tab. Retain only the first **Appearance** button and remove all others as shown below.

Repeat this section to add a new user for each SIP extension from **Section 5.4**. In the compliance testing, four users with names of "26010, 26011, 26012 and 26013" were created.

5.6. Administer Hunt Group

From the configuration tree in the left pane, right-click on **Group** and select **New** from the pop-up list to add a new hunt group. This hunt group, 26000 will be used to deliver calls to DuVoice for hospitality features. Under the **Group** tab, enter desired values for the **Name** and **Extension** fields, and retain the default values in the remaining fields. Click on **Edit** in the **User List** section to add members.
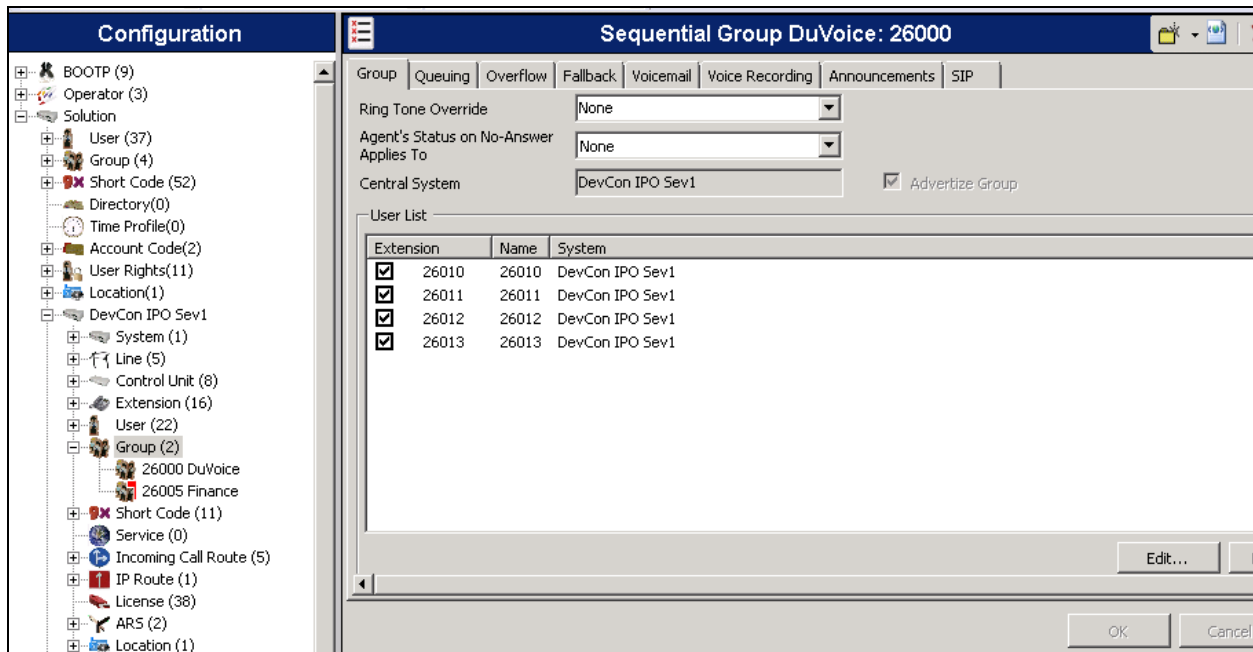
The **Sequential | Hunt Group** screen is displayed. Select all SIP users created earlier in this document, and click the **Append** button to move the selected entries to the right.

The **Sequential Group** screen is displayed again and updated with the selected members.

Under the **Queuing** tab, uncheck box for **Queuing On**.

Under the **Voicemail** tab, uncheck box for **Voicemail On**.

Under **Voice Recording** tab, **Record Inbound** should be None. **Mailbox** should be empty. Under the **Announcements** Tab, **Announcements On** should be unchecked.

5.7. Administer Short Codes

5.7.1. Administer short codes for Message Waiting Indicator

This section describe step how to setup short code to activate and de-activate MWI. From the configuration tree in the left pane, navigate to **Solutions → Short Codes**. Right-click **Short Codes** and select **New** from the pop-up menu. Two short codes will need to be added, one for MWI On and another for MWI Off.

Configure the short codes as follows.
- **Code**: enter type in ***81*N***.
- **Feature**: select **Display Msg**.
- **Telephone Number**: enter **N"; Mailbox Msgs=1 OLD=0 Sav=0"**.

Click **OK** to save changes.
Note: Create another short code, ***80*N*** for MWI Off, where **Telephone Number** field will be set to **N";Mailbox Msgs=0 OLD=0 Sav=0".**

5.7.2. Short code for Operator

By default the DuVoice assigns the operator mailbox extension "0". This will be dialed for transfers to the operator, and for a Failed wakeup alert. It is required to configure a short code that will direct calls to 0 to the appropriate extension or hunt group. This will normally be the reception desk. The following example sends 0 to hunt group 26000 created in Section **5.6**.

5.7.3. Administer short code to forward call to DuVoice hunt group number.

Create short code to dial DuVoice hunt group number.
- Type in ***67;** in **Code** field.
- Select **Dial Extn** for **Feature.**
- Type in **26000S##E** for **Telephone Number** field.

Click **OK** to save changes.

5.7.4. Administer short code to activate and de-activate Do Not Disturb

Configure the short codes as follows.
- **Code**: enter type in ***98*N***.
- **Feature**: select **Forward Unconditional On**.
- **Telephone Number**: enter **"@POST="N";"**.

Click **OK** to save changes.
Note: Create another short code, ***99*N*** for MWI Off, where **Telephone Number** field will be set to "@POST="N";" and **Feature** is Forward Unconditional Off.

5.8. Administer User Rights

From the configuration tree in the left pane, right-click on **User Rights**, and select **New** to create a new user rights template. Enter a desired **Name** to designate user rights for guests in the check-in state.

Repeat this section to create the desired number of user rights templates for guests in various states. In the compliance testing, two user rights templates with names of "**CheckIn**" and "**CheckOut**" were created.
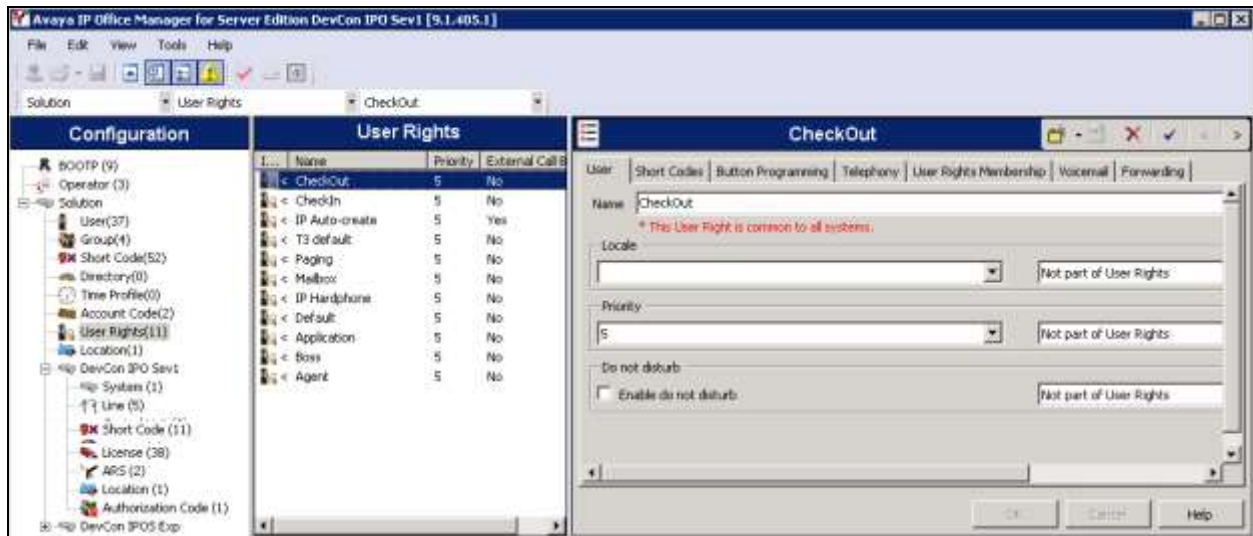
5.9. Administer Guest Phones

From the configuration tree in the left pane, right-click on **Extension**, and select **New → SIP Extension** from the pop-up list to add a new SIP or H.323 extension; H.323 in this case. Under the **Extn** tab, enter available extension number for **Base Extension**. Enter **Phone Password** such as 1234 and retype password again in **Confirm Phone Password**. Click **Ok** to save changes.
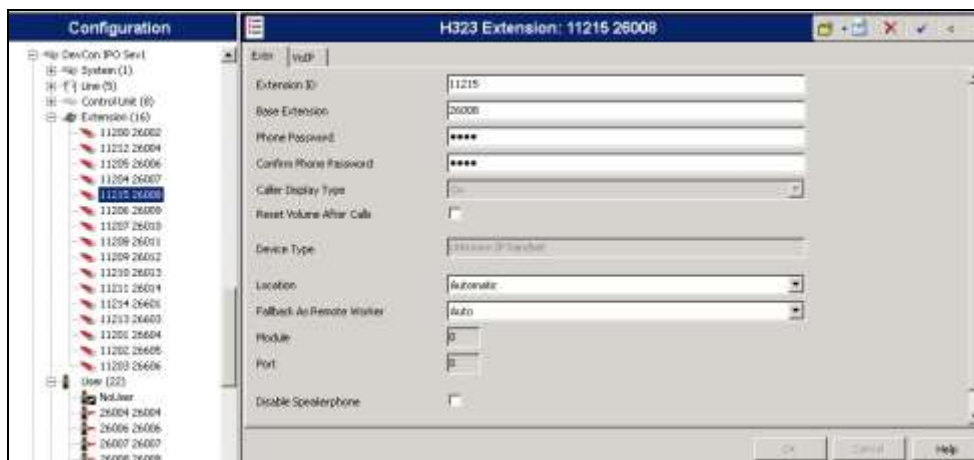
From the configuration tree, right-click on **User**, select **New** from the pop-up list to add a new user. Enter desired values for **Name** and **Full Name**. For **Extension**, enter the extension number that was added earlier in this section. Enter **User Password** such as 123456 and retype password again in **Confirm Password.** Retain the default values in the remaining fields.

Select the **Voicemail** tab, and uncheck **Voicemail On**, as shown below.

Select the **Forwarding** tab:
- Check boxes for **Forward On Busy, Forward On No Answer** and **Forward Internal Calls**.
- Type in the short cut to DuVoice hunt group that was configured in **Section 5.7.3.**
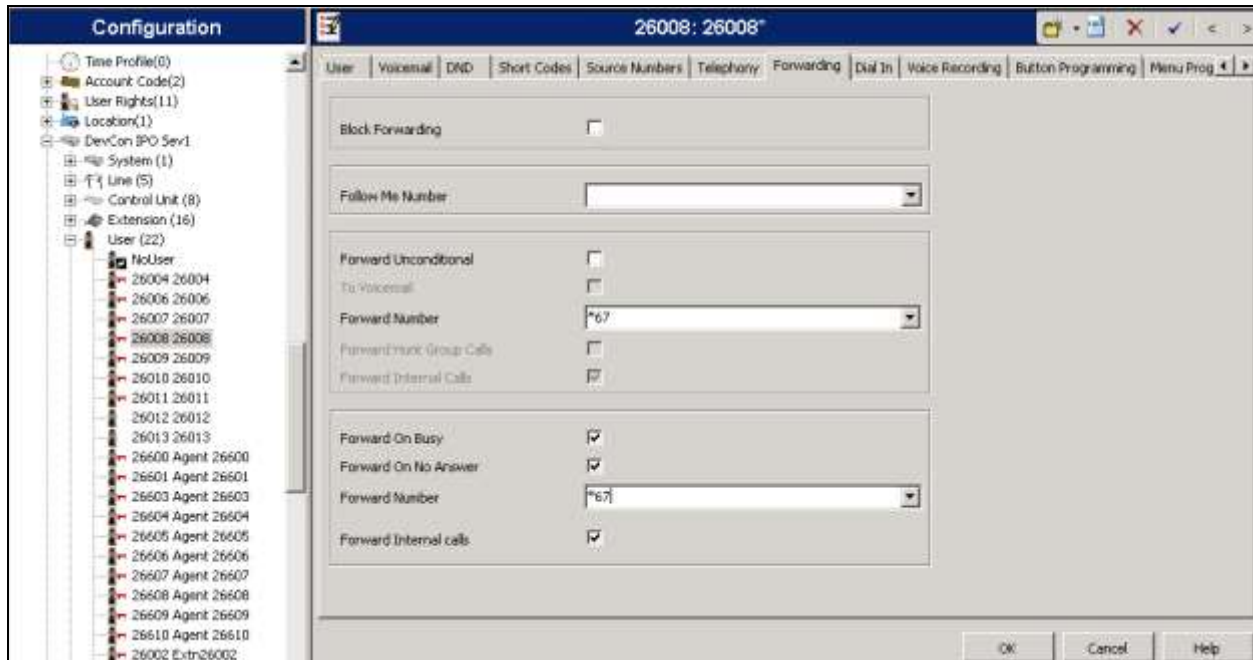
Click on **Save** icon to save all the changes to server.

5.10. Administer Analog Guest phone

Note: Guest rooms cannot be hidden from the directory.

From the configuration tree in the left pane, click on **Extension**, select an available Analogue Extension. In this example below extension 25 is selected, type in an available extension number for **Base Extension**.

Select the **Analogue** tab. It is recommended to use the following settings for analog phone:

- **Standard Telephone:** is checked. This will give a phone a positive disconnect.
- **Message Waiting Lamp Indication Type: ON** is selected.

Click **OK** to save changes.

6. Configure DuVoice
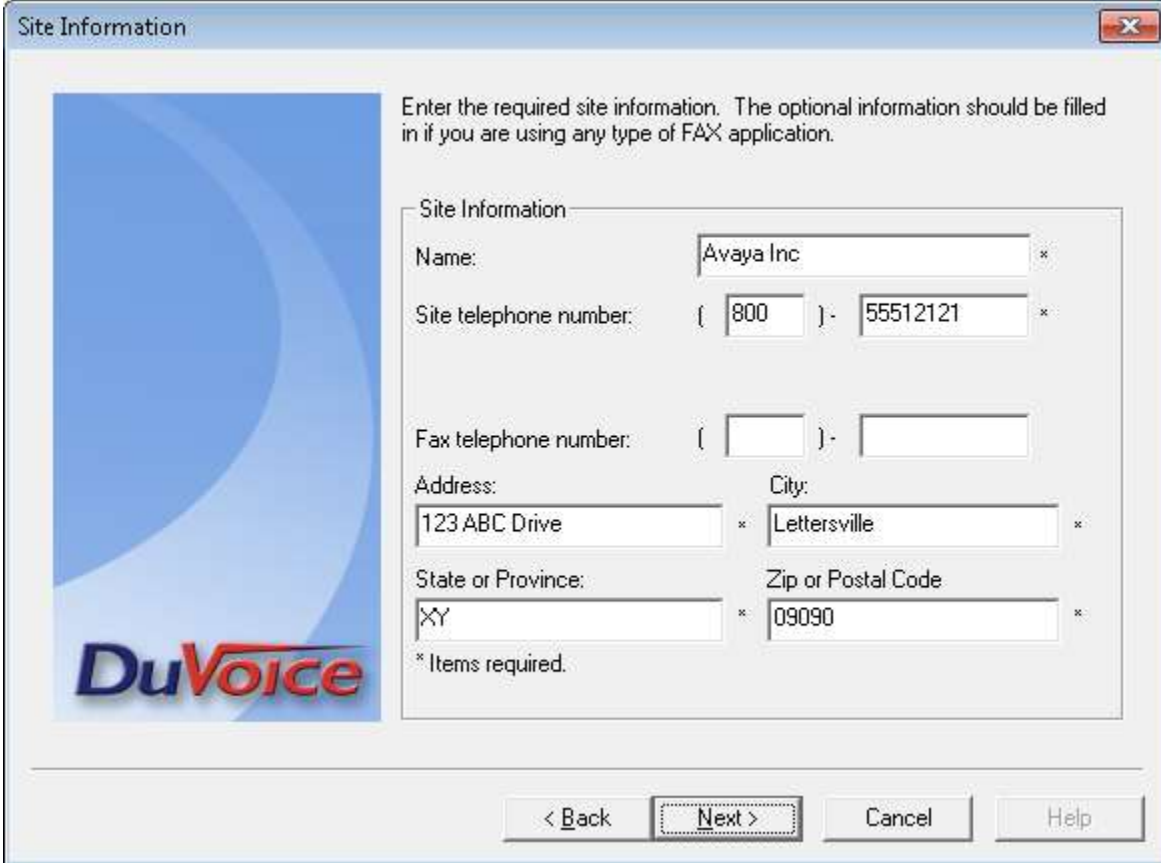
This section provides the procedures for configuring DuVoice.

6.1. Administer Setup Wizard

From the DuVoice server, select **Start → All Programs → DuVoice → System Configuration**. The **Wizard Start** screen is displayed upon initial access. Click **Next**.
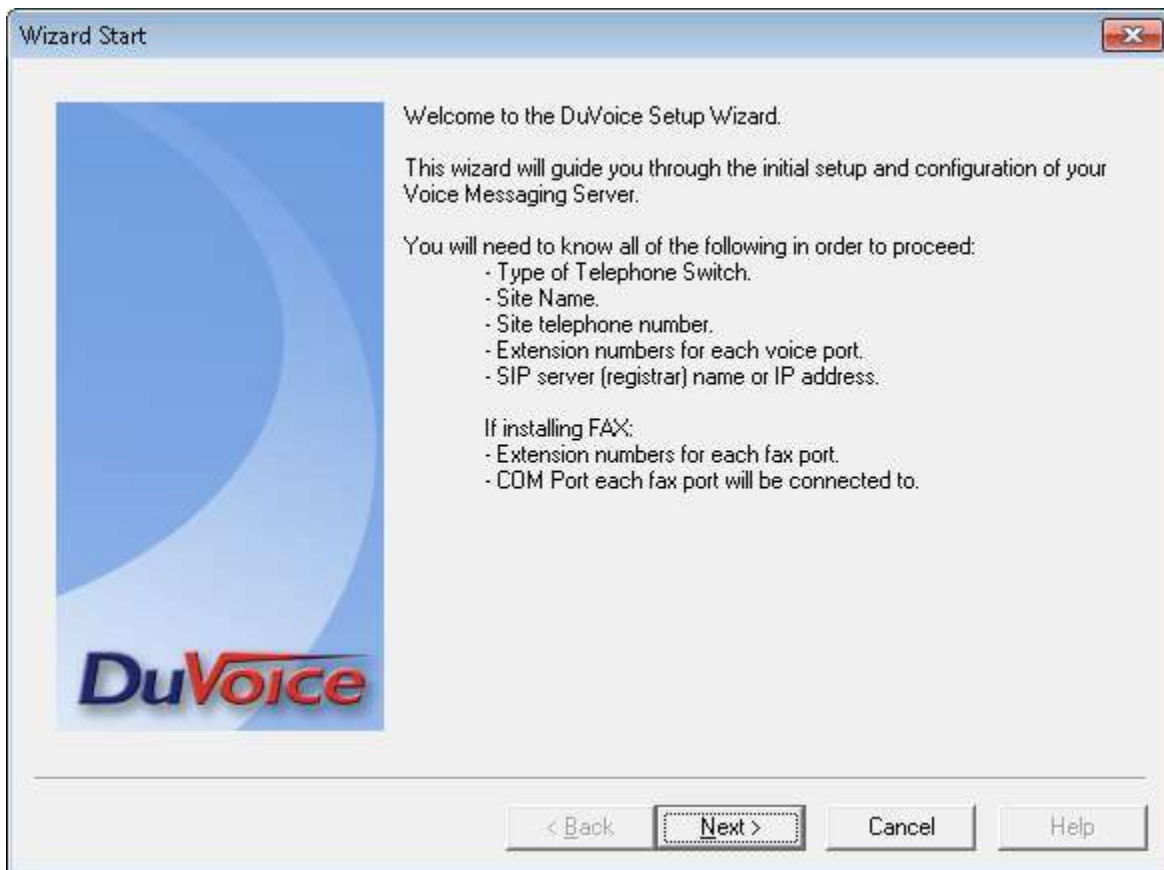
The **Site Information** screen is displayed next. Enter desired values for the required fields, and click **Next**.

The **PBX Model** screen is displayed next. Select **Avaya** → **Avaya IP Office** from the listing, and click **Next**.
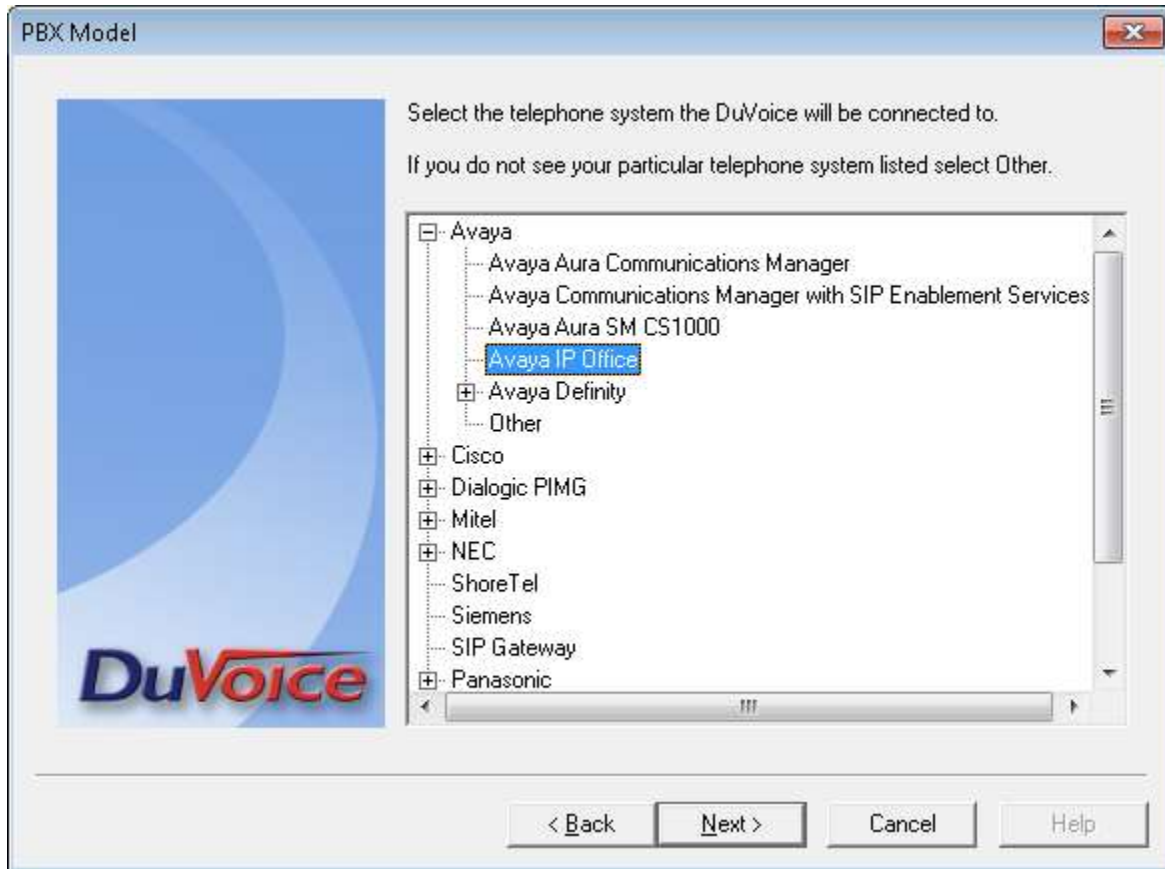
The **MWI Method** screen is displayed. Select **Inband using a feature or shortcode** and retain rest of the default values.
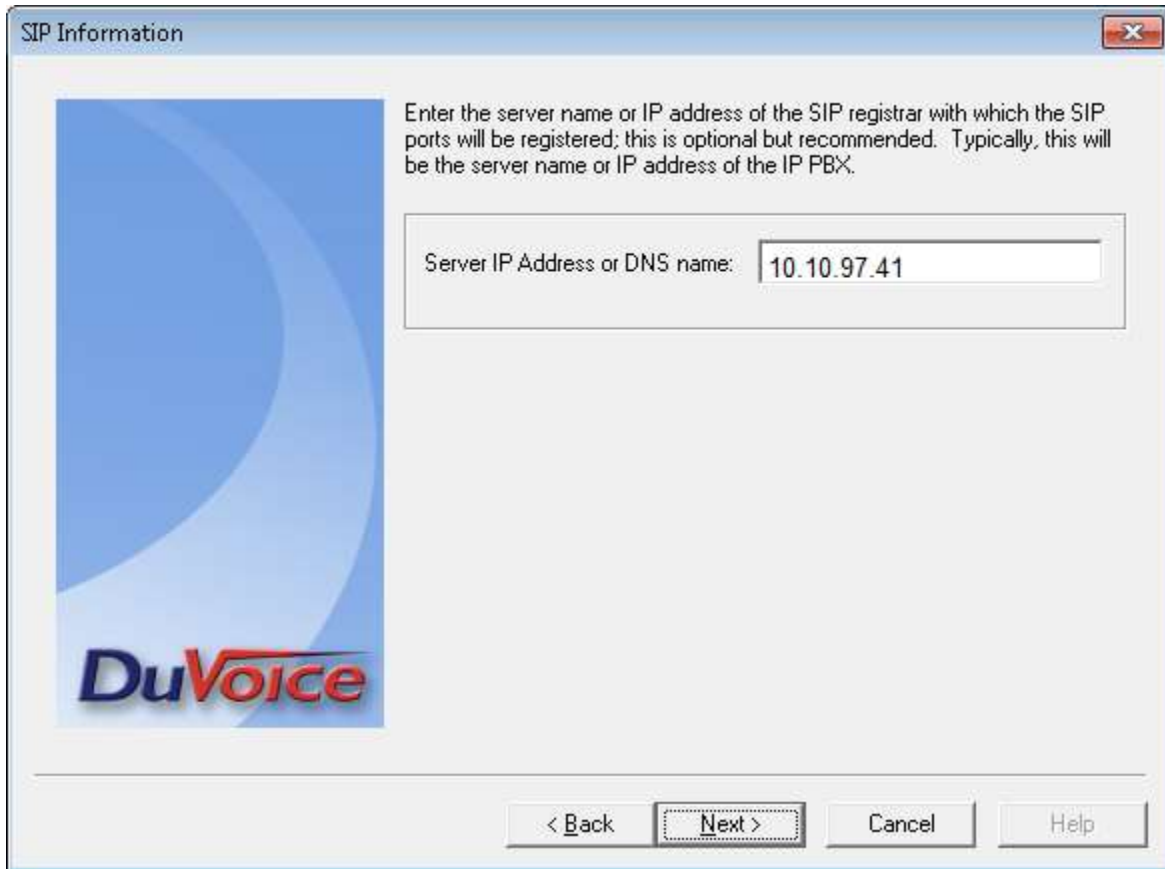
The **SIP Information** screen is displayed next. For **Server IP Address or DNS name**, enter the IP address or DNS name of IP Office as mention in Section **5.2**, and click **Next**.

The **Voice Ports** screen is displayed. For **Voicemail Huntgroup**, enter the hospitality hunt group extension from **Section 5.6**. Assign each SIP base extension from **Section 5.5** to an available **Port**, as shown below.

In the compliance testing, four DuVoice ports were configured to correspond to the four SIP extensions created on IP Office.

Click **Next**, followed by **Finish** in the subsequent screen to complete the wizard.
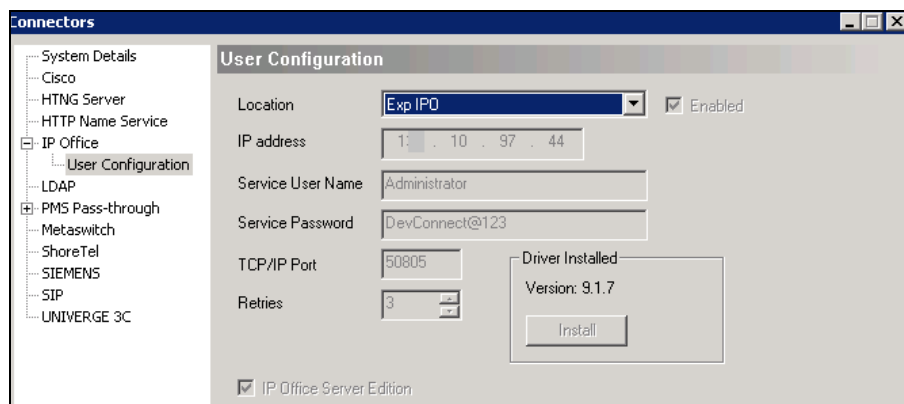
6.2. Administer Connectors

From the DuVoice server, select **Start → All Programs → DuVoice → System Configuration**. The **System Configuration** screen is displayed. Select **Features → Connectors…** from the top menu. Select **IP Office → User Configuration**, enter the following information:

- **Location**: select Default Location.
- Check **Enabled** checkbox.
- **IP address**: enter IP Office primary Linux Server, in this case it is 10.10.97.41
- **Service User Name**: enter user name to login primary server, it is Administrator.
- **Service Password**: enter password for above user name.
- **IP Office Server Edition** checkbox is checked.
- **Driver Installed:** verified the installed Version is 9.1.7.

Click **OK** to save changes. This connector is used to establish a Configuration Web Service connection to IP Office, for update of guest user names and user rights template
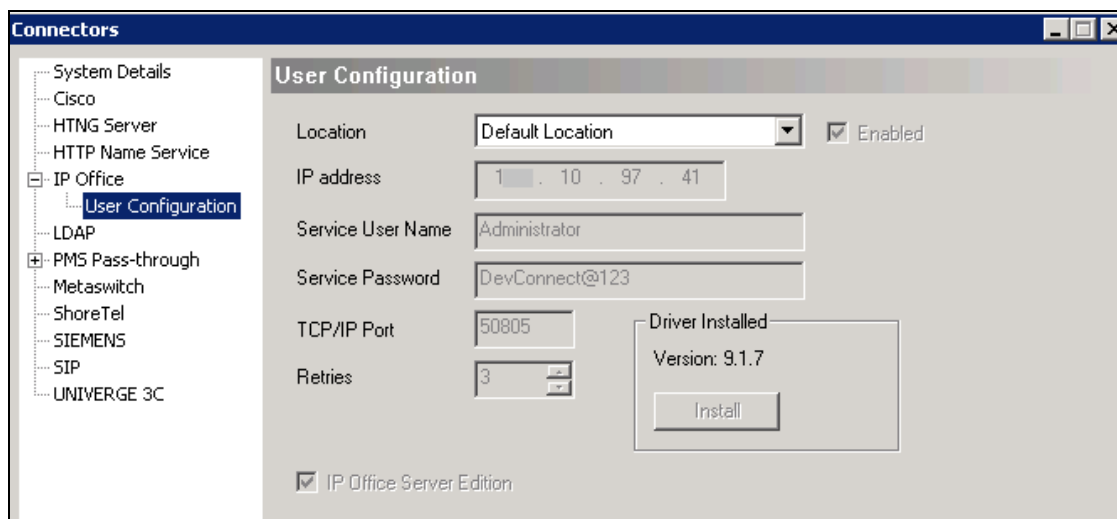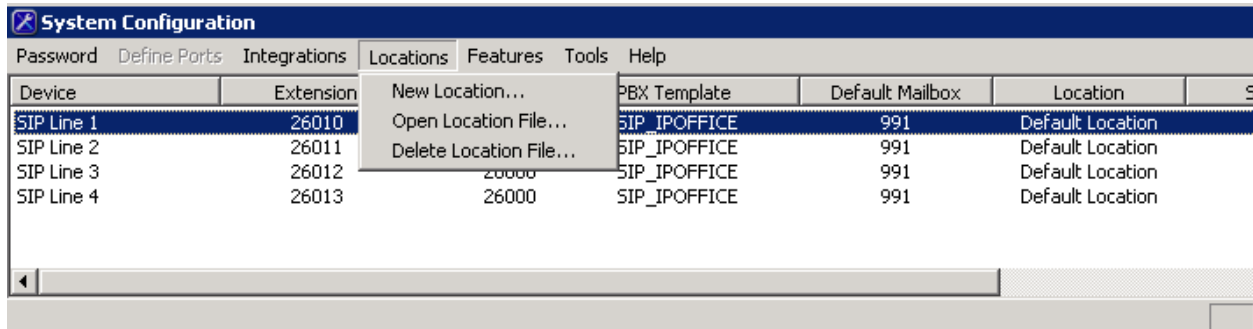

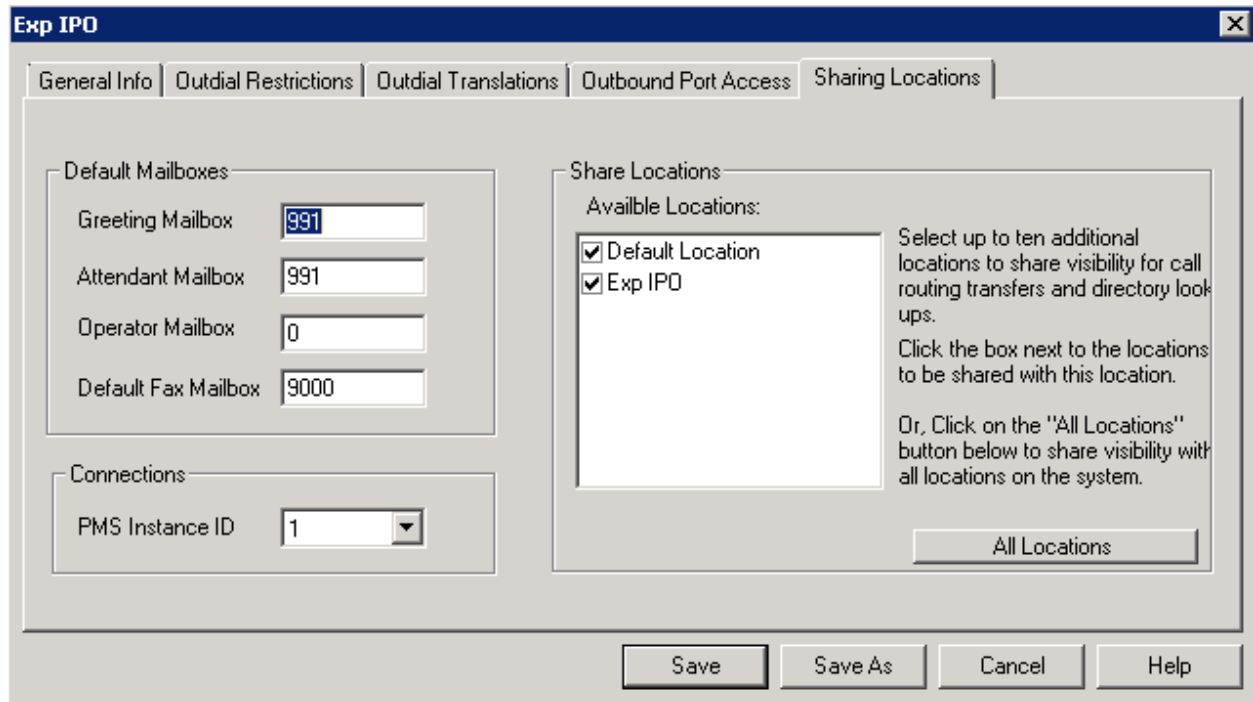Repeat the same step for Expansion system:

6.3. Administer Location

From the DuVoice server, select **Start → All Programs → DuVoice → System Configuration**. The **System Configuration** screen is displayed. Select **Locations → New Location…** from the top menu.

Follow the screen to create a new location for 500v2. Below screenshot is an example of location created for **Exp IPO** Expansion during compliance test.

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6.4. Administer Hospitality

From the **System Configuration** screen shown in **Section 6.3**, select **Features → Hospitality** from the top menu. The **Hospitality Configuration** screen is displayed. Select **Maid Codes** from the left pane, to display the **Maid Codes** screen in the right pane.

Check the desired **PMS Digit** to be used, and enter the desired **Display Text**. The digits can be used by the maids to indicate the room clean status, upon dialing into the hospitality hunt group and selecting the appropriate option.

Select **Phone Control** from the left pane, to display the **Phone Control** screen in the right pane. For **PBX Type**, select "Avaya IP Office".

In the **User group restrictions / call restriction values** section (bottom half of screen), add an entry to match each user rights template in **Section 5.8**. Note that the **PBX Value** is case sensitive and must match the user rights template name in **Section 5.8**. Enter desired names for **Display Text**. In the compliance testing, two entries were created to match the two user rights template in **Section 5.8**. Click **Apply**.

After clicking **Apply**, the new user group rights will show up in the field drop-down list for
Check-In and **Check-out**. In the **Auto-set phone state on** section, check **Check-in** and **Check-out**, and select the corresponding drop-down values as shown below.

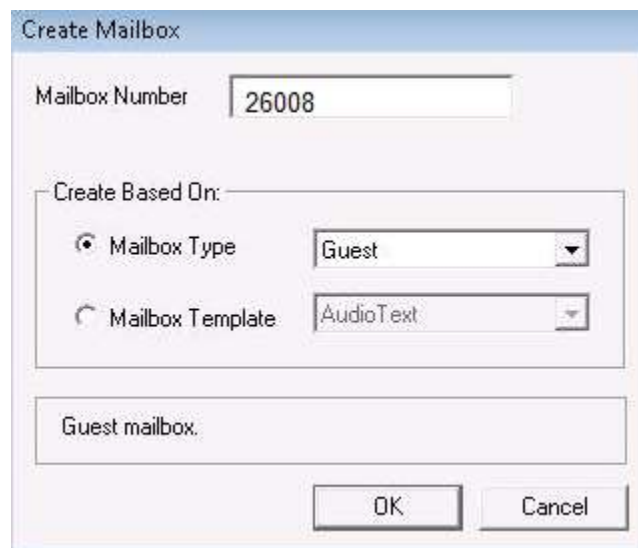Retain the default values in the remaining fields
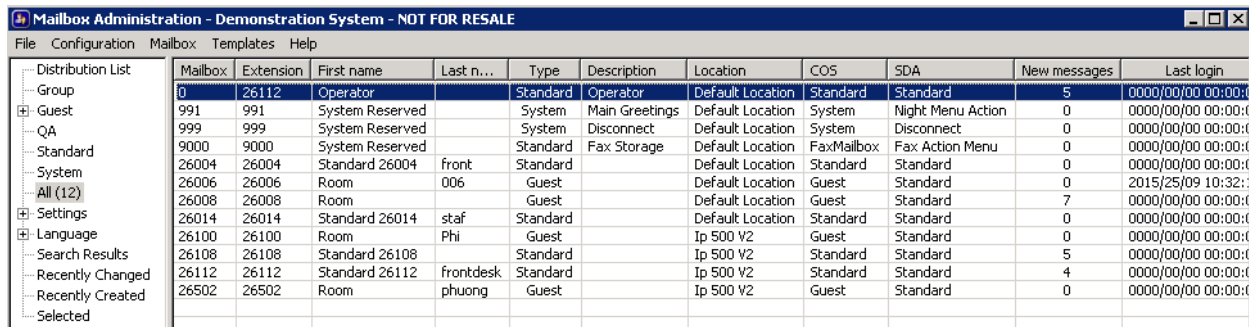
6.5. Administer Mailboxes

From the DuVoice server, select **Start → All Programs → DuVoice → Mailbox Administration**. The **Mailbox Administration** screen is displayed. Select **Mailbox → Create** from the top menu.

The **Create Mailbox** screen is displayed next. For **Mailbox Number**, enter the first voicemail user extension from **Section** Error! Reference source not found., in this case "26008". For **Mailbox Type**, select "Guest" for guest users, and "Standard" for front desk and staff users.

The **Create Mailbox 26008** screen is displayed. Enter desired values for **Password**, **First Name**, **Last Name** and **Location**, and retain the default values in the remaining fields.


Click on Notification verify the following **Notifications** is added as shown in below screenshot:

Repeat this section for all voicemail users from **Section** Error! Reference source not found., as shown below.

Mailbox	Extension	First name	Last n...	Type	Description	Location	COS	SDA	New messages	Last login
0	26112	Operator		Standard	Operator	Default Location	Standard	Standard	5	0000/00/00 00:00:0
991	991	System Reserved		System	Main Greetings	Default Location	System	Night Menu Action	0	0000/00/00 00:00:0
999	999	System Reserved		System	Disconnect	Default Location	System	Disconnect	0	0000/00/00 00:00:0
9000	9000	System Reserved		Standard	Fax Storage	Default Location	FaxMailbox	Fax Action Menu	0	0000/00/00 00:00:0
26004	26004	Standard 26004	front	Standard		Default Location	Standard	Standard	0	0000/00/00 00:00:0
26006	26006	Room	006	Guest		Default Location	Guest	Standard	0	2015/25/09 10:32:
26008	26008	Room		Guest		Default Location	Guest	Standard	7	0000/00/00 00:00:0
26014	26014	Standard 26014	staf	Standard		Default Location	Standard	Standard	0	0000/00/00 00:00:0
26100	26100	Room	Phi	Guest		Ip 500 V2	Guest	Standard	0	0000/00/00 00:00:0
26108	26108	Standard 26108		Standard		Ip 500 V2	Standard	Standard	5	0000/00/00 00:00:0
26112	26112	Standard 26112	frontdesk	Standard		Ip 500 V2	Standard	Standard	4	0000/00/00 00:00:0
26502	26502	Room	phuong	Guest		Ip 500 V2	Guest	Standard	0	0000/00/00 00:00:0

6.6.   Startup Server

From the DuVoice server, select **Start** → **All Programs** → **DuVoice** → **Activity Monitor**. The **Activity Monitor** screen is displayed. Select **Service** → **Start** from the top menu to start all services.
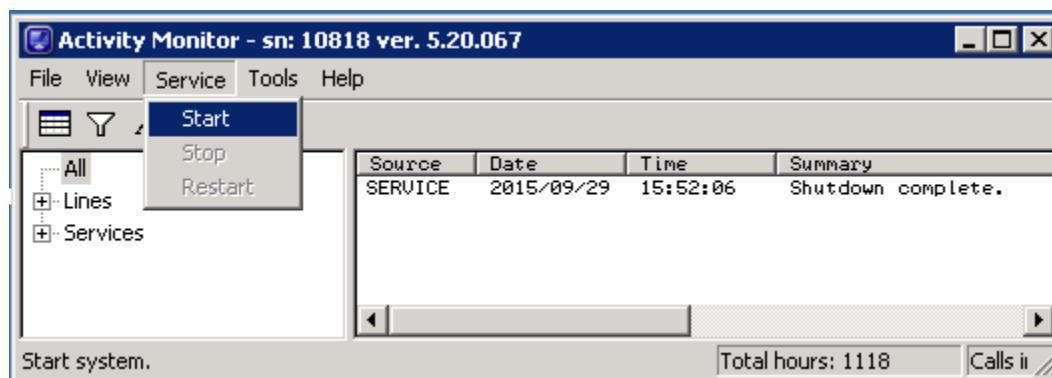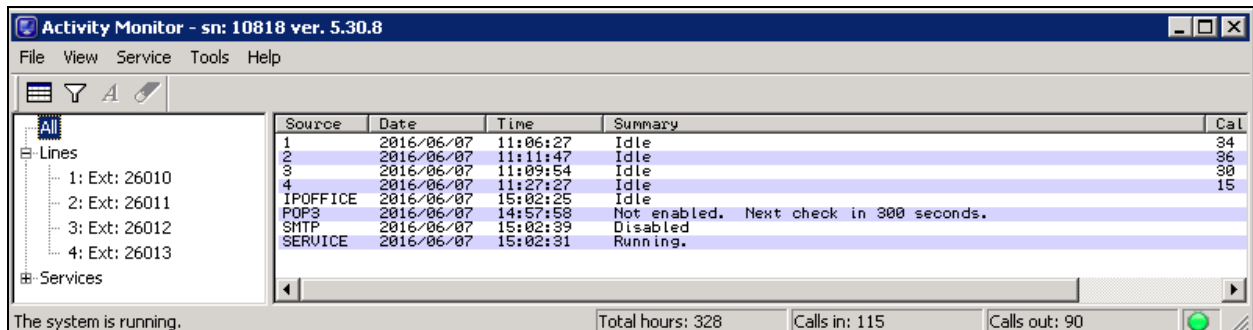
7. Verification Steps

This section provides the tests that can be performed to verify proper configuration of Avaya IP Office and DuVoice.

7.1. Verify DuVoice Activity Monitor

Follow the procedures in **Section 6.6** to display the **Activity Monitor** screen. Verify that ports **1**-4, **IPOffice** is in the "Idle" state, as shown below.
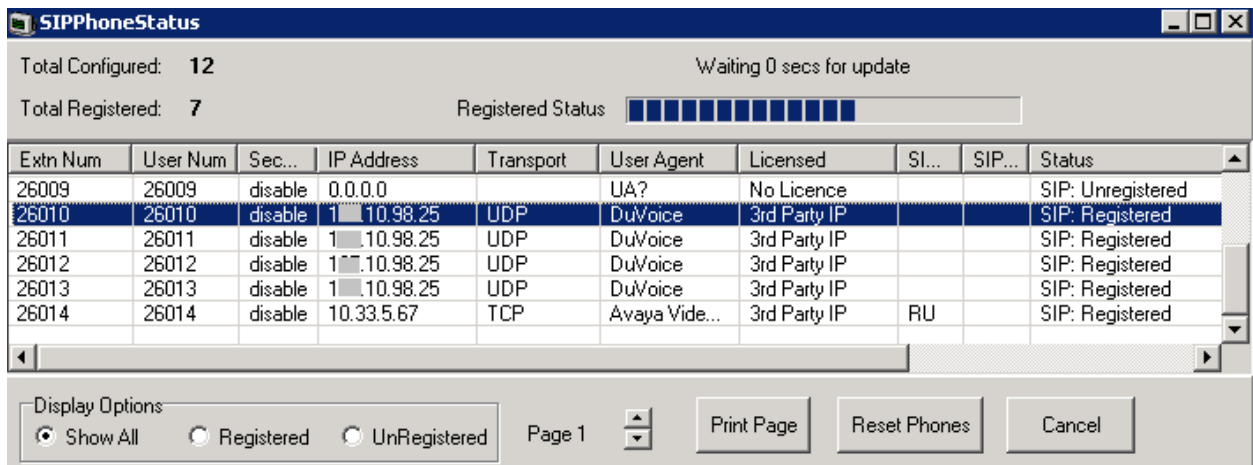

7.2. Verify SIP User Integration

From a PC running the Avaya IP Office Monitor application, select **Start → Programs → IP Office → Monitor** to launch the application. The **Avaya IP Office R9 SysMonitor** screen is displayed. Select **Status > SIP Phone Status** from the top menu.

The **SIPPhoneStatus** screen is displayed. Verify that there is an entry for each SIP extension from **Section 5.4**, that the **User Agent** is "DuVoice", and that the **Status** is "SIP: Registered", as shown below.


Place an incoming call from the PSTN to the hospitality hunt group. Verify that the calling party hears the greeting announcement from DuVoice. Enter the extension of a guest user, and verify that the call is transferred to the guest user.

7.3.   Verify Configuration Web Service Integration

Open the **Avaya IP Office R9 Manager – Security Administration** screen. Select **System** from the left pane, followed by **Certificates** in the right pane. Verify that **Offer Certificate** is checked, and that **Issued to** contain an automatically generated string to IP Office name, in this case, it is **DevCon IPO Sev1**, as shown below.
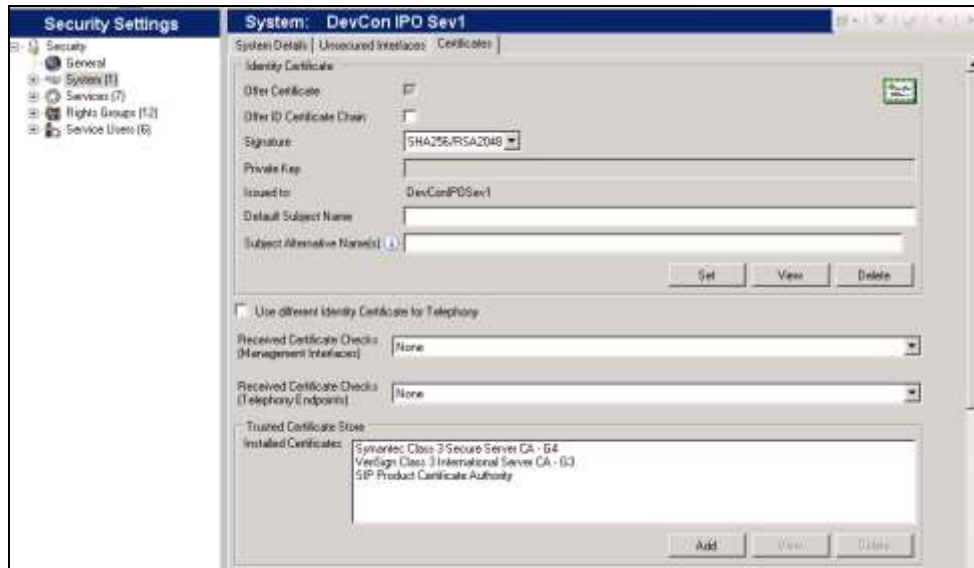

7.4.   Verify user name change and check-in/out status for guest

Use Hospitality tester to perform check in a guest for room 26008 with name Phuong MacNeil. Verify that the guest name Phuong MacNeil 26008 is updated automatically on **Full Name** field.
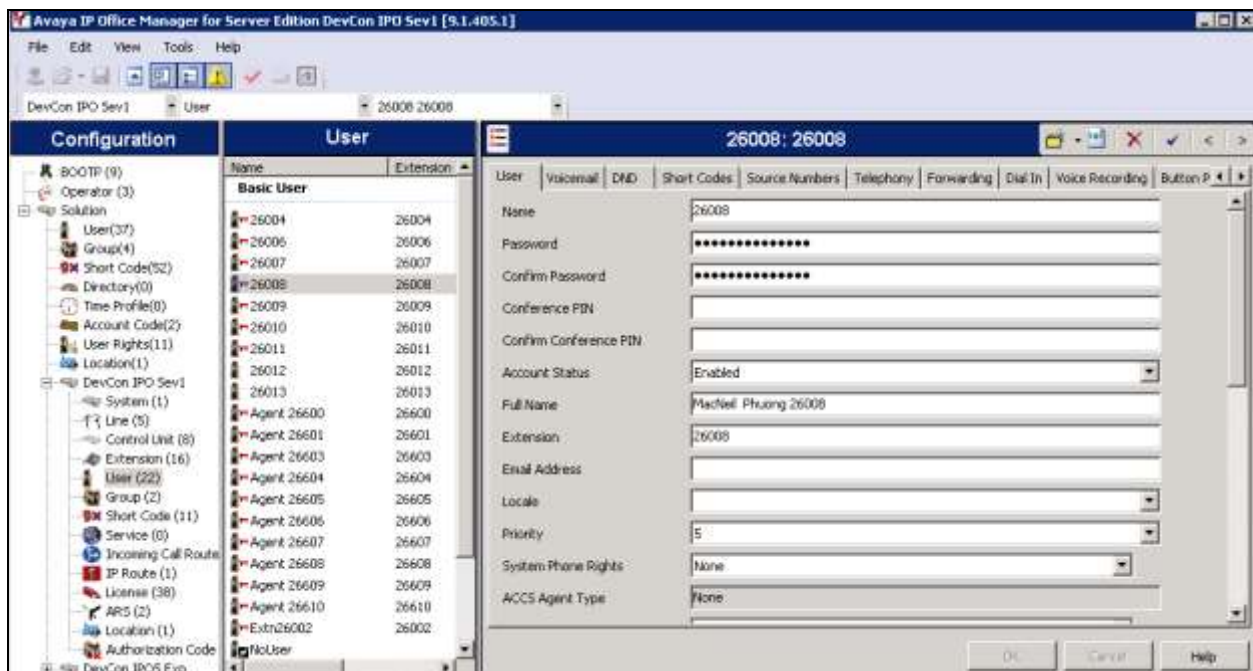
Verify user right template CheckIn is updated on **Working hours User Rights** field on IP Office as part of the check-in process.
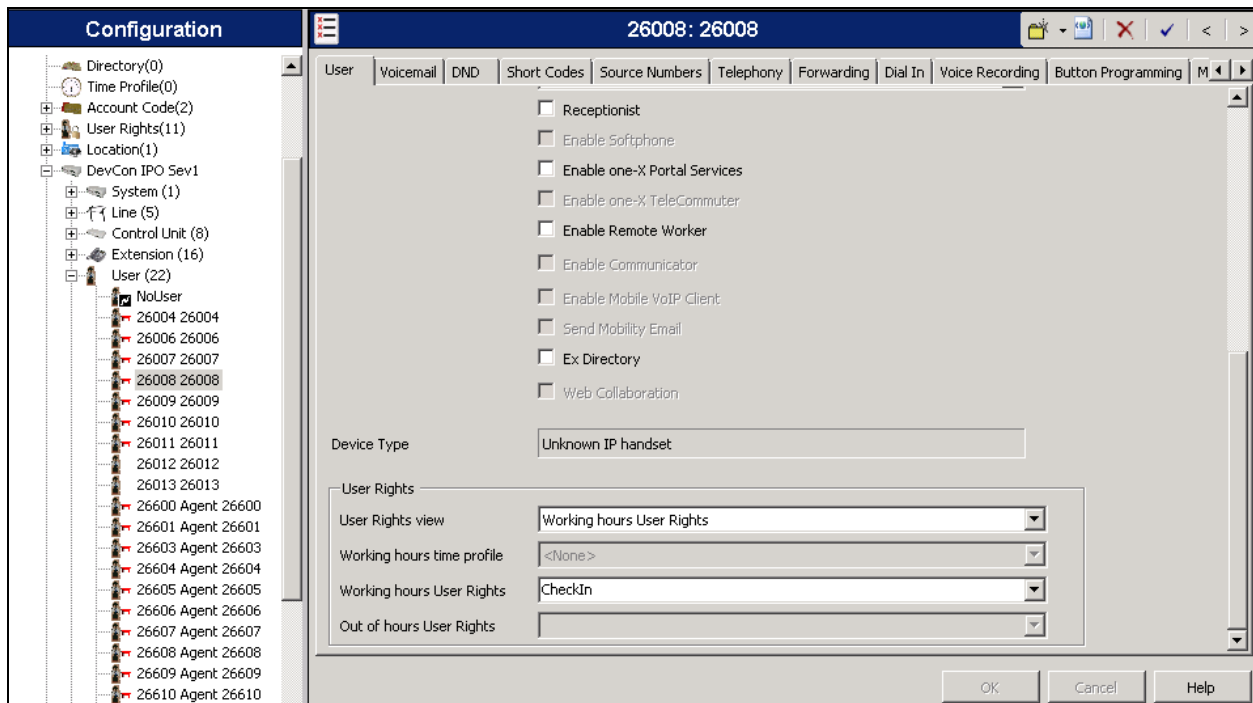
8. Conclusion

These Application Notes describe the configuration steps required for DuVoice to successfully interoperate with Avaya IP Office Server Edition 9.1. All feature and serviceability test cases were completed with an observation noted in **Section 2.2**.

9. Additional References

This section references the product documentation relevant to these Application Notes.

1. *IP Office Manager 9*, Document 15-601011 Issue 9.14 0, September 2015, available at http://support.avaya.com.
2. http://support.duvoice.com/dv530/pbx/avaya/ipofficev91/usingsip

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