



## **Avaya Solution & Interoperability Test Lab**

---

# **Application Notes for Configuring WinExpress 3.0 with Avaya IP Office Server Edition R9.1 – Issue 1.0**

### **Abstract**

These Application Notes describe the configuration steps required for WinExpress 3.0 to interoperate with Avaya IP Office Server Edition Release 9.1. WinExpress is a universal system which offers a real-time, multi-tasking, seamless interface between the hotel exchange and the hotel front office system. It comprises of two main components, i.e., Phoenix voicemail, and Unicorn which includes call billing and interface solution. In the compliance testing, WinExpress used SIP Users, Short Codes, SMDR, and Configuration Web Service interfaces from Avaya IP Office Server to provide voicemail, wake-up call, room status, mini-bar posting, call billing, as well as name and user profile template change features.

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 WinExpress 3.0 to interoperate with Avaya IP Office Server Edition R9.1. WinExpress is a Windows-based hospitality system that provides a seamless interface with a hotel's Front Office System and Avaya IP Office Server. In the compliance testing, WinExpress used SIP Users, Short Codes, SMDR, and Configuration Web Service interfaces from Avaya IP Office Server to provide voicemail, message waiting lamp control, wake-up call, room status and mini-bar posting, call billing, name and user profile template change, and do not disturb features.

In the compliance testing, Phoenix voicemail lines registers as SIP users on Avaya IP Office Server for voice mail and wakeup services and posting of mini-bar and room status through the phones. The voicemail lines were configured as members of a hospitality hunt group. Guest room phones were forwarded to these voicemail lines when busy or did not answer within the specified time. Each voicemail line will forward to another in a round robin fashion till one is available.

For the voicemail coverage scenarios, voicemail messages were recorded and saved on WinExpress. Short Codes were used to activate/deactivate the Message Waiting Indicator (MWI).

The Unicorn component was used in the compliance testing to initiate the room Check-In, Check-Out, and move requests on WinExpress. In the compliance testing, multiple rights templates were set up on Avaya IP Office Server for use with Check-In and Check-Out guests. Unicorn used the Configuration Web Service to send updates to Avaya IP Office Server on the guest name and user rights template as part of the Check-In, Check-Out, and move process.

The Station Message Detail Reporting (SMDR) interface was used by WinExpress to capture calls made from room phones for the purpose of call billing.

## 2. General Test Approach and Test Results

The feature test cases were performed manually. Calls were made from the PSTN, and from local users, to the hospitality hunt group by dialing the different extensions for voice message recording/retrieval, mini-bar and room status posting and setting of wake-up call. Unicorn was used to manually initiate Check-In/Check-Out/Move requests, update guest info, and to set Do Not Disturb. For SMDR testing, outgoing calls were made to the PSTN (simulated) and the WinExpress call billing reports were verified. The serviceability test cases were performed manually by disconnecting and reconnecting the Ethernet cable to WinExpress, and rebooting the Avaya IP Office server and WinExpress server.

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 WinExpress:

- Registration of SIP users
- Handling of voicemail and text messages including message waiting lamp control
- Voicemail recording and retrieval, with proper message waiting lamp activation/deactivation for users with analog, digital and IP telephones
- Scheduling and delivering of wake-up call requests, including retried attempts and escalation to Operator
- Setting of MWI for both voice and text messages using short codes
- Posting of room status and mini-bar consumption from the room phones
- Use of Configuration Web Services to update guest name and user rights template associated with Check-In, Check-Out, Do Not Disturb and move requests from Unicorn
- Capture calls made from room phones for the purpose of call billing

The serviceability testing focused on verifying the ability of WinExpress to recover from adverse conditions, such as disconnecting and reconnecting the Ethernet cables to WinExpress server and rebooting of IP Office server and WinExpress server.

## 2.2. Test Results

All test cases were executed and passed. The following were observed:

- SIP registration with TCP was not successful due to the URL format request in the SIP Invite. Registration using UDP was required
- For message forwarding by admin user to properly control the MWI, a patch was required for WinExpress by running a script file **aretrieve\_forward.script**.
- Simultaneous Wake Up calls required Phoenix to make calls using multiple channels (different SIP user) instead of the same channel. Otherwise, multiple wake up calls cannot be launched simultaneously from Phoenix.
- Avaya IP Office does not provide history info for Call Forwarding Do Not answer /Busy to allow caller to hear different voice mail prompts

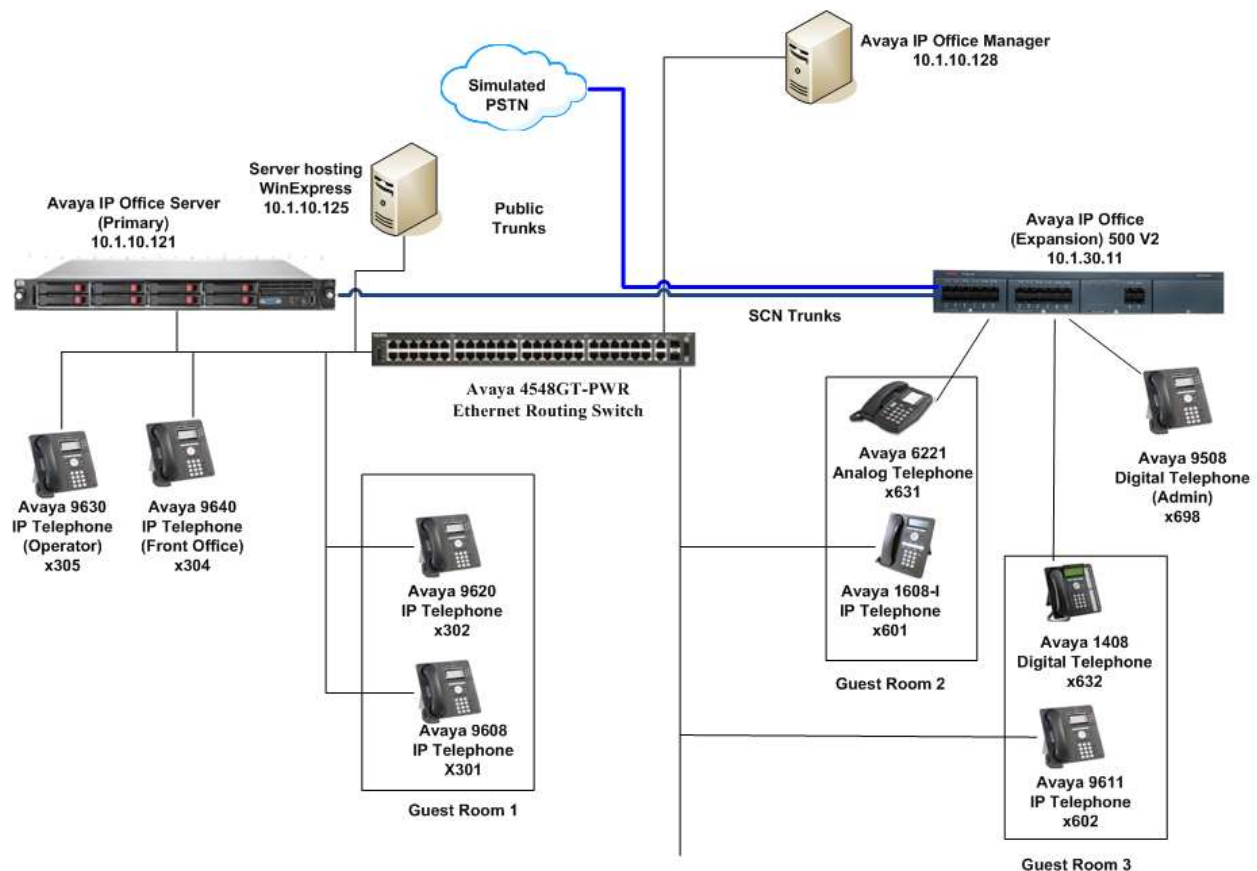
## 2.3. Support

Technical support on WinExpress can be obtained through the following:

- **Website:** <http://www.fcscs.com/>

### 3. Reference Configuration

The configuration used for the compliance testing is shown below. In the compliance testing, WinExpress was installed on a single server. Unicorn initiate room Check-In/Check-Out and room move via an Opera Simulator, capture SMDR, and to set Do Not Disturb. Phoenix handles the voicemail reception, recording and playback, message waiting lamps, wake-up calls as well as room and mini-bar status posting and reporting. Avaya IP Office Server Edition comprises of a Primary Server and an Expansion Module (500 V2). Avaya IP Deskphones (H.323) 96x1, 96x0, 16xx, Avaya Digital Deskphones 14xx and Analog Deskphones were deployed as guest room, front desk, operator and admin phones.



**Figure 1: Test Configuration of WinExpress 3.0 and Avaya IP Office Server R9.1**

## 4. Equipment and Software Validated

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

Equipment/Software	Release/Version
Avaya IP Office Server Edition (Primary)	9.1.400.137
Avaya IP Office 500 V2 (Expansion)	9.1.400.137
Avaya IP Office Manager	9.1.400.137
Avaya 96x1 H323 IP Deskphone	6.6029
Avaya 96x0 H323 IP Deskphone	3.250A
Avaya 950x H323 IP Deskphone	R55
Avaya 16xx H323 IP Deskphone	1.380B
Avaya 14xx Digital Deskphone	R40
Avaya 6221 Analog Deskphone	-
FCS Phoenix and Unicorn running on Microsoft Windows 2012 R2 SP1 hosted on VMware 5.x platform	*2.1 (Phoenix) 1.2 (Unicorn)

*Compliance Testing is applicable when the tested solution is deployed with a standalone IP Office 500 V2 and also when deployed with IP Office Server Edition in all configurations.*

*\*Script file name "atrieve\_forward.script" is required for fixed on issue with message forwarding.*

## 5. Configure Avaya IP Office

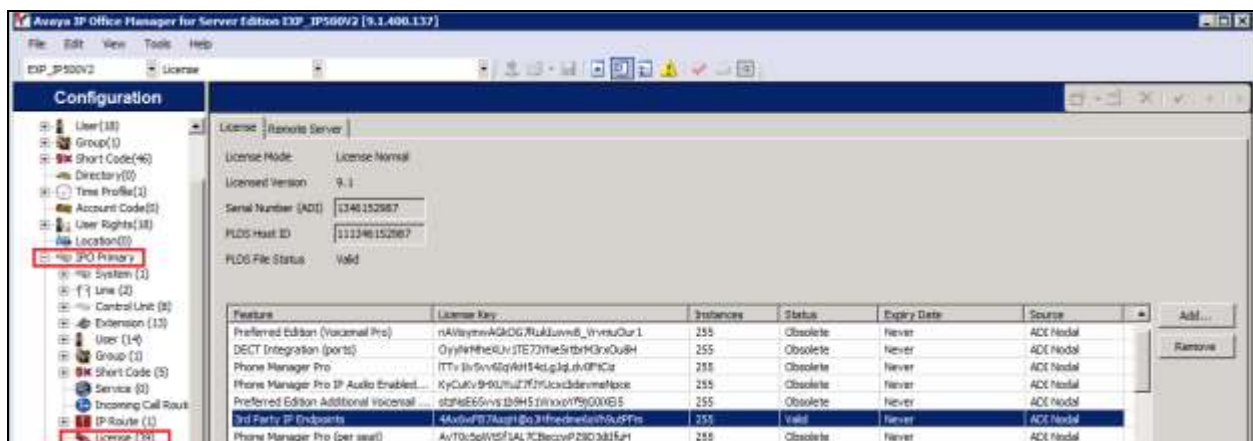
This section provides the procedures for configuring Avaya IP Office. The procedures include the following:

- Verify Avaya IP Office Server license
- Obtain LAN IP address
- Administer SIP Registrar
- Administer SIP Extensions
- Administer SIP Users
- Administer Hospitality Hunt Group
- Administer Incoming Call Route
- Administer Voicemail Users
- Administer Short Codes for message waiting lamp on/off
- Administer Analog User MWI
- Administer User Rights
- Administer Security Service
- Administer System Password
- Administer SMDR

### 5.1. Verify Avaya IP Office Server License

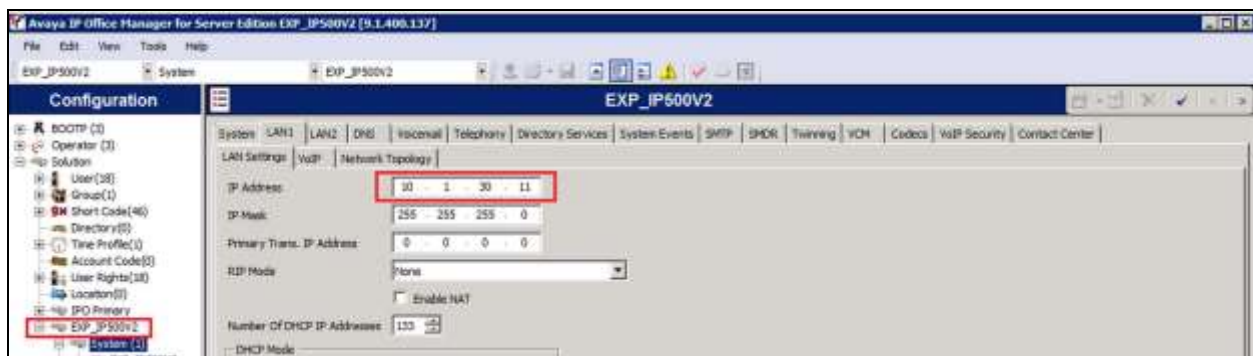
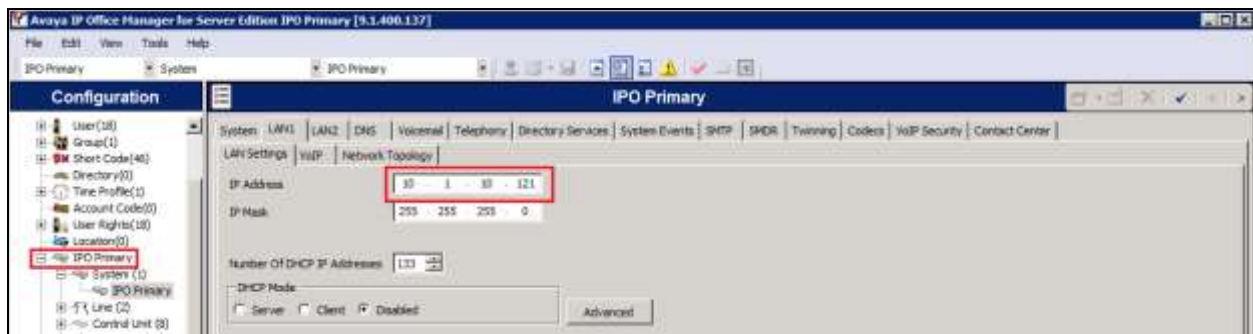
From a PC running the Avaya IP Office Manager application, select **Start → All Programs → IP Office → Manager** to launch the Manager application. Select the correct IP Office system and log in with the appropriate credentials.

From the home screen configuration tree in the left pane, select the server where the SIP user will be administered. In this Compliance Testing, the primary server is **IPO Primary**. Click on **License** and on the right pane, select **License** sub-tab and scroll down to display the **3rd Party IP Endpoints**. Verify that the **License Status** is “Valid”. This license is required for Phoenix to register to IP Office as a SIP User.



## 5.2. Obtain LAN IP Address

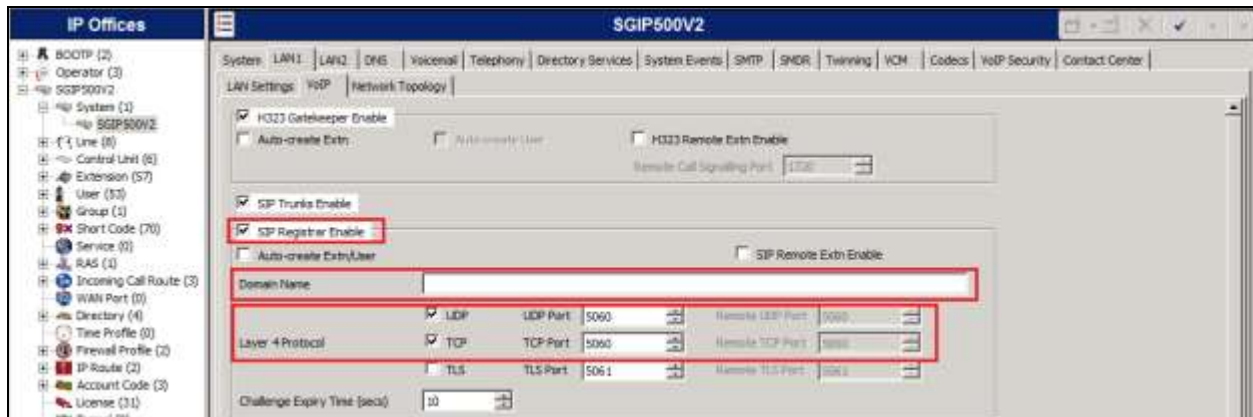
From the configuration tree in the left pane, select **System** → **IPO Primary** screen in the right pane. Select the **LAN1** tab followed by the **LAN Settings** sub-tab in the right pane. Make a note of the **IP Address**, which will be used later to configure WinExpress. Note that IP Office Server can support SIP on the LAN1 and/or LAN2 interfaces; in this compliance testing LAN1 interface is used. Note the same for the Expansion Module **EXP\_IP500V2**.





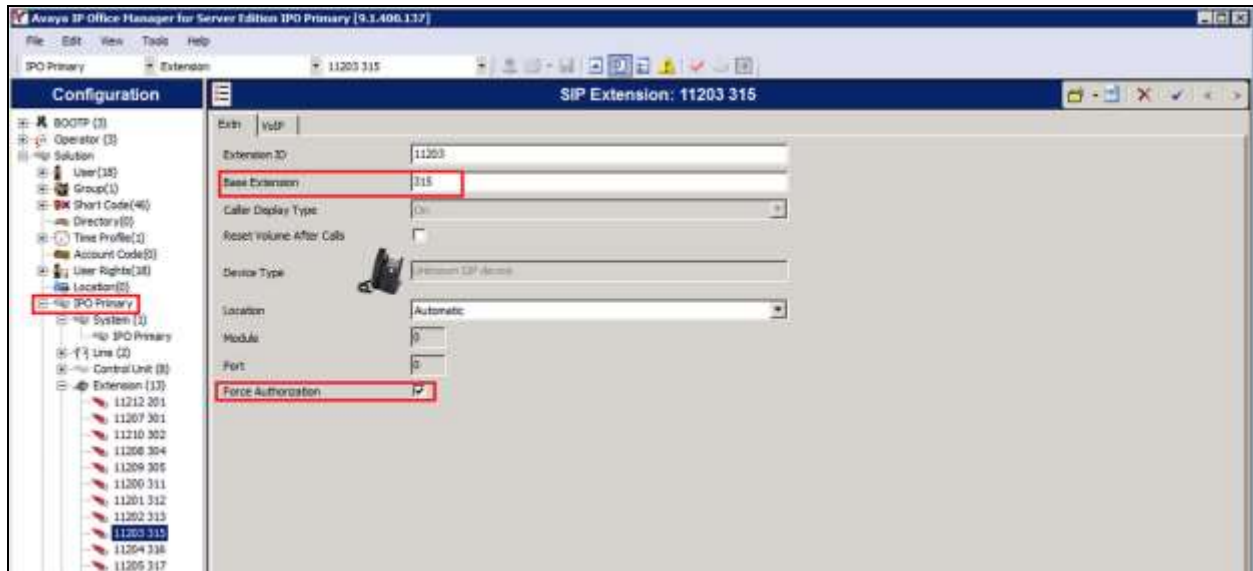
### 5.3. Administer SIP Registrar

From the screen in **Section 5.2** for the Primary Server, select the **VoIP** sub-tab. Ensure that **SIP Registrar Enable** is checked. Enter a valid **Domain Name** for SIP endpoints to use for registration with IP Office. In this compliance testing, the **Domain Name** is left **blank** so that the LAN IP address is used for registration. Ensure the **UDP** and **TCP** is selected for Layer 4 Protocol with **UDP/TCP Port** set to **5060**. In this compliance testing, the UDP port is used for SIP registration by Phoenix. TCP port was not successful in registration due to the SIP Invite URL request format that can be accepted in this IP Office version.

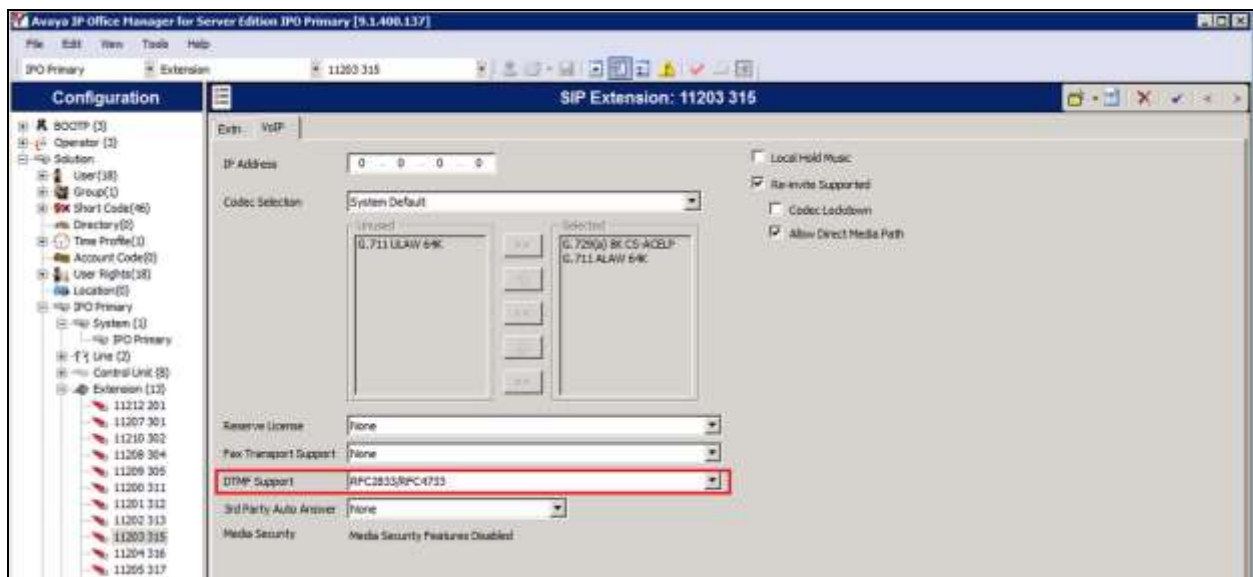


## 5.4. Administer SIP Extensions

From the configuration tree in the left pane for **IPO Primary**, right-click on **Extension** and select **New → SIP Extension** (not shown) from the pop-up list to add a new SIP extension. Enter the desired digits for **Base Extension** and check **Force Authorization**, as shown below.



Click on the **VoIP** tab and select **RFC2833/RFC4733** from the drop down menu for the DTMF Support.



Repeat this section to add other SIP extensions.

In the compliance testing, the following SIP extensions with base extensions of **311-313** and **315-317** were created. Phoenix used the called-party number **311-313** for various hospitality features. Phoenix registered as extensions **315-317** to function as Voice Mail ports.

***Note:** Customer needs to purchase enough SIP ports to provide for the voicemail lines and services.*

Phoenix can detect whether the call is routed from another phone or is an incoming direct call based upon the called-party number in the SIP INVITE to extensions 315-317. If it is direct hospitality hunt group, the caller is retrieving a voice message. But if it is indirect, where the called-party is user, the caller is leaving a voice message.

SIP Extension	Usage
315, 316 and 317	Phoenix registers to these extension for receiving voicemail calls
311	Post mini-bar/room status
312	Express leave voice message
313	Set wakeup call

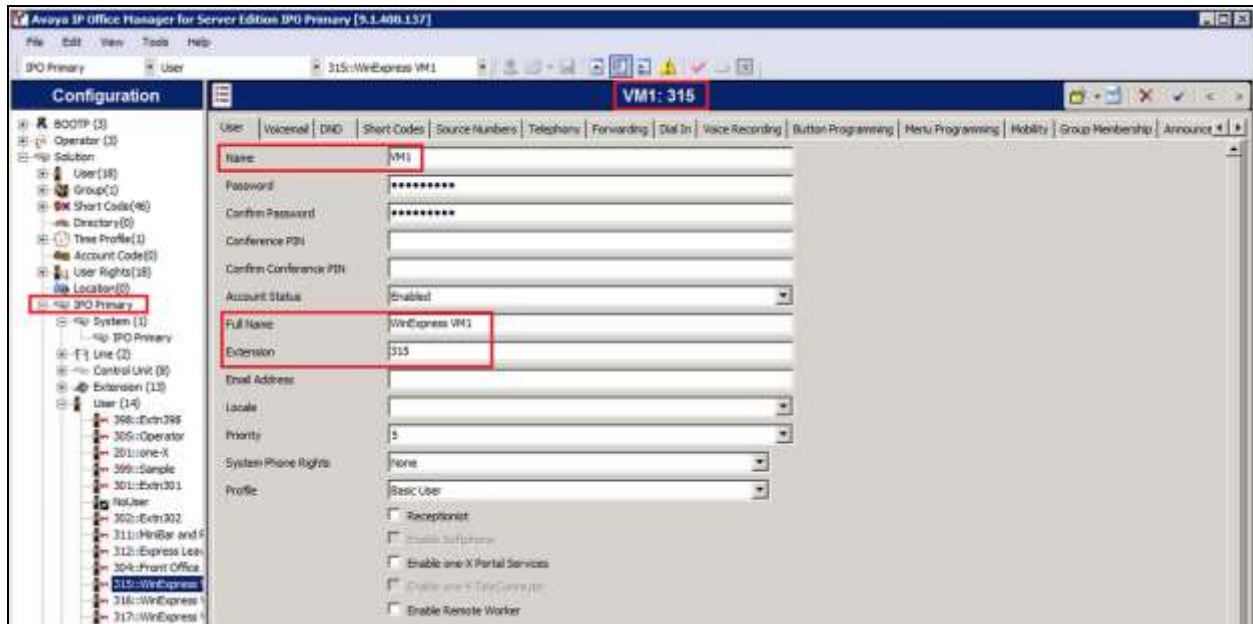
***Note:** The above services tied to the numbers (311-313) are merely a sample configuration*

## 5.5. Administer SIP Users

SIP users are administered for the SIP extensions created in **Section 4.4**. The primary SIP users **315, 316** and **317** are for receiving calls and the secondary SIP users **311, 312** and **313** are to forward calls to primary SIP users.

### 5.5.1. Administer Primary SIP Users

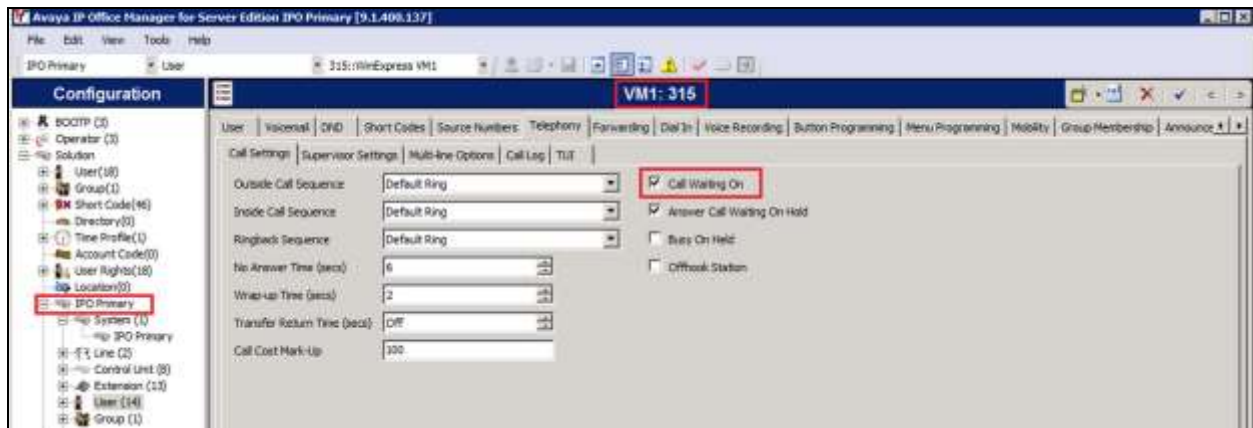
From the configuration pane on the left for **IPO Primary**, right click on **User** and select **New** from the pop-up list (not shown). Enter the desired values for **Name** and **Full Name**. For **Extension**, enter the Base Extension from **Section 4.4**. Phoenix registers using this primary SIP User to receive calls.



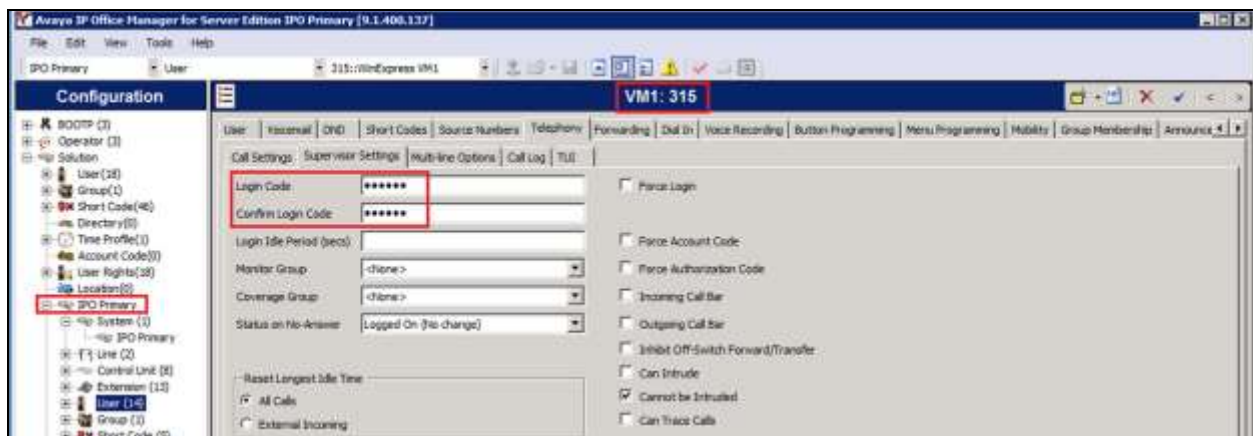
Select the **Voicemail** tab and uncheck **Voicemail On** as shown below because the default Voicemail of IPO Server Edition will not be used.



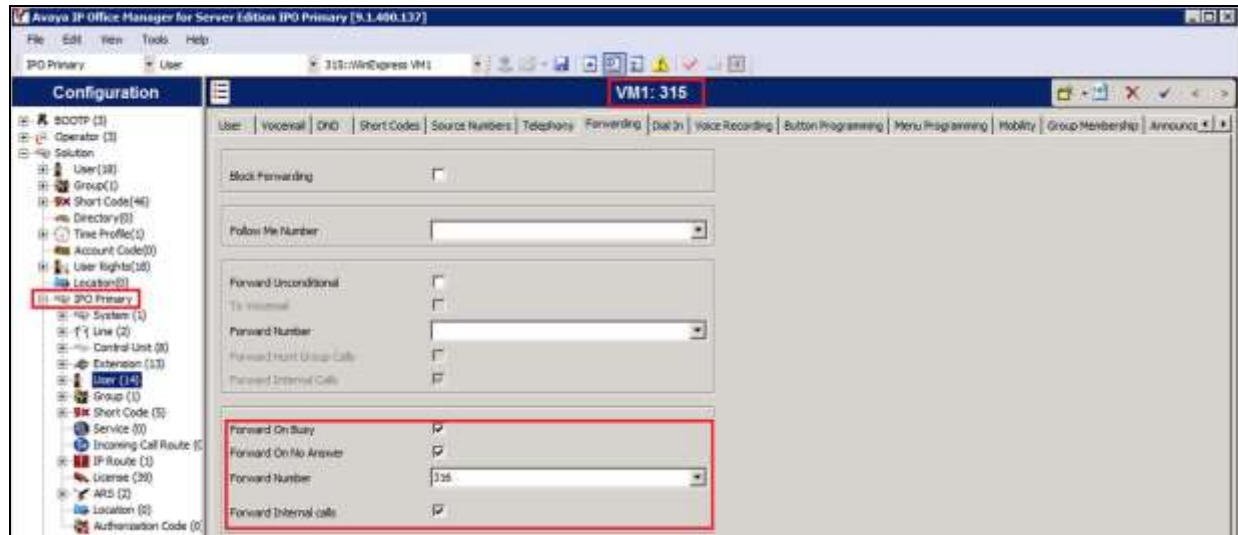
Select the **Telephony** tab followed by the **Call Settings** sub-tab. Check **Call Waiting On**, as shown below.



Select the **Supervisor Settings** sub-tab. Check the **Cannot be Intruded** field, as shown below. Specify the **Login Code** and **Confirm Login Code** field, which will be used by Phoenix to log in as the SIP User.



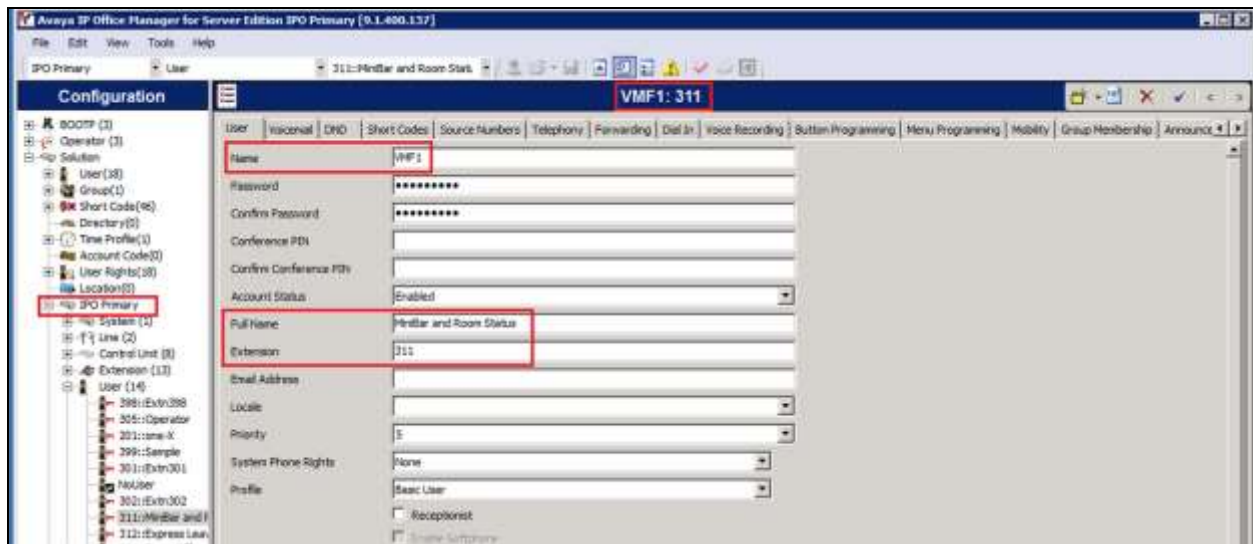
Select the **Forwarding** sub-tab. Check **Forward on Busy**, **Forward On No Answer** and **Forward Internal Calls** with the forwarding number as the next Voicemail Hunt group member, i.e. **316**. The last primary SIP User will forward back to the first Voicemail Hunt Group member i.e. **315**.



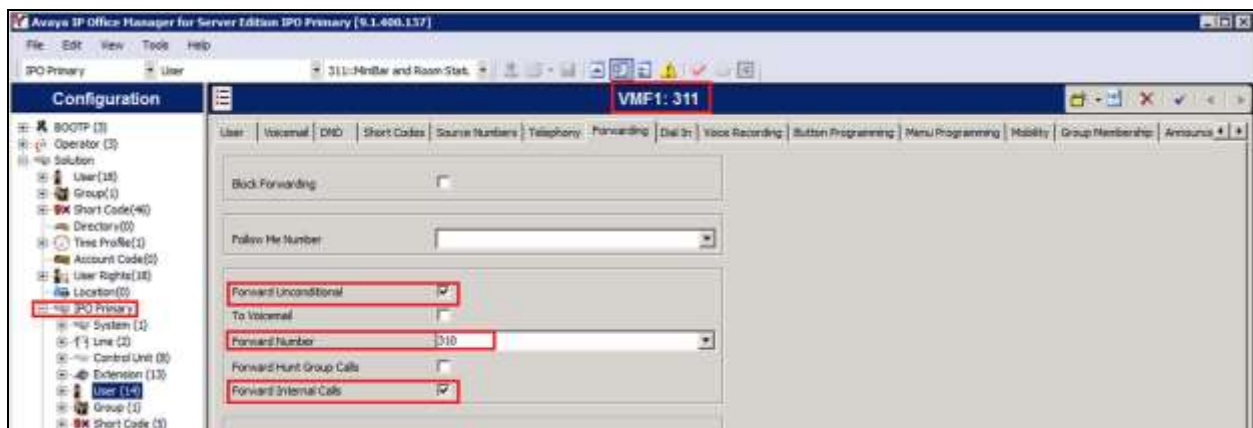
Repeat this section to add another two primary SIP Users associated with the last two primary SIP Extensions from **Section 4.4**.

## 5.5.2. Administer Secondary SIP Users

From the configuration pane on the left for **IPO Primary**, right click on **User** and select **New** (not shown) from the pop-up list. Enter the desired values for **Name** and **Full Name**. For **Extension**, enter the secondary SIP users Base Extension configured in **Section 5.4**, in this case starting from “311”.



Select the **Forwarding** tab. Check **Forward Unconditional** and set the **Forward Number** to the primary SIP Users hunt group, in this case “310” (created in the next section), as shown below. Check **Forward Internal Calls**.

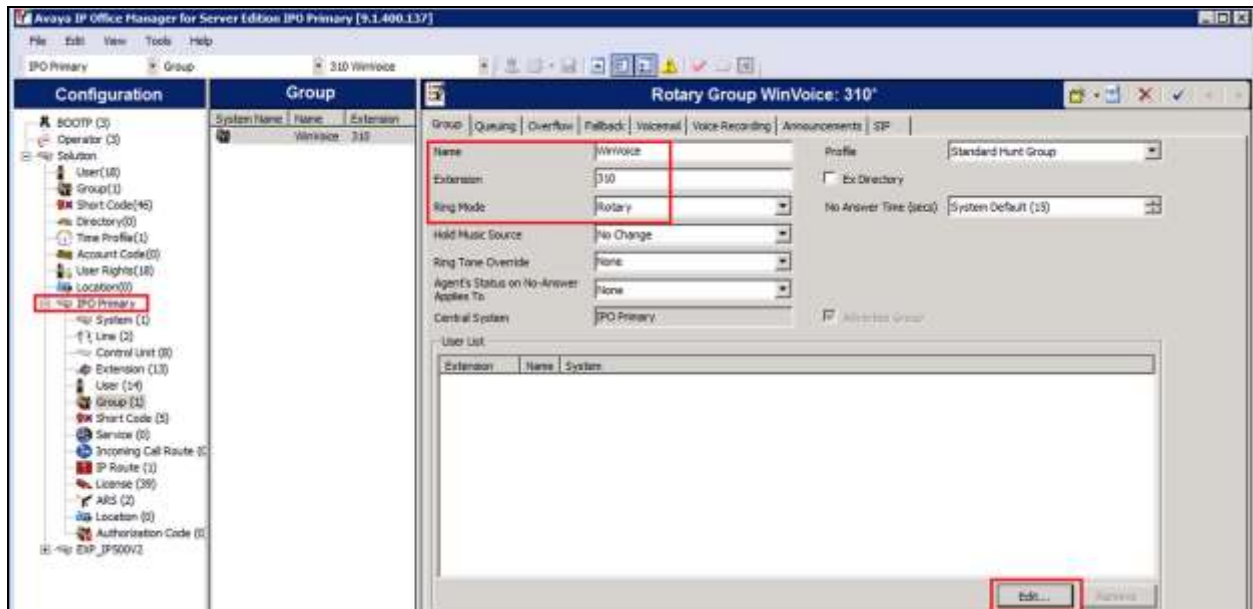


Repeat this section to add another two secondary SIP Users associated with the last two SIP Extensions from **Section 4.4**. In this compliance testing, SIP Users 311-313 were created.



## 5.6. Administer Hospitality Hunt Group

From the **Configuration** pane on the left for **IPO Primary**, right click on **Group** and select **New** (not shown) from the pop-up list to add a new hunt group. This hunt group will be used to deliver calls to Phoenix for the hospitality features and voicemail. Enter desired values for the **Name** and **Extension** fields and select **Ring Mode** as **Rotary** and retain the default values for the remaining fields. Rotary will allow the last selected member to be remembered and not necessary from the first member unlike sequential. Click on **Edit** in the **User List** section below the page to add members.





The **Select Members** screen is displayed. Select the SIP primary users from **Section 0** and click the **Append** button to move the selected entries to the right.

**Rotary | Hunt Group | 310 WinVoice - Select Members**

Filters

Extn Name      Extn Number      PBX Name      PBX Address

Available Users (18/18)

Name	Extn	PBX Name	PBX Address
Extn201	201	IPO Primary	10.1.10.121
Extn304	304	IPO Primary	10.1.10.121
Extn305	305	IPO Primary	10.1.10.121
Extn398	398	IPO Primary	10.1.10.121
Extn698	698	EXP_IP500V2	10.1.30.11
Room1_1	301	IPO Primary	10.1.10.121
Room1_2	302	IPO Primary	10.1.10.121
Room2_1	601	EXP_IP500V2	10.1.30.11
Room2_2	631	EXP_IP500V2	10.1.30.11
Room3_1	602	EXP_IP500V2	10.1.30.11
Room3_2	632	EXP_IP500V2	10.1.30.11
Template	399	IPO Primary	10.1.10.121
VM1	315	IPO Primary	10.1.10.121
VM2	316	IPO Primary	10.1.10.121
VM3	317	IPO Primary	10.1.10.121

Members (3/3)

Order	Enabled	Name	Extn	PBX Name	PBX Address
1	<input checked="" type="checkbox"/>	VM1	315	IPO Primary	10.1.10.121
2	<input checked="" type="checkbox"/>	VM2	316	IPO Primary	10.1.10.121
3	<input checked="" type="checkbox"/>	VM3	317	IPO Primary	10.1.10.121

The **Rotary Group** screen is displayed again and updated with the selected member.

**Avaya IP Office Manager for Server Edition IPO Primary (9.1.400.137)**

File Edit View Tools Help

IPO Primary      Group      310 WinVoice

**Rotary Group WinVoice: 310**

Group: QubeRing    Overflow:    Fallback:    Vocmail:    Voice Recording:    Announcements:    SIP

Name: WinVoice    Profile: Standard Hunt Group

Extension: 310    ☐ Ex Directory

Ring Mode: Rotary    No Answer Time (sec): System Default (15)

Hold Music Source: No Change

Ring Tone Override: None

Agent's Status on No-Answer: None

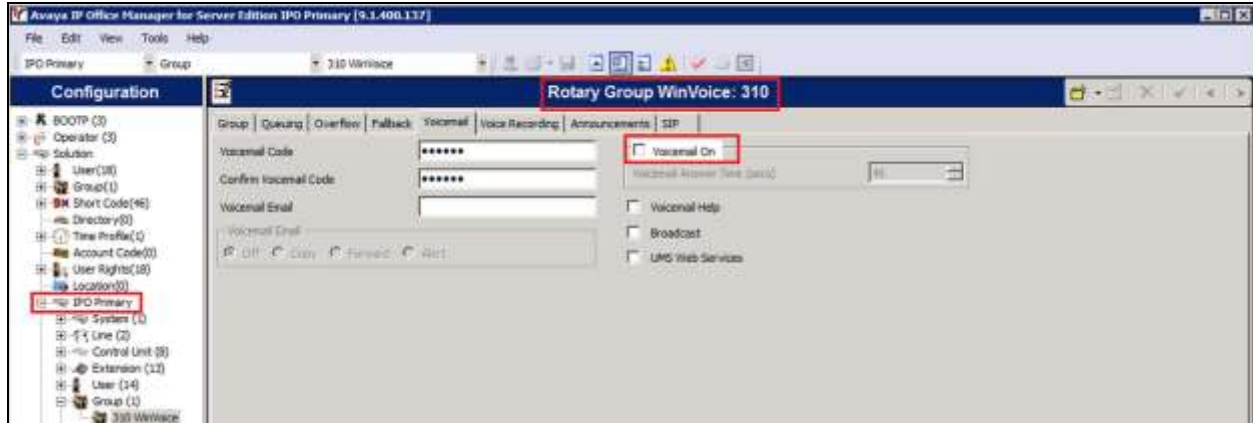
Applies To: IPO Primary    ☐ Applies to Group

Central System

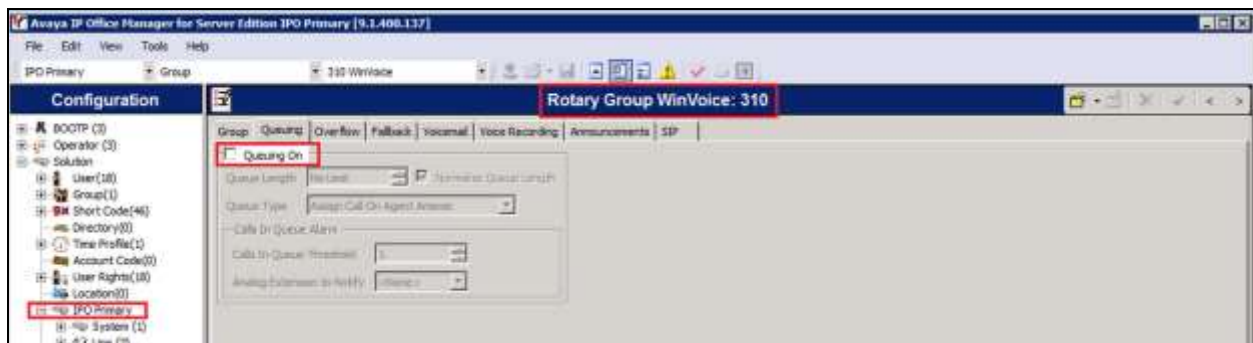
User List

Extension	Name	System
<input checked="" type="checkbox"/>	315	VM1 IPO Primary
<input checked="" type="checkbox"/>	316	VM2 IPO Primary
<input checked="" type="checkbox"/>	317	VM3 IPO Primary

Select the **Voicemail** tab and make sure **Voicemail On** is unchecked, as shown below.



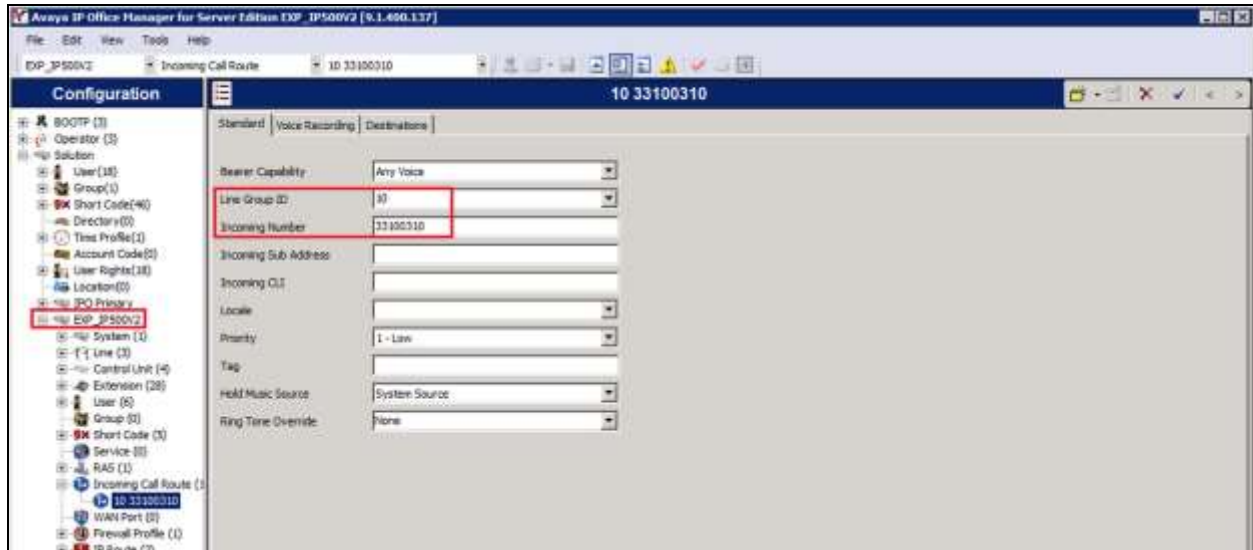
Select the **Queuing** tab and uncheck **Queuing On**, as shown below.



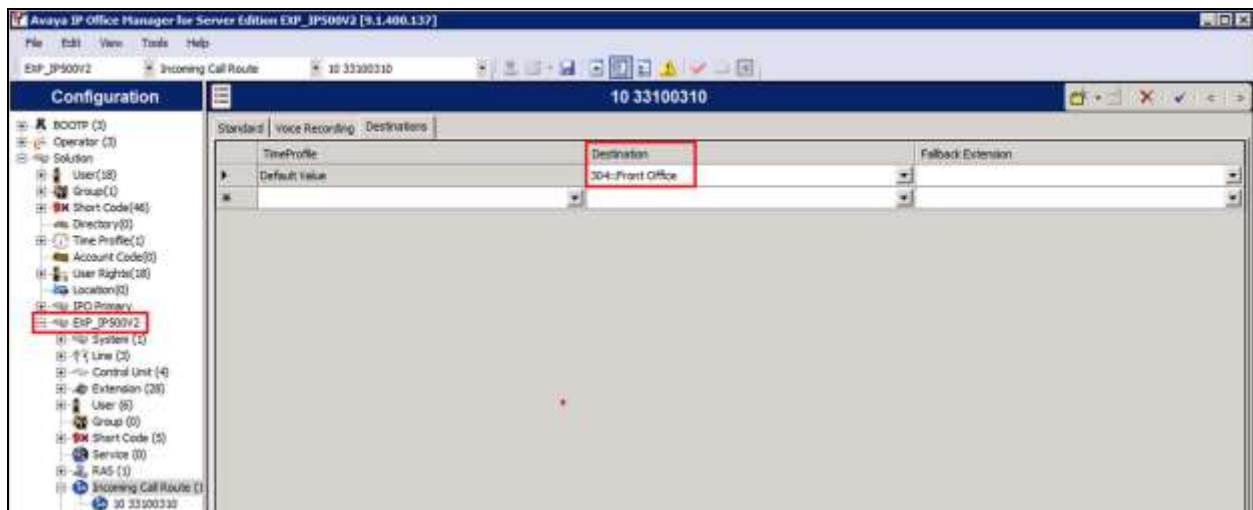
## 5.7. Administer Incoming Call Route

If necessary, create an incoming call route to route incoming calls to the desired phones. During compliance testing, an incoming call route was created to route incoming calls for the ISDN PRI Trunk in Expansion Module to the front office phone.

As shown in the screen below with the Expansion Module (**EXP\_IP500V2**), the **Incoming Number** for the ISDN PRI line **10** is **33100310**.

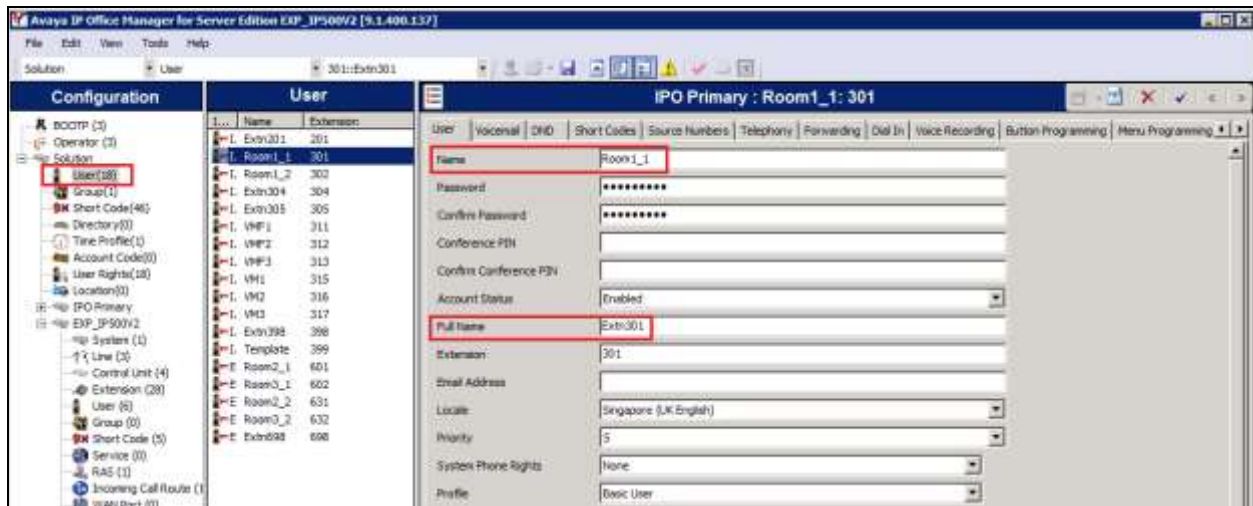


In the **Destinations** tab, select the front office phone extension from the **Destination** drop-down menu to route all incoming trunk calls to it. During the compliance testing, extension **304** was used, as shown below.

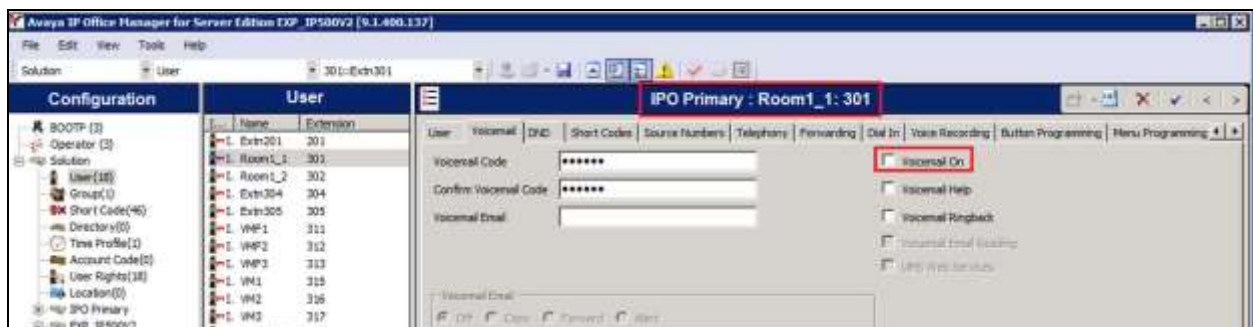


## 5.8. Administer Voicemail Users

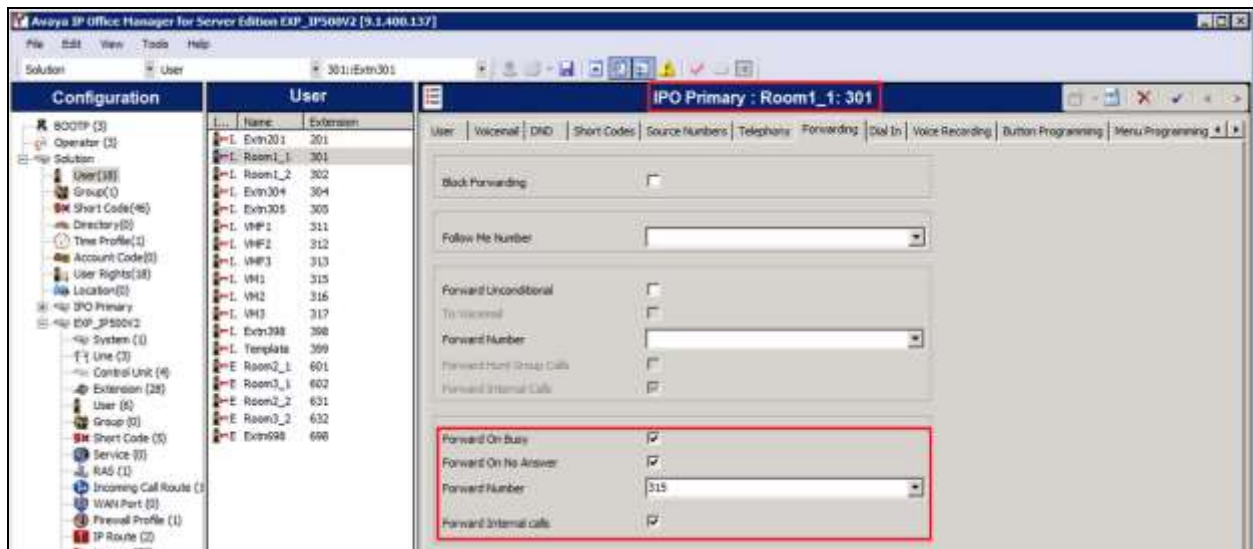
From the configuration tree in the left pane, select the first user that will be using WinExpress for voicemail – these can be Guests and/or Admin staff. In this case, the user is **301**. Enter a descriptive **Name**. The **Full Name** can be completed as a template for identification or leave it as blank as Unicorn will update the guest name through IP Office Configuration Web Services regardless.



Select the **Voicemail** tab. Uncheck **Voicemail On**, as shown below because the default system Voicemail will not be used.



Select the **Forwarding** tab. Check **Forward On Busy**, **Forward On No Answer** and **Forward Internal Calls** with the forwarding number as the first Voicemail Hunt group member in **Section 5.6**, as shown below.

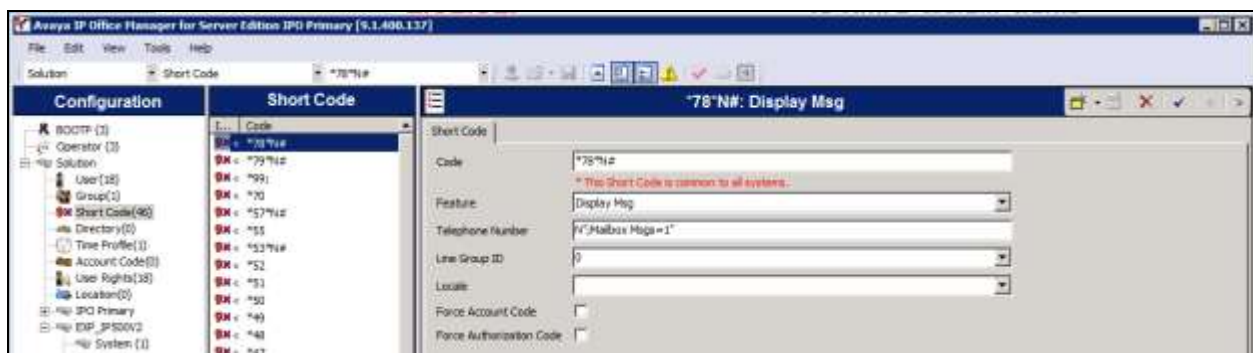


Repeat this section for all users using Phoenix for voicemail, including all guest rooms, front desk, and staff. In the compliance testing, the voicemail users consisted of one front desk with extension **304**, admin phone with extension **698** and guest rooms with extensions **301**, **302**, **601**, **631**, **602** and **632**, as shown in **Figure 1**.

## 5.9. Administer Short Codes for message waiting lamp on/off

From the configuration screen in the left panel, select **Short Code** and right click **New** from the pop-up list (not shown). Enter the parameters as below for turning message waiting lamp **ON** and leave the rest as default.

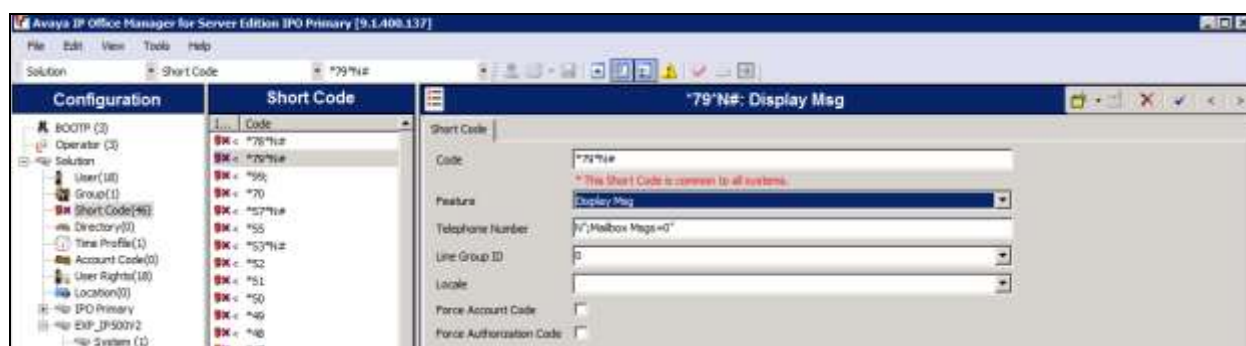
- **Code** \*78\*N# where **78** is a free number randomly assigned and **N** represents user station
- **Feature** Select **Display Msg** from drop down menu
- **Telephone Number** Enter the format **N";Mailbox Msgs=1"**





Similarly, create a new **Short Code** and enter the parameters as below for turning message waiting lamp **OFF** and leave the rest as default.

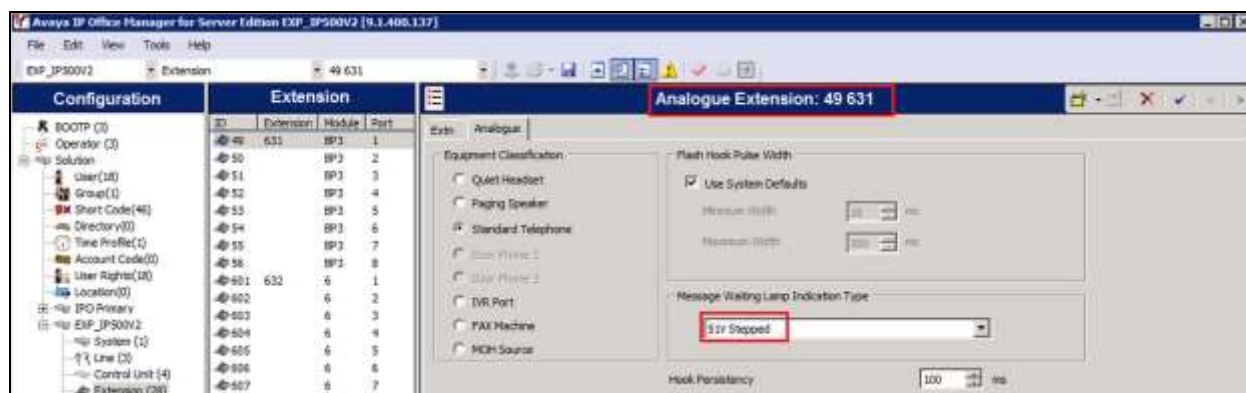
- **Code** \*79\*N# where **79** is a free number randomly assigned and N represents user station
- **Feature** Select **Display Msg** from drop down menu
- **Telephone Number** Enter the format N";Mailbox Msgs=0"



## 5.10. Administer Analog User MWI

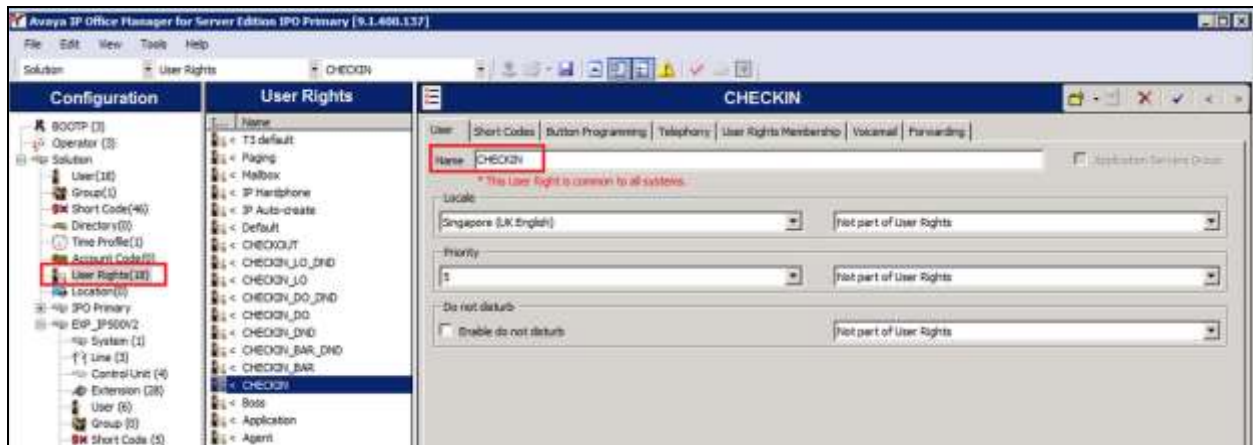
For voicemail users with analog telephones, the MWI setting on the analog extension may need modification depending on the type of analog telephone. Please refer to **Section 9** of these Application Notes for information on the specific analog telephone types requiring the MWI setting.

From the configuration tree in the left pane for Expansion Module (**EXP\_IP500V2**), select **Extension** followed by the extension corresponding to the analog user. In this case, the extension is **631**. In the **Message Waiting Lamp Indication Type** section, **51V Stepped** is selected from the drop-down list, as shown below.

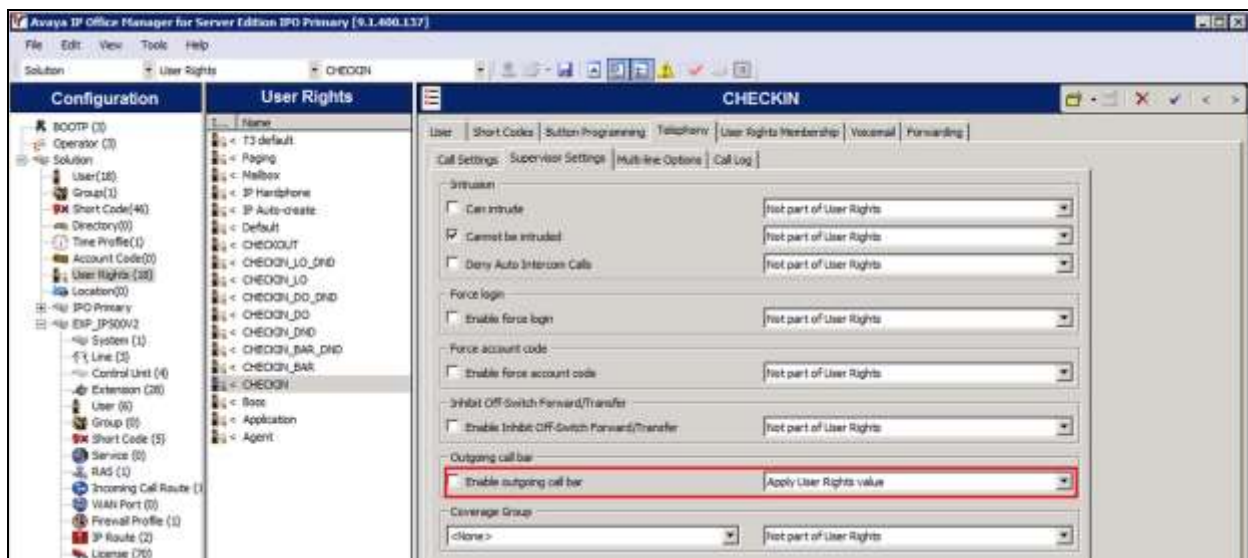


## 5.11. Administer User Rights

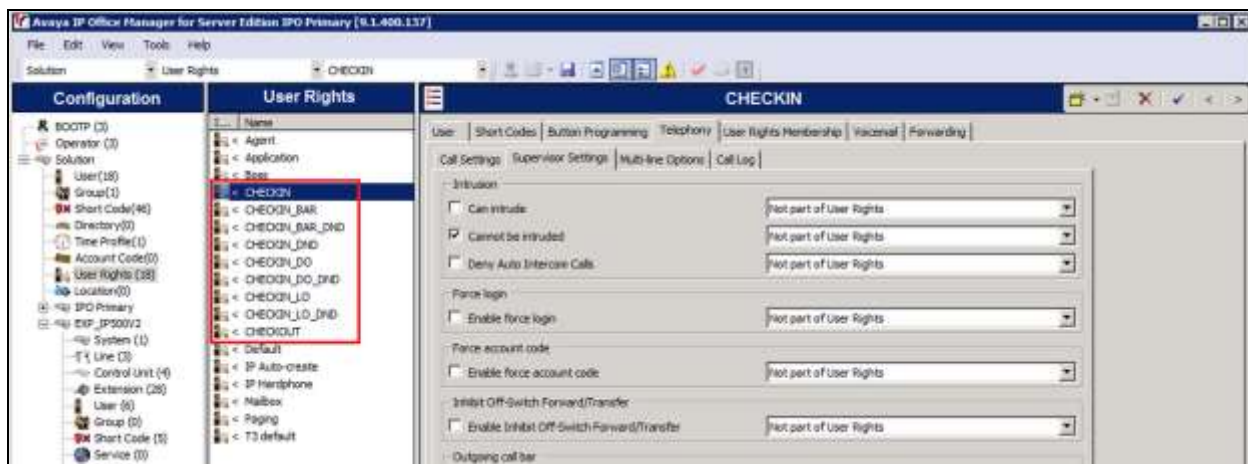
From the configuration tree in the left pane, right-click on **User Rights** and select **New** (not shown) to create a new user rights template. Enter a desired **Name** to designate user rights for guests in the Check-In state. In the compliance testing, the name was set to **CHECKIN** as shown below.



Select the **Telephony** tab and then the **Supervisor Settings** sub-tab. Uncheck **Enable outgoing call bar** field towards the bottom and select **Apply User Rights value** from the corresponding drop-down box, as shown below.

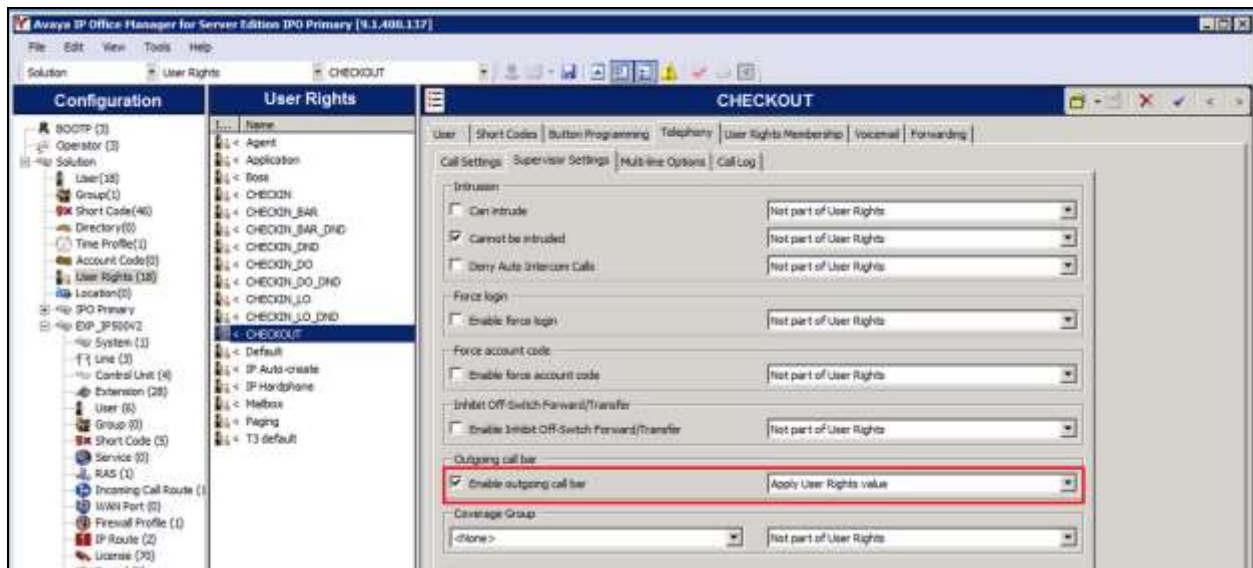


In the compliance testing, user rights templates were created with names as highlighted in the red box below.

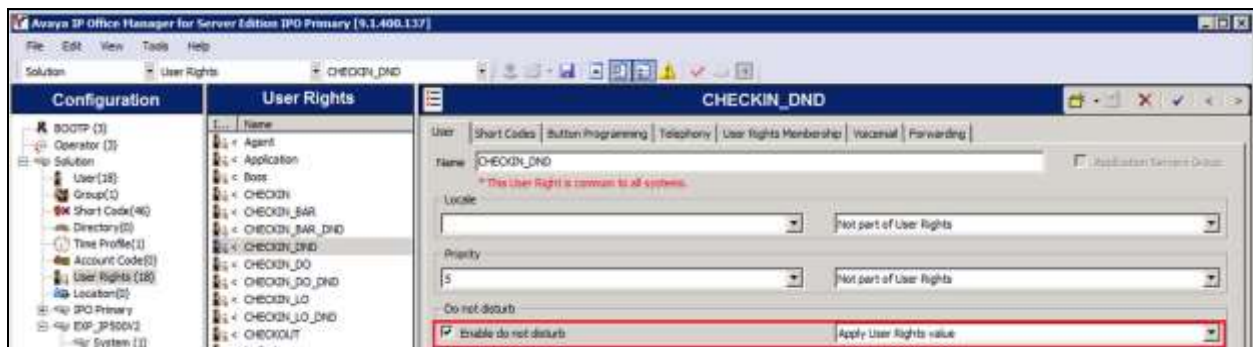




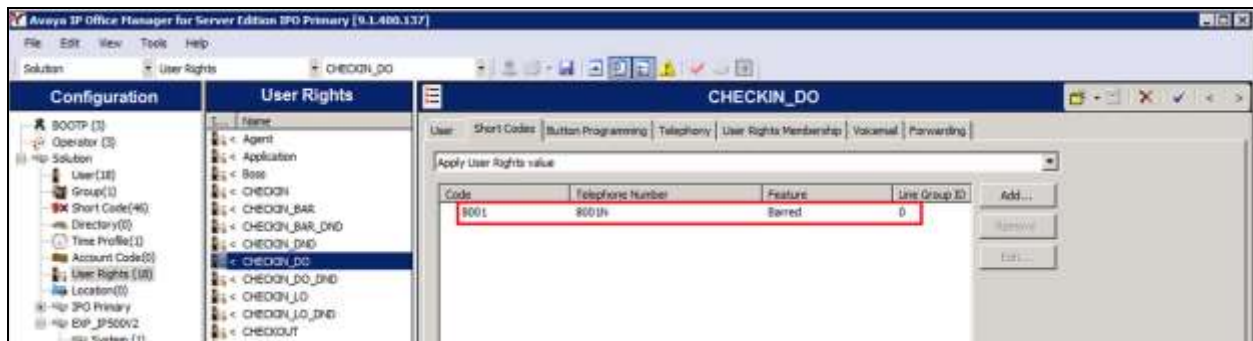
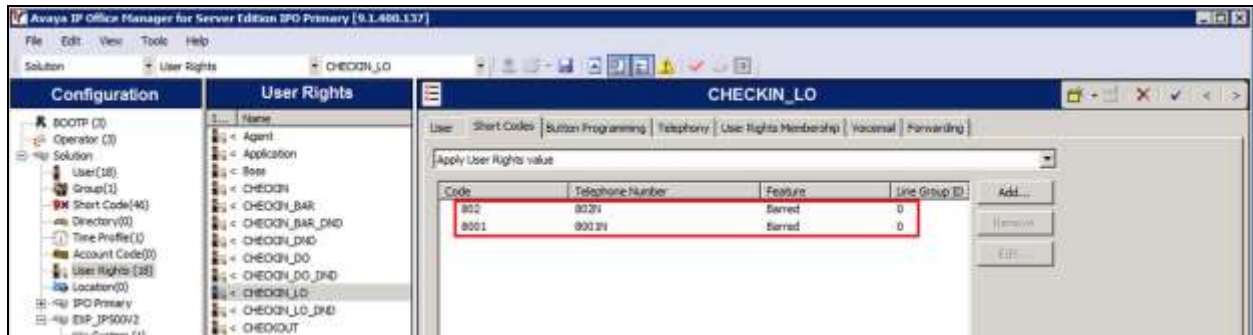
During this compliance testing, the **Enable outgoing call bar** field was checked for the user rights **CHECKOUT** to prevent the guest room users from making calls out to the PSTN when either of these user rights is applied.



User rights **CHECKIN\_DND** was set with **Enable do not disturb** checked and User Rights applied. Guest user will not be disturbed upon Check-In to hotel room.



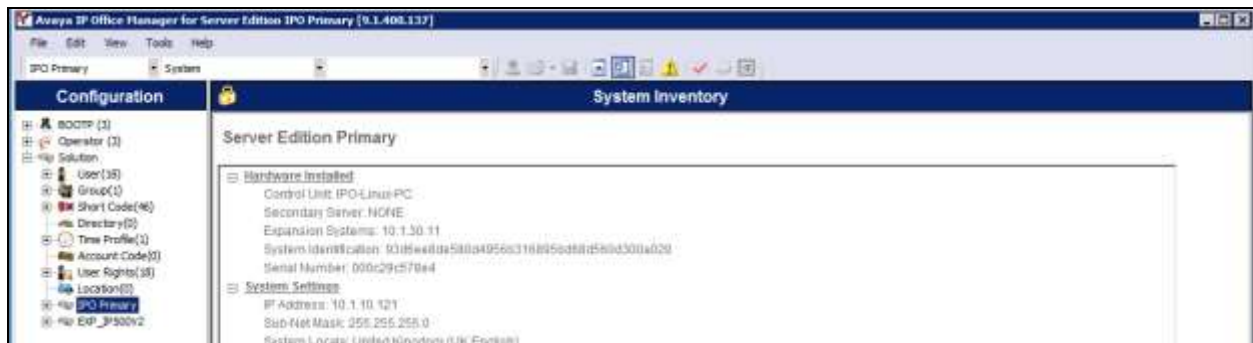
User rights **CHECKIN\_LO** mean that guest will only be able to make local calls. User rights **CHECKIN\_DO** mean that guest user will be able to call up to domestic (long distance) but not international. Short Codes sub-tab will be used in this case to restrict domestic or international calls by the digit dialed.



The rest of the user rights will be a combination of the above.

## 5.12. Administer Security Settings

From the **Avaya IP Office Manager** screen, click on **Solution → IPO Primary** and select **File → Advanced → Security Settings** (not shown) from the top menu. Select the correct IP Office system and log in with the appropriate security user credentials.

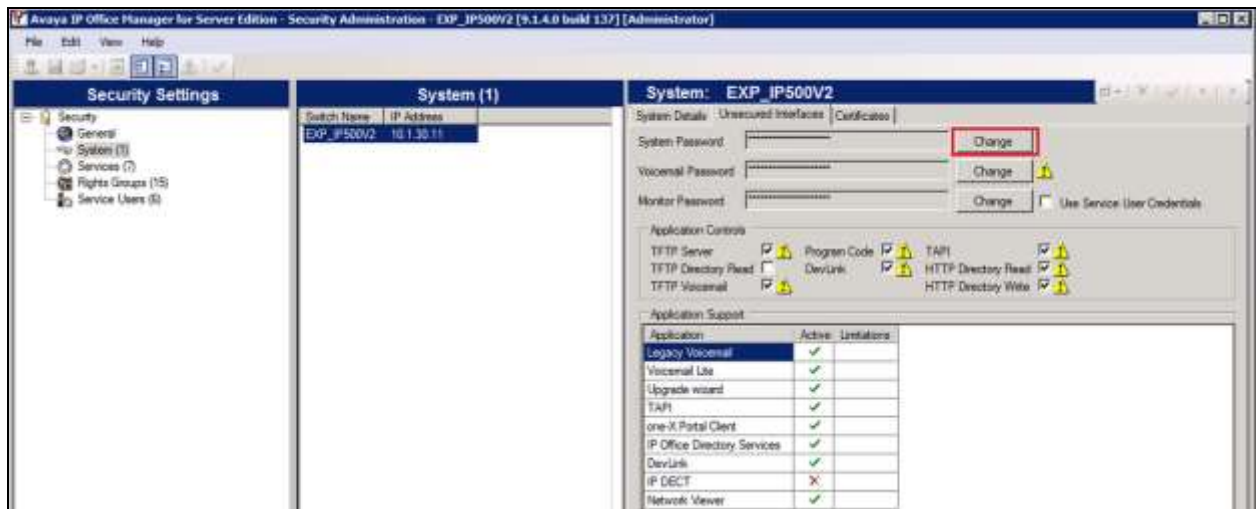
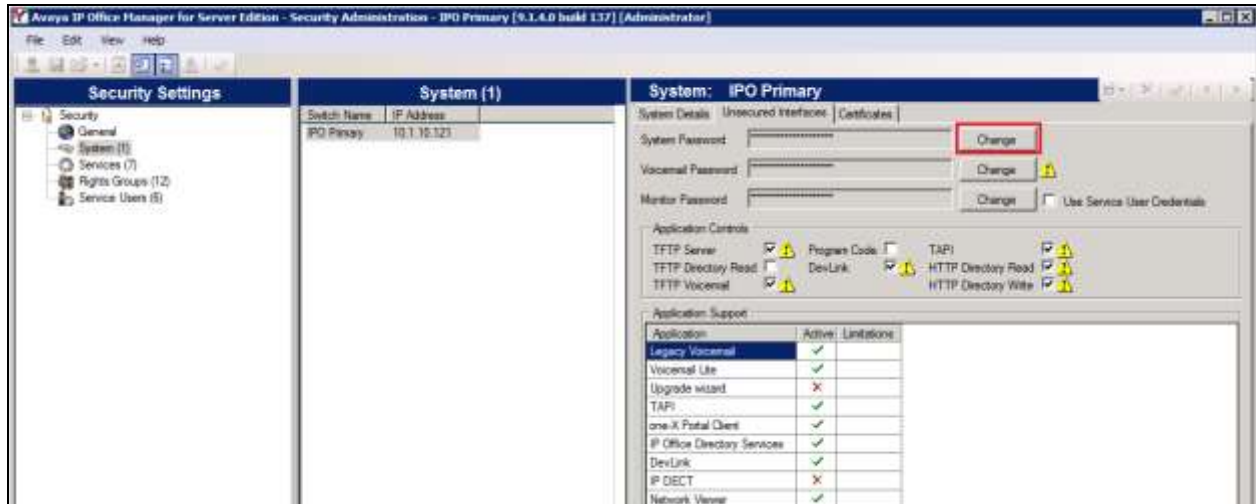


The **Avaya IP Office Manager - Security Administration** screen is displayed. From the configuration tree in the left pane, select **Security → Services → Configuration** to display the **Service: Configuration** screen in the right pane. For **Service Security Level**, select **Unsecure + Secure** as shown below. In this compliance testing, Unicorn used the **Unsecure** level for the Configuration Web Service interface. Repeat the whole process for the security settings of the expansion module **EXP\_IP500V2** shown in the screen above.



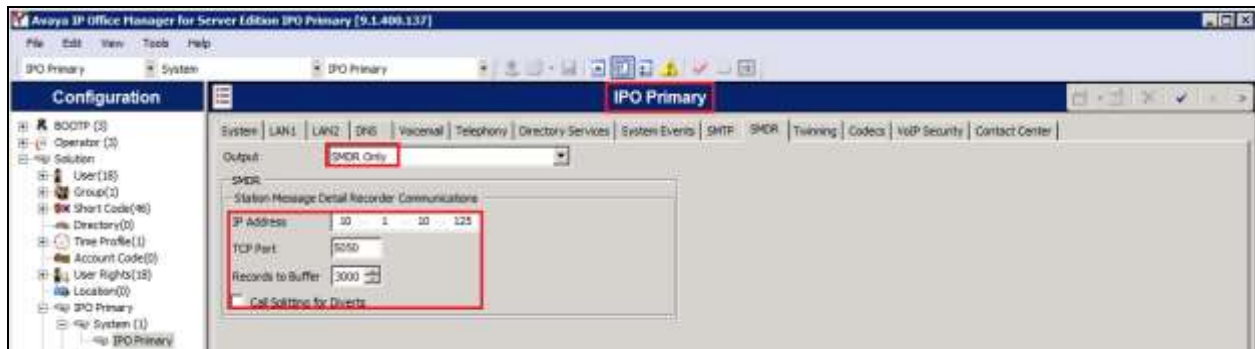
## 5.13. Administer System Password

From the **Avaya IP Office Manager – Security Administration** screen, select **Security** → **System** from the configuration tree in the left pane to display the **System: IPO Primary** screen in the extreme right pane. In the **Unsecured Interfaces** tab, click the **Change** button next to the **System Password** to configure the IP Office System Password. The System Password is used in **Section 6.2** for Configuration Web Services. Repeat these steps for the IP Office Expansion Module.



## 5.14. Administer SMDR

From the configuration tree in the left pane for **IPO Primary**, select **System** to display the screen in the right pane, next select the **SMDR** sub-tab. For the Output field, select **SMDR Only** from the drop-down box. Set **IP Address** to the WinExpress server IP address, and set the **TCP Port** to **5050**. Optionally, you can increase the **Records to Buffer** field from default **500** to **3000** to provide more buffer for call records in case the SMDR link is broken.



## 6. Configure WinExpress

This section provides the procedures for configuring WinExpress. WinExpress comprises of two main components, i.e., Phoenix guest voicemail, and Unicorn call billing package and interface solution. The procedures include the following:

- Obtaining IP Office Configuration Web Service SDK
- Configuring Unicorn
- Configuring Phoenix

### 6.1. Obtaining Avaya IP Office Configuration Web Service SDK

Avaya provides the IP Office Configuration Web Service SDK for DevConnect members to incorporate IP Office configuration changes in their solutions. The Configuration Web Service SDK must match the release of the IP Office that is deployed, in this case **Release 9.1**. To obtain the IP Office Configuration Web Service SDK, browse to <http://www.devconnectprogram.com/> using a web browser and login using a valid DevConnect member account. Then click **Downloads → IP Office™ → Configuration Web Services**. Locate and download the latest Configuration Web Service SDK which in this case is 9.1 Service Pack 1. Member's implementation engineer will then deploy the files from the Configuration Web Service SDK onto the WinExpress server.

## 6.2. Configuring Unicorn

Unicorn is a Windows-based integrated billing and interface solution. This section details the essential portion of the Unicorn configuration to interoperate with IP Office. These Application Notes assume that the Unicorn application has already been properly installed by FCS service Engineer.

1. To enable Unicorn Interface configuration for Phoenix, Avaya IPO PMS WS, Avaya IPO TAPI and Avaya IPO CDR use **Unicorn.xml** located is in the **C:\Program Files(x86)\FCS\Unicorn\Control\** directory.

In the <Child> section of the xml file, the configuration highlighted in bold below indicates what needs to be added.

```
<Child Id="VMS1">
    <PropertyId>MY99</PropertyId>
    <EXENAME>Phoenix.VMS.exe</EXENAME>
    <!--can be a remote child ; need to insert full path \\192.168.2.1\Unicorn\Fidelio.exe-->
    <LogFilePattern>VMS\VMS1</LogFilePattern>
    <Description>Phoenix.VMS</Description>
    <XMLFile>Phoenix-VMS.xml</XMLFile>
    <IntfInQueueName>.\Private$\VMS1In</IntfInQueueName>
    <!--can be a remote MSMQ queue-->
    <IntfOutQueueName>.\Private$\VMS1Out</IntfOutQueueName>
    <IntfOutQueueFilterThresholdInHour>99999</IntfOutQueueFilterThresholdInHour>
    <!-- interface will filter the packet if it's more than this value (in hour) as compared to
system clock-->
    <!--during startup, the child has to initial a dialog with mother via tcp/ip before can send
the info. to the message queue The message queue name to be assigned by unicorn , and be part of the XML dialog
string -->
    <UnicornMotherIPPort>4017</UnicornMotherIPPort>
    <MemoryPage>7</MemoryPage>
</Child>

<Child Id="PBX1">
    <PropertyId>MY99</PropertyId>
    <EXENAME>AvayaIPOPMS.PBX.exe</EXENAME>
    <LogFilePattern>PBX\PBX1</LogFilePattern>
    <Description>AvayaIPOPMS</Description>
    <XMLFile>AvayaIPOPMS-PBX.xml</XMLFile>
```



```

        <IntfInQueueName>.\Private$\PBX1In</IntfInQueueName>
        <IntfOutQueueName>.\Private$\PBX1Out</IntfOutQueueName>
        <IntfOutQueueFilterThresholdInHour>99999</IntfOutQueueFilterThresholdInHour>
        <UnicornMotherIPPort>4018</UnicornMotherIPPort>
        <MemoryPage>10</MemoryPage>
    </Child>

    <Child Id="PBX2">
        <PropertyId>MY99</PropertyId>
        <EXENAME>AvayaIPOPMS2.PBX.exe</EXENAME>
        <LogFilePattern>PBX\PBX2-</LogFilePattern>
        <Description>AvayaIPOPMS2.PBX</Description>
        <XMLFile>AvayaIPOPMS-PBX2.xml</XMLFile>
        <IntfInQueueName>.\Private$\PBX2In</IntfInQueueName>
        <IntfOutQueueName>.\Private$\PBX2Out</IntfOutQueueName>
        <IntfOutQueueFilterThresholdInHour>99999</IntfOutQueueFilterThresholdInHour>
        <UnicornMotherIPPort>4016</UnicornMotherIPPort>
        <MemoryPage>11</MemoryPage>
    </Child>

    <!--
    <Child Id="PBX2">
        <PropertyId>MY99</PropertyId>
        <LogFilePattern>PBX\PBX2-</LogFilePattern>
        <EXENAME>AvayaIPOTAPL.PBX.exe</EXENAME>
        <Description>AvayaIPOTAPI PBX Interface</Description>
        <XMLFile>AvayaIPOTAPI-PBX.xml</XMLFile>
        <IntfInQueueName>.\Private$\PBX2In</IntfInQueueName>
        <IntfOutQueueName>.\Private$\PBX2Out</IntfOutQueueName>
        <IntfOutQueueFilterThresholdInHour>99999</IntfOutQueueFilterThresholdInHour>
        <UnicornMotherIPPort>9302</UnicornMotherIPPort>
        <MemoryPage>11</MemoryPage>
    </Child>

    -->

    <Child Id="CDR1">

```

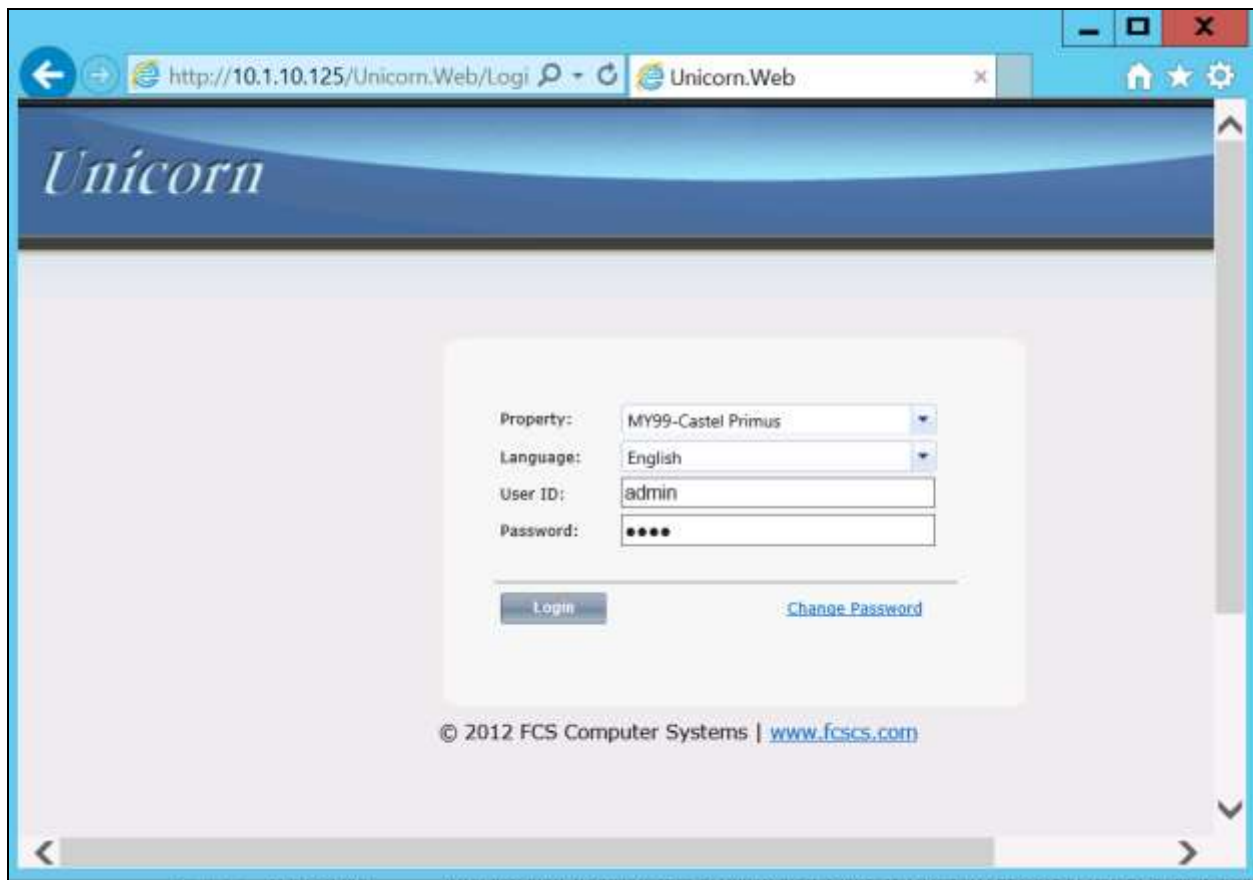



```

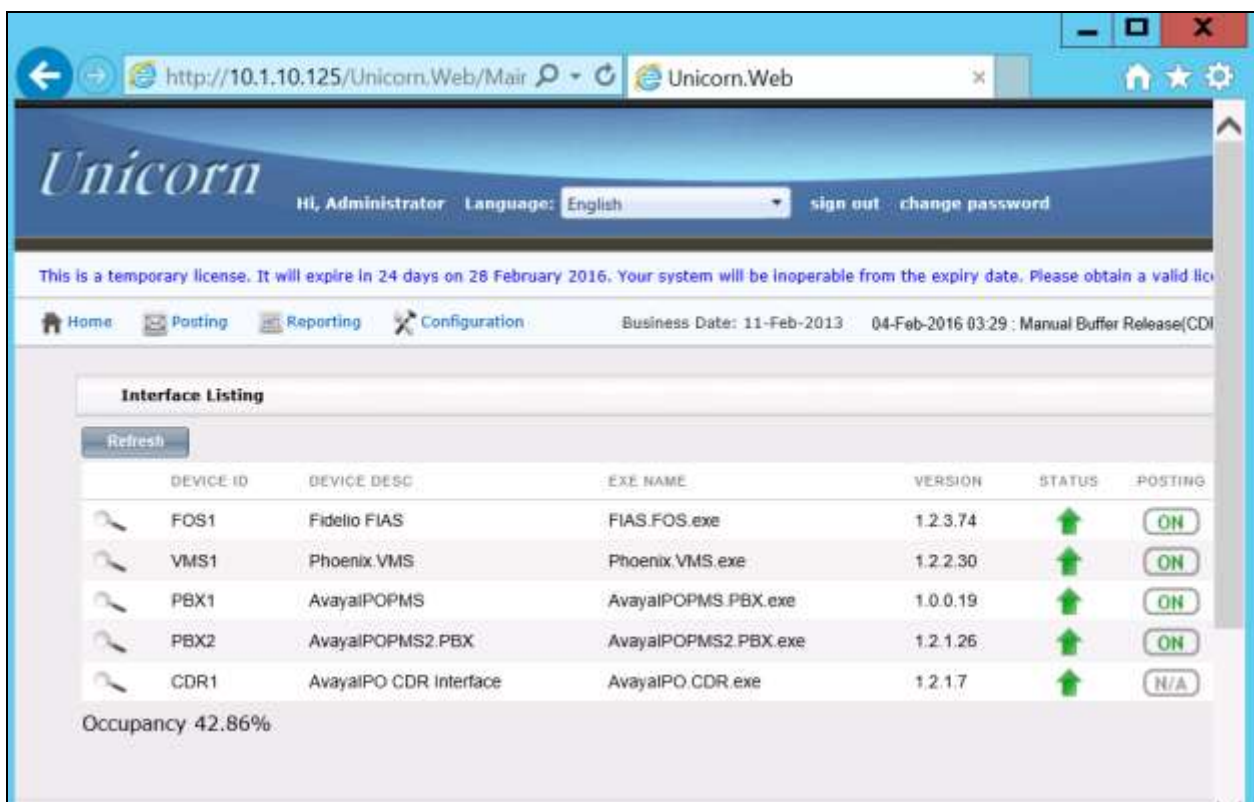
<PropertyId>MY99</PropertyId>
<LogFilePattern>CDR\CDR1-</LogFilePattern>
<EXENAME>AvayaIPO.CDR.exe</EXENAME>
<Description>AvayaIPO CDR Interface </Description>
<XMLFile>AvayaIPO-CDR.xml</XMLFile>
<IntfInQueueName>.\Private$\SMDRIn</IntfInQueueName>
<IntfOutQueueName>.\Private$\SMDROut</IntfOutQueueName>
<IntfOutQueueFilterThresholdInHour>99999</IntfOutQueueFilterThresholdInHour>
<UnicornMotherIPPort>4001</UnicornMotherIPPort>
<MemoryPage>9</MemoryPage>
</Child>






```

2. Unicorn provides a web interface for configuration of guest rooms, posting like DND and MWI on/off updates and operations reporting. An administrator can log in with the appropriate credentials from <http://<server name or ip address>/Unicorn.Web/Login.aspx> as shown below by substituting the appropriate server IP address. Select the **Property** and click **Login** with the appropriate credentials.



3. Click **Home** → **System** → **Interface Listing** to show the integrated interfaces and their status which should show up . The list below shows the **Device ID** list and their purpose.
  - a. **FOS1** – Front Office System
  - b. **VMS1**- Phoenix Voicemail
  - c. **PBX1** – IP Office Primary Server PMS
  - d. **PBX2** – IP Office Expansion Module PMS
  - e. **CDR1** – IP Office SMDR



DEVICE ID	DEVICE DESC	EXE NAME	VERSION	STATUS	POSTING
FOS1	Fidelio FIAS	FIAS.FOS.exe	1.2.3.74		ON
VMS1	Phoenix VMS	Phoenix.VMS.exe	1.2.2.30		ON
PBX1	AvayaPOPMS	AvayaPOPMS.PBX.exe	1.0.0.19		ON
PBX2	AvayaPOPMS2.PBX	AvayaPOPMS2.PBX.exe	1.2.1.26		ON
CDR1	AvayaPO CDR Interface	AvayaPO.CDR.exe	1.2.1.7		N/A

Occupancy 42.86%

4. The Unicorn Avaya PMS interface module port and data configuration is defined in the **AvayaIPOPMS-PBX.xml** and **AvayaIPOPMS-PBX2.xml** located in the **C:\Program Files(x86)\FCS\Unicorn\Control\** directory. **WebService** is configured for interfacing with Configuration Web Services of IP Office.

```
8 = Webservice
    <InterfaceSetting>URL string</InterfaceSetting>
-->
<!--
Examples:
<InterfaceType>1</InterfaceType>
<InterfaceSetting>1,9600,n,8,1</InterfaceSetting>
<InterfaceType>2</InterfaceType>
<InterfaceSetting>C,127.0.0.1:9600</InterfaceSetting>
<InterfaceType>2</InterfaceType>
<InterfaceSetting>C,10.8.2.127:5006</InterfaceSetting>
<InterfaceType>2</InterfaceType>
<InterfaceSetting>C,127.0.0.1:9600</InterfaceSetting>

<InterfaceType>2</InterfaceType>
<InterfaceSetting>C,127.0.0.1:9600</InterfaceSetting> -->
<!-- <InterfaceSetting>1,9600,n,8,1</InterfaceSetting> if you change to TCP/IP please restart interface -->
<InterfaceType>8</InterfaceType>
<!--<InterfaceSetting>http://10.10.10.1</InterfaceSetting>-->
<InterfaceSetting>http://localhost:8085/IPOConfigurationService</InterfaceSetting>
<UDPSvrInterfaceSetting>U,127.0.0.1:4544</UDPSvrInterfaceSetting>
<!--
    if TCP/IP, interfaceSetting could be "X,192.168.1.12:5600",
    where X = H = host, C=client
```

In the both configuration xml file, the host is set as the **IPAddress** of IP Office server (or Expansion Module) listening to port **50805** which corresponds with the IP Office port at **Section 5.12** and the **AccountName** and **password** administered in **Section 5.13**. The password is not revealed for security reasons.

```
<InterPacketDelay>100</InterPacketDelay>
<!--
    Specify delay to allow for sufficient time to collected fragmented data
-->
<CheckRTSSignal>No</CheckRTSSignal>
<!--needed for RS232 Setting only-->
<CheckDTRSignal>No</CheckDTRSignal>
<!--needed for RS232 Setting only-->
<CheckCTSSignal>No</CheckCTSSignal>
<!--needed for RS232 Setting only-->
<SendChecksum>Yes</SendChecksum>
<MultiPosting>1</MultiPosting>
<InterStringDelay>100</InterStringDelay>
<!--in second-->
<SendRetry>3</SendRetry>
<AccountName>Administrator</AccountName>
<PassWord>          </PassWord>
<IPAddress>10.1.10.121</IPAddress>
<PortNumber>50805</PortNumber>
<SendDelay>200</SendDelay>
```

```

<InterPacketDelay>100</InterPacketDelay>
<!--
    Specify delay to allow for sufficient time to collected fragmented data
-->
<CheckRTSSignal>No</CheckRTSSignal>
<!--needed for RS232 Setting only-->
<CheckDTRSignal>No</CheckDTRSignal>
<!--needed for RS232 Setting only-->
<CheckCTSSignal>No</CheckCTSSignal>
<!--needed for RS232 Setting only-->
<SendChecksum>Yes</SendChecksum>
<MultiPosting>1</MultiPosting>
<InterStringDelay>500</InterStringDelay>
<!--in second-->
<SendRetry>3</SendRetry>
<AccountName>Administrator</AccountName>
<PassWord>      </PassWord>
<IPAddress>10.1.30.11</IPAddress>
<PortNumber>50805</PortNumber>
<SendDelay>200</SendDelay>

```

5. The Unicorn Avaya CDR interface module port & data configuration is defined in the **AvayaIPO-CDR.xml** located in the **C:\Program Files (x86)\FCS\Unicorn\Control\** directory. The host is set as **tcp.ip** type listening to port **5050**. This corresponds with the setup of IP Office SMDR port at **Section 5.14**.

```

<PBX ID="CDR1">
  <!-- need to match with the XML filename -->
  <CommunicationSetting>
    <Name>Avaya IPO</Name>

    <ProtocolFormat>2</ProtocolFormat>
    <!--1 =[STX]xxxxx[ETX], 2=xxxxxxx[13][10] 3=[13][10]xxxxxxx, 4=Fixed Lenght-->
    <InterfaceType>2</InterfaceType>
    <!--1 = RS232, 2=tcp.ip 3=udp, 4=telnet,5=bisvnc 6=file sharing-->
    <InterfaceSetting>H,192.168.42.10:5050</InterfaceSetting>
    <!-- if tcp.ip, interfaceSetting could be "X,192.168.1.12:5600" , where X = H = host, C=client-->
    <!-- 3,9600,n,8,1 - com. port 3, baud rate 9600,n,8,1 -->
    <UDPSvrInterfaceSetting></UDPSvrInterfaceSetting>
    <InterPacketDelay>100</InterPacketDelay>
  </CommunicationSetting>
</PBX ID="CDR1">

```

6. The **Posting** tab below shows the various features such as Check In/Out, Edit Guest Profile that can performed from the web interface. The screenshot below shows the **Check In/Out** page for checking a guest with name, date, room number and check in/out date etc.

7. Click **Configuration** → **Extensions** and select **Primary Extension Numbering** and **Slave Extension** to view the extensions configured with each room.

ExtNo	ExtName	Prop
301	Guest	MY99
302	Guest	MY99
303	Guest	MY99
601	Guest	MY99



The screenshot below shows the **Slave Extension** page which also lists the primary extension number on the left column.

The screenshot shows the Unicorn Web application interface. The browser address bar displays `http://10.1.10.125/Unicorn.Web/Main.aspx`. The page header includes the Unicorn logo, user information "Hi, Administrator", language "English", and links for "sign out" and "change password". A license notice states: "This is a temporary license. It will expire in 24 days on 28 February 2016. Your system will be inoperable from the expiry date. Please obtain a valid license." The navigation menu includes Home, Posting, Reporting, and Configuration. The business date is 11-Feb-2015, and the manual buffer start is 04-Feb-2016 03:00.

The main content area features the "Slave Extension List" table and the "Slave Extension Information" form.

ExtensionNumber	PropertyID	SlaveExtension	Edit	Delete
301	MY99	302		
601	MY99	631		
602	MY99	632		

The "Slave Extension Information" form includes the following fields:

- Extension Number : 301 (dropdown menu)
- Slave Extension : (text input field)
- Admin : (checkbox)

## 6.3. Configure Phoenix

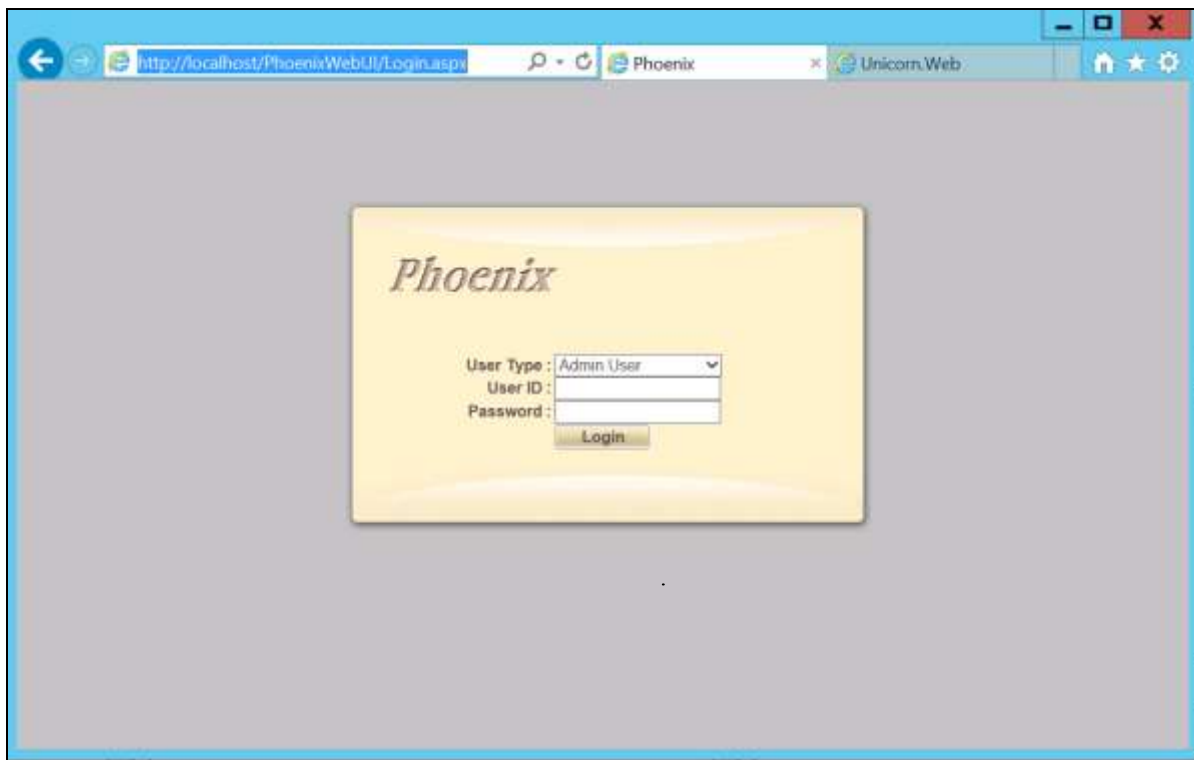
This section details the essential portion of the Phoenix configuration to interoperate with IP Office. These Application Notes assume that the Phoenix application has already been properly installed by FCS professional services personnel.

The following settings will be verified:

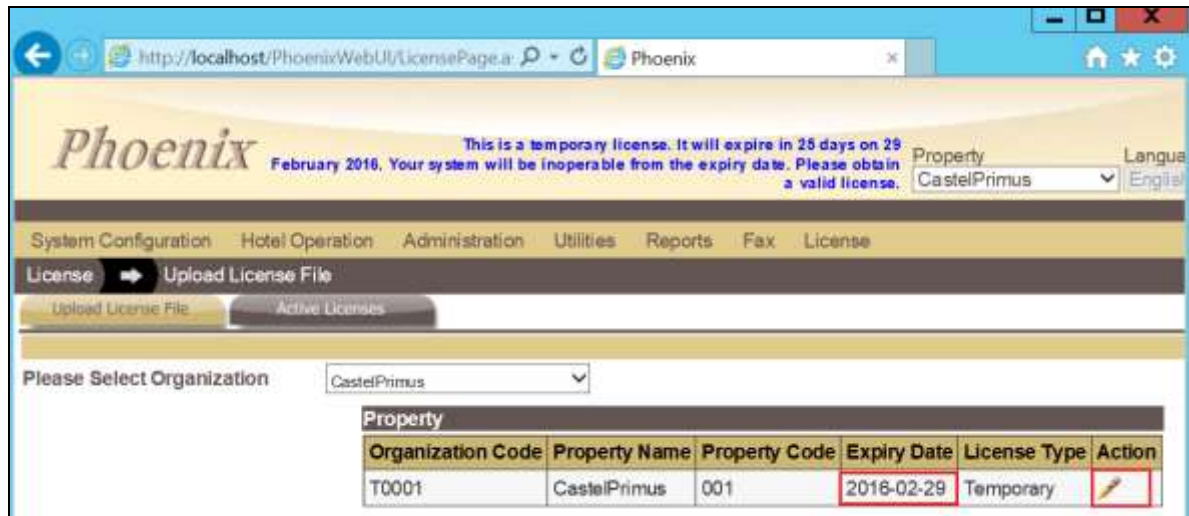
- License Verification
- PBX setting
- Server setting
- Service Numbers (Entry Points)

### 6.3.1. License Verification

To log into the Phoenix System, launch any browser and type in the Phoenix Configuration URL; in this case <http://<server name or ip address>/PhoenixWebUI/Login.aspx> as shown below by substituting the appropriate server IP Address. At the login screen, enter an account with administrative privileges.



Select **License** → **Active Licenses**. Ensure that the License has not expired.



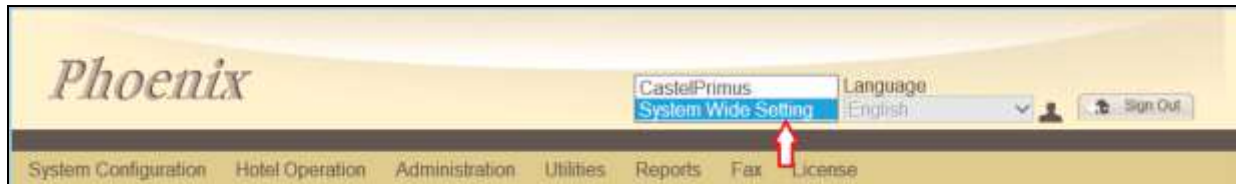
Click on the pen under **Action** and view the details. Ensure that the appropriate license parameters are enabled.

License Details		
License Type:	Temporary	Modules:
Expiry Date :	2016-02-29	Room Status
MAC Address* :	00:0C:29:93:97:E5	Auto WakeUp
Organization:	CastelPrimus	Auto Attendant
Organization Code :	T0001	VPIM
Property :	CastelPrimus	ConsoleXML
External Code :	1	MiniBar
Address :		Voicemail
Number Of Rooms :	Unlimited	Fax
Number Of Mailboxes :	10000	IVR
Number Of Super Users :	1	Agent-Assisted VIP Wakeup Call
Number Of Web Users :	50	Voicemail to Email
Number Of SIP Ports :	MAX	Languages:
Number Of Analog Ports :	0	English
Number Of E1 Ports :	0	arabic
Number Of Fax Ports :	MAX	british
Number Of Enhanced RTP :	0	CANTONESE



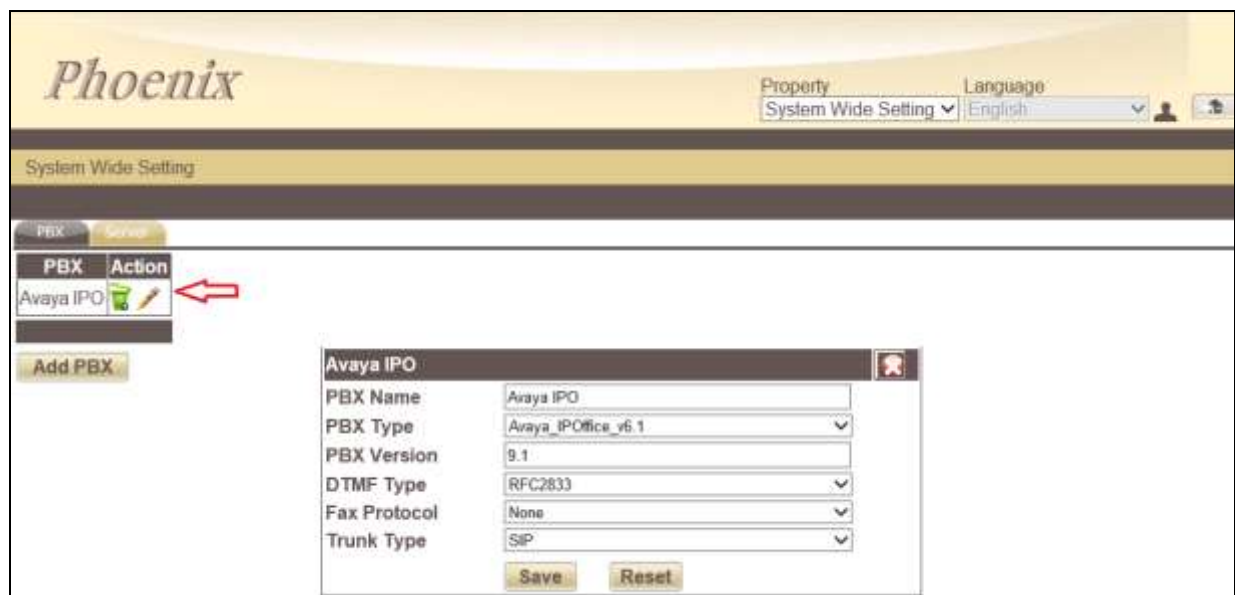
### 6.3.2. PBX Setting

From the home screen, select **System Wide Setting** from the drop down menu.



Select the **PBX** tab below. Click on the pen and view the PBX settings. Ensure that the following settings are configured:

- **PBX Name:** Enter the appropriate name
- **PBX Type:** Select **Avaya\_IPOffice\_v6.1** from the drop down menu
- **PBX Version:** Enter **9.1** for the version number
- **DTMF Type:** Select **RFC2833** from the drop down menu as configured in **Section 5.4** for Primary SIP Extensions
- **FAX Protocol:** Select **None** as fax feature is not offered
- **Trunk Type:** Enter **SIP** for SIP type of signaling with IP Office
- Click **Save**



### 6.3.3. Server Setting

Select the **Server** tab below and select the icon next to the **App Server** name **Phoenix**. Check the box next to Avaya IPO under **PBX Assigned** and select the appropriate property from the drop down **Property** list. Then click on the **Pencil** icon to edit the settings.

Phoenix

Property: System Wide Setting Language: English

System Wide Setting

Server

Server Action

Phoenix

Please restart Phoenix for the changes to take effect

App Server Name: Phoenix

IP: 127.0.0.1 Port: 18888

☒ Channel Monitor IP 1 ☐ Channel Monitor IP 2 ☐ Channel Monitor IP 3

System Trace: ☒ Debug ☒ Info Log ☒ Warning

Info Log Level: NORMAL

E-connect IVR Host Port: 11003

SMTP: ☐ IMAP: ☐

Enable: ☐

Server:

Port No.:

SMTP SSL Port No.:

Email Address:

SMTP Username:

SMTP Password:

PBX Assigned	Interoperability	Property
<input checked="" type="checkbox"/> Avaya IPO	<input type="text"/>	CastelPrimus

A pop-up form appears, and the SIP User settings are configured as follows:

- **Connection Type:** Select **SIP Register**
- **SIP Registration Name:** Provide an appropriate name
- **PBX IP:** Enter Avaya IP Office Server IP address
- **Local IP:** Enter WinExpress Server IP address
- **Transport protocol:** Select **UDP**
- **Client Extension:** Enter the SIP User in a URL form: “[316@10.1.10.121](#)”
- **Contact:** Enter the SIP contact as: “[316@10.1.10.125](#)”
- **Time Alive:** Enter a time less than 180 seconds (default expiry time for SIP registration)
- **Authentication:** Select **Yes**
- **Identity:** Enter the SIP Identity as in **Client Extension** above
- **Realm:** Leave it as default, i.e., **ipoffice**
- **User Name:** User name in **Section 5.5.1**
- **Password:** Login Code in **Section 5.5.1**

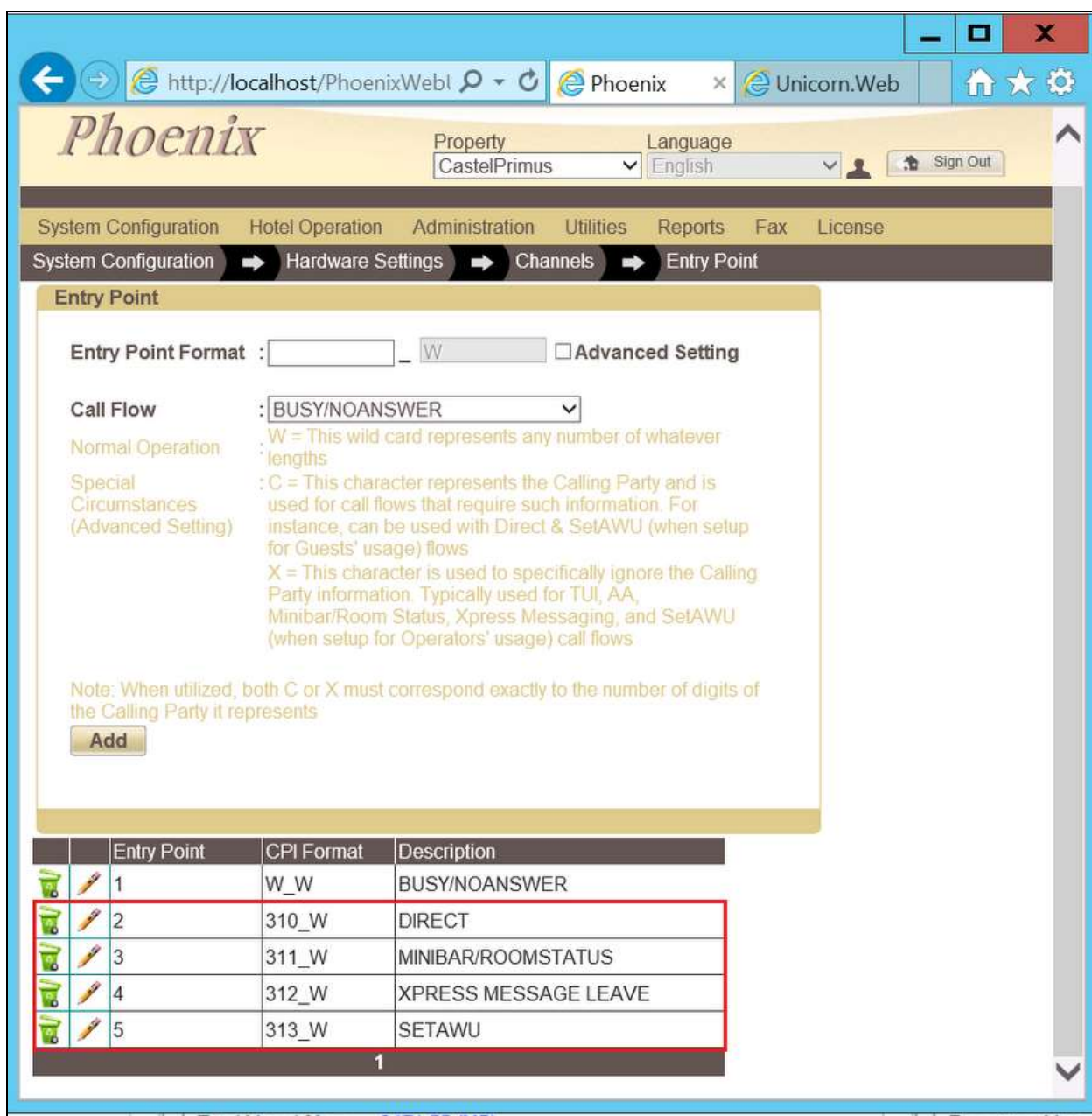
The screenshot shows a configuration window titled "PBX Interoperability - Avaya IPO". It has two tabs: "SIP Register" (selected) and "SIP Trunk". The form contains the following fields and settings:

- Connection Type:** ☒ SIP Register, ☐ SIP Trunk
- SIP Registration Name:** AvayaIPO
- PBX IP:** 10.1.10.121, PortNo: (empty)
- Local IP:** 10.1.10.125, PortNo: (empty)
- Transport protocol:** ☐ TCP, ☒ UDP
- Client Extension:** 316@10.1.10.121
- Contact:** 316@10.1.10.125
- Time Alive:** 120
- Authentication:** ☒ Yes, ☐ No
- Identity:** 316@10.1.10.121
- Realm:** ipoffice
- User Name:** 316
- Password:** (masked with dots)

At the bottom, there are "Save" and "Reset" buttons.

### 6.3.4. Service Numbers

Select **System Configuration** → **Hardware Settings** → **Channels** → **Entry Point** from the home screen. Check that the Service Numbers tally with the Secondary SIP users created in **Section 5.5.2**. Create an entry with “W\_W” mapped to BUSY/NOANSWER Call Flow and one more with the Pilot Number (in this case 310) to “DIRECT”. The Entry Points configured are shown at the bottom of the home screen.



**Phoenix** Property: CastelPrimus Language: English Sign Out

System Configuration Hotel Operation Administration Utilities Reports Fax License

System Configuration → Hardware Settings → Channels → Entry Point

**Entry Point**

Entry Point Format :  ☐ Advanced Setting

Call Flow :

Normal Operation : W = This wild card represents any number of whatever lengths

Special Circumstances (Advanced Setting) : C = This character represents the Calling Party and is used for call flows that require such information. For instance, can be used with Direct & SetAWU (when setup for Guests' usage) flows

X = This character is used to specifically ignore the Calling Party information. Typically used for TUI, AA, Minibar/Room Status, Xpress Messaging, and SetAWU (when setup for Operators' usage) call flows

Note: When utilized, both C or X must correspond exactly to the number of digits of the Calling Party it represents

	Entry Point	CPI Format	Description
	1	W_W	BUSY/NOANSWER
	2	310_W	DIRECT
	3	311_W	MINIBAR/ROOMSTATUS
	4	312_W	XPRESS MESSAGE LEAVE
	5	313_W	SETAWU

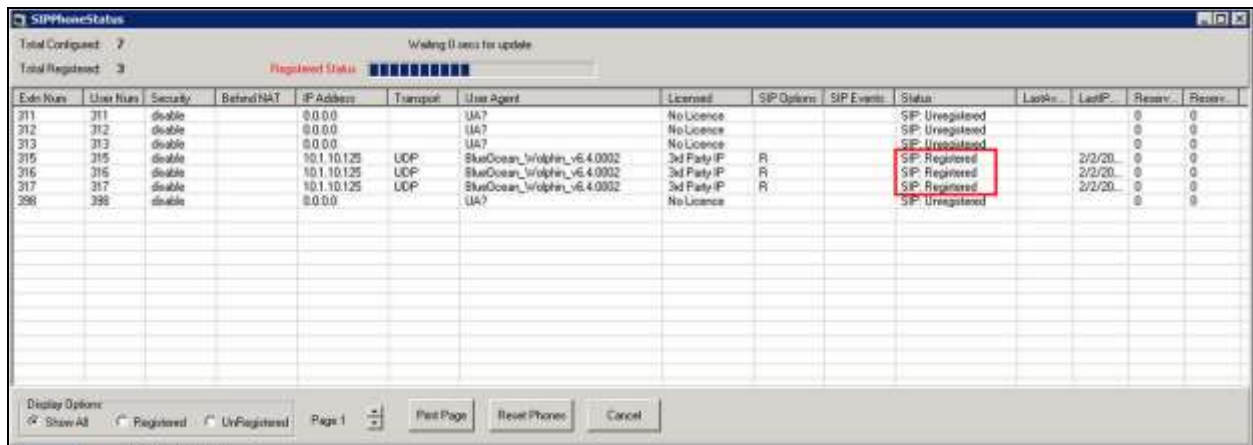
1

## 7. Verification Steps

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

### 7.1. Verify SIP User Integration

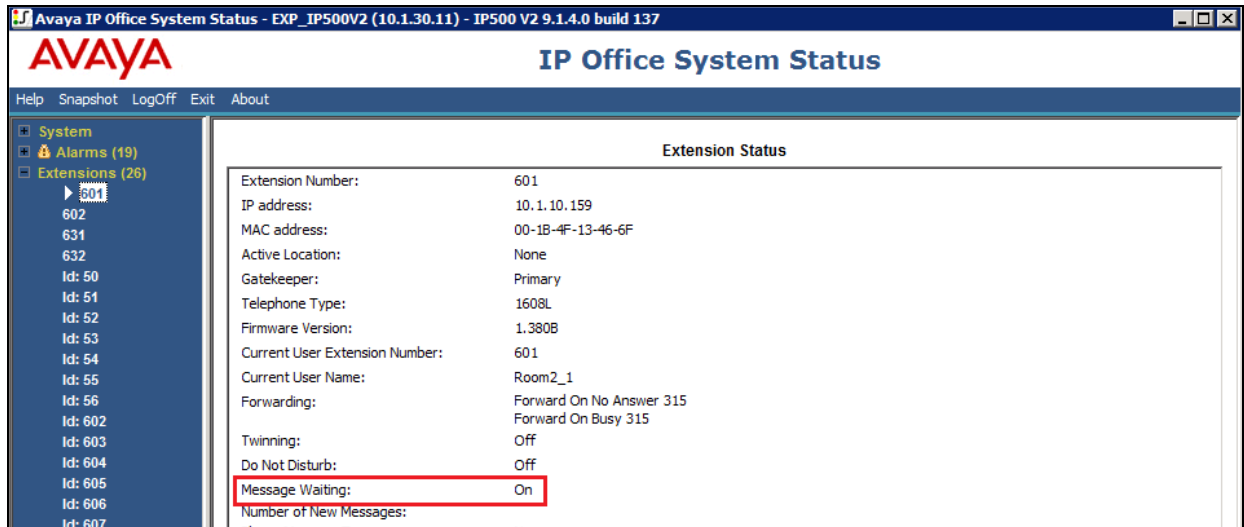
From a PC running the Avaya IP Office Monitor application, select **Start → All Programs → IP Office → Monitor** to launch the application. Select **Status → SIP Phone Status** from the top menu and the **SIPPhoneStatus** screen is displayed. Verify that there are entries for the three Primary SIP Extensions **315**, **316** and **317** configured in **Section 5.4** and the **Status** shown is **SIP: Registered** for each, as shown below.



Ext. Num	User Name	Security	Behind NAT	IP Address	Transport	User Agent	License	SIP Options	SIP Events	Status	LastIP	Reserv.	Reserv.
311	311	disable		0.0.0.0	UDP	UA?	No License			SIP: Unregistered		0	0
312	312	disable		0.0.0.0	UDP	UA?	No License			SIP: Unregistered		0	0
313	313	disable		0.0.0.0	UDP	UA?	No License			SIP: Unregistered		0	0
315	315	disable		10.1.10.125	UDP	SkatOcean_Wolfen_v6.4.0002	3rd Party IP	R		SIP: Registered	2/2/20	0	0
316	316	disable		10.1.10.125	UDP	SkatOcean_Wolfen_v6.4.0002	3rd Party IP	R		SIP: Registered	2/2/20	0	0
317	317	disable		10.1.10.125	UDP	SkatOcean_Wolfen_v6.4.0002	3rd Party IP	R		SIP: Registered	2/2/20	0	0
398	398	disable		0.0.0.0	UDP	UA?	No License			SIP: Unregistered		0	0

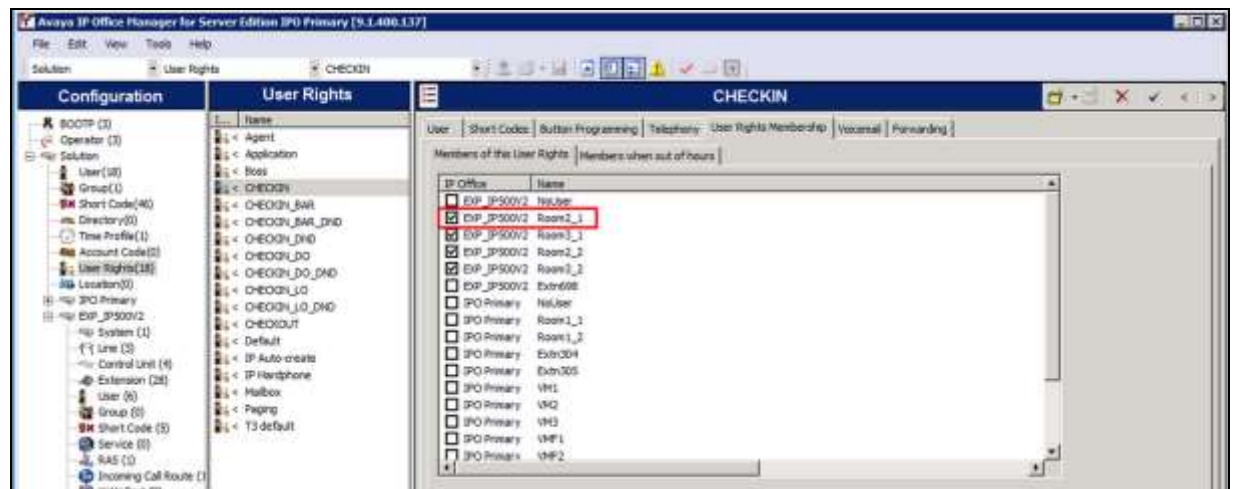
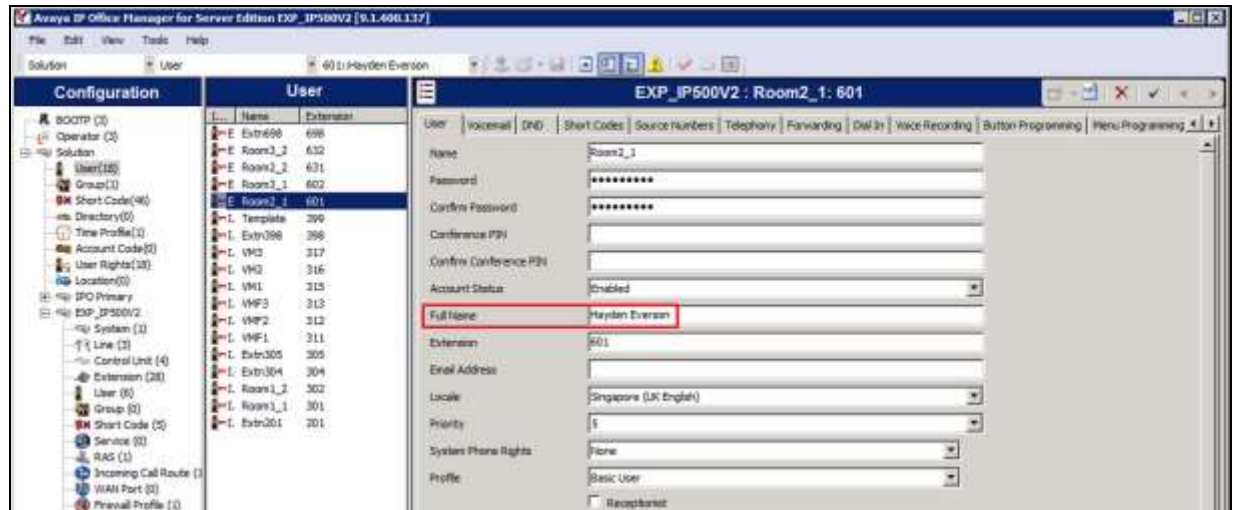
## 7.2. Verify Message Waiting Lamp

Check-In a guest and leave a message for the room. Verify physically or from IP Office System Status application that the message waiting lamp is on. Retrieve the message and verify that the message waiting lamp is turned off on the phone.



### 7.3. Verify Configuration Web Service Integration

Use a simulator to perform a guest Check-In request. Verify from IP Office Manager that the guest name on the phone display or User Full Name and user rights template shown on IP Office Manager User is updated correctly on IP Office as part of the Check-In process.





## 7.4. Verify SMDR


On the Unicorn web interface, click **Home** → **System** → **Billing**. Place a few outbound calls to an internal, local, mobile, toll free and international location. Verify that the calls are all processed correctly as shown below:

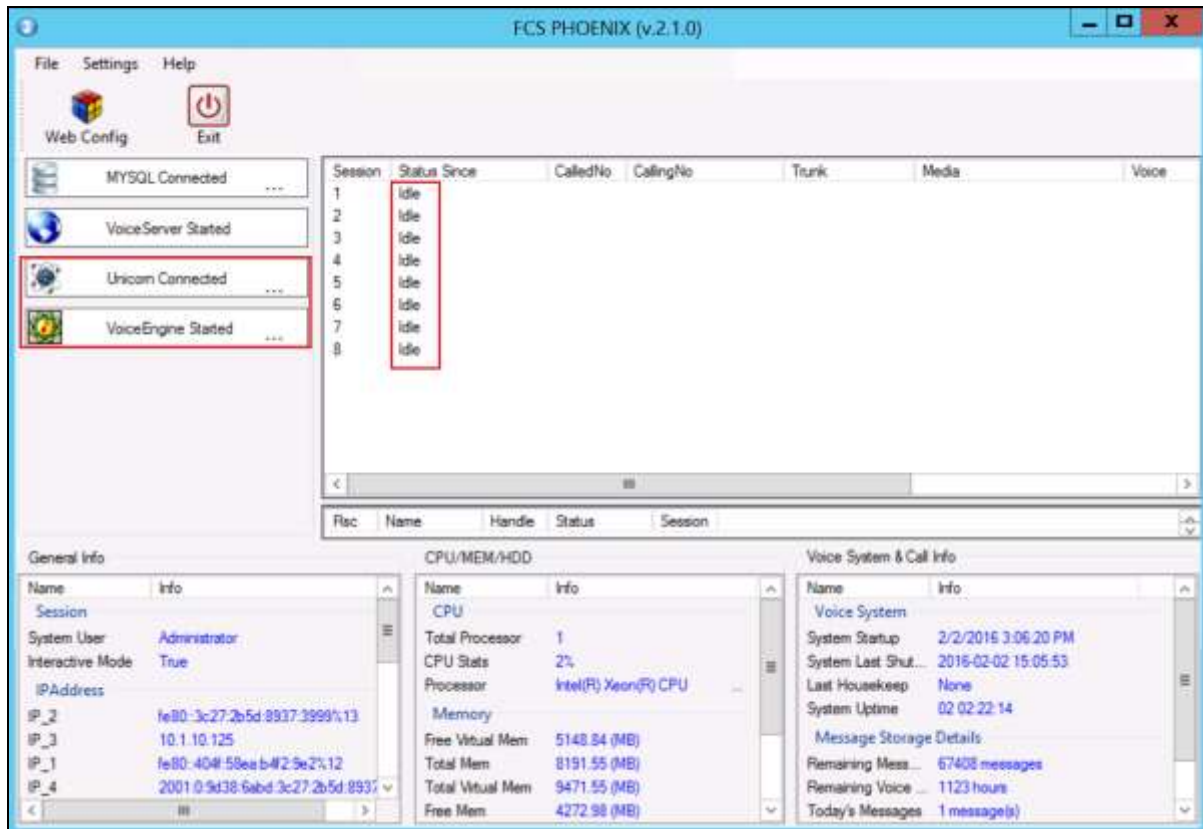


The screenshot shows the 'Billing' page in the Unicorn web interface. At the top, it indicates 'Data last refreshed: 2:34:17 PM' and 'Data will be refreshed every 30 sec'. There is a checkbox for 'Auto refresh' and a 'Refresh' button. A legend shows 'Error' in red, 'PD' in yellow, 'FP' in blue, and 'NP' in green. The table below lists call records with columns: SENDER, EXTNO, DATE, ROOM, TRUNK, TELEPHONE, DESTINATION, DURATION, COST, BASIC, SURCHARGE, PROFIT, TAX, SERVICE, and TI. The table contains six rows of data, alternating between yellow and light blue backgrounds.

SENDER	EXTNO	DATE	ROOM	TRUNK	TELEPHONE	DESTINATION	DURATION	COST	BASIC	SURCHARGE	PROFIT	TAX	SERVICE	TI
CDR1	301	2016/01/29 14:33:15	301		898728599	Singapore	17s	0.20	0.20	0.00	0.00	0.00	0.00	0
CDR1	301	2016/01/29 14:32:54	301		601	Internal Call	12s	0.00	0.00	0.00	0.00	0.00	0.00	0
CDR1	301	2016/01/29 14:32:28	301		818008728599	Singapore	13s	0.20	0.20	0.00	0.00	0.00	0.00	0
CDR1	301	2016/01/29 14:31:55	301		80016068728599	Singapore	12s	0.20	0.20	0.00	0.00	0.00	0.00	0
CDR1	301	2016/01/29 14:31:27	301		8028728599	Singapore	17s	0.20	0.20	0.00	0.00	0.00	0.00	0
CDR1	301	2016/01/29 14:30:51	301		868728599	Singapore	14s	0.20	0.20	0.00	0.00	0.00	0.00	0

## 7.5. Verify Phoenix Voicemail Integration

From the server, launch **Phoenix** from the desktop shortcut  to run the main program. Verify on the left pane that the Voice Engine status shows **VoiceEngine Started** and the voice channels under **Status Since** column are **Idle**. Once the Unicorn communication has been successfully established, the Unicorn status will show up as **Unicorn Connected**.



Dial one of the guest room or front office phone and let it cover to voicemail. Observe that one channel of the SIP Channel is busy as shown below. Verify that leaving a voice mail message to either a guest or front office mailbox works. Also, to verify the Operator transfer function, call any checked-in guest room and let it go to coverage on the voicemail. Press the DTMF digit **0** to select for call to be routed to Operator. Verify call is connected to Operator.

The screenshot displays the FCS PHOENIX (v.2.1.0) application window. The interface includes a menu bar (File, Settings, Help), a toolbar with 'Web Config' and 'Exit' buttons, and a left sidebar with status indicators for 'MYSQL Connected', 'VoiceServer Started', 'Unicom Connected', and 'VoiceEngine Started'.

The main area features a session table with the following data:

Session	Status	Since	CalledNo	CallingNo	Trunk	Media	Voice
1	Busy	2016-02-03 09:17	310@1	304@10.1.10.121	5, H:5 [Busy]	9, H:10 [Busy]	17, H:18 [Busy]
2	Idle						
3	Idle						
4	Idle						
5	Idle						
6	Idle						
7	Idle						
8	Idle						

Below the session table is a 'Rsc' table with columns: Rsc, Name, Handle, Status, and Session.

The bottom section of the interface is divided into three panels:

- General Info:** Displays session details including Session Name, System User (Administrator), Interactive Mode (True), and IP addresses (IP\_2, IP\_3, IP\_1, IP\_4).
- CPU/MEM/HDD:** Displays system resource usage including Total Processor (1), CPU Status (1%), Processor (Intel(R) Xeon(R) CPU), and Memory usage (Free Virtual Mem, Total Mem, Total Virtual Mem, Free Mem).
- Voice System & Call Info:** Displays system and call information including Voice System Name, System Startup time, System Last Shut time, Last Housekeep status, System Uptime, Message Storage Details (Remaining Messages, Remaining Voice, Today's Messages).

## 8. Conclusion

These Application Notes describe the configuration steps required for WinExpress 3.0 to successfully interoperate with Avaya IP Office Server Edition R9.1. All features and serviceability test cases were completed with observation noted in **Section 2.2**.

## 9. Additional References

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

- [1] *IP Office KnowledgeBase 9.1 Documentation Library*, Apr 2015, available at <http://support.avaya.com>

Product information and documents for WinExpress Phoenix and Unicorn can be obtained from FCS Computer Systems Sdn Bhd.

---

**©2016 Avaya Inc. All Rights Reserved.**

Avaya and the Avaya Logo are trademarks of Avaya Inc. All trademarks identified by ® and ™ are registered trademarks or trademarks, respectively, of Avaya Inc. All other trademarks are the property of their respective owners. The information provided in these Application Notes is subject to change without notice. The configurations, technical data, and recommendations provided in these Application Notes are believed to be accurate and dependable, but are presented without express or implied warranty. Users are responsible for their application of any products specified in these Application Notes.

Please e-mail any questions or comments pertaining to these Application Notes along with the full title name and filename, located in the lower right corner, directly to the Avaya DevConnect Program at [devconnect@avaya.com](mailto:devconnect@avaya.com).