Avaya Solution & Interoperability Test Lab

Application Notes for Configuring iCALL Solution with Avaya IP Office 9.0 - Issue 1.0

Abstract

These Application Notes describe the procedures for configuring iCALL Solution with Avaya IP Office. iCALL Solution integrates with Avaya IP Office by the Microsoft Telephony Application Programmer Interface (TAPI).

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 iCALL Solution to successfully interoperate with Avaya IP Office. iCALL solution is made up of 3 major components, namely Computer Telephony Integration (CTI), Interactive Voice Response (IVR) and Recording System. CTI allows for screen-pops with customer information available to agent prior to the call connection with the customer. IVR allows detection of voice and keypad inputs. The Recording System records voice for inbound and outbound calls. It can store correspondence in multiple formats.

2. General Test Approach and Test Results

For feature testing, the general test approach was to queue incoming calls to the agents. The call flow is developed with a service builder tools with the IVR. Agents use OCX application on their desktop to manage incoming and outgoing calls. Call Management System (CMS) was used to collect call records for the agents' inbound and outbound calls. For serviceability testing, failures such as reboot of the iCALL Server and the Avaya IP Office were applied.

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 both feature and serviceability testing.

The feature testing focused on verifying iCALL Solution's handling of TAPI messages to request and respond to Avaya IP Office features. The serviceability testing introduced failure scenarios to verify iCALL Server could resume operation after failure recovery.

2.2. Test Results

All feature and serviceability tests passed. Note that for TAPI control, the agent cannot reject incoming calls and hence this feature is not supported.

2.3. Support

For technical support on iCALL Solution, contact NSE Telecom at:

- Phone: +86-21-62290011
- Fax: +86-21-62348877
- Email: nsetelecom@nsetelecom.com

3. Reference Configuration

Figure 1 illustrates the test configuration used to verify the iCALL Solution. The setup of this compliance testing comprised of an Avaya IP Office 500V2 which has connections to the following: Avaya 9621 IP Deskphone (H323), Avaya 9630 IP Deskphone (H323), Avaya 1408 Digital Telephone, Avaya analog telephone and an ISDN-PRI trunk to the PSTN. At one time, only 3 agents are used for testing. So, only 3 logical agents are created. The spare IP stations can be used as utility phones.

iCALL Solution is installed on a server running Microsoft Windows 2003 R2. In short, it is termed as iCALL Server. It has connections to the IP Office 500V2 via two IVR SIP extensions for queuing of calls and playing announcements and one SIP extension for recording of calls. Agent OCX is installed on desktop PCs running Microsoft Windows 7 Enterprise version Service Pack 1 and is used to control the IP, Digital and analog telephones respectively.

In this compliance testing, IP Office Manager is installed on a separate Windows 2003 R2 server (not shown) for managing the setup of the phones and hunt group. The Avaya 5520-48T-PWR Ethernet Routing Switch provides Ethernet connectivity to the servers and IP telephones and Layer 3 IP routing.

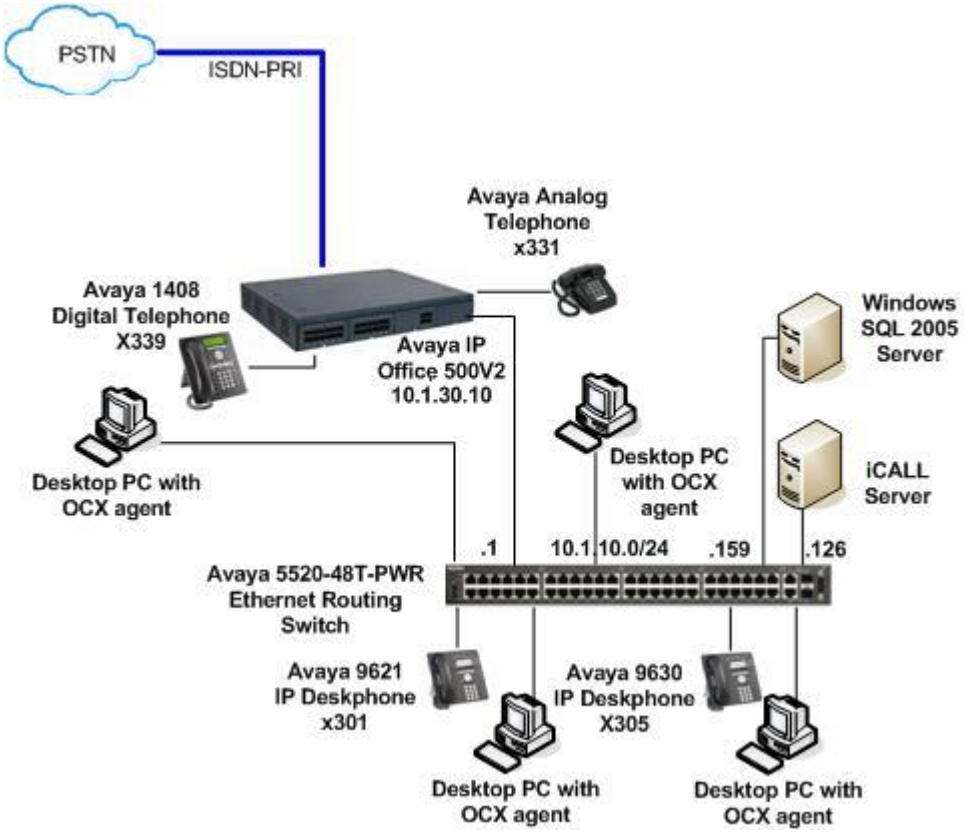


Figure 1: Test Configuration

4. Equipment and Software Validated

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

Equipment/Software	Release/Version
Avaya IP Office 500V2	9.0
Avaya IP Office Manager on Windows 2003 R2 Server	9.0.200.860
Avaya 9621 IP Deskphone (H.323)	6.3.1
Avaya 9630 IP Deskphone (H.323)	3..2.1
Avaya 1408 Digital Telephone	R38
Avaya Analog Telephone	-
Avaya 5520-48T-PWR Ethernet Routing Switch	V6.2.4.010
iCALL Server on Windows 2003 R2 Server	2.0
OCX Agent PCs on Windows 7 SP1	2.0

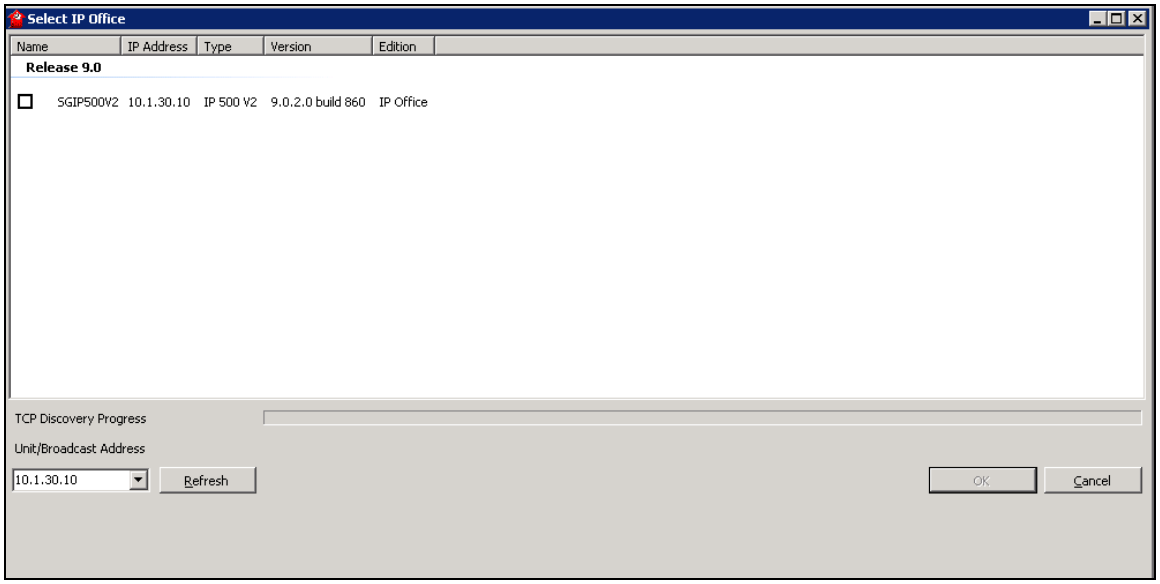
5. Configure Avaya IP Office

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

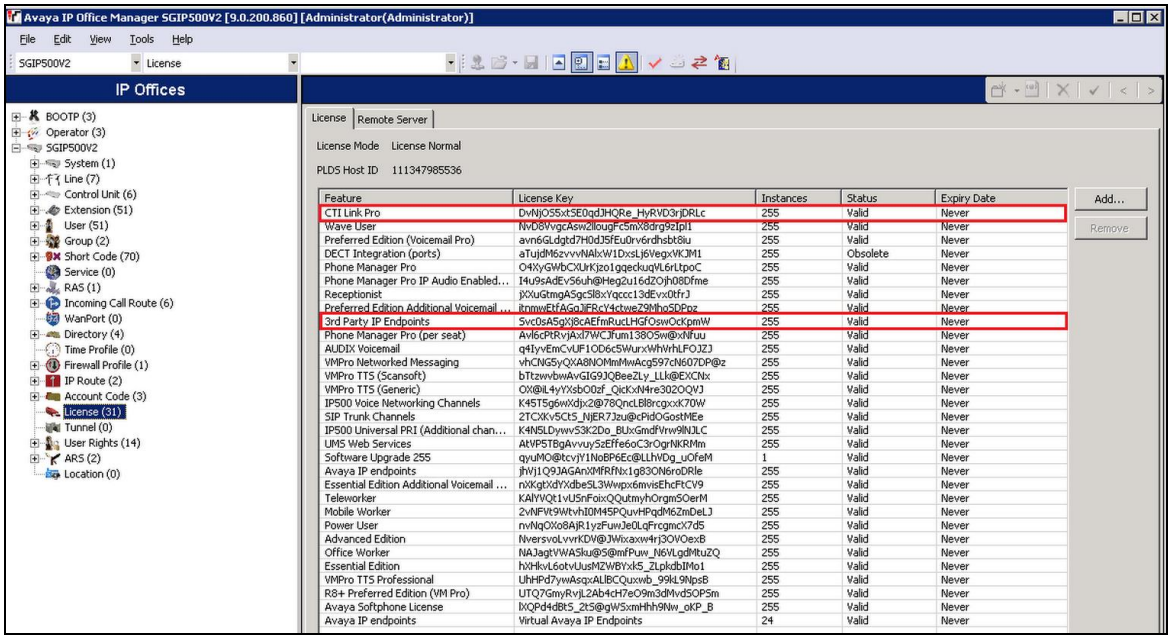
- Verify IP Office license
- Obtain LAN IP address
- Configure Call Listen Short Code
- Administer SIP Registrar
- Administer SIP extensions for IVR and Recording line
- Administer SIP users for IVR and Recording line
- Administer Agent users
- Configuring Monitoring Hunt Group
- Configuring Call Center Hunt Group
- Administer incoming call route

It is expected that the installer is familiar with configuring users, hunt groups, short codes, etc. on Avaya IP Office as the focus of these Application Notes is on the configuration of the TAPI interface only. For all other provisioning information, such as software installation, installation of optional components, basic configuration of Avaya IP Office, etc., refer to the Avaya IP Office product documentation in reference [1] of **Section 9**.

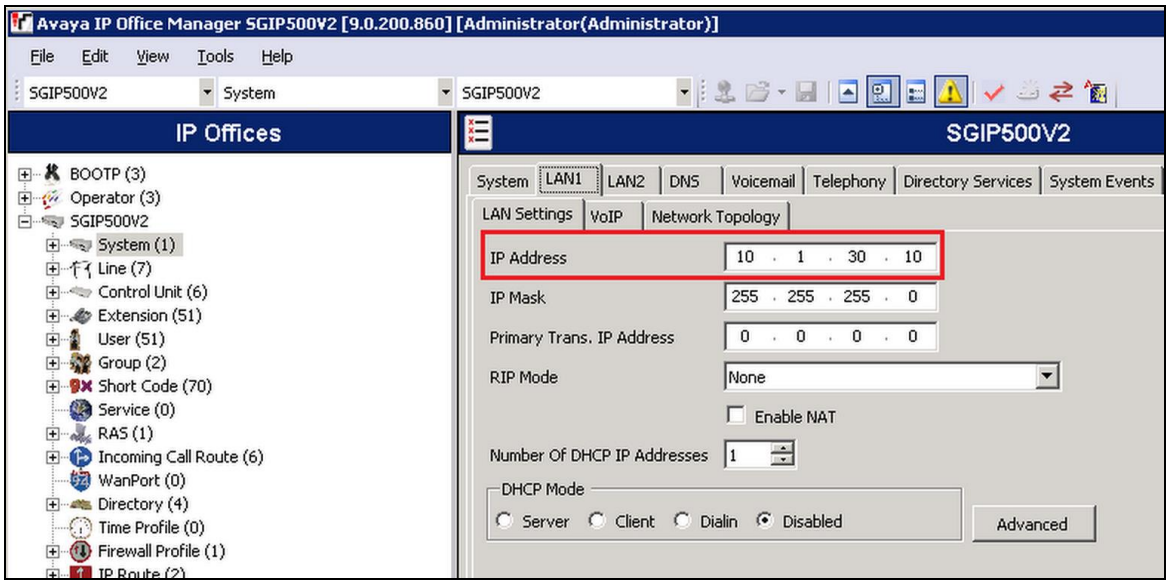
5.1. Verify IP Office License

Step	Description
1.	From a PC running the Avaya IP Office Manager application, select **Start → All Programs → IP Office → Manager** to launch the Manager application. Select the proper IP Office system, and log in with the appropriate credentials.  Log into the Avaya IP Office Manager application by using the appropriate user name and password (not shown).

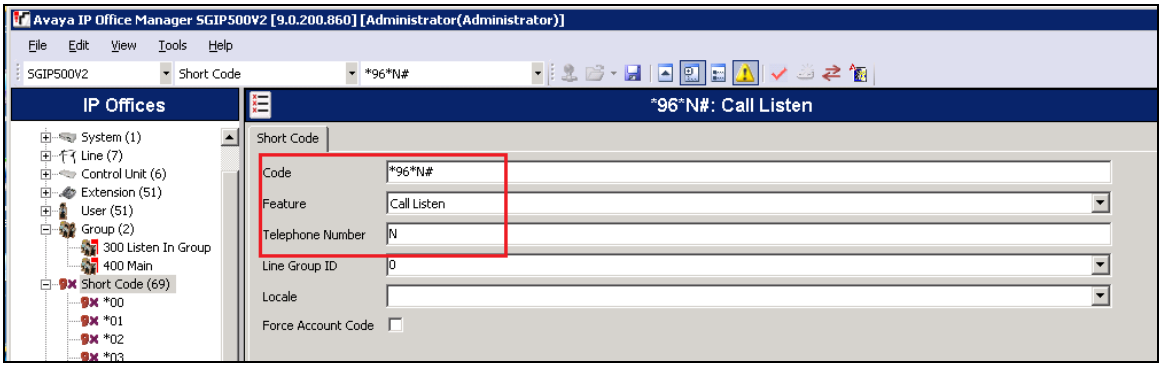
Step	Description
2.	It is assumed that appropriate trunk and other basic licenses are acquired. The CTI Link Pro license is required for iCALL Server to connect to Avaya IP Office via TAPI. Scroll down the left pane and select **License**, to display the **CTI Link Pro** screen in the right pane. Verify that the license **Status** is "Valid". This license is required for iCALL Server to use third-party TAPI control mode on IP Office. Verify also the 3rd Party IP Endpoints license **Status** is also "Valid".



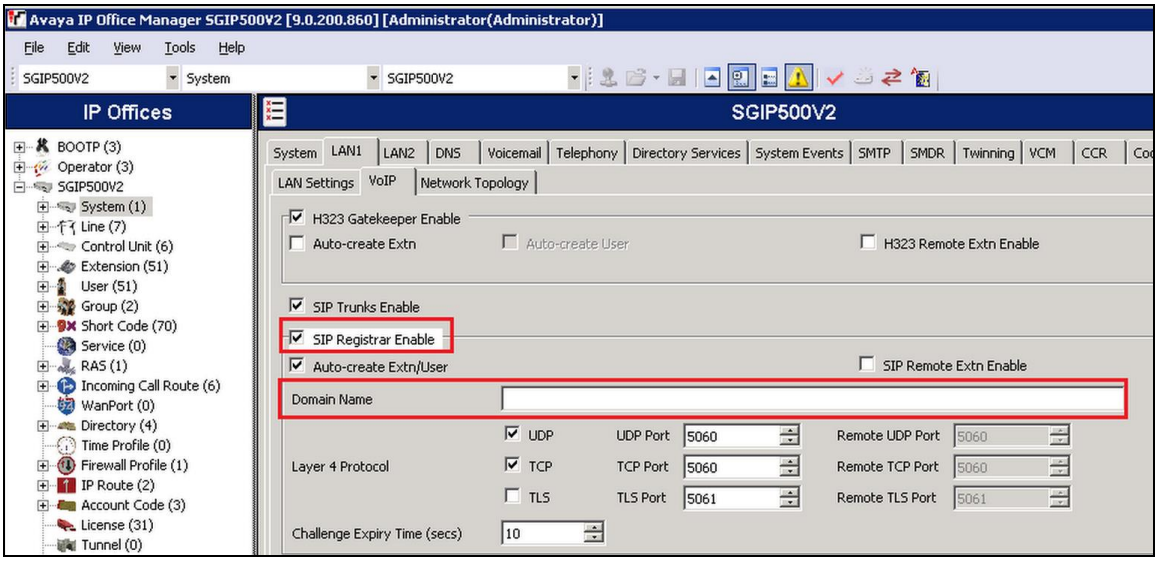
5.2. Obtain LAN IP address

Step	Description
1.	From the configuration tree in the left pane, select **System** to display the system being configured 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 iCALL Server. Note that IP Office can support SIP on the LAN1 and/or LAN2 interfaces, and the compliance testing used the LAN1 interface. 

5.3. Configure Call Listen short code

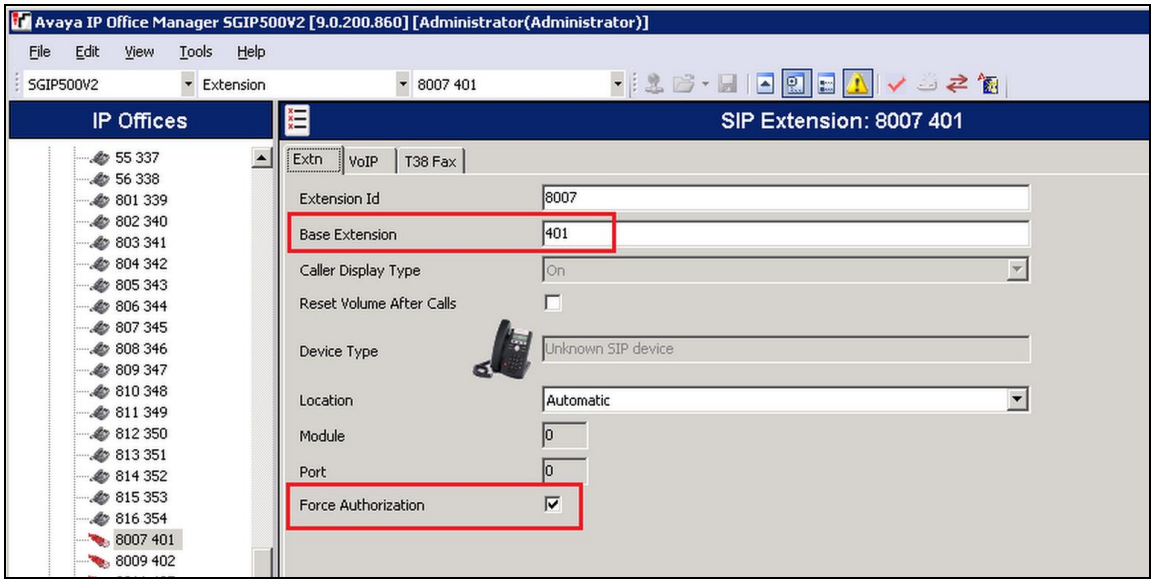
Step	Description
1.	From the configuration tree in the left pane, select **Short Code** and right click to select **New.** Enter the following for Call Listen feature to be used for recording by SIP line later. • **Code**: *96*N# • **Feature**: Call Listen • **Telephone Number**: N 

5.4. Administer SIP Registrar

Step	Description
1.	Select the **VoIP** sub-tab. Make certain that **SIP Registrar Enable** is checked as shown below. 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. 

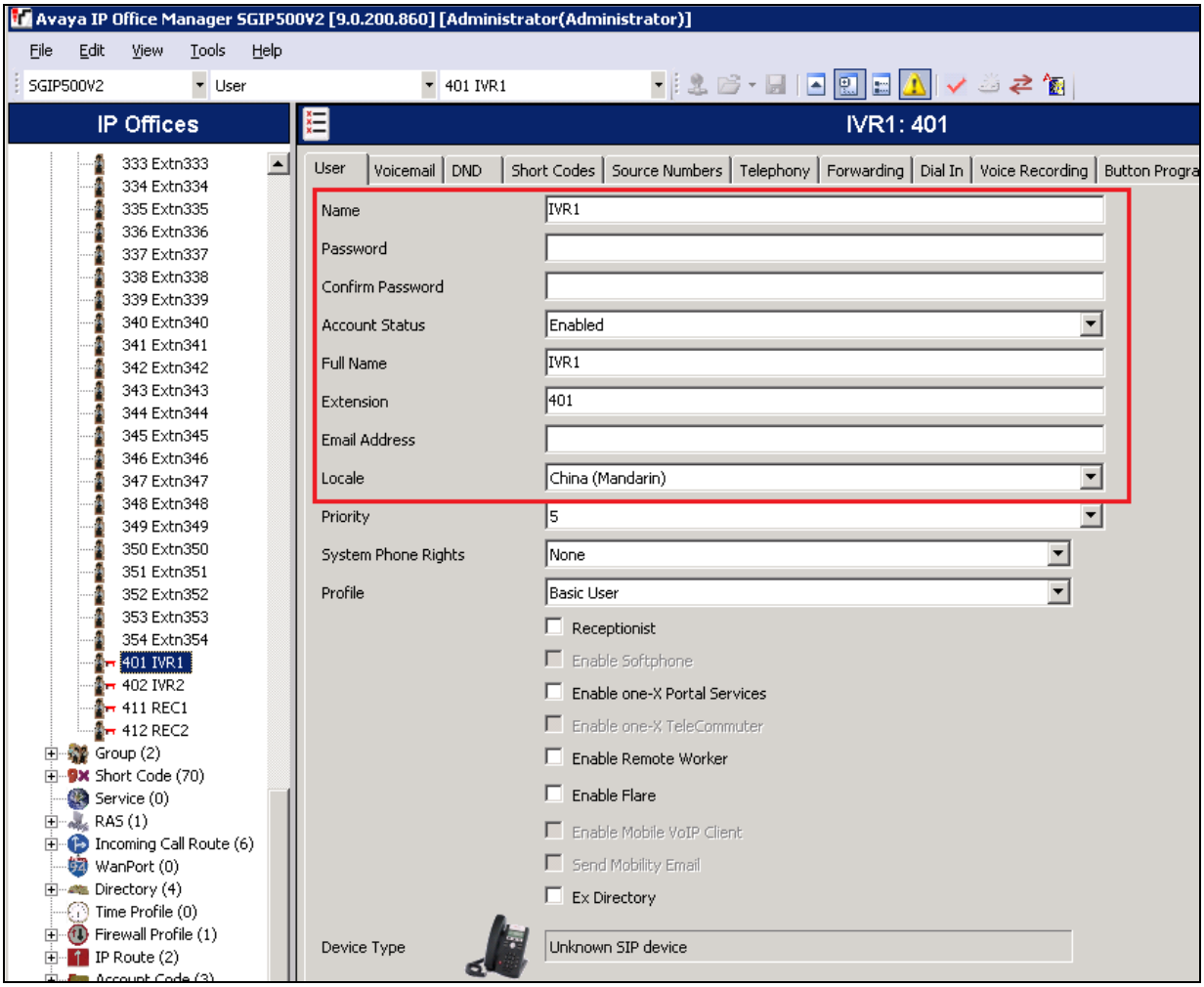
5.5. Administer SIP extensions for IVR/Recording

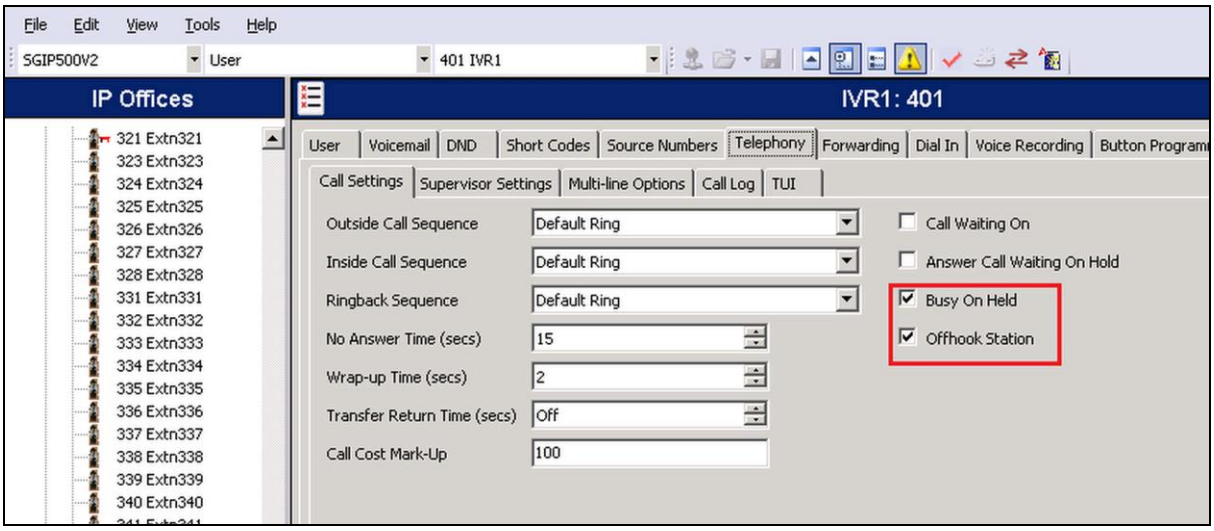
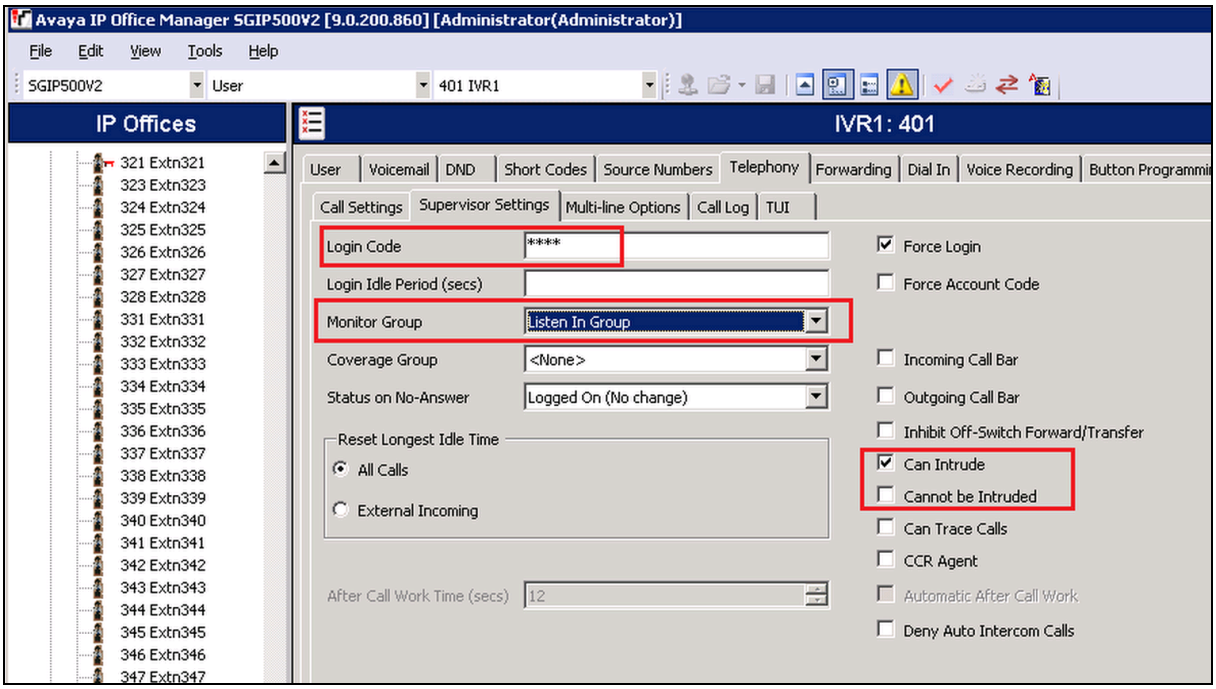
Step	Description
1.	From the configuration tree in the left pane, right-click on **Extension** and select **New** → **SIP Extension** from the pop-up list to add a new SIP extension. Enter the desired digits for **Base Extension**, and check **Force Authorization**, as shown below. In this case, "401" for IVR line. Repeat for extensions 402 for IVR line and 411 for recording line.



5.6. Administer SIP users for IVR/Recording

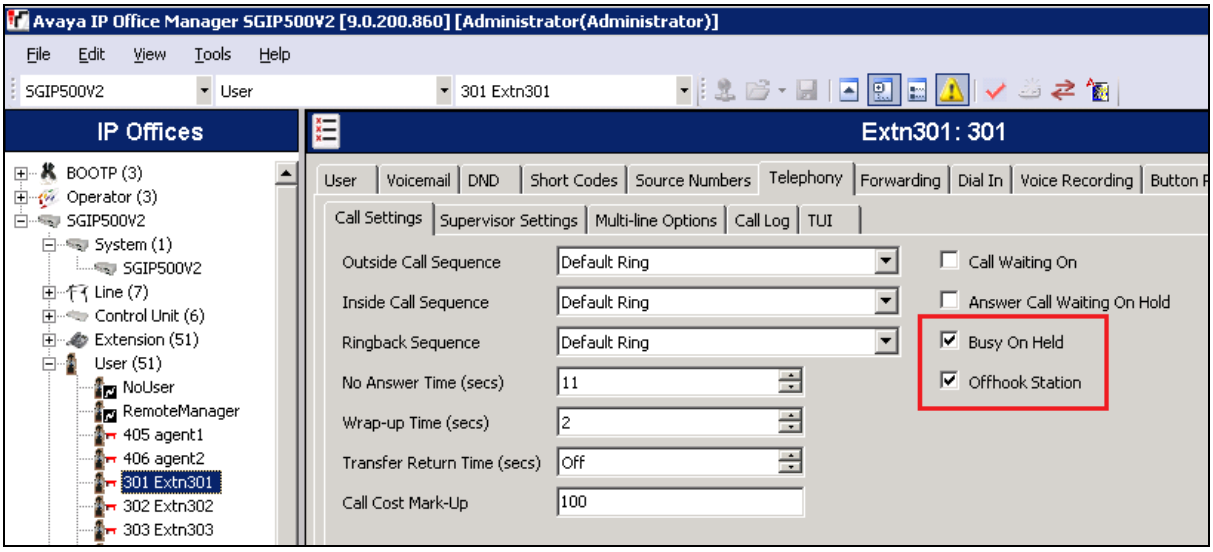
Step	Description
1.	iCALL Server registers with the SIP User which is used to queue calls redirected from incoming call hunt group by TAPI control. From the configuration tree in the left pane, right-click on **User** and select **New** from the pop-up list (not shown). Enter desired values for **Name** and **Full Name**. For **Extension**, enter the first Base Extension from **Section 5.5**. Enter desired **Password** and **Confirm Password**. Depending on country, for the Locale, **China (Mandarin)** is selected for this Compliance Testing. Repeat for extensions 402 for IVR line and 411 for recording line.

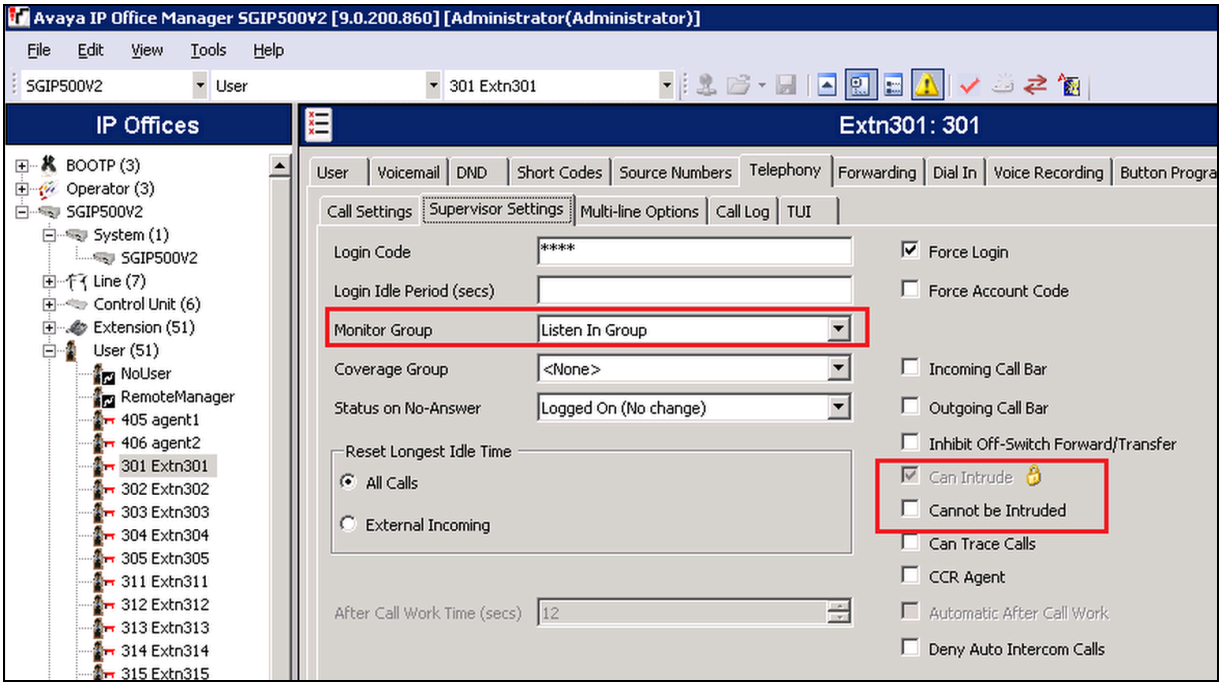


Step	Description
2.	Select the **Telephony** tab; followed by the **Call Settings** sub-tab. Check **Busy On Held** and **Offhook Station**, as shown below. Repeat for extensions 402 for IVR line and 411 for recording line. 
3.	Select the **Supervisor Settings** sub-tab. Check the **Can Intrude** field and make sure the **Cannot be Intruded** is not checked, as shown below. Specify the **Login Code** field, which will be used by iCALL Server to log in the SIP User. This login code should be the same as the password set in **Step 1** of this section. Also specify the **Monitor Group** as Listen In Group created in **Section 5.7** for Call Listen to work. Repeat for extensions 402 for IVR line and 411 for recording line. 

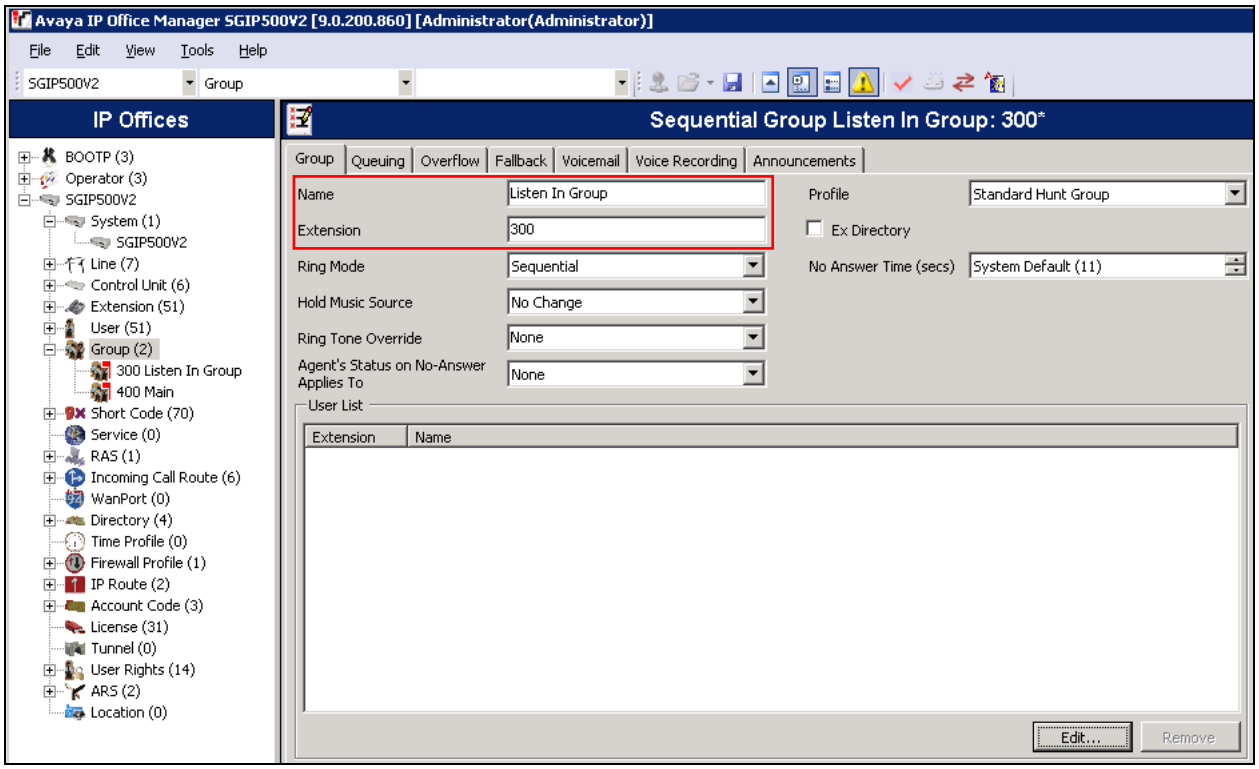
5.7. Administer Agent Users

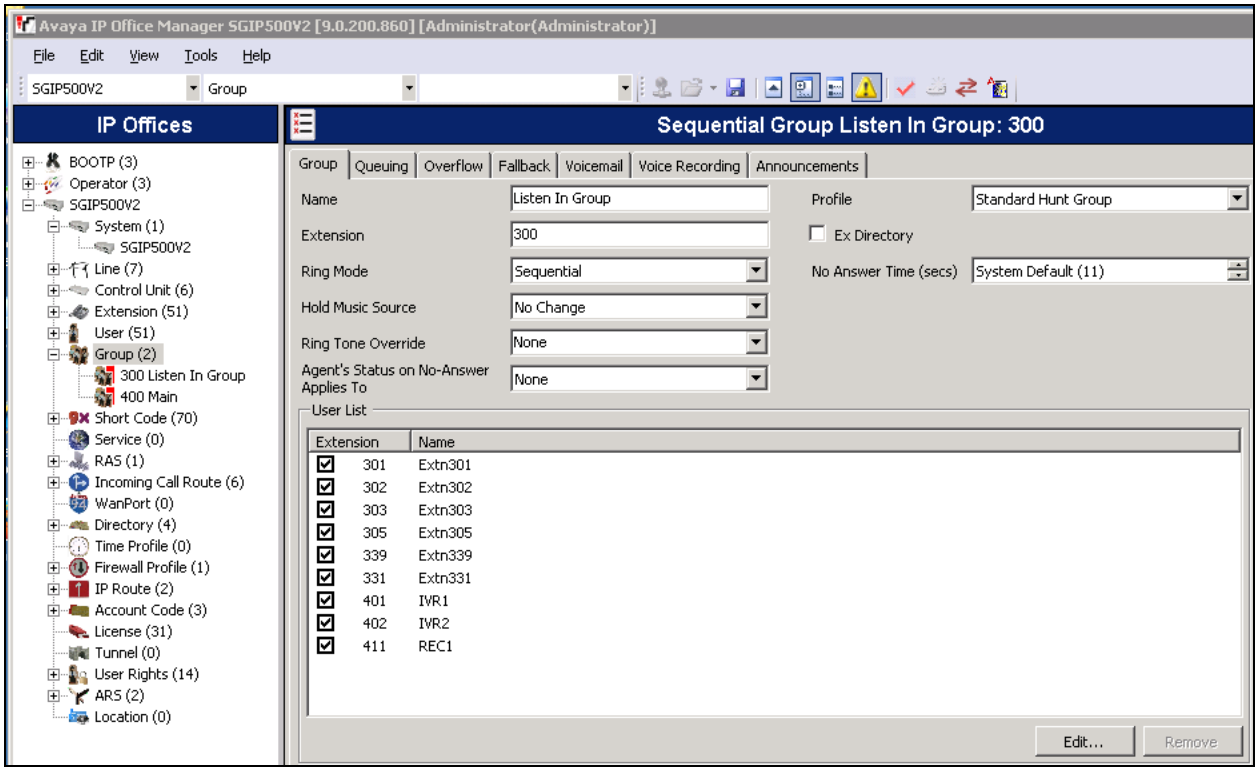
This section assumes agent extensions are already setup. The agent users are configured as detailed below.

Step	Description
1.	From the configuration tree in the left pane, select **User** and **301 Extn301**. On the right pane, select the **Telephony** tab; followed by the **Call Settings** sub-tab. Check **Busy On Held** and **Offhook Station**, as shown below. Repeat for Agent Users 305, 331 and 339. 

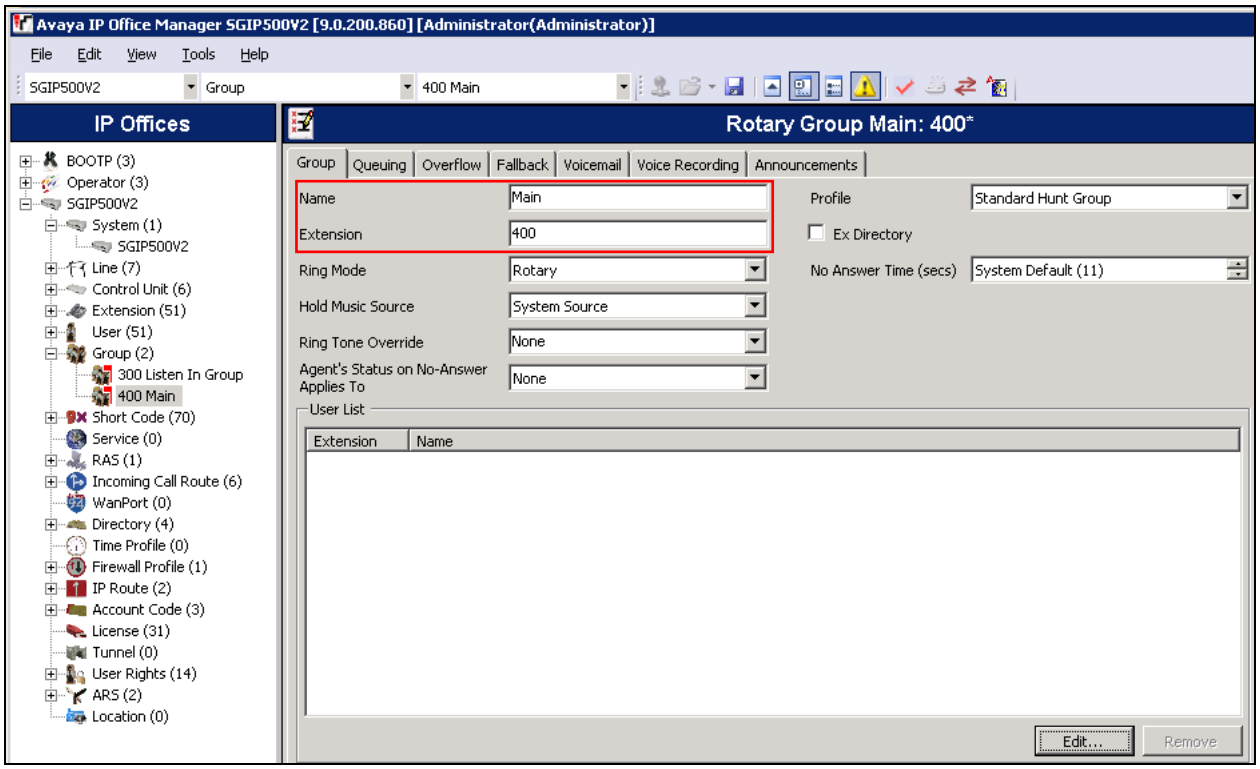
Step	Description
2.	Select the **Supervisor Settings** sub-tab. Check the **Can Intrude** field and make sure the **Cannot be Intruded** is not checked, as shown below. Also specify the **Monitor Group** as Listen In Group created in **Section 5.7** for Call Listen to work. Repeat for Agent Users 305, 331 and 339. 

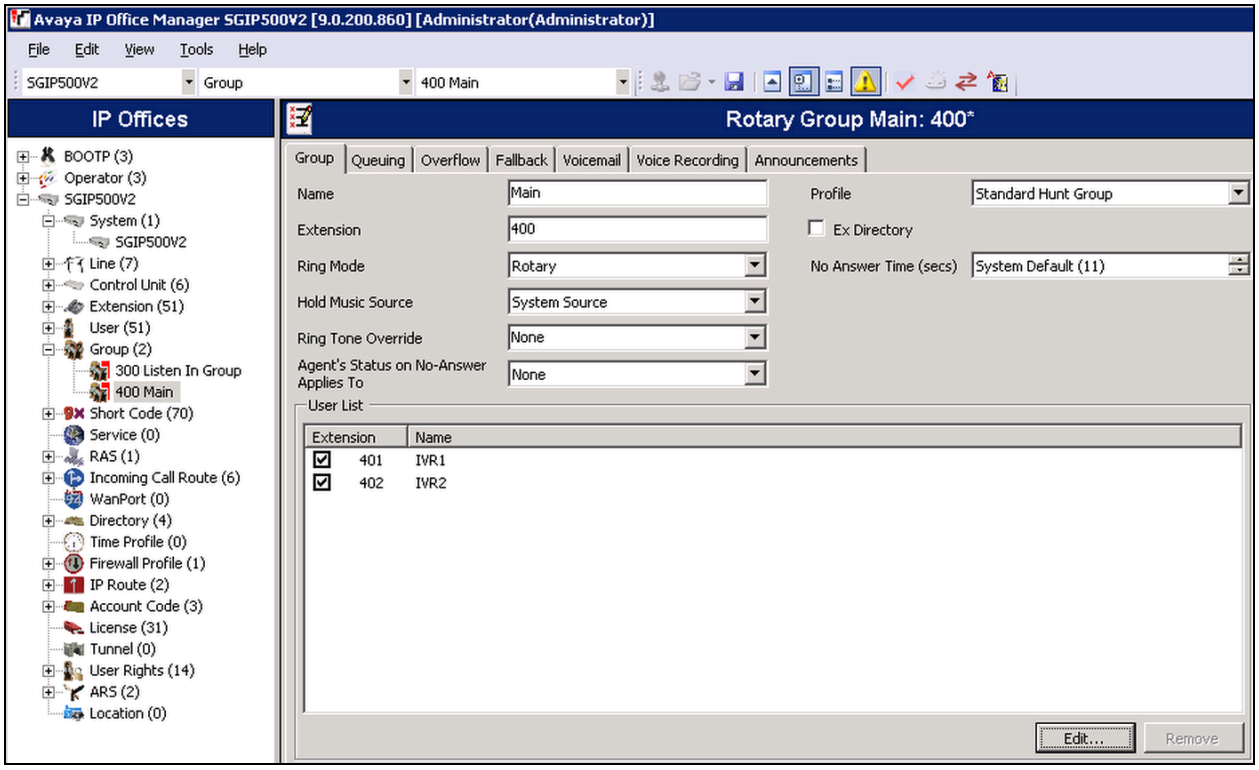
5.8. Configuring Monitoring Hunt Group

Step	Description
1.	This hunt group will be used for the recording by SIP Line 411 to use the Call Listen feature. 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. 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. 

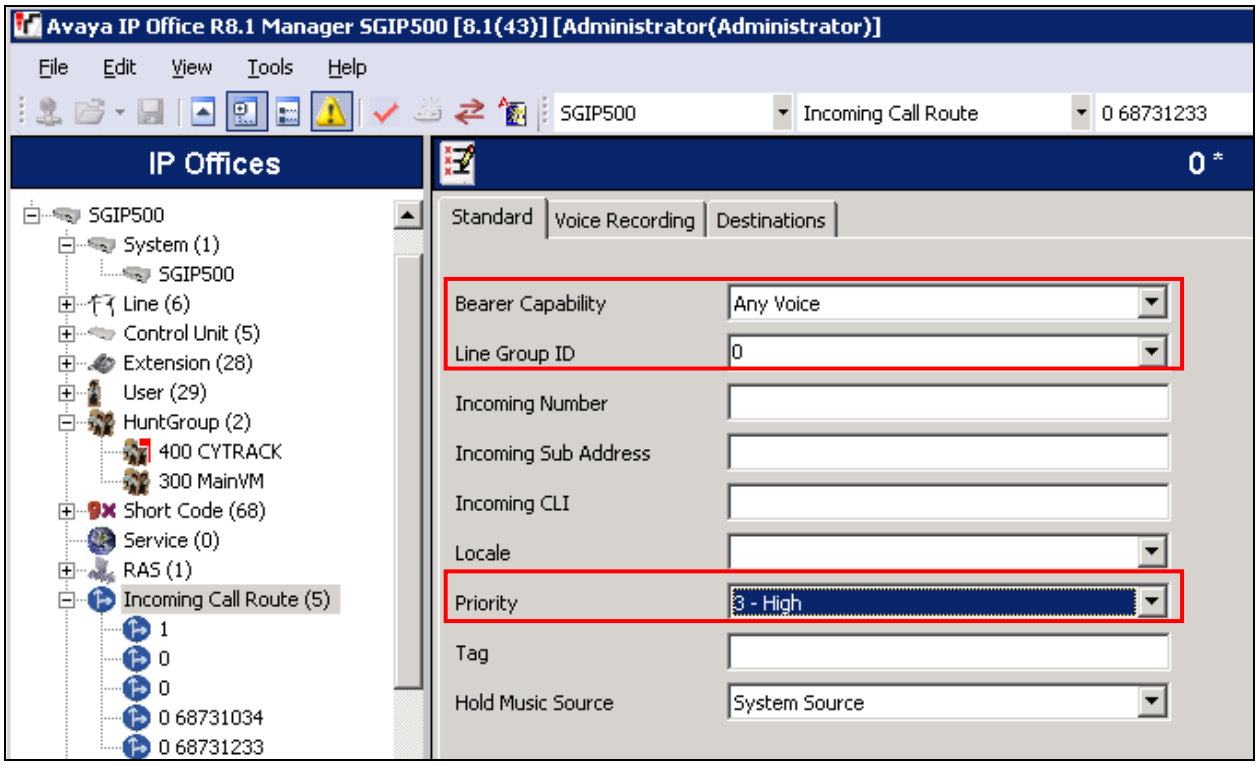
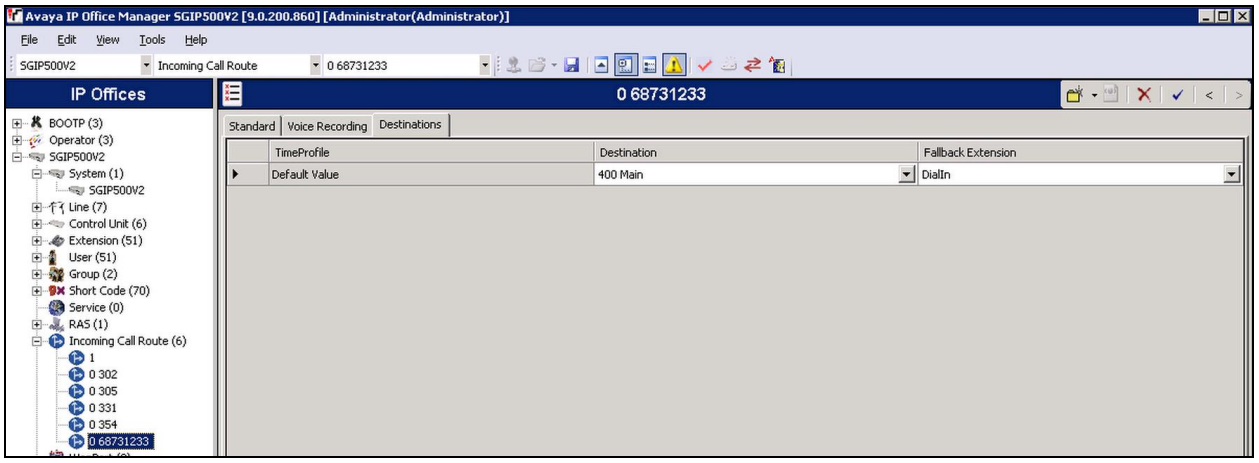
Step	Description
2.	Select all the Agent Users, IVR Users and the Recording User and **Append** to the **Members** list as shown below. 

5.9. Configuring Call Center Hunt Group

Step	Description
1.	This hunt group will be used to receive inbound calls to call queuing for a typical call center environment. 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. 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. 

Step	Description
2.	Select an IVR Users 401 and 402, and **Append** to the **Members** list as shown below. 

5.10. Administer incoming call route

Step	Description
1.	From the configuration tree in the left pane, right-click on **Incoming Call Route** and select **New** from the pop-up list to add a new incoming call route. Select **Any Voice** for the **Bearer Capability** and **Priority** to be **3-High** as this is incoming trunk for receiving service calls. The **Line Group ID** will depend on what trunk is setup for receiving incoming calls. In this case, ISDN PRI trunk (**Line Group ID 0)** is selected and assumed to be configured. 
2.	Select **Destinations** tab and pick the hunt group 400 created in **Section 5.9** as the **Destination**. 

6. Configure iCALL Solution

This section provides the procedures for configuring the iCALL solution. The procedures include the following areas:

- Install and configure Avaya TAPI driver
- Configure iCALL Server
- Configure Agent OCX on the PCs

Please note that not all the configured details are mentioned. Only those essential for setup and interface with Avaya are stated. For all other provisioning information, such as software installation, installation of optional components, basic configuration of Avaya IP Office, etc., refer to the Avaya IP Office product documentation in reference [1] of **Section 9.**

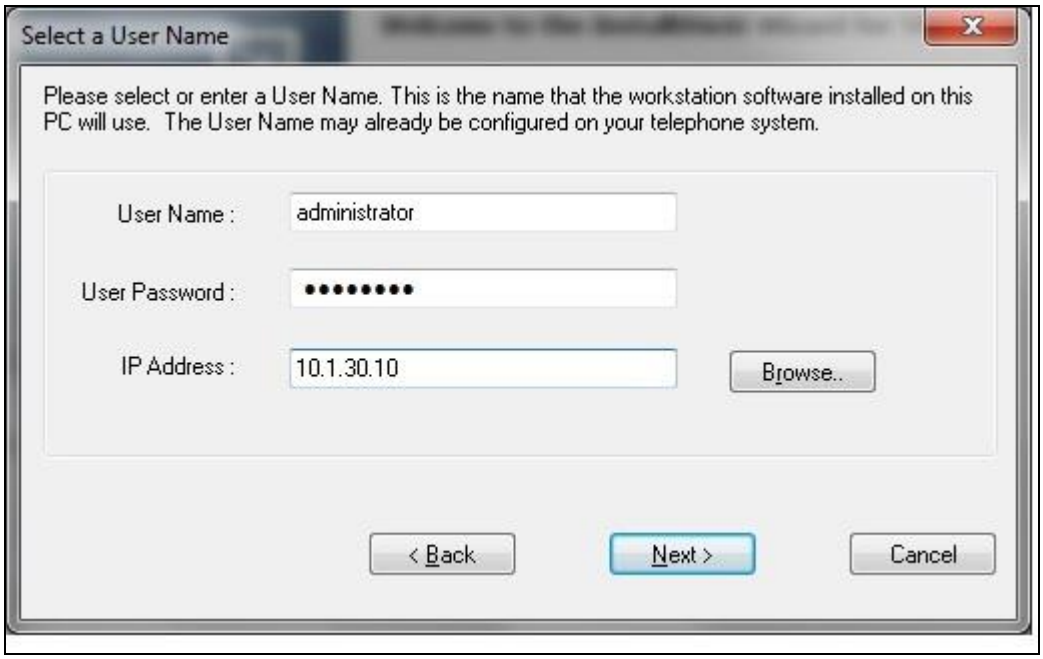
6.1. Install and configure Avaya TAPI Driver

This section provides the procedures for configuring the Avaya TAPI Driver on the iCALL Server. The procedures include the following areas:

- Install Avaya TAPI driver
- Configure Avaya TAPI driver

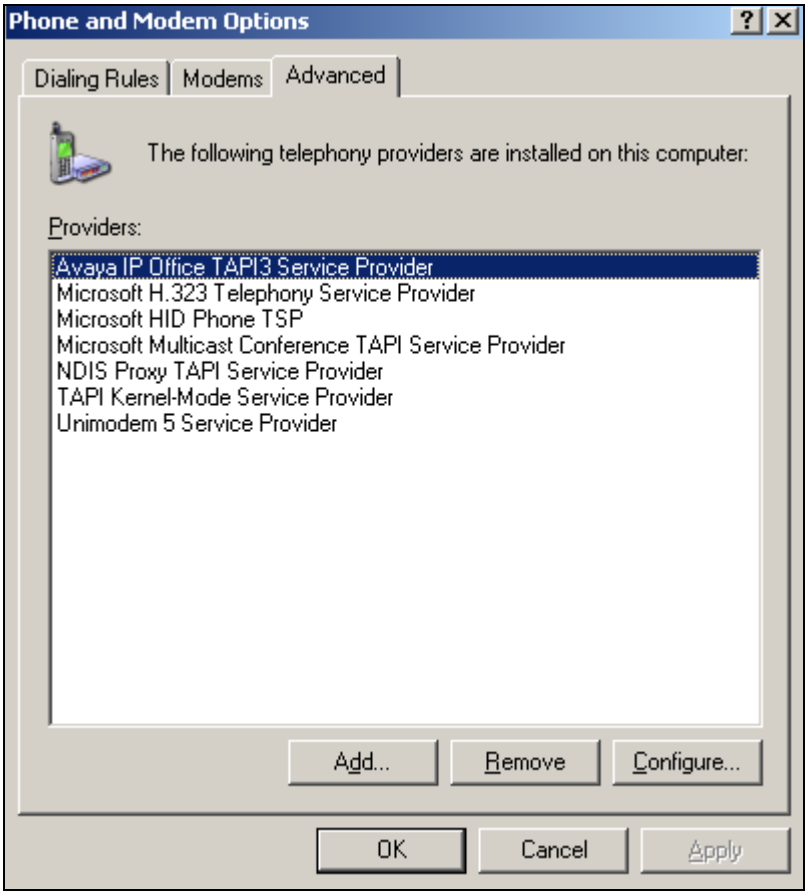
6.1.1. Install Avaya TAPI Driver

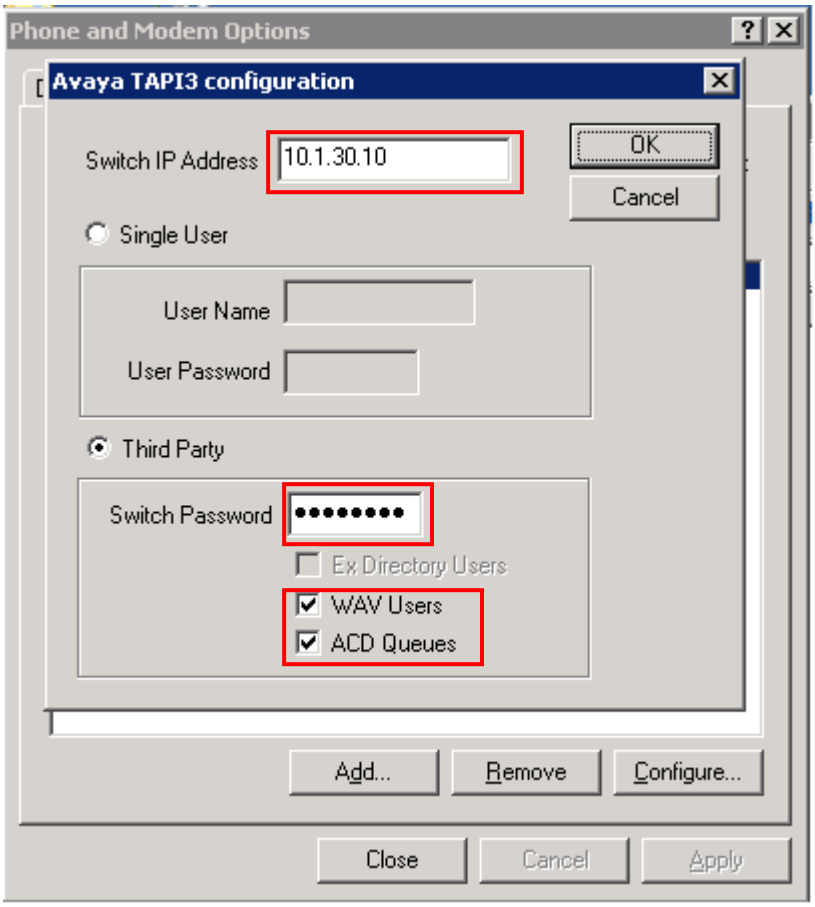
Avaya TAPI driver can be obtained from the IP Office User CD which is also available on Avaya Support portal at http://support.avaya.com/. The latest driver is used for installation on the iCALL Server in this compliance testing.

Step	Description
1.	Log into the iCALL Server with administrative privileges and double click the driver installation program "**tapiSetup.exe**". You may need to enter the following information if the IP Office is not detected. Click **Next** to complete the installation of the TAPI driver. At the InstallShield Wizard Complete window, click **Finish** (not shown). 

6.1.2. Configure Avaya TAPI Driver

Step	Description
1.	Go to the Windows Control Panel and open **Phone and Modem** Options. Click the **Advanced** tab, select **Avaya IP Office TAPI3 Service Provider** and click **Configure…**.



Step	Description
2.	In the Avaya TAPI3 configuration window that is displayed, set **Switch IP Address** to the IP address of Avaya IP Office, select **Third Party** and set **Switch Password** to the IP Office System password provided by the administrator. Click **OK**. 
3.	In the Phone and Modem Options window, click **OK**. Reboot the server for the new changes to take effect.

6.2. Configure iCALL Server

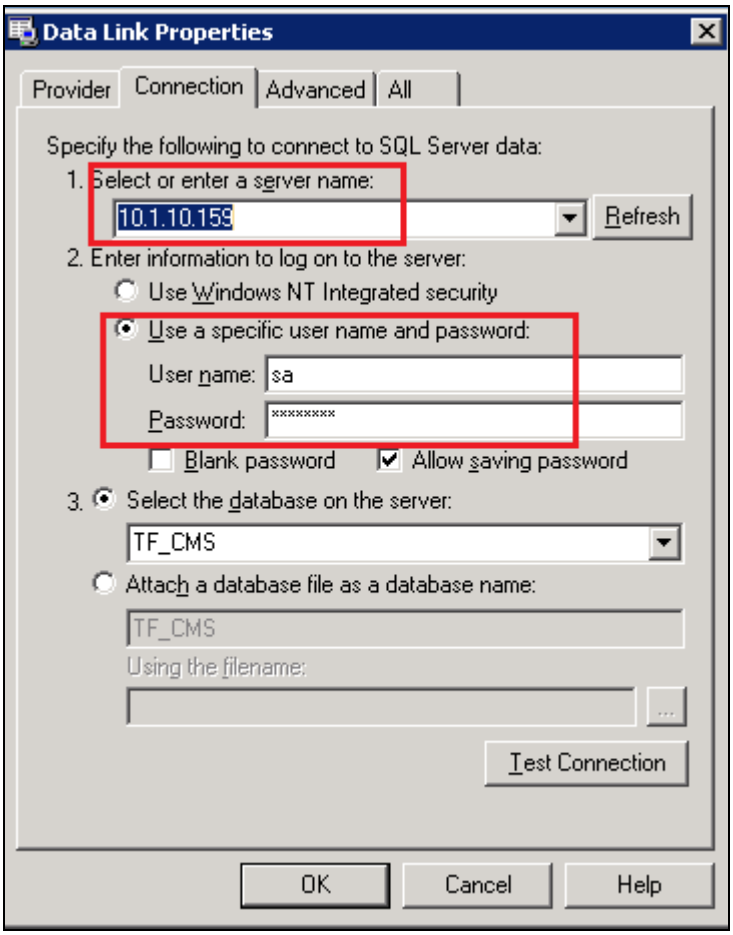
The installation of the components on the iCALL Server and the Database Server is assumed to be completed and activated with the appropriate license. The complete steps required to configure iCALL Server for service is beyond the scope of this document. Refer to NSE Telecom for details.

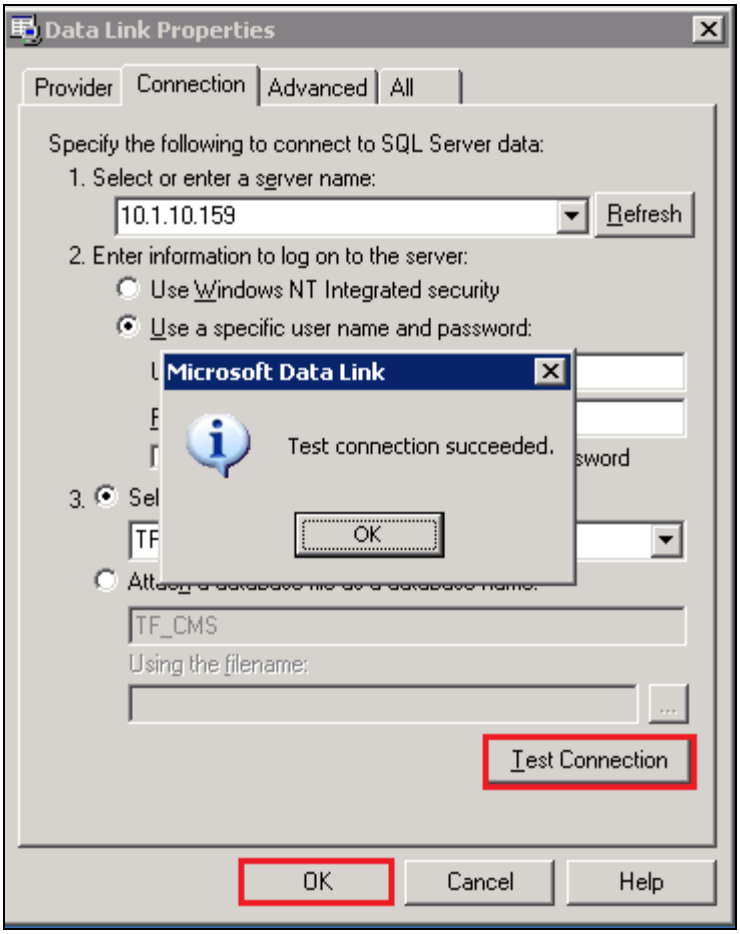
This section provides the procedures for configuring iCALL Server. The procedures include the following areas:

- Database Connection configuration
- IVR configuration
- CTI Core Service configuration
- IVR Channel configuration
- Recording Channel configuration
- Restart IVR and CTI service
- Agent configuration
- Recording System configuration

6.2.1. Database Connection configuration

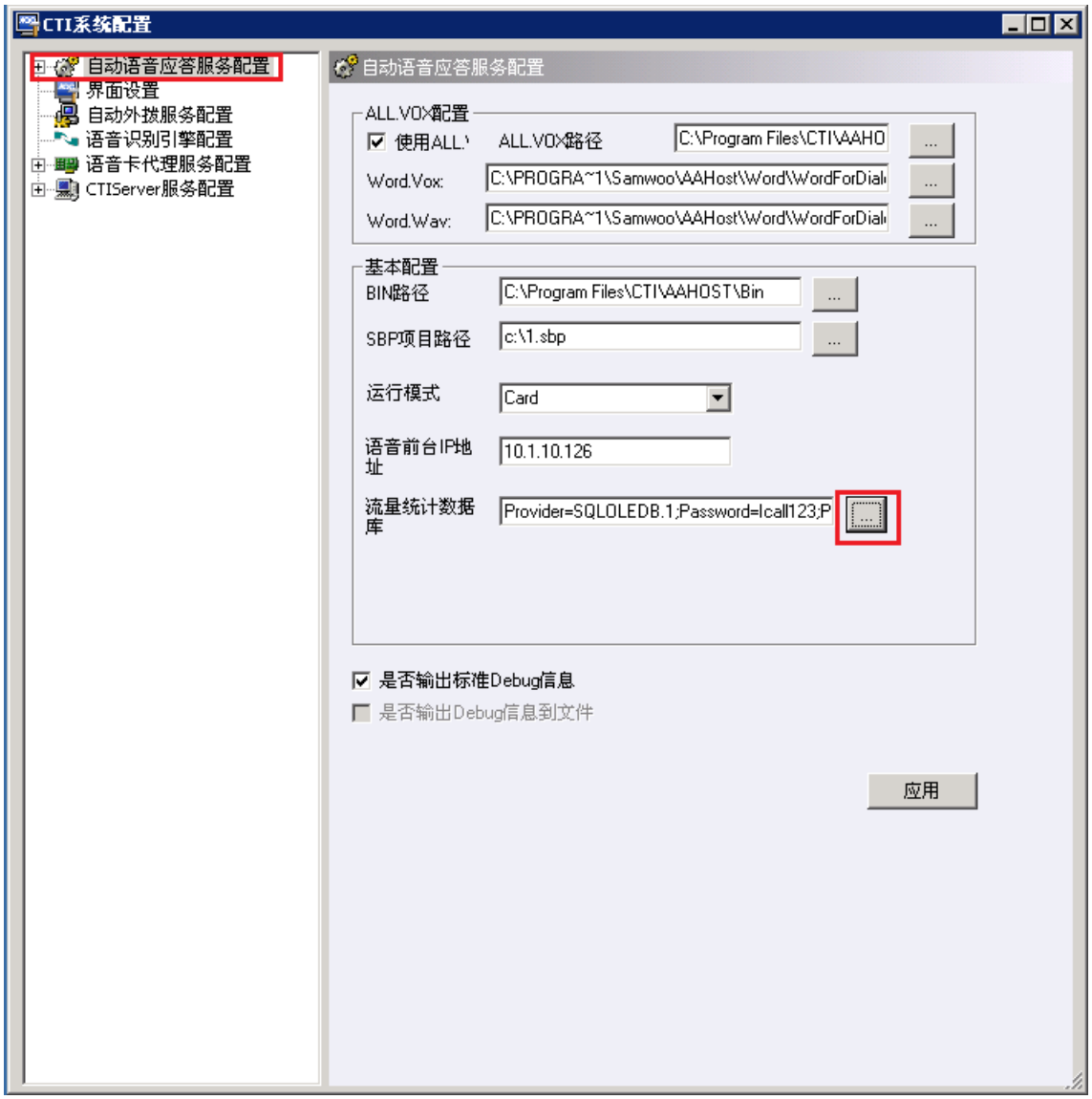
Step	Description
1.	Log into the iCALL Server with administrative privileges. Click **Start → All Programs → CTI → AAManager**. Log in with the appropriate credentials and click the database connection setup below. 

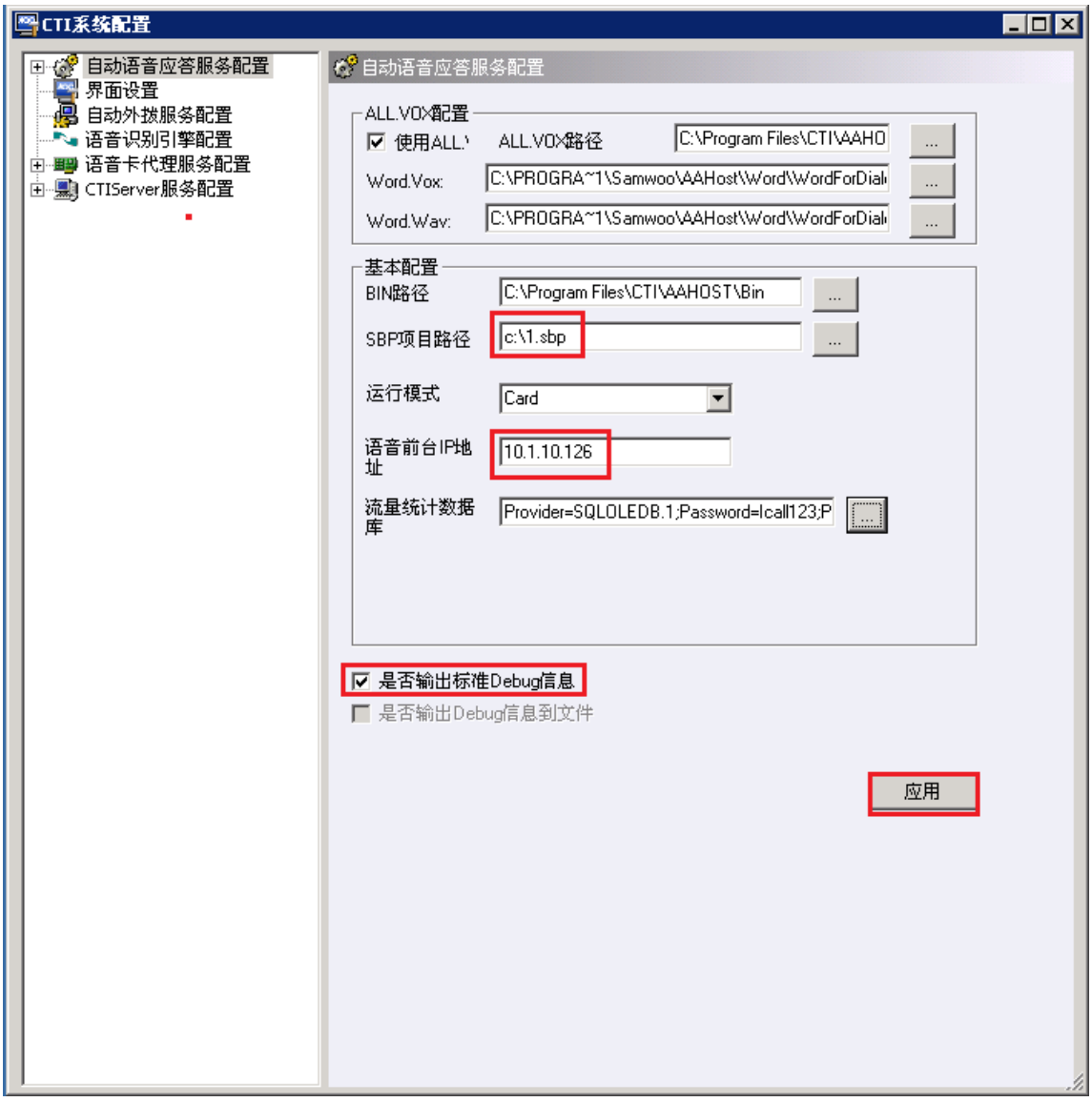
Step	Description
2.	Enter the database server IP address in the **Select or enter a server name** field and select **Use a specific user name and password**. Enter the **User name** sa and **Password**. Leave the rest as default. 

Step	Description
3.	Click the **Test Connection** to verify the database connection is properly setup. A message "Test connection succeeded" will be displayed. Press **OK** to confirm setup. 

6.2.2. IVR configuration

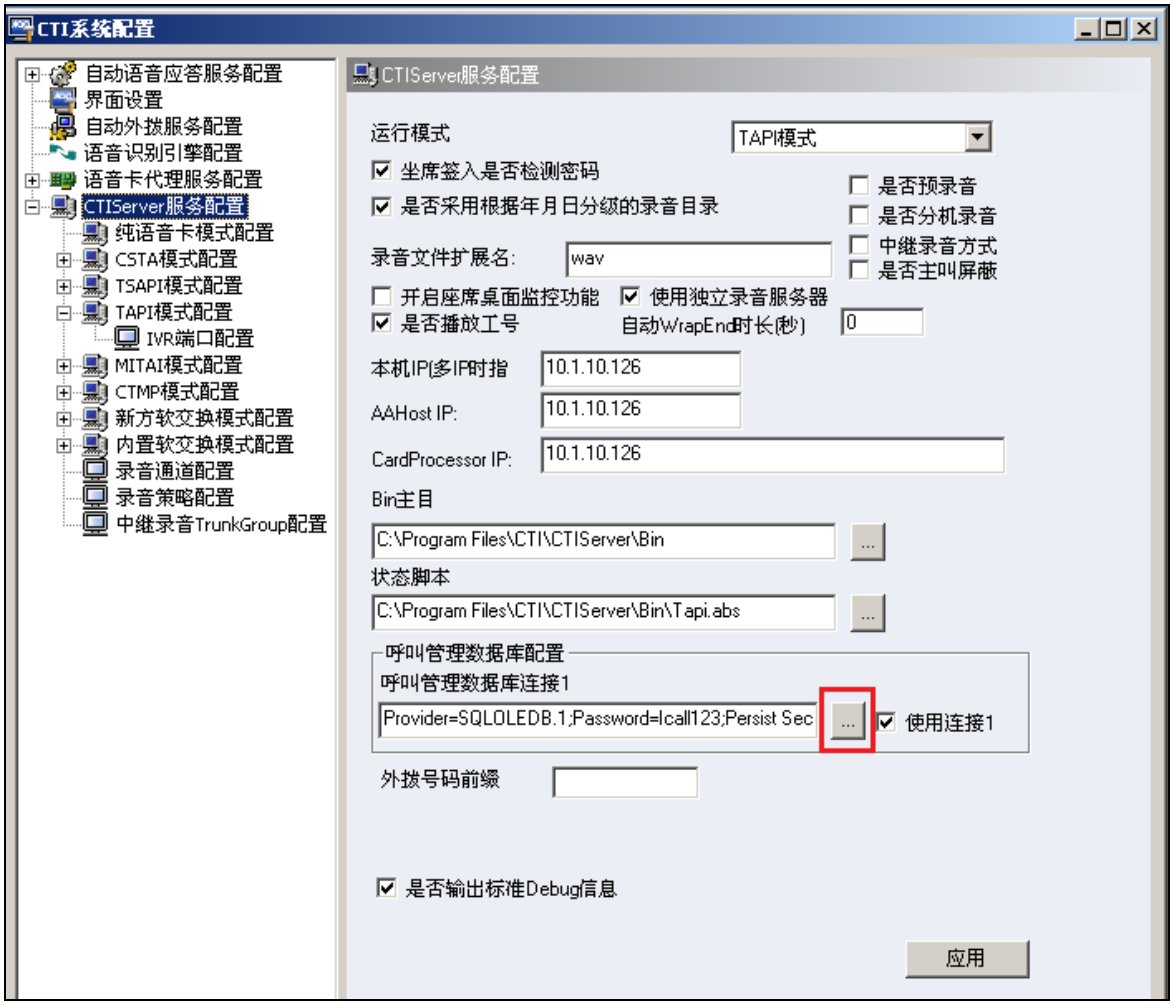
Step	Description
1.	Log into the iCALL Server with administrative privileges. Click **Start → All Programs → CTI → AAManager**. Log in with the appropriate credentials and click **Enter as** below**.** 
2.	On the next screen, click  to enter the Setup. 

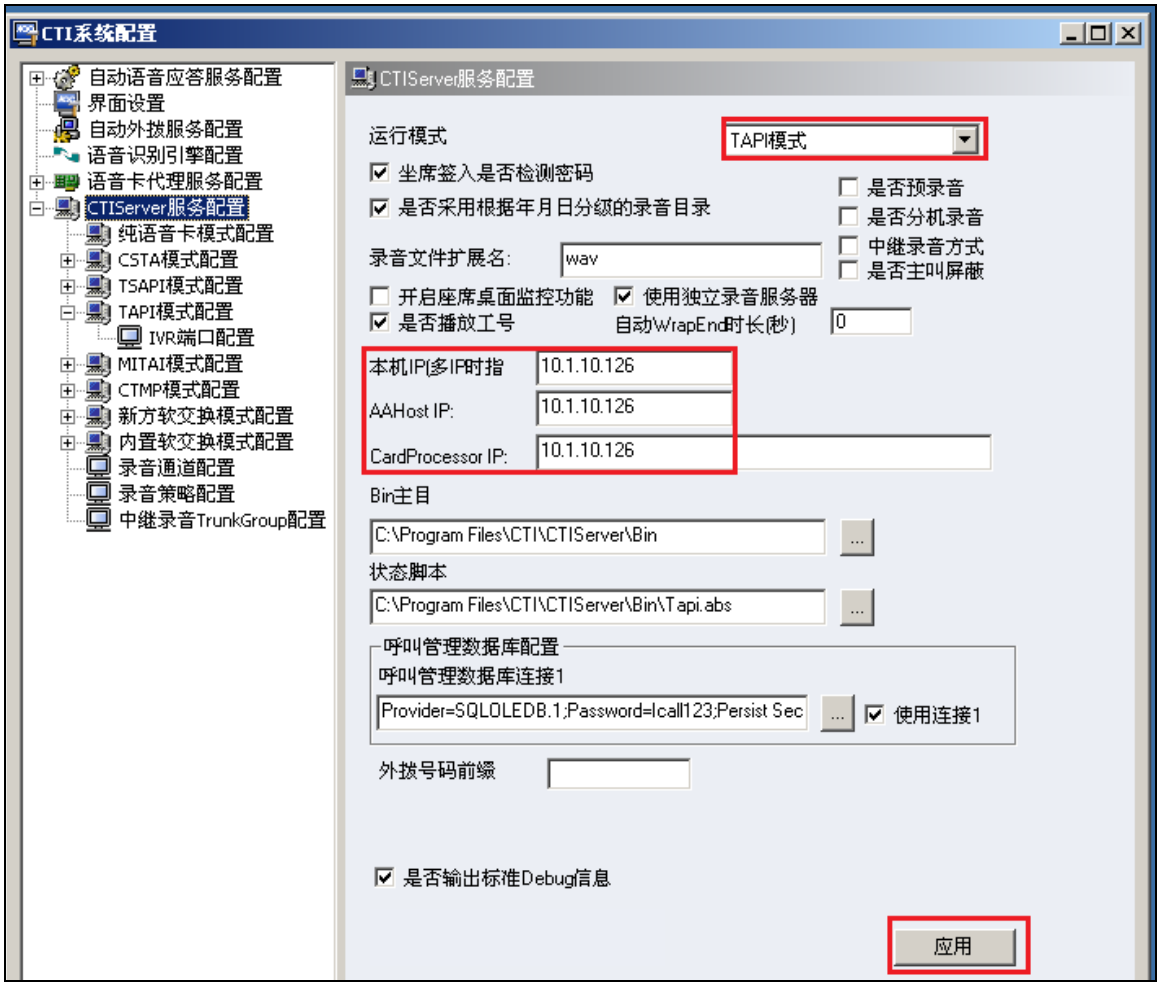
Step	Description
3.	On the left panel, select the IVR configuration setup and click the “analysis data” symbol as below and complete the database connection information, the same as in **Section 6.2.1 Step 2** and **3**. 

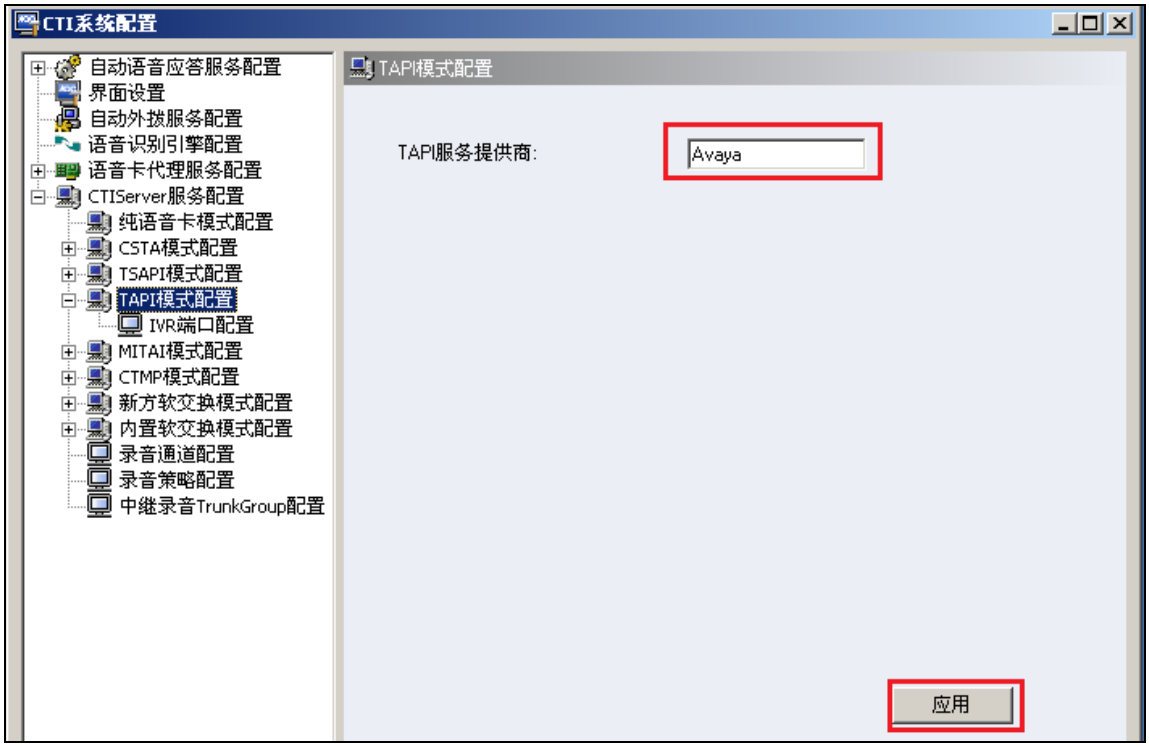
Step	Description
4.	Enter the IP address of the iCALL server for the IVR service. In this Compliance Testing, the iCALL server performs the IVR function as well. The script file for handling the call flow is located at c:\1.sbp as set as below. Detail on the design of the script will not be described here. Check the box at the bottom for basic debug log output. Click **Apply** to finish configuration. 

6.2.3. CTI Core Service configuration

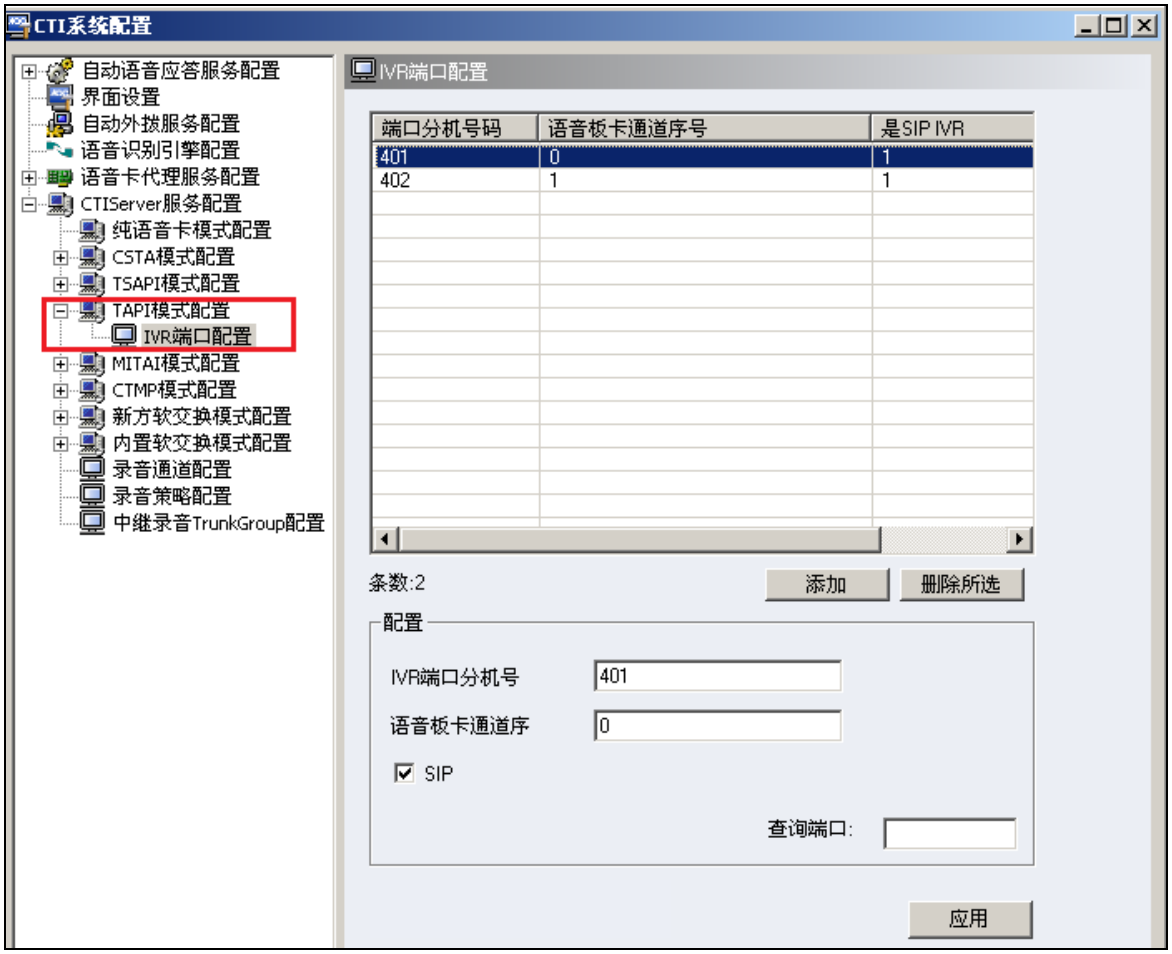
Step	Description
1.	Repeat Step 1 and 2 in **Section 6.2.2** and select **CTIServer** on the left panel below. Click on the "analysis data" symbol below and complete the database connection information the same as in **Section 6.2.1 Step 2** and **3.**



Step	Description
2.	On the same screen, configure the local IP address for the following: • **Local IP**: IP address of the CTI Server • **AAHost IP**: IP address of the AA Host. • **CardProcessor IP**: IP address of IVR Server Select also **TAPI** as the type of connection to PBX from the drop down menu. Check the box at the bottom for basic debug log output. Click **Apply** to finish configuration. 

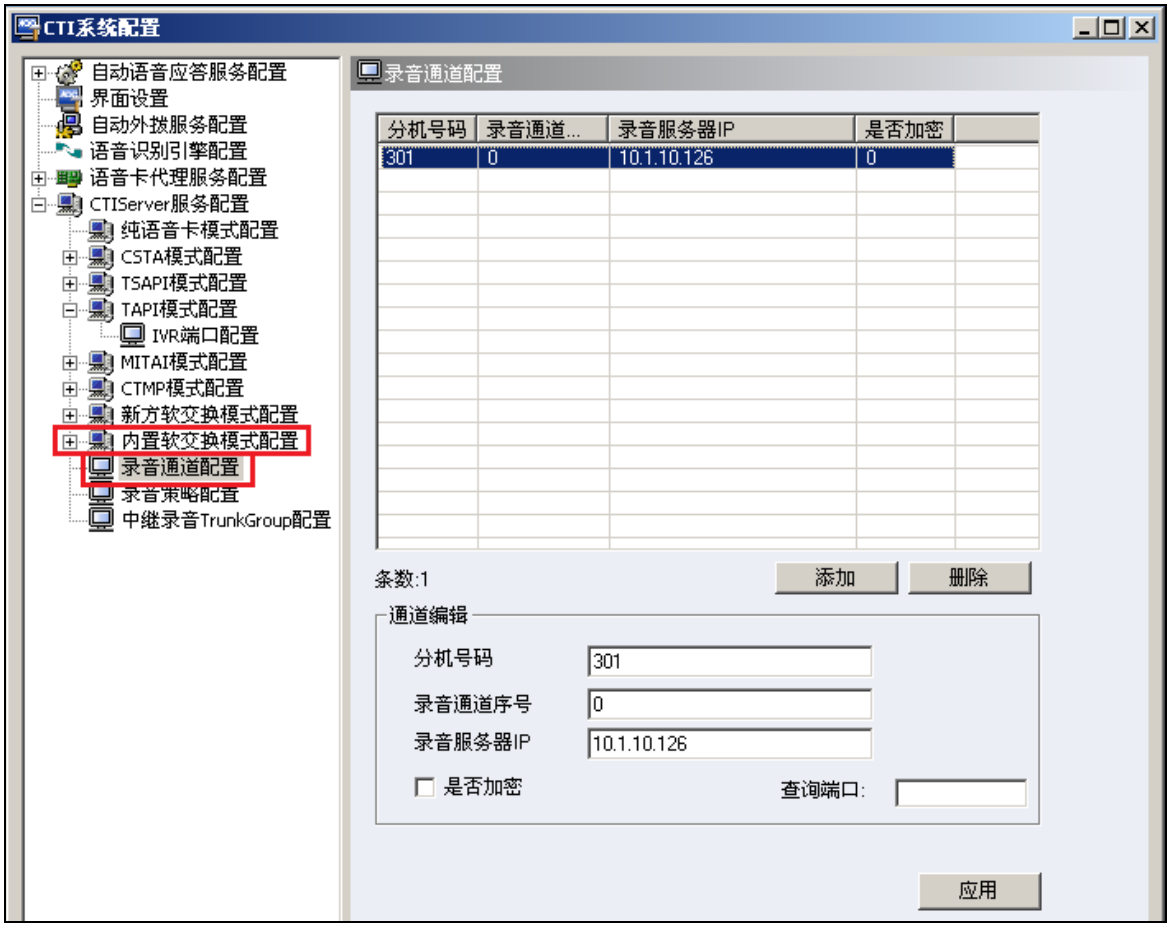
Step	Description
3.	On the left panel, select **TAPI model configuration** and enter Avaya on the right panel. Click **Apply** to finish configuration. 

6.2.4. IVR Channel configuration

Step	Description
1.	On the left panel, expand the **TAPI model configuration**. Click on the **IVR port configuration**. The diagram shows the 2 IVR Users configured corresponding to the IP Office configuration. 

6.2.5. Recording Channel configuration

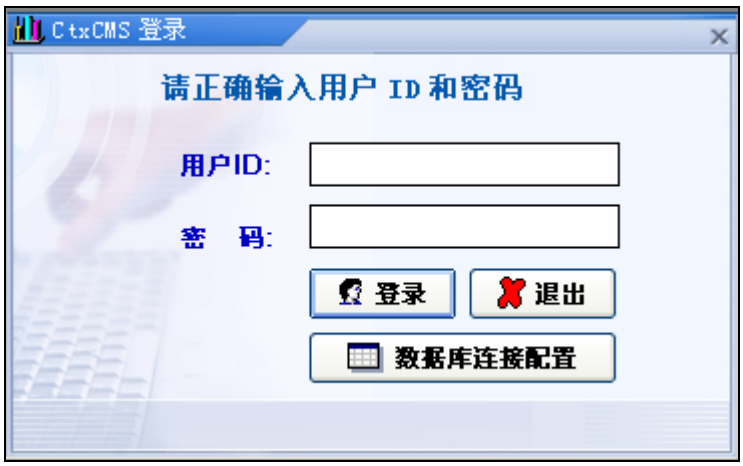
Step	Description
1.	On the left panel, expand the **built-in soft model configuration**. Click on the **recording port configuration**. The diagram below shows the Recording User 411 configured corresponding to the IP Office configuration.

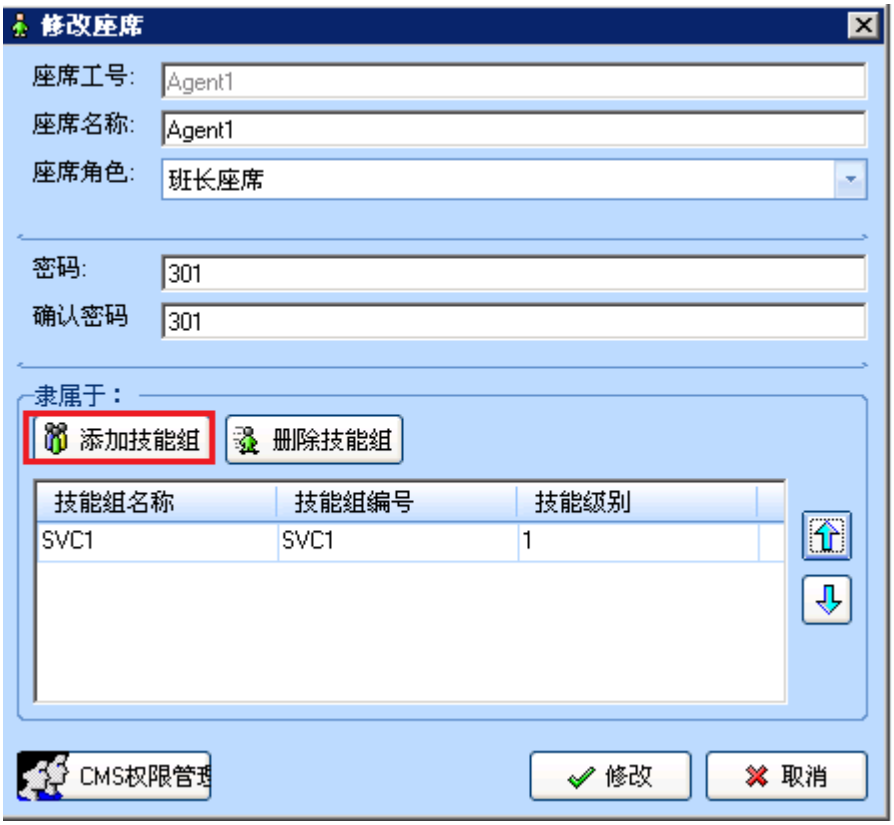


6.2.6. Restart IVR and CTI service

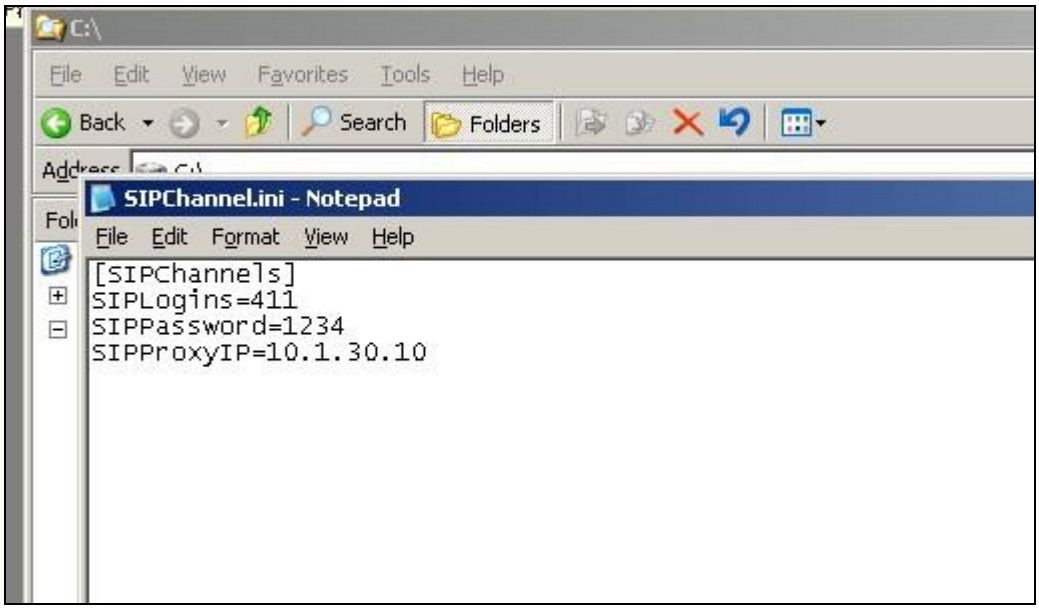
Step	Description
1.	Log into the iCALL Server with administrative privileges. Click **Start → All Programs → CTI → AAManager**. Log in with the appropriate credentials and click **Enter** as below. 
2.	After the configuration in the components of CTI and IVR, the services has to be restarted. Ensure that the automatic restart is ticked for IVR and CTI service. Restart these services by clicking the **STOP** button. These services will automatically be stopped and restarted. 

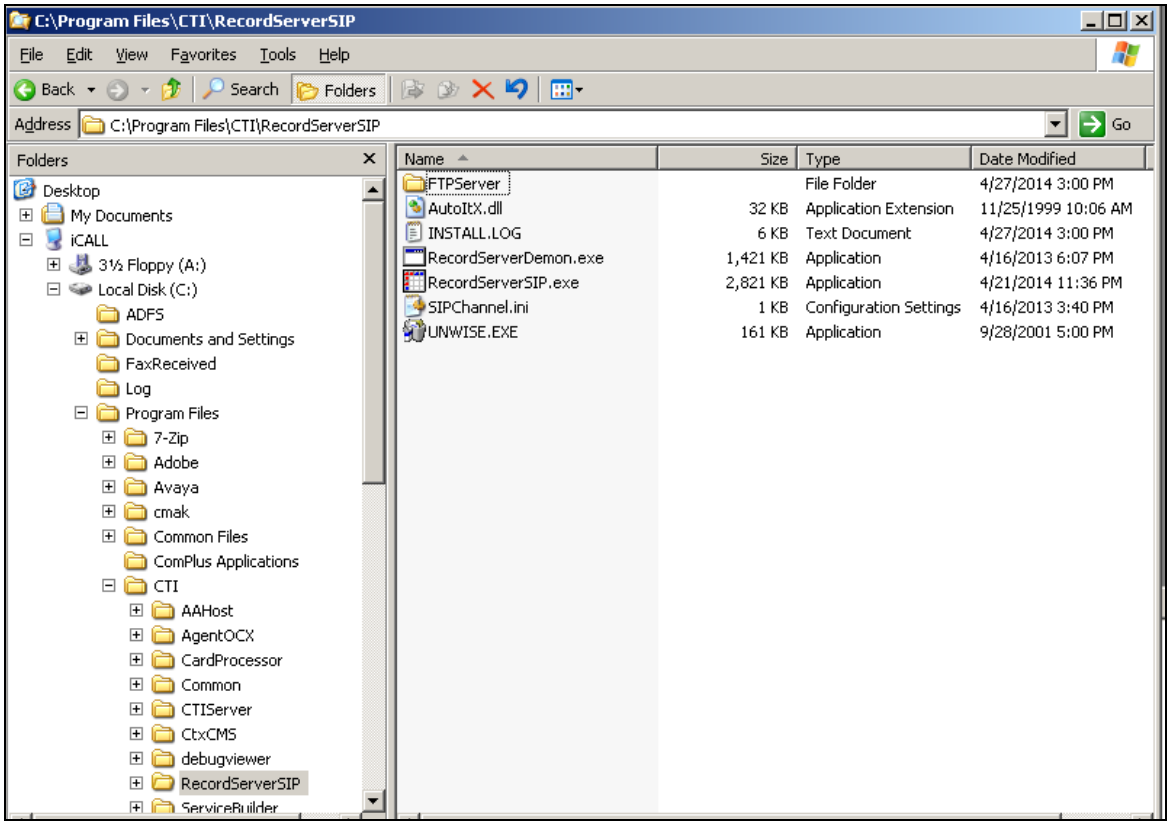
6.2.7. Agent configuration

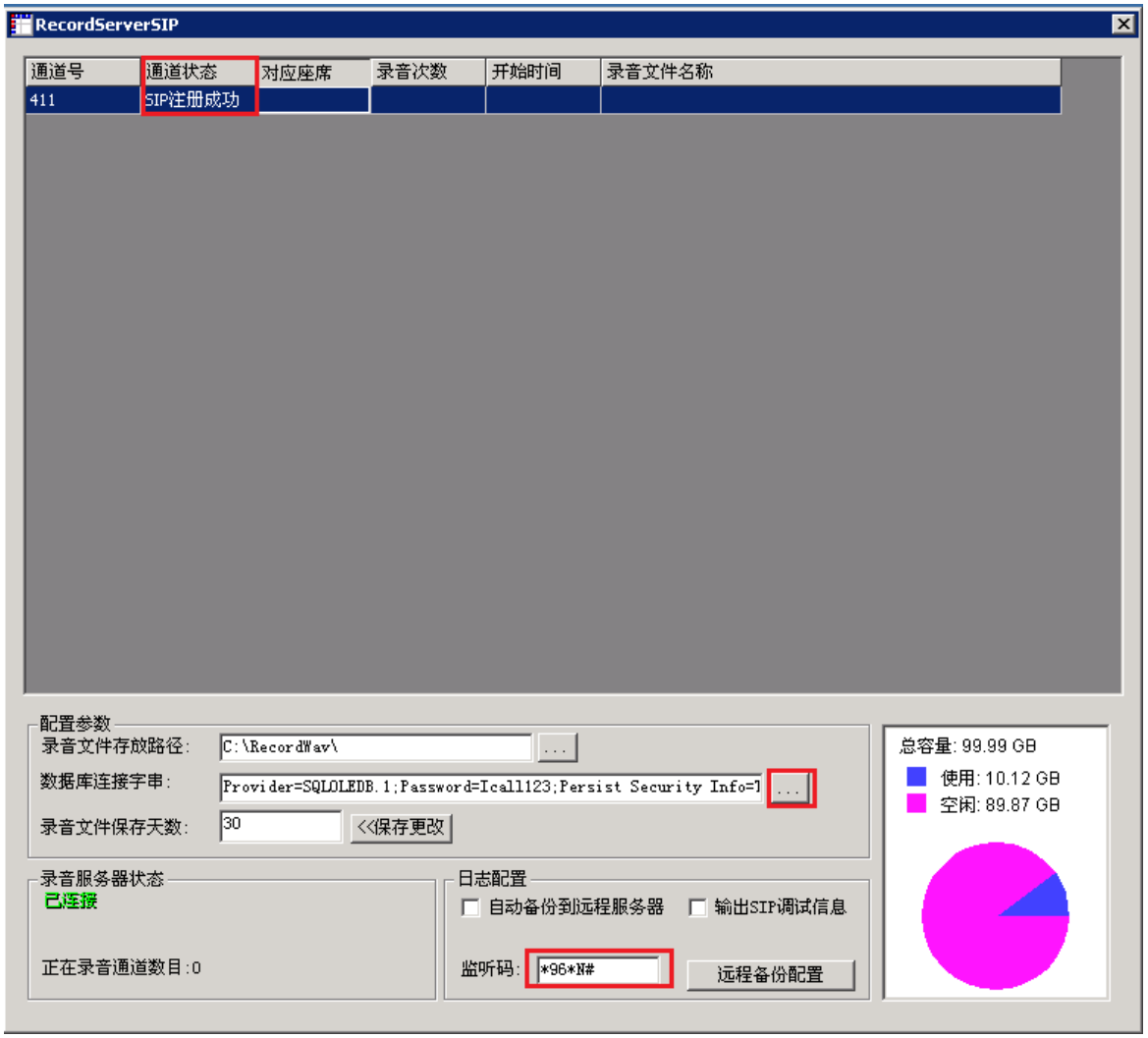
Step	Description
1.	Select **Start → All Programs → CTI → CtxCMS → CtxCMS** for login into Call Management System (CMS). Log in with the appropriate credentials and click **Enter** as below. 
2.	Click **Add Seats** to add agents. 

Step	Description
3.	Enter the following information: • **User ID**: Agent1 • **User Name:** Agent1 • **User function**: Supervisor • **Password**: 301 • **Confirm Password**: 301 Assuming Skills are already setup, click on **Add Skills** (not shown) below to enter the appropriate skills for the agent. 

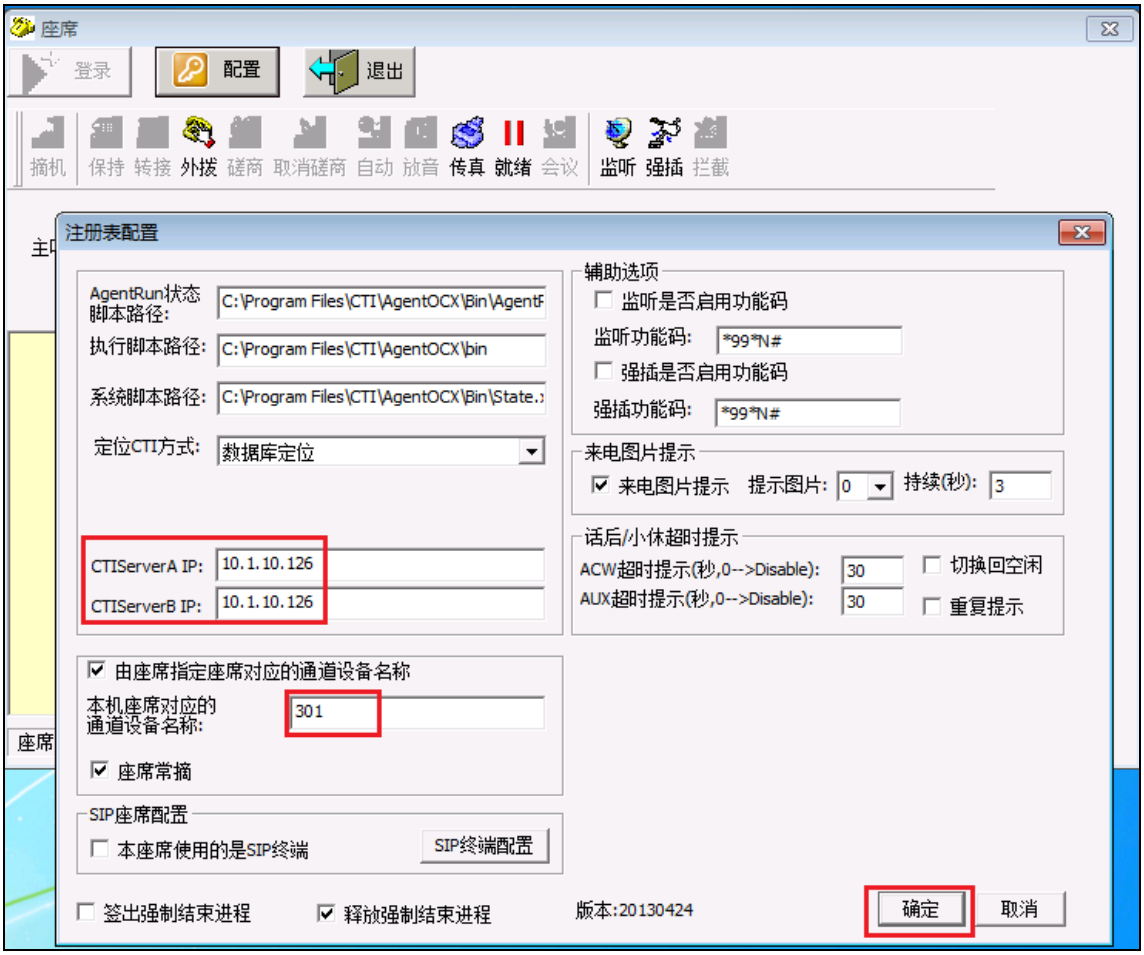
6.2.8. Recording System configuration

Step	Description
1.	Locate the **SIPChannel.ini** file in the C drive root. Edit the parameters for the Recording SIP Users Login and Password configured on IP Office as below. 

Step	Description
2.	Locate and run the **RecordServerSIP.exe** from the directory **C:\Program Files\CTI\.** 

Step	Description
3.	Verify that the SIP User 411 is regisered under the Status column. Ensure that **Call Listen Short Code** *96*N# is configured as in **Section 5.3**. Click the "analysis data" symbol below and complete the database connection information the same as in **Section 6.2.1 Step 2** and **Step 3.** 

6.3. Configure Agent OCX on the PCs

Step	Description
1.	Log into the PC running Agent OCX with administrative privileges. Click **Start → All Programs → CTI → AgentOCX → Project1** to configure Agent OCX. Enter the IP address of the iCALL Server for **CTIServerA IP and CTIServerB IP** and the **Station number** for the Agent as 301. Click **Confirm** to apply configuration. Repeat this for the other agents. The available Station numbers are 305 (IP), 331 (Analog) and 339 (Digital). 

7. Verification Steps

The following steps may be used to verify the configuration.

- Verify the CTI Link Pro license is enabled on Avaya IP Office (see **Section 5.1**).
- Log in and make the agent available. Place an incoming call to the inbound queue. Verify that the agent's phone rings and the agent is able to answer the call with Agent OCX softphone.
- Verify also the call is recorded for inbound call.
- Log in with the agent in AUX mode. Verify that an outbound call is placed.
- Verify also the call is recorded for outbound call.
- Using the CMS, verify that Call Records were captured after call completion.

8. Conclusion

These Application Notes describe the compliance-tested configuration used to validate Avaya IP Office 9.0 with iCALL Solution. All test cases were completed successfully with a note indicated in **Section 2.2** test results.

9. Additional References

The following documents are available at http://support.avaya.com.

[1] *Avaya IP Office Knowledgebase CD,* Release 9.0, Build: 01, 24th Sept 2013

Documents available from NSE Telecom can be obtained upon request.

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.