Avaya Solution & Interoperability Test Lab

A Sample Configuration for iVoice TAPI Speech-Enabled Auto Attendant 3.2 with Avaya IP Office System 1.4 - Issue 1.0

Abstract

These Application Notes describe the configuration steps required for the iVoice Speech-Enabled Auto Attendant to successfully interoperate with the Avaya IP Office System. Features and functionality were validated and performance testing was conducted in order to verify operation under load. Information in these Application Notes has been obtained through interoperability compliance testing and additional technical discussions. Testing was conducted via the Developer*Connection* Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

These Application Notes describe the compliance-tested configuration utilizing Avaya IP Office 1.4 and iVoice Speech-Enabled Auto Attendant 3.2.

The iVoice Speech-Enabled Auto Attendant (SE-AA) is a stand-alone auto attendant that enables businesses to incorporate speech recognition into their current communication systems without duplicating voice mail applications. Features provided by SE-AA include:

- Recognizing any name or word in the English language
- Allowing callers to barge-in[1] on the Auto Attendant at any time
- GUI-Configurable User/Extension Dictionary

The SE-AA interfaces with the IP Office System over the LAN via TAPI (IP Office TAPI and Wave drivers are installed on the SE-AA server). The IP Office is configured to route inbound calls to a hunt group that includes "virtual" TAPI Wave extensions which are enabled on the SE-AA. Upon receipt of the inbound calls, the SE-AA determines the destination extension via caller voice recognition or DTMF digits entered. The SE-AA then transfers the call to the destination extension by performing a TAPI-based transfer. The SE-AA is not a voice mail system.

Upon initial configuration, the SE-AA goes through a tuning period where it adapts to the speech levels, noise levels, and line clarity of the phone system it is using. After the initial tuning period, the success rate for recognizing names increases. The SE-AA has the ability to speed up tuning, but this requires experienced SE-AA operators and is not left to the end-user to configure. After three failed attempts by the caller, the SE-AA will route the call to the Operator. Please refer to the SE-AA product documentation or contact iVoice technical support for more information.

The tested configuration is shown in **Figure 1**.

[1] Use of iVoice barge-in feature is recommended for IP Office systems configured with only T1 / PRI trunks and no analog stations. Please refer to section 1.1 for details.

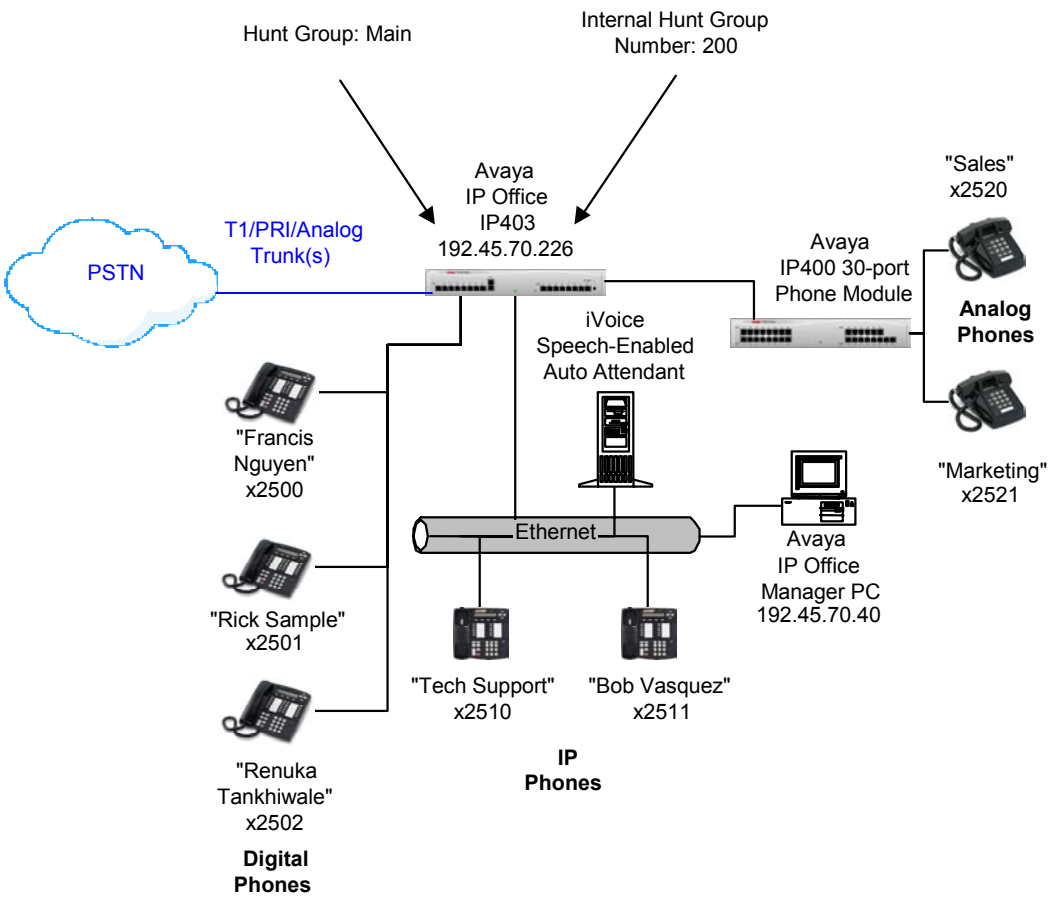


Figure 1: iVoice SE-AA and Avaya IP Office Configuration

1.1. Compliance Test Notes / Observations

IVoice Barge-In feature limited to IP Office configurations using only T1/PRI trunks and no analog stations: The current version of the IP Office TAPI Wave driver does not separate incoming and outgoing audio streams on analog devices (trunk and station). It is recommended that barge-in be disabled on SE-AA TAPI Wave systems connected to IP Office systems configured with analog trunks and/or analog stations. IP Office configurations using T1/PRI trunks only and no analog stations are unaffected.

Recorded Greeting-Clipping Observation: Either beginning or ending portions of greetings recorded on the SE-AA get clipped on playback. Users are advised to pause for 1-2 seconds prior to recording a greeting. IVoice is investigating clipping of the beginning and end portion of greetings.

2. Equipment and Software Validated

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

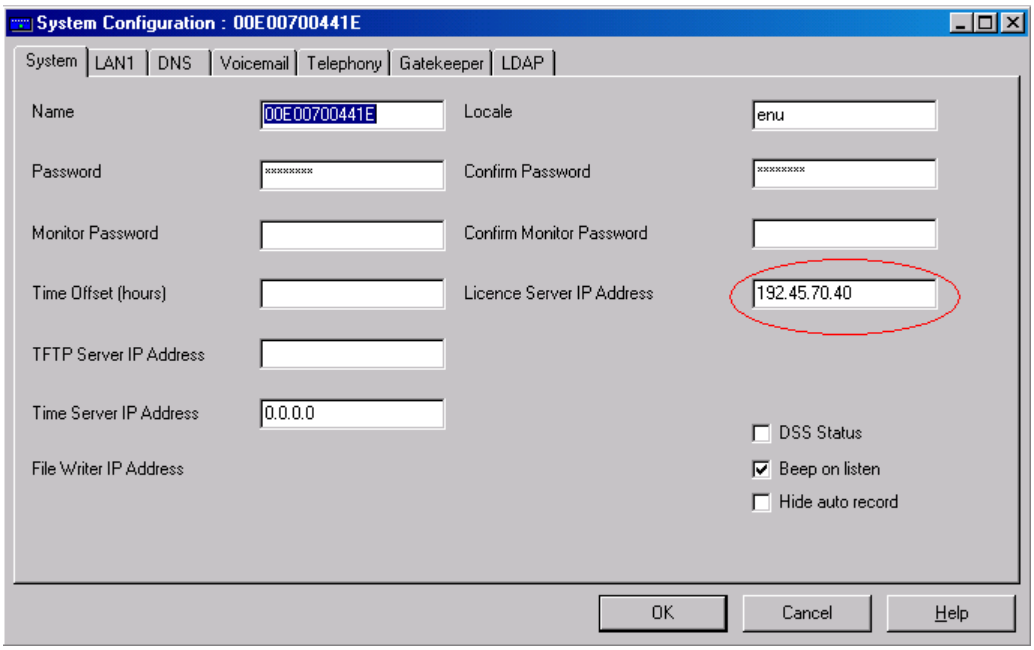
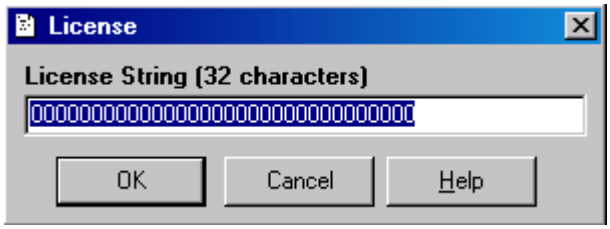
Equipment	Software
Avaya IP 403 Office System	1.4(25)
Avaya IP 400 Phone 30 Expansion Module	-
Avaya 6408D+, 6416D+M Telephones	-
Avaya 4612 IP Telephones	1.73
iVoice Speech-Enabled Auto Attendant	3.2
Generic PCs	Windows 2000 Professional
Generic Analog Telephones	-

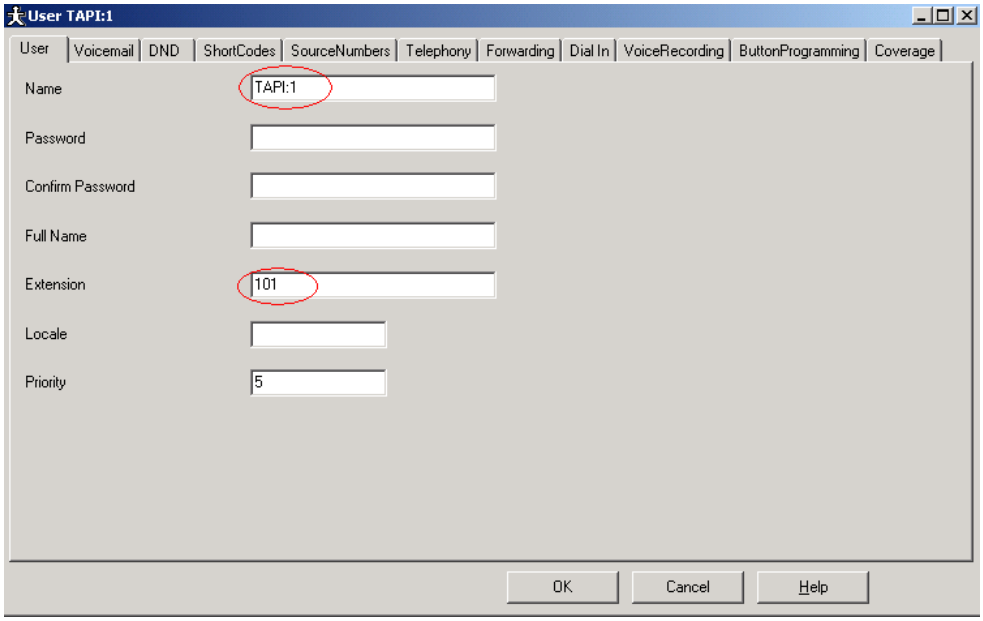
3. Configure Avaya IP Office

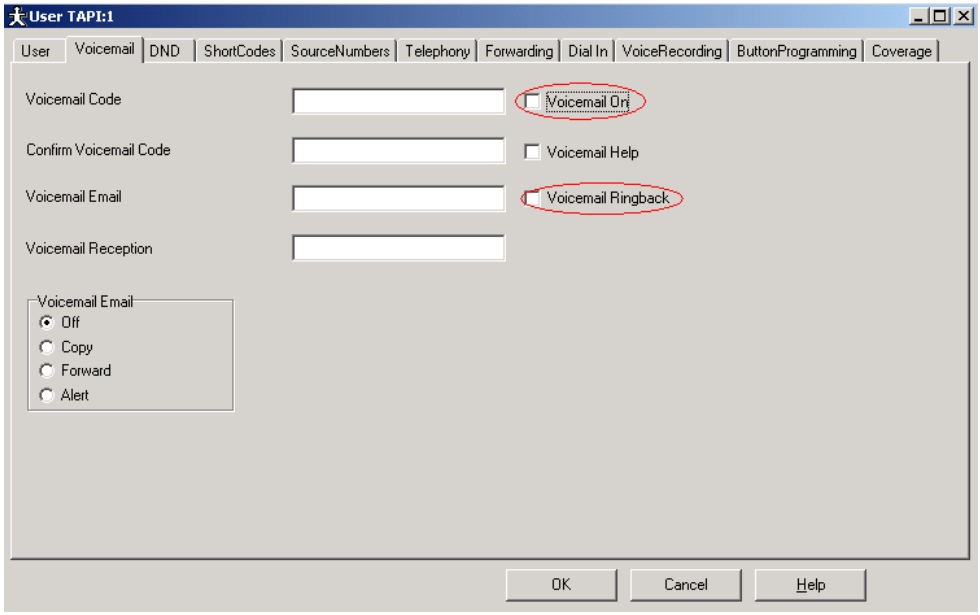
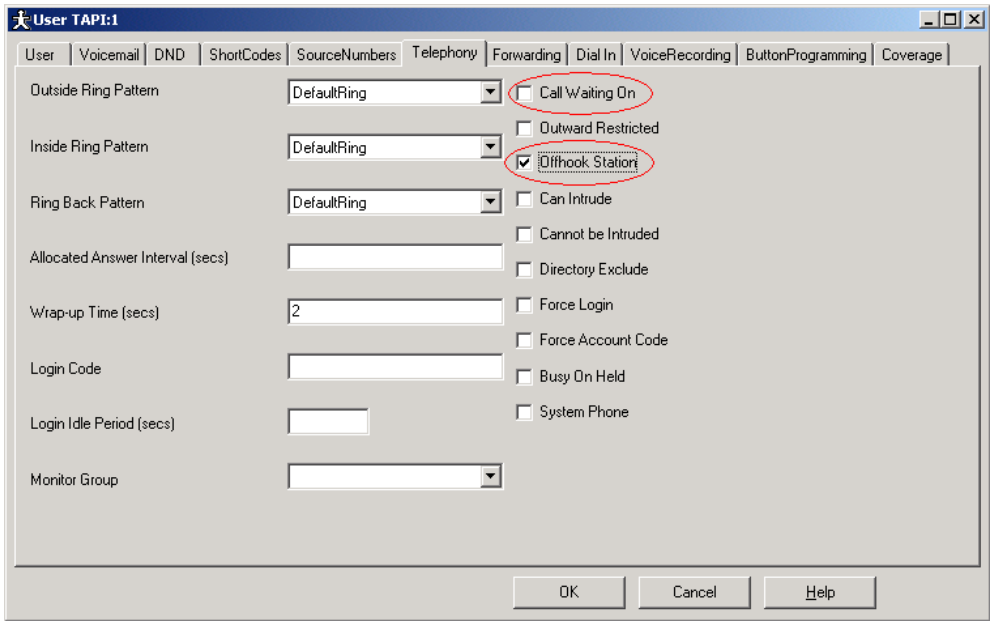
These Application Notes address provisioning of the IP Office as it relates to integration of the TAPI SE-AA. For all other provisioning information such as provisioning of the trunks for outbound dialing, call coverage, extensions, etc., please refer to the IP Office Product documentation.

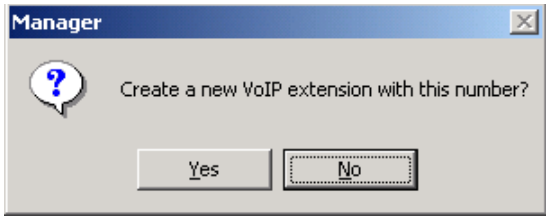
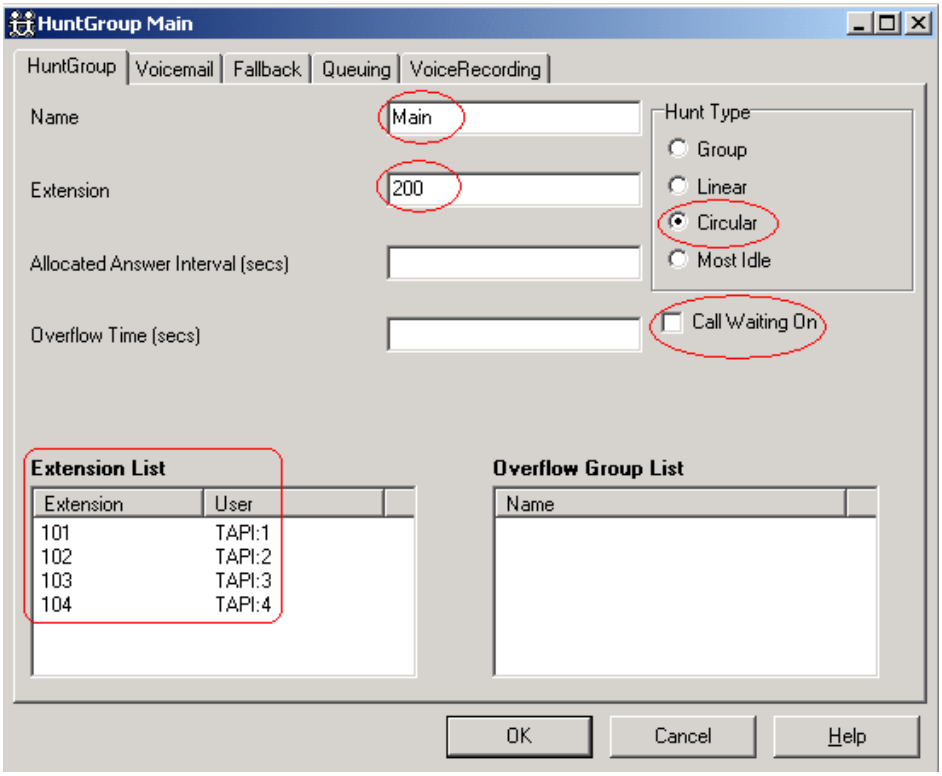
Note 1: The SE-AA does not support mixed extension lengths but it does support existing extensions with the same length. For example, the SE-AA does not support all the extensions of a switch configured with 3-digit and 4-digit extensions. The reader is advised to take this limitation into account during provisioning with the SE-AA and ensure the switch is configured with extensions of the same length.

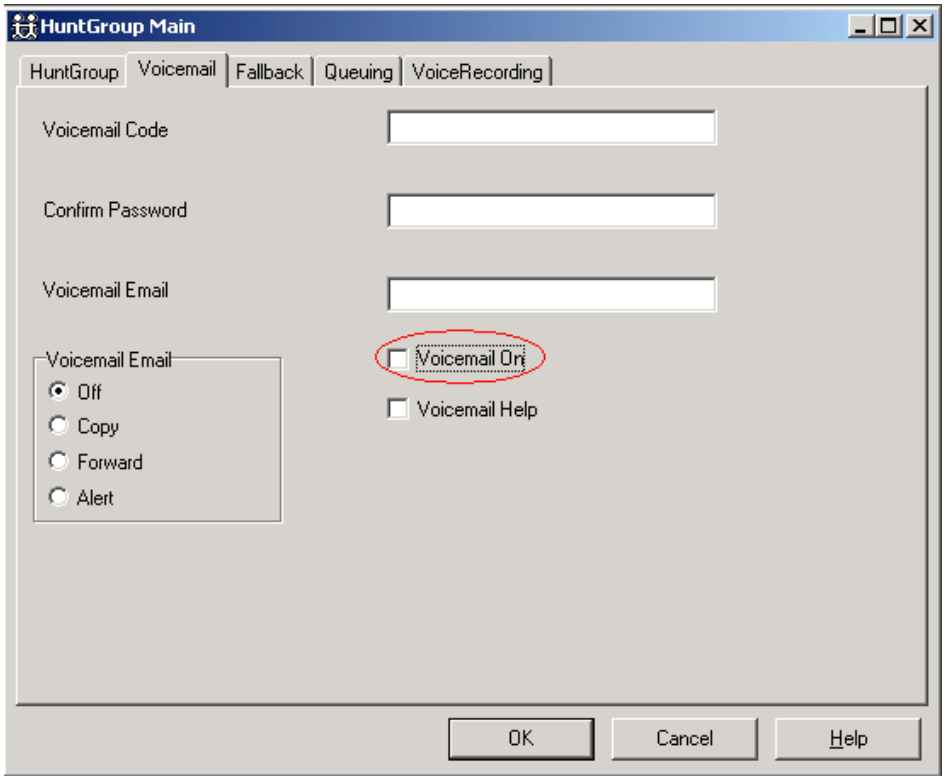
Step	Description
	IP Office License Key Physical Installation
1.	Plug in the red Avaya Software Sentinel key into the parallel port of the IP Office Manager PC.
	Configure License Key Server IP Address
2.	Log in to the IP Office Manager PC and go to **Start → Programs → IP Office → Manager** to launch the Manager application. Login to the Manager application using the appropriate credentials.
3.	In the Manager window that appears, select **File → Open** to search for the IP Office system in the network.
4.	Log in to the IP Office system using the appropriate login credentials to receive its configuration.

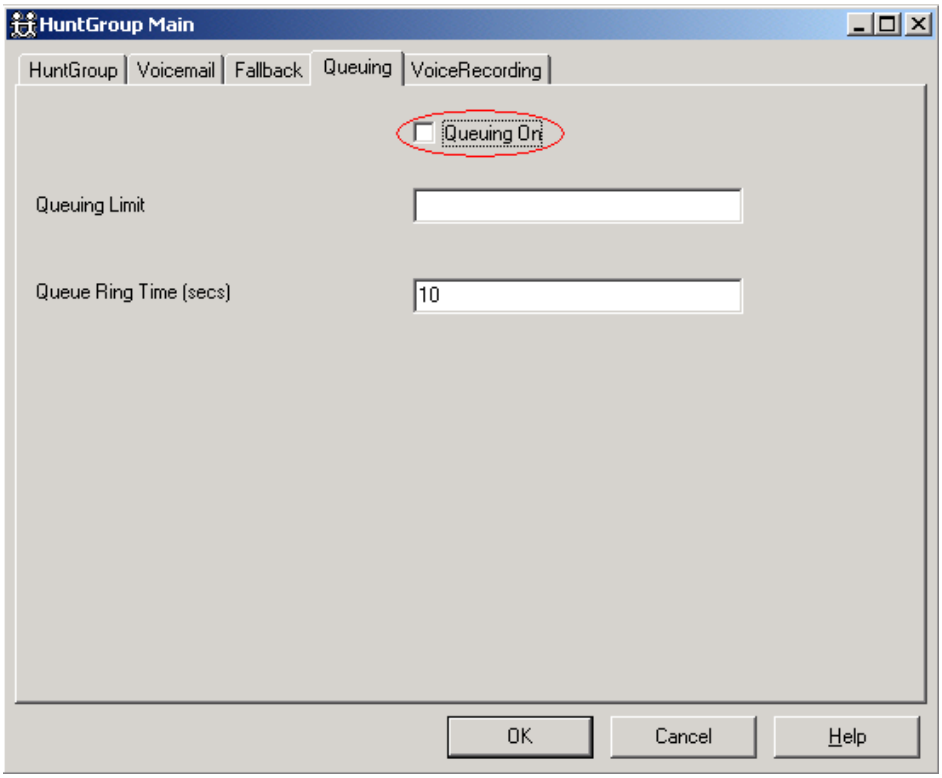
Step	Description
5.	In the Manager window, go to the Configuration Tree and double-click **System**. In the System Configuration window that appears, select the **System** tab and set *License Server IP Address* to the IP address of the machine to which the red Avaya Software Sentinel key is connected. This is typically the IP Office Manager PC. 
	Install Licenses
6.	In the Manager window, go to the Configuration Tree and double-click **License** to open the list of licenses installed in the IP Office system.
7.	Right click in the license list window and select **New**. In the License window that appears, enter the CTI Link Pro License Key and click **OK.** 
8.	Repeat Step 7 to install the TAPI WAVE USER license.
9.	In the Manager window, select **File → Save** to save the licenses to the IP Office system and wait for the system to update. **Note 2**: Before the system reloads, the new licenses will be listed with an Unknown status. After the system reloads, the new licenses will list as Valid.
	Configure TAPI Extensions
10.	In the Manager window, select **File → Open** to search for the IP Office system in the network.

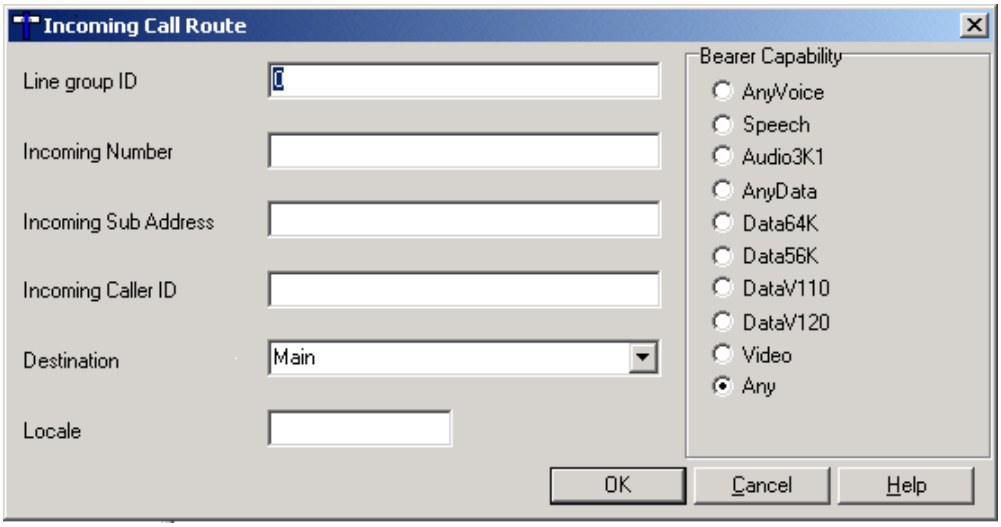
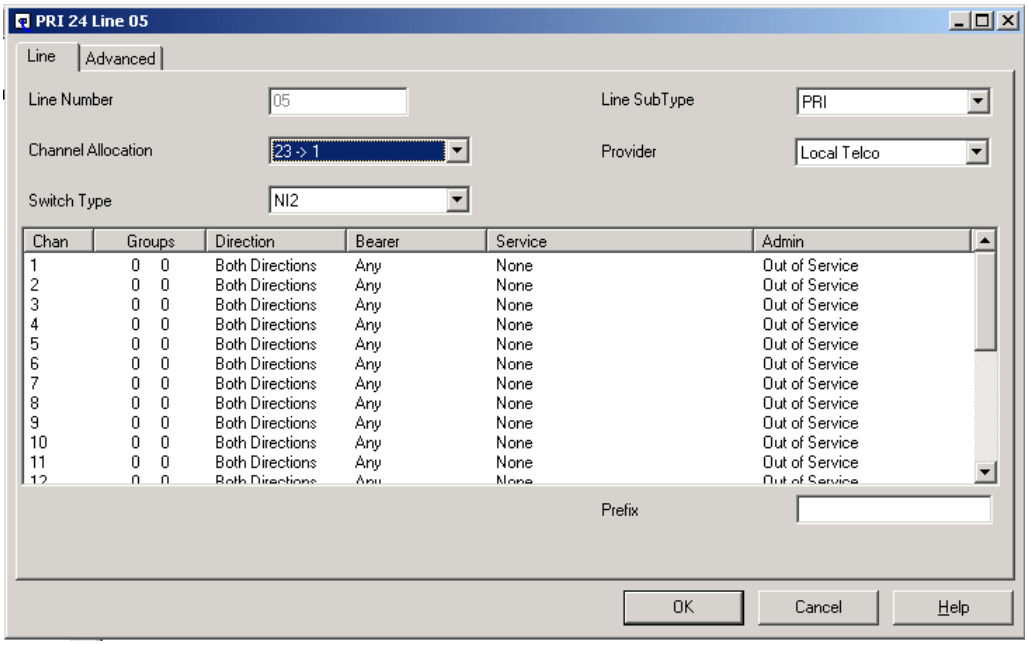
Step	Description
11.	Log in to the IP Office system using the appropriate login credentials to receive its configuration.
12.	In the Manager window, go to the Configuration Tree and double-click **User** to open the list of users on the IP Office system.
13.	Right click in the User list window and select **New**. In the User window that appears, set *Name* to **TAPI:x** where **x** is the number of the TAPI user extension desired, e.g., 1, 2, etc., and *Extension* to the extension number to be used.  **Note 3**: Although the SE-AA requires end-user extensions to be uniform in length, the length of the TAPI Wave User extensions are not an issue because the TAPI Wave User extensions are not listed in the SE-AA User Directory.

Step	Description
14.	In the Voicemail tab of the User window, verify *Voicemail On* and *Voicemail Ringback* is not checked.  **Note 4**: This applies only to the TAPI Wave extensions and is not relevant whether the system has voicemail or not.
15.	In the Telephony tab of the User window, verify *Call Waiting On* is unchecked, check *Offhook Station* and click **OK**. 

Step	Description
16.	In the Manager popup that appears, click **No**. 
17.	Repeat Steps 13 - 16 for each TAPI extension needed. For the purposes of these Application Notes, four TAPI extensions were created (extensions 101 – 104). The number of iVoice licenses and Avaya TAPI Wave licenses purchased limits the number of TAPI extensions that can be created.
	Configure Hunt Group
18.	In the Manager window, go to the Configuration Tree and double-click **HuntGroup** to open the list of hunt groups on the IP Office system.
19.	Select the Main hunt group by double-clicking.
20.	In the HuntGroup window that appears, add extensions to the Extension List that will be part of the hunt group by right clicking in the Extension List section and selecting **Add**. Then, set *Extension* to **200** (or the extension number desired for the hunt group), *Hunt Type* to **Circular**, and *Call Waiting On* to unchecked. 

Step	Description
21.	In the Voicemail tab of the HuntGroup window, verify *Voicemail On* is not checked. 

Step	Description
22.	In the Queuing tab of the HuntGroup window, verify Queuing *On* is not checked and click **OK.**  **Note 5**: Hunt Group queuing to TAPI Wave extensions is not supported in this release of IP Office.
23.	In the Manager window, select **File → Save** to save the configuration to the IP Office system and wait for the unit to reboot with the saved configuration.
24.	Log in to the IP Office system using the appropriate login credentials to receive its configuration.
	Select Inbound Call Route
25.	In the Manager window, go to the Configuration Tree and double-click **Incoming Call Route** to open the list of incoming call routes on the IP Office system. Select the route with the destination set to Main and double-click it.

Step	Description
26.	In the Incoming Call Route window that appears, record the *Line group ID*. Click **OK**. 
	Assign Trunks to the Incoming Call Route
27.	In the Manager window, go to the Configuration Tree and double-click **Line** to open the list of lines (trunks) available on the IP Office system. Double-click the Line (analog or digital) whose incoming calls are to be routed to the SE-AA.
28.	In the Line window that appears, assign the line to the Line group ID recorded in Step 26.  For example, each channel in the PRI line window must be assigned to the Line group ID recorded in Step 26. To do so, double-click the channel and edit the Incoming Group field in the Edit Channel pop up that appears. A similar procedure is used on the analog lines.

Step	Description
29.	In the Manager window, select **File → Save** to push the configuration to the IP Office system and wait for the unit to reboot.
30.	Verify the incoming call route is properly operating by temporarily assigning a telephone extension to the hunt group and placing calls through the selected inbound line (trunk) until the telephone extension assigned to the hunt group rings -- the TAPI Wave extensions will not answer until after the SE-AA is configured.
31.	Repeat Steps 26 – 28 for each line (trunk) assigned to the incoming call route.

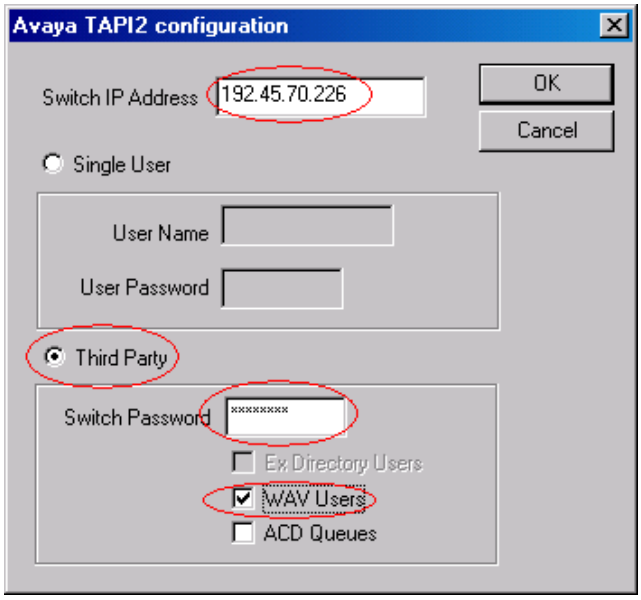
4. Configure the iVoice Speech-Enabled Auto Attendant

These Application Notes address provisioning of the iVoice Speech-Enabled Auto Attendant as it relates to TAPI integration with the Avaya IP Office System. For all other provisioning information, such as iVoice Speech-Enabled Auto Attendant software installation, License Key installation and Speech Recognition engine tuning, please refer to the Speech-Enabled Auto Attendant System Guide available on the iVoice Software Installation CD.

4.1. Installing and Configuring Avaya IP Office TAPI Service Provider

Please refer to the Avaya IP Office CTI Link Installation Manual, 40DHB0002UKCC – Issue 4 (05/08/2002) for additional information.

Step	Description
1.	Install the Avaya IP Office TAPI Service Provider driver on the SE-AA server from the Avaya IP Office User Applications CD. NOTE: Do not install the Phone Manager.
2.	After the system reboots, log in to the system again as administrator and go to **Start → Settings → Control Panel**. In the Control Panel window that appears, double-click **Phone and Modem Options**.
3.	In the Advanced tab of the Phone and Modem Options window, double-click **Avaya IP Office TAPI2 Service Provider**.

Step	Description
4.	In the Avaya TAPI2 configuration window that appears, set *Switch IP Address* to the IP Address of the IP Office System, check *Third Party*, set *Switch Password* to the IP Office System password, check *WAV Users*, and click **OK**. 
5.	Reboot the system.
	Verify Connectivity with the IP Office
6.	After the system reboots, log in to the system and go to **Start → Programs → Accessories → Communications → Phone Dialer**.
7.	In the Phone Dialer window that appears, select **Edit → Options**.
8.	In the Lines tab of the Options window that appears, select the **Phone Calls:** drop-down list. If one or more "IP Office Phone: XXX" (where XXX is an extension number) entries appear, then the IP Office TAPI Driver is installed and working properly.

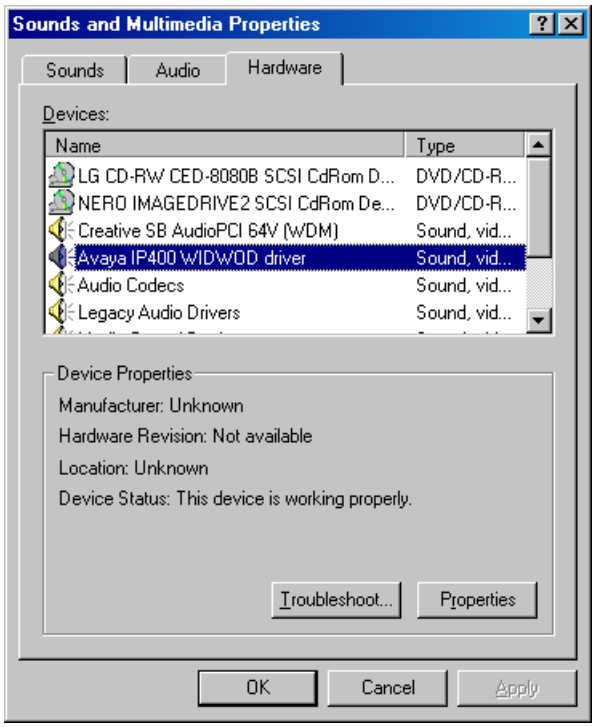
4.2. Installing and Configuring Avaya IP Office TAPI Wave Driver

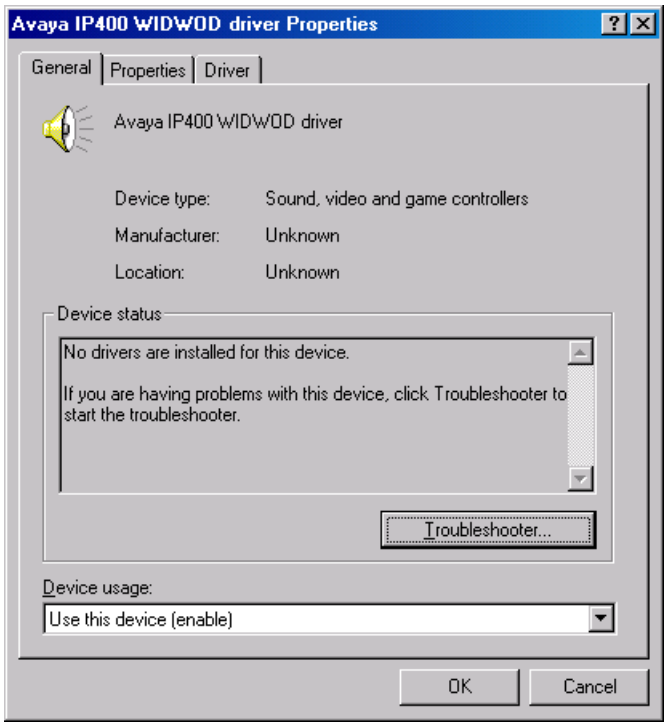
The IP400 wave driver is a soft emulation; there is no associated hardware. It therefore needs to be installed manually.

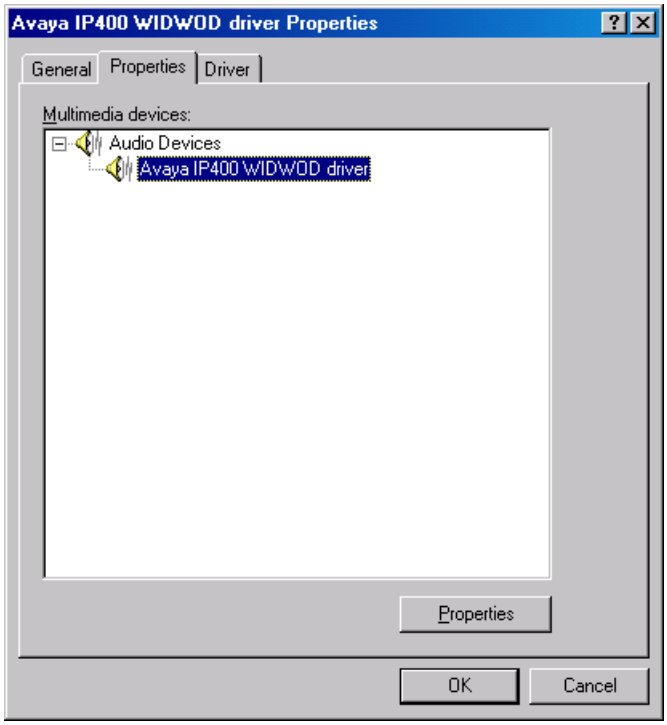
The steps that follow are for a Windows 2000 installation; please refer to the Avaya IP Office CTI Link Installation Manual, 40DHB0002UKCC – Issue 4 (05/08/2002) for additional information as well as the Windows 2000 and NT installation steps.

Step	Description
	Install TAPI Wave Driver
1.	Log in to the SE-AA server as administrator and go to **Start → Settings → Control Panel**. In the Control Panel window that appears, double-click **Add/Remove Hardware**.
2.	In the Add/Remove Hardware Wizard Welcome window that appears, click **Next**.
3.	In the Choose a Hardware Task window that appears, select 'Add/Troubleshoot a device' and click **Next**.

Step	Description
4.	In the New Hardware Detection window that appears, wait while the PC searches for a new device.
5.	In the Choose a Hardware Device window, select 'Add a new device' and click **Next**.
6.	In the Find New Hardware window, select 'No, I want to select the hardware from a list' and click **Next**.
7.	In the Hardware Type window that appears, select 'Sound, video and game controllers' and click **Next**.
8.	In the Select a Device Driver window that appears, click **Have Disk…**.
9.	In the Install from Disk popup that appears, click **Browse…** to navigate to the Wave32 directory on the Avaya IP Office User Applications CD, select the oemsetup.inf file, and click **Open**.
10.	In the Install From Disk popup that appears, verify the pull-down field lists the path to the Wave32 directory on the CD and click **OK**.
11.	In the Select a Device Driver window that appears, verify *Avaya IP400 WIDWOD driver* is listed in the Models field and click **Next**.
12.	In the Start Hardware Installation window that appears, click **Next**.
13.	In the Completing the Add/Remove Hardware Wizard window that appears, click **Finish**.
14.	In the Systems Settings Change popup that appears, click **Yes** to reboot the system.
	Ensure Avaya TAPI Wave Driver is only used by TAPI
15.	Login to the SE-AA server as administrator and go to **Start → Settings → Control Panel**. In the Control Panel window that appears, double-click **Sounds and Multimedia Properties**.
16.	In the Hardware tab of the Sounds and Multimedia Properties window, double-click **Avaya IP400 WIDWOD driver**.

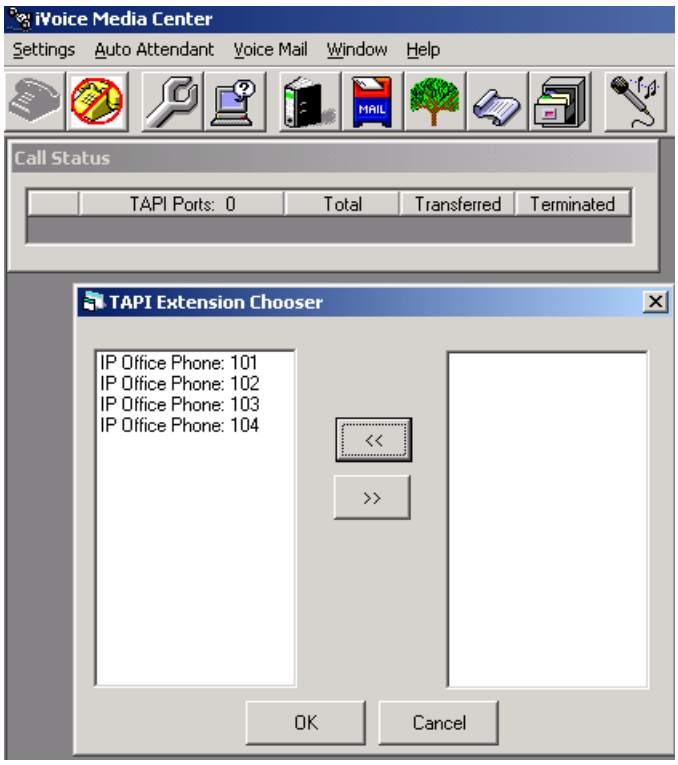


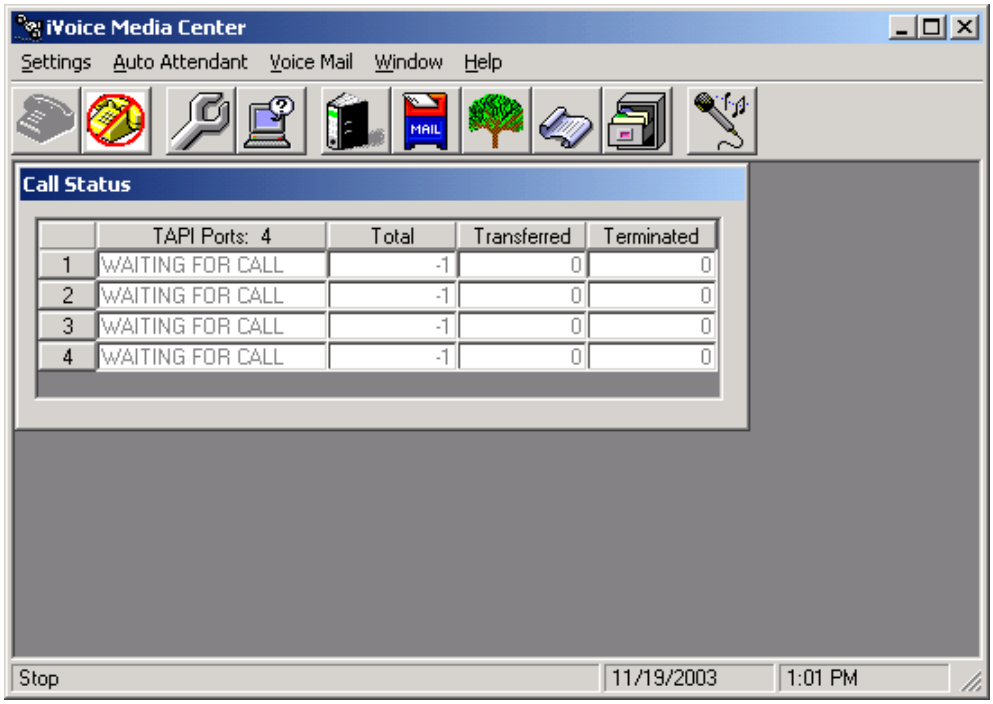
Step	Description
17.	In the Avaya IP400 WIDWOD driver Properties window that appears, go to the **Properties** tab. 

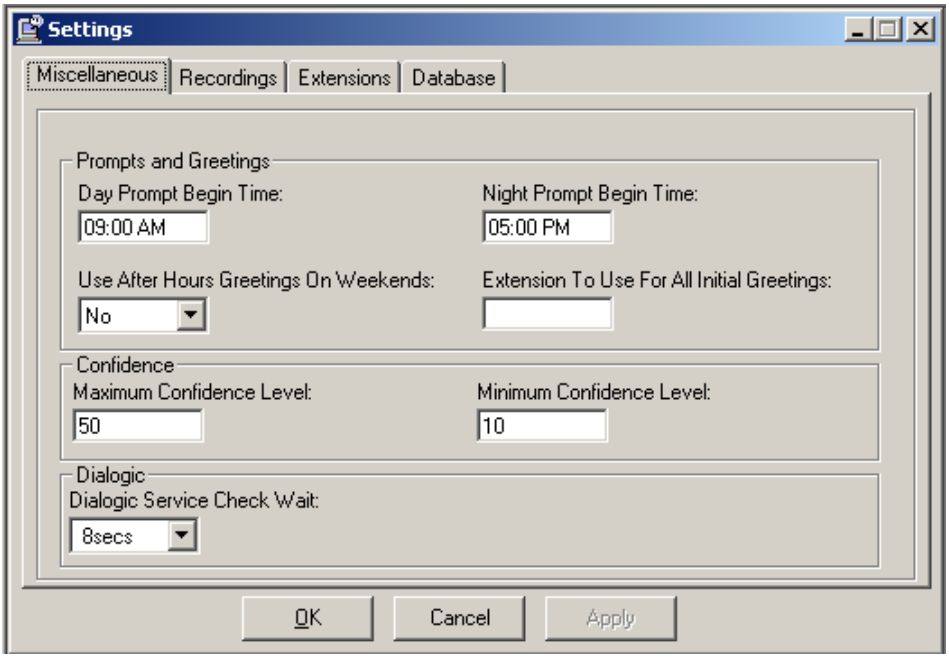
Step	Description
18.	In the Properties tab of the Avaya IP400 WIDWOD driver Properties window, double-click **Audio Devices** to reveal the Avaya IP400 WIDWOD driver and double-click **Avaya IP400 WIDWOD driver**. 
19.	In the Avaya IP400 WIDWOD driver Properties window that appears, check *Do not map through this device* and click **OK**. 

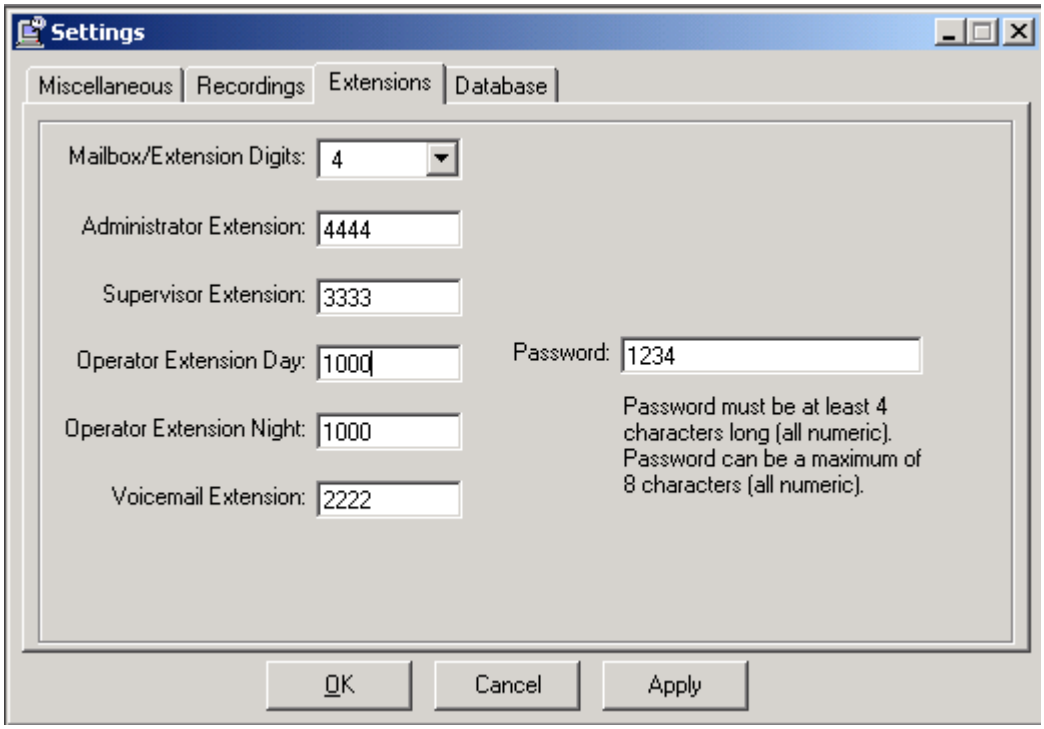
Step	Description
20.	In the Changes Saved popup that appears, click **OK** and reboot the SE-AA server so the changes can take effect. 

4.3. Configuring the iVoice Speech-Enabled Auto Attendant

Step	Description
	Enable incoming TAPI lines
1.	Log in to the SE-AA server and go to **Start → Programs → iVoice.com → iVoice Media Center** to launch the Media Center.
2.	In the iVoice Media Center window that appears, select **Settings → Tapi Line Selection**.
3.	In the TAPI Extension Chooser window that appears, select all TAPI extension numbers that will be enabled as incoming TAPI lines to the SE-AA server and move them to the left-side of the window by clicking "**<<**"**.** In this example, IP Office Phone: 101 through 104 have been selected. When finished, click **OK**. 
4.	Close and restart the SE-AA media center program for the changes to take effect.

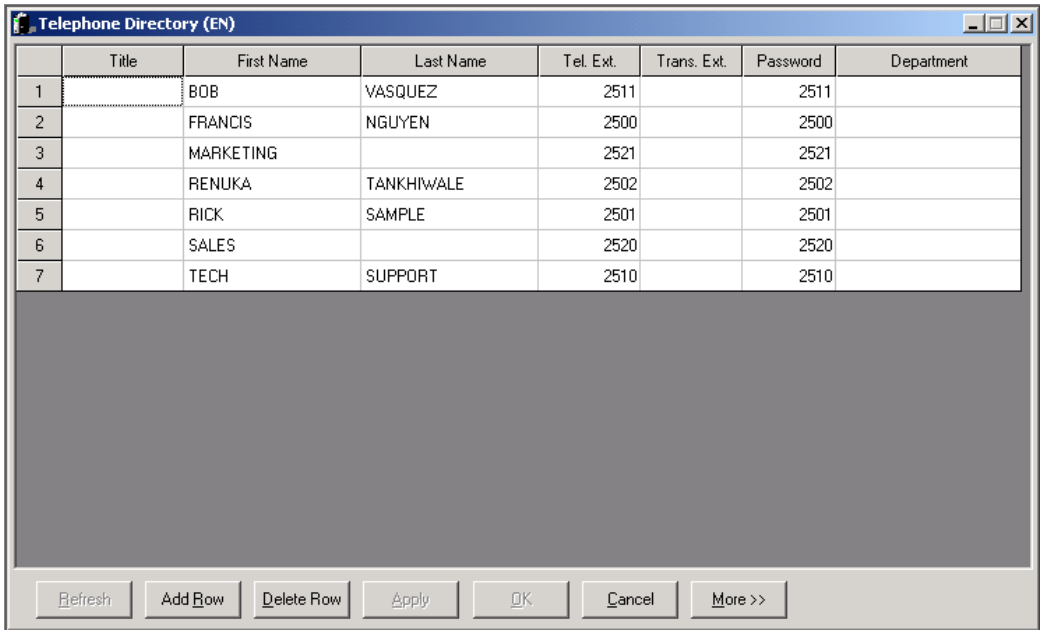
Step	Description
	Settings
5.	Log in to the SE-AA server and go to **Start → Programs → iVoice.com → iVoice Media Center** to launch the Media Center. 
6.	In the iVoice Media Center window that appears, select **Auto Attendant → Settings**.

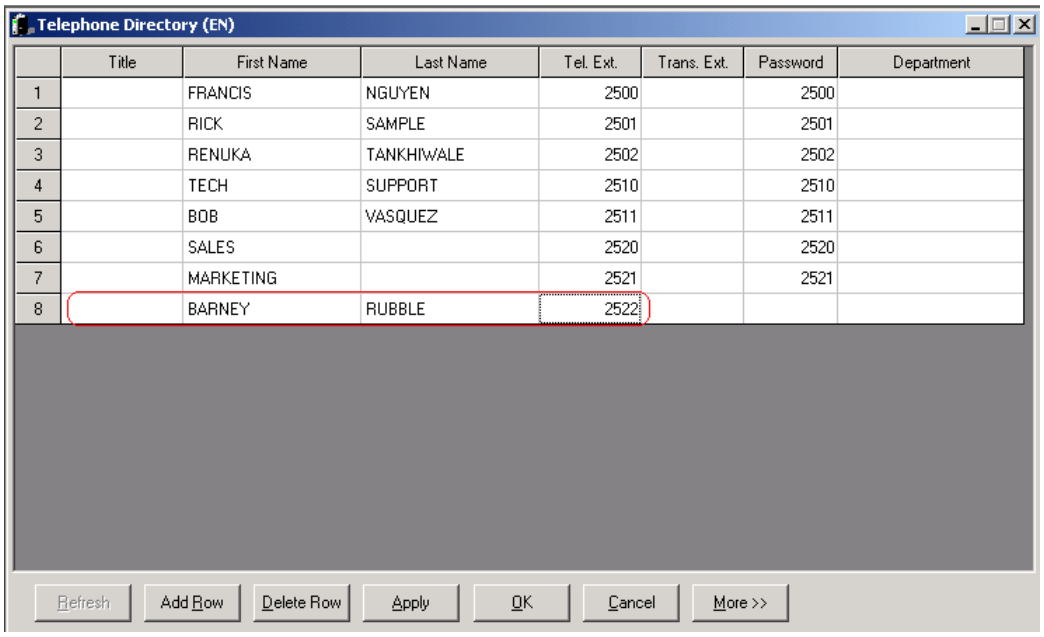
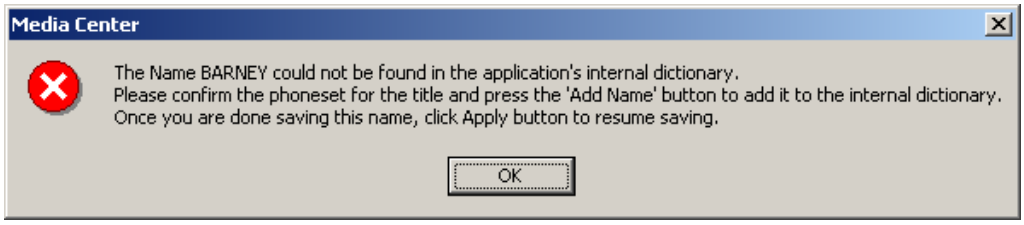
Step	Description
7.	In the Settings window that appears, select the Miscellaneous tab and enter the desired times for playing day and night prompts. 

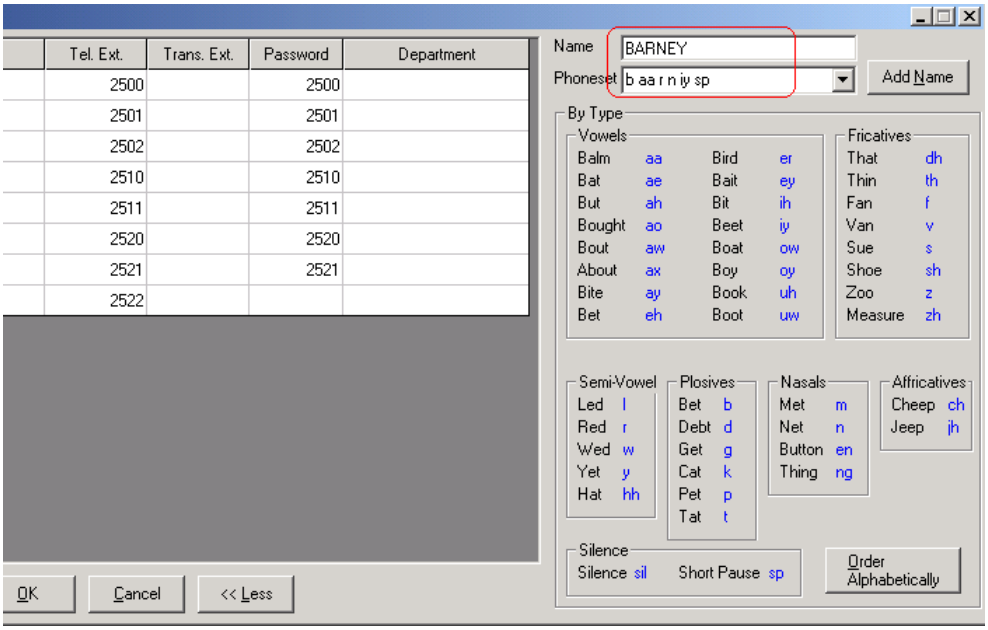
Step	Description
8.	In the Settings window, select the Extensions tab and set *Extension Digits* (length of the extensions on the switch) to **4**, *Administrator Extension* to **4444**, *Supervisor Extension* to **3333**, *Password* (user-defined), *Operator Extension Day* (extension to which the SE-AA routes calls after three failed call attempts) to **1000** and *Operator Extension Night* to **1000**. Click **OK**.  **Note 6**: The SE-AA does not support mixed extension lengths but it does support existing extensions with the same length. For example, the SE-AA does not support all the extensions of a switch configured with 3-digit and 4-digit extensions. The reader is advised to take this limitation into account during provisioning with the SE-AA and ensure the switch is configured with extensions of the same length.
	Recording Prompts
9.	Place a call to the hunt group from an extension on the IP Office system. When the welcome greeting plays, dial the supervisor extension, e.g., 3333, and enter the supervisor password when prompted.
10.	To record the day greeting, press **1**. Press **2** to record the night greeting. For both the day and night greeting, press **1** to record, **2** to review the recording, or **#** to exit.
11.	Hang up when finished.

4.4. Configuring the Telephone Directory in the iVoice SE-AA

Step	Description
	Adding Names to the Telephone Directory
1.	In the iVoice Media Center window, select **Auto Attendant → Telephone Directory**.



Step	Description
2.	In the Telephone Directory window, click on the **Add Row** button at the bottom of the window to add a blank row to the Directory. Enter the appropriate information in the blank row. The password will default to the extension number if not entered. Click **Apply**.  If the name is in the dictionary, it will be saved in the Telephone Directory. If it is not in the dictionary, a Media Center message box will pop up. Click **OK**. 

Step	Description
3.	If the name is not in the dictionary, return to the Telephone Directory window and click **More>>**. The Telephony Directory window expands to show the Dictionary entry form on the right with the word that is not in the dictionary as well as a generated pronunciation for it. Click **Add Name** to add it to the dictionary.  If the name is added successfully to the dictionary, the following message pop up will appear. Click **OK**. 
4.	Return to the Telephone Directory window and click **Apply** to save the entry into the Telephone Directory.
5.	Repeat Steps 2 - 4 for all names that need to be added to the dictionary. When done, click **OK**. **Note 7**: iVoice has tools available to import a large quantity of names and extensions. Please refer to the product documentation to learn how to do this.
	Recording Names
	The SE-AA system will pronounce a person's name based on the dictionary entry defined for the name. Users have the option of recording their names for the SE-AA system to use instead.
6.	Dial the SE-AA hunt group extension from an extension on the IP office system. When

Step	Description
	connected to the SE-AA, dial the Administrator Extension, e.g., 4444.
7.	When prompted, dial the extension of the name you will be recording.
8.	Press **1** to record the name, **2** to review the recording, or **#** to exit.
9.	You may only record 1 name at a time. Repeat Steps 6 - 8 to record more names.

5. Interoperability Compliance Testing

This Interoperability Compliance Test included feature, functionality and performance load testing. Feature and functionality testing examined the SE-AA's ability to properly transfer inbound and internal calls to the appropriate destination extension (digital, analog, IP phone) regardless of whether the caller used voice or DTMF input. Performance load tests verified the configuration to continue operating under load.

5.1. General Test Approach

Feature and functionality testing was performed manually. Inbound calls were made to the IP Office system from analog, T1 and PRI trunks as well as internal extensions. The IP Office system routed the calls to the SE-AA, which transferred the calls based on speech recognition, or DTMF input of a valid extension number on the IP Office system. Analog loop start trunks from the central office were connected to the IP Office. T1 trunk connectivity to the central office was simulated during testing by connecting the T1 port on the IP Office to an Avaya Communication Manager system. The configuration was changed to PRI on both systems for the PRI test cases.

Performance testing was accomplished by utilizing call generation tools for placing and receiving calls from T1 to analog station ports. Analog station ports on the call generation tool were connected to analog station ports on the IP Office Phone Expansion Module of the IP Office system. Call generation tool scripts were written to place calls to the SE-AA configured hunt group on the IP Office system. Each script barged in on the Welcome greeting and spoke a different name or department. The SE-AA then transferred the calls to the appropriate destination extension. The call generation tool script on the destination extension verified the incoming call was from the proper source.

5.2. Test Results

All feature, functionality, and performance test cases passed successfully. Overnight performance testing at a rate of approximately 525 - 535 BHCC was conducted on the SE-AA system provided for compliance testing. The SE-AA was provisioned with four (4) TAPI Wave extensions. Performance statistics were captured on the SE-AA server to ensure that it was able to handle the call volume.

6. Verification Steps

The following steps can be used to verify system operation after a field installation:

- To verify the SE-AA is operating properly for internal calls: place a call to the SE-AA hunt group from an IP Office extension. Verify the SE-AA Welcome greeting plays and

either speak a name or department, or enter a valid extension number on the IP Office system. Verify the call is transferred to the correct extension.

- To verify the SE-AA is operating properly for external calls: place a call to the IP Office system through one of the trunks assigned to the SE-AA hunt group. Verify the SE-AA Welcome greeting plays and either speak a name or department, or enter a valid extension number on the IP Office system. Verify the call is transferred to the correct extension.

7. Support

Customers should call the iVoice Customer Service Center when having problems related to the Speech-Enabled Auto Attendant. iVoice will then determine the nature of the problem and recommend the best plan to the customer whether it is to:

- Fix the problem through remote access.
- Dispatch, at iVoice's discretion, on-site technical support.

For technical support on Speech-Enabled Auto Attendant, contact the iVoice Customer Service Center at (732) 441-7700 and dial x217 or say "Tech Support". Technical support email can be sent to techsupport@ivoice.com.

8. Conclusion

These Application Notes describe the required configuration steps for iVoice's Speech-Enabled Auto Attendant to successfully interoperate with Avaya IP Office System. Features, functionality, and performance were validated. The SE-AA speech recognition engine goes through an initial tuning period where the system adapts to the speech levels, noise levels, and line clarity of the phone system it is using. Adaptation allows the system to accurately identify call recipients through speech.

The SE-AA does not support mixed extension lengths but it does support existing extensions with the same length. For example, the SE-AA does not support all the extensions of a switch configured with 3-digit and 4-digit extensions. The reader is advised to take this limitation into account during provisioning with the SE-AA and ensure the switch is configured with extensions of the same length.

9. Additional References

Avaya IP Office CTI Link Installation Manual, 40DHB0002UKCC – Issue 4 (05/08/2002).

Avaya IP Office Installation Manual, 40DHB0002USCL, Issue 8 (03/07/2003).

iVoice Speech-Enabled Auto Attendant System Guide, Version 3.1.0.

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 Developer*Connection* Program at devconnect@avaya.com.