



Avaya Solution & Interoperability Test Lab

Application Notes for DuVoice DV2000 with Avaya IP Office - Issue 1.0

Abstract

These Application Notes describe the configuration steps required for the DuVoice DV2000 to successfully interoperate with the Avaya IP Office. The DuVoice DV2000 is a Windows XP-based hospitality messaging system that provides a hotel with messaging for three classes of service: guest, extended stay guest, and staff. 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 *DeveloperConnection* Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

These Application Notes describe the compliance-tested configuration utilizing Avaya IP Office 2.0 and DuVoice DV2000 3.03.025.

DuVoice DV2000 3.03.025 is a Windows XP-based hospitality messaging system that provides a hotel with messaging for three classes of service: guest, extended stay guest, and staff. Additional features include automated attendant, wake-up call, and an interface to 3rd party property management systems (PMS)¹ for guest check-in/check-out and guest room moves.

Upon notification of guest check-out by a 3rd party PMS system, DV2000 purges the voicemail of the extension associated with the guest, turns off the message waiting lamp, removes any scheduled wake-up calls and restricts outbound calls.

Upon notification of a guest room move by a 3rd party PMS system, DV2000 copies the guest's voicemail from the previous room's extension to the new room's extension, sets the message waiting light to the same state as in the previous room's extension, turns off the message waiting lamp in the previous room, purges the voicemail of the previous room's extension and restricts outbound calls from the previous room.

The DV2000 is easy to configure and much of the behavior described above can be customized.

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

¹ Please contact DuVoice for a current list of supported PMS systems.

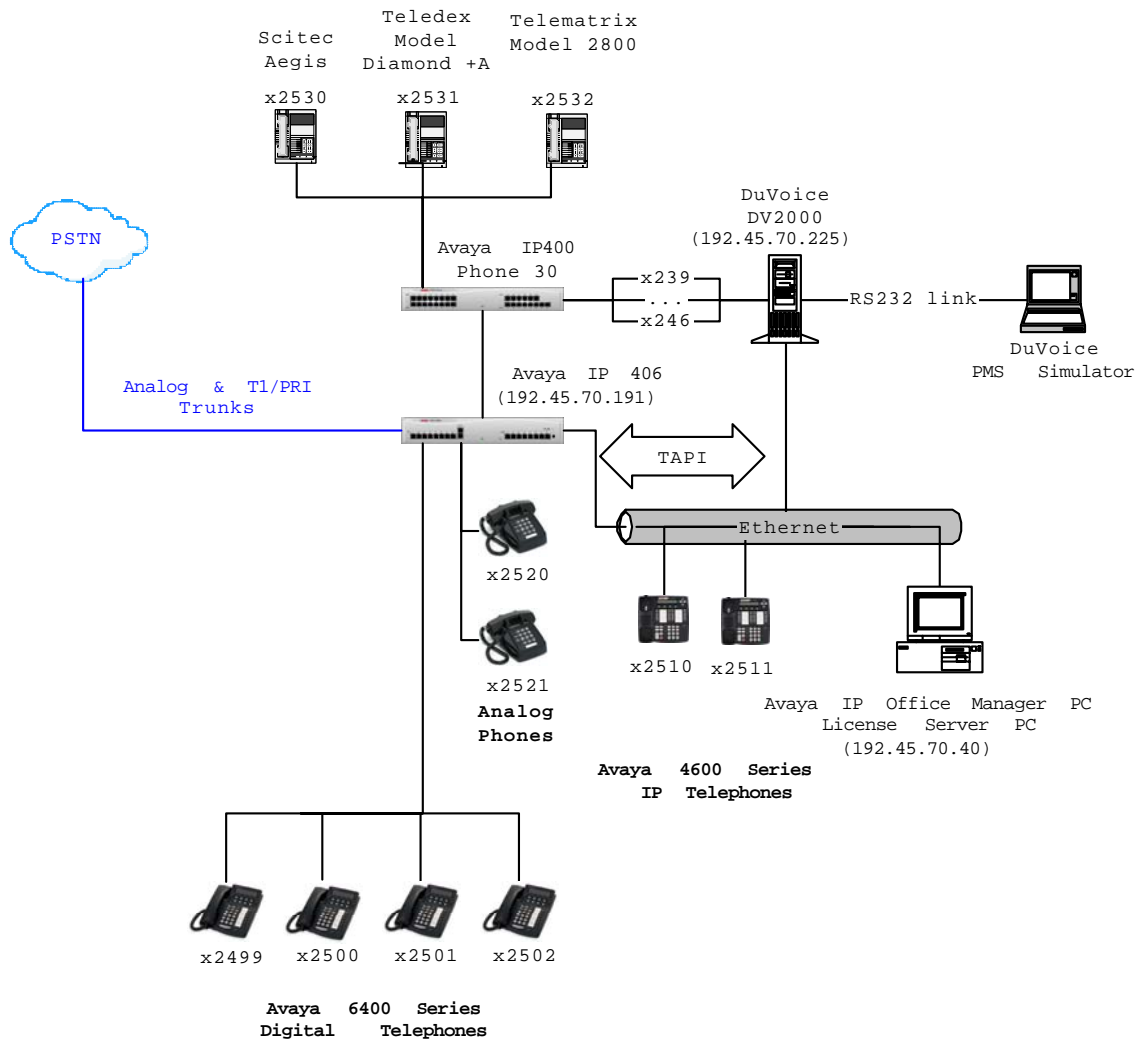


Figure 1: DuVoice DV2000 and Avaya IP Office Configuration

1.1. Compliance Test Notes / Observations

- **Message waiting lamp issue for analog phones:** The current version of IP Office in the U.S. provides cadenced voltage to drive the message-waiting lamp (55-60VDC for 500ms / 0 VDC for 1000ms). Outside the U.S., a constant 81 VDC is provided to drive the message-waiting lamp. Analog telephones requiring more voltage such as the Scitec Aegis, Teledex Model Diamond +A, and Telematrix Model 2800 are not currently supported.
- **TAPI call restriction settings not static:** Call restrictions set via TAPI for an extension are not saved to Flash. If the IP Office is rebooted, the call restriction settings get lost. The current workaround is to repeat the guest room checkout on all unoccupied rooms.
- **‘Do Not Disturb’ (DND) feature is not recommended for use in this solution:** If ‘Do Not Disturb’ is enabled on an extension, internal calls to the extension result in the caller

getting a busy signal rather than being sent to the extension's voicemail. For inbound trunk calls, the DV2000 performs a blind transfer to the desired extension. This caused trunk calls to the DND-enabled extension to be dropped rather than getting a busy signal (as observed for internal calls).

- **Voicemail settings in User Form not supported:** Within IP Office, voicemail settings in the Voicemail tab of the User Form are not supported when DV2000 is used instead of Avaya Voicemail PRO.
- **No welcome message provided by DV2000 in current release:** The current implementation of DV2000 does not provide initial welcome voicemail message to new guests upon check in.
- **Call traffic reports not available in current DV2000 release:** Call traffic reports are not available for TAPI in the current release of DV2000.

2. Equipment and Software Validated

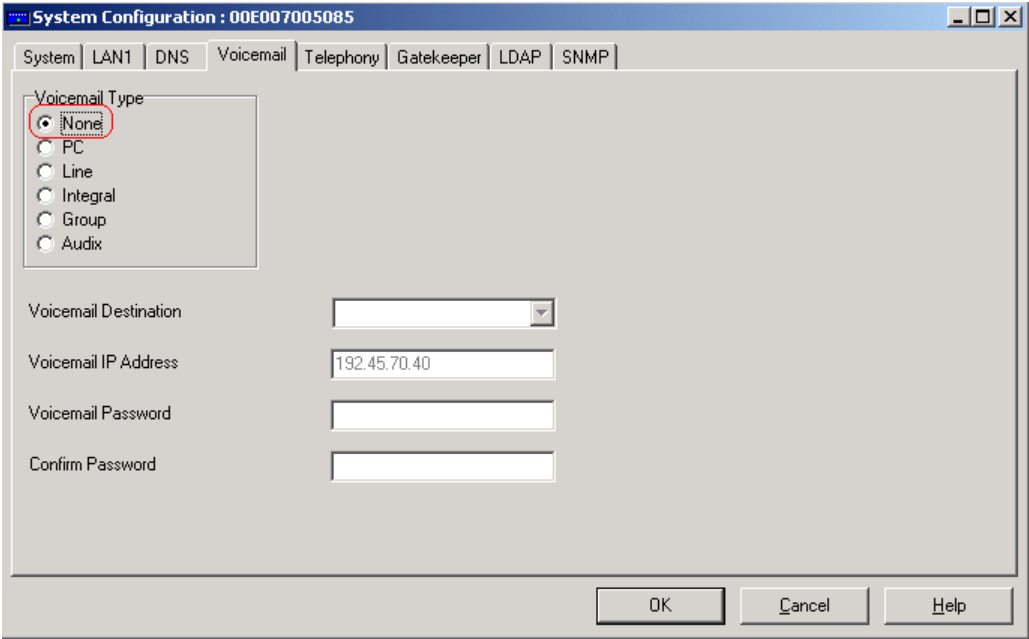
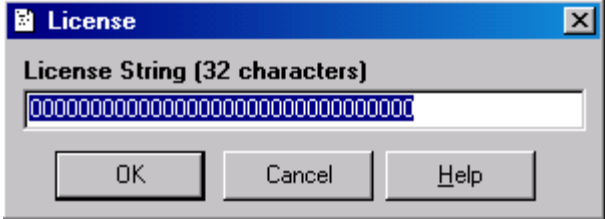
The following equipment and software were used for the sample configuration provided:

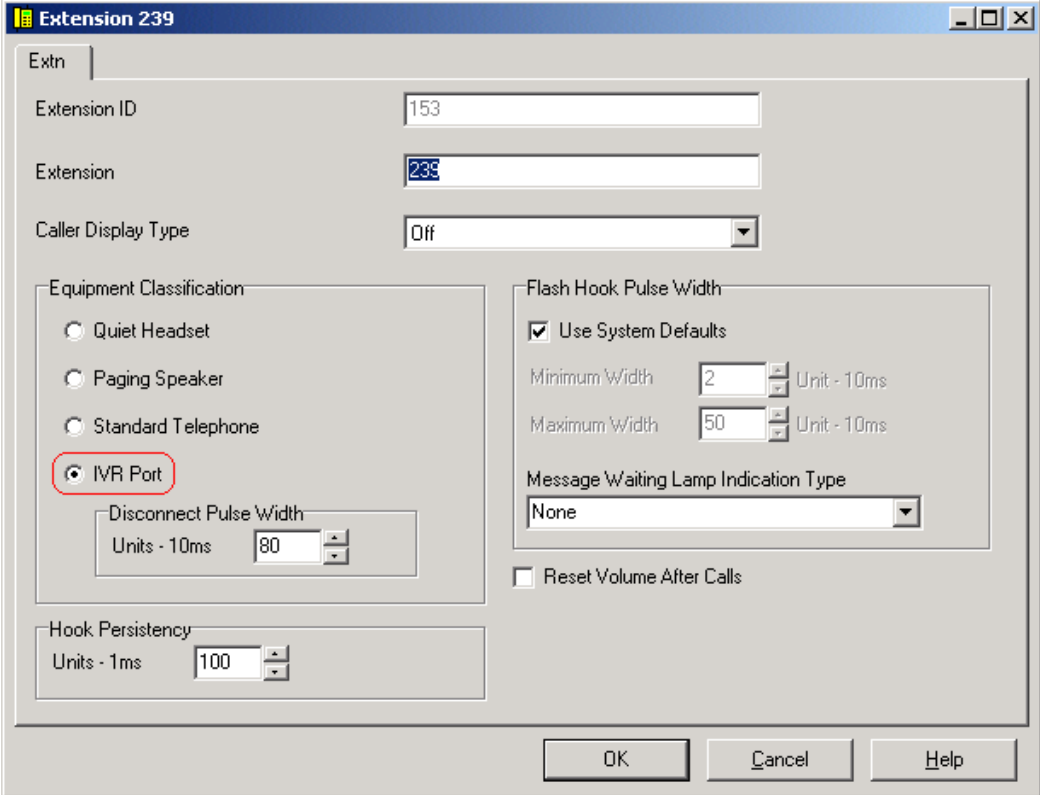
Equipment	Software
Avaya IP 406 Office System	2.0(18)
Avaya IP 400 Phone 30 Expansion Module	-
Avaya CTI Link Pro License	-
Avaya 6408D+, 6416D+M Telephones	-
Avaya 4612, 4624 IP Telephones	1.81
Avaya IP Office Manager software	4.0.19
DuVoice DV2000	3.03.025
Dialogic 4 (ISA) 4-port analog board	System Release 5.1.1
Dialogic 4 (PCI) 4-port analog board	System Release 5.1.1
Scitec Aegis Analog Telephone	-
Teledex Model Diamond +A Analog Telephone	-
Telematrix Model 2800 Analog Telephone	-
Generic laptop for DuVoice PMS Simulator software	Windows XP professional
Generic PC for Avaya IP Office Manager	Windows 2000 professional
Generic Analog Telephones	-

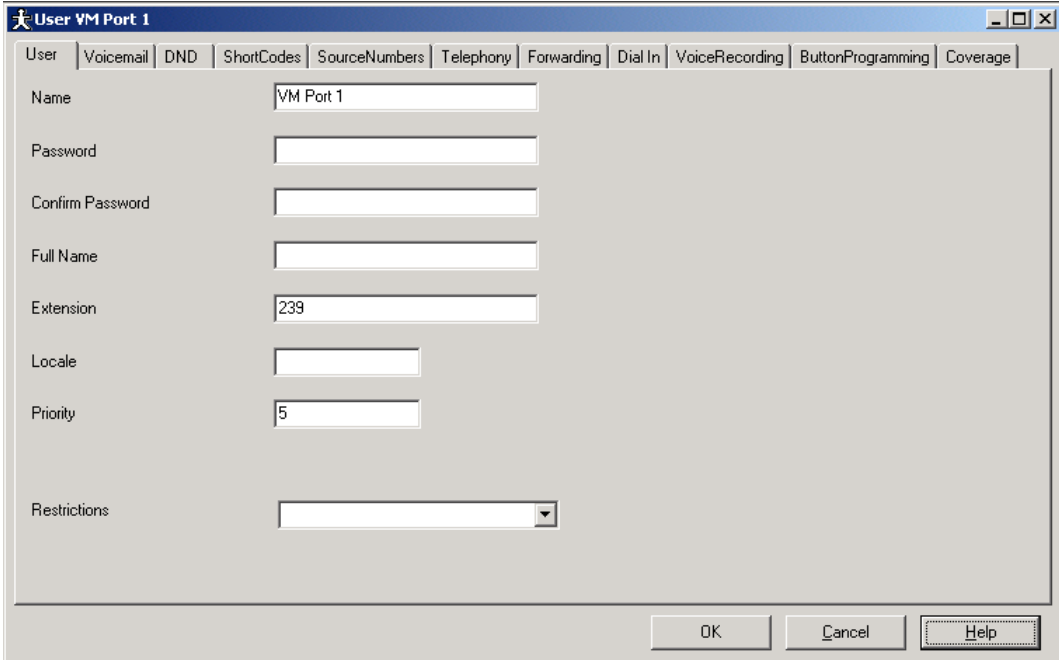
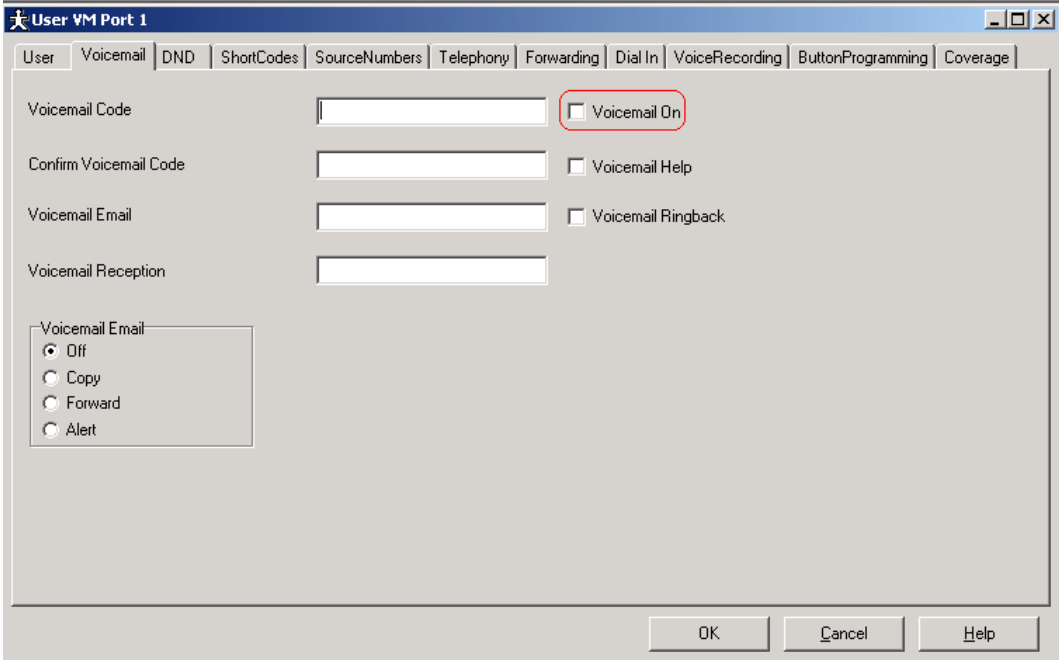
3. Configure Avaya IP Office

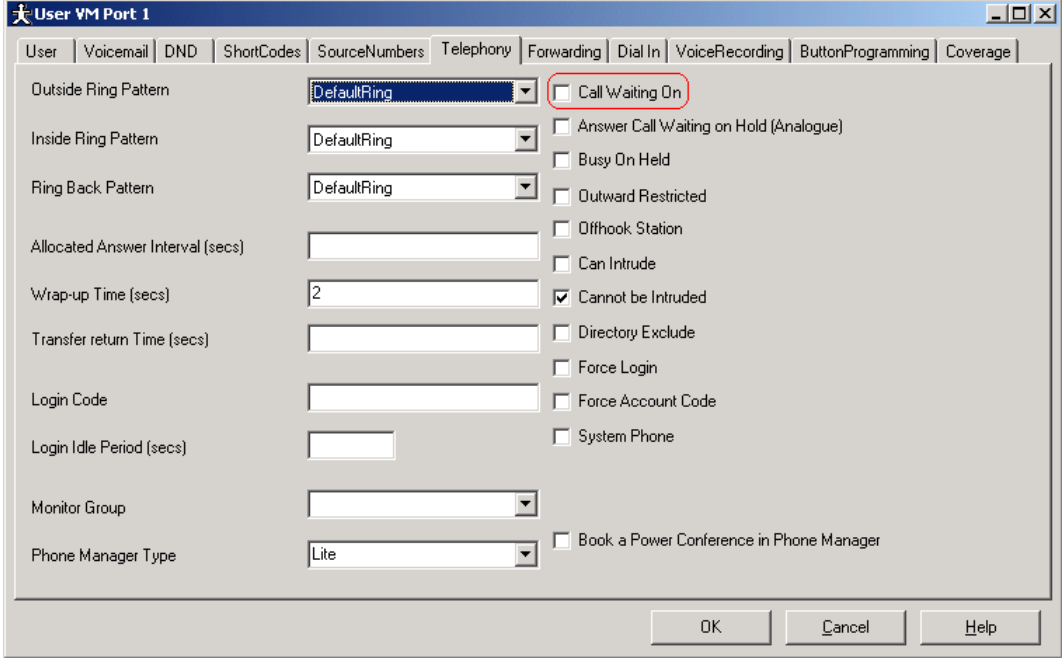
These Application Notes address provisioning of the IP Office as it relates to integration of the DV2000. For all other provisioning information, such as provisioning of the trunks for outbound dialing, call coverage, extensions, etc., please refer to the IP Office documentation.

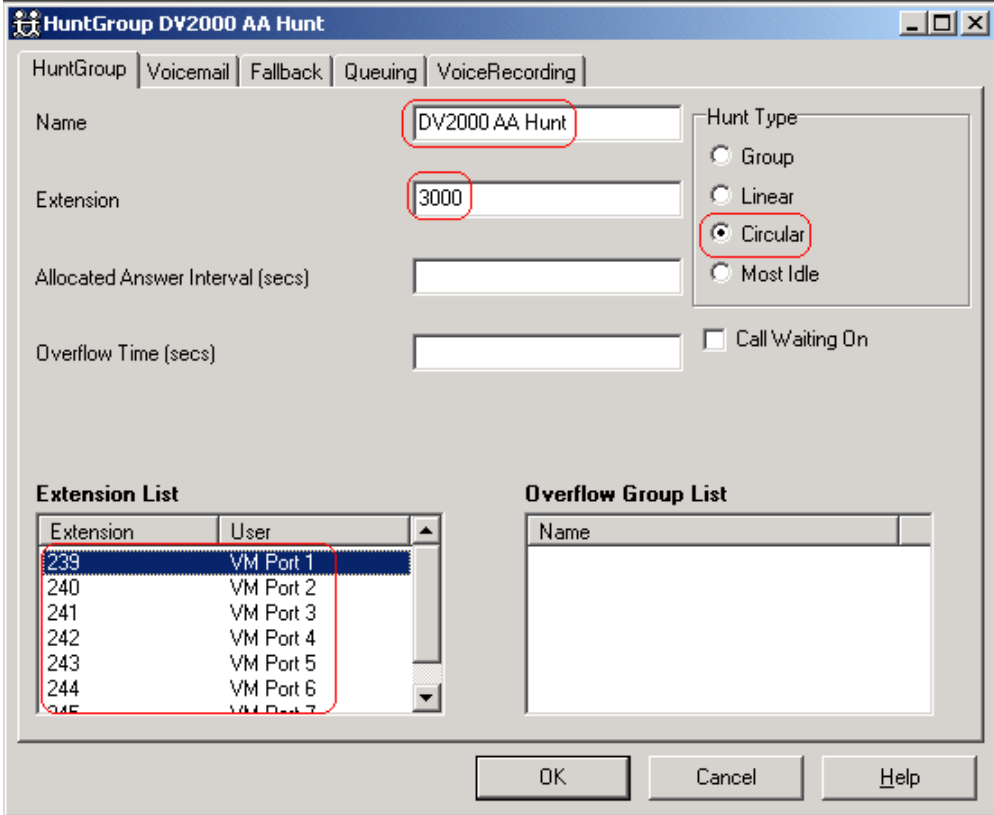
Step	Description
IP Office License Key Physical Installation	
1.	Plug in the red Avaya Software Sentinel key into the parallel port of the IP Office Manager PC.
Configure License Key Server IP Address	
2.	Log in to the IP Office Manager PC and go to Start → Programs → IP Office → Manager to launch the Manager application. Log in 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.
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 <i>License Server IP Address</i> 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.

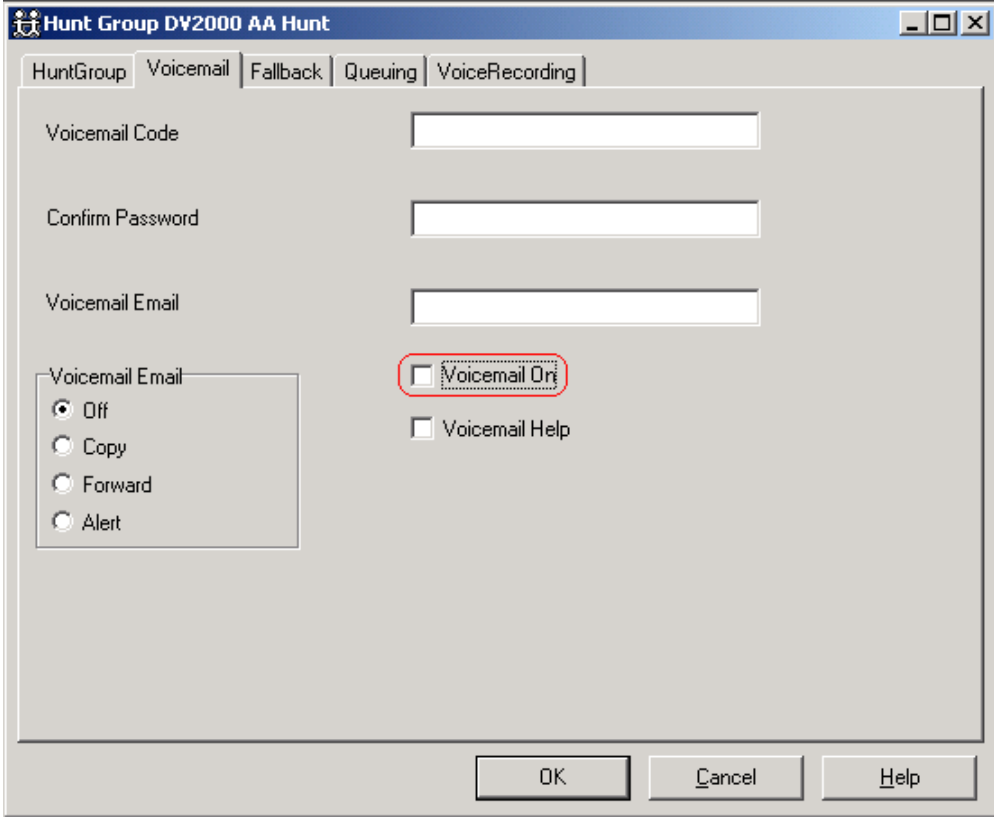
Step	Description
6.	<p>In the Voicemail tab of the System configuration window, set <i>Voicemail Type</i> to None, and click OK.</p> 
Install Licenses	
7.	<p>In the Manager window, go to the Configuration Tree and double-click License to open the list of licenses installed in the IP Office system.</p>
8.	<p>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.</p> 
9.	<p>In the Manager window, select File → Save to save the licenses to the IP Office system and wait for the system to update. The system reload validates the new license.</p>
Configure Voicemail Ports	
10.	<p>In the Manager window, select File → Open to search for the IP Office system in the network.</p>
11.	<p>Log in to the IP Office system using the appropriate login credentials to receive its configuration.</p>
12.	<p>In the Manager window, go to the Configuration Tree and double-click Extension to open the list of extensions on the IP Office.</p>

Step	Description
13.	Select an analog station port on the IP Office Phone Expansion module that will be connected to the DV2000, and record the corresponding extension number. Verify the extension number is correct by first attaching a phone to the Phone Expansion module port. Place a call to the extension number and confirm the phone rings.
14.	Select the extension number recorded in the previous step from the Extension list and double-click it.
15.	<p>In the Extension window that appears, select <i>IVR Port</i> and click OK.</p> 
16.	In the Manager window, go to the Configuration Tree and double-click User to open the list of extensions on the IP Office.

Step	Description
17.	<p>In the User tab of the User window that appears, set <i>Name</i> to VM Port x where x is the port number on the DV2000, e.g., 1.</p>  <p>The screenshot shows a window titled "User VM Port 1" with several tabs: User, Voicemail, DND, ShortCodes, SourceNumbers, Telephony, Forwarding, Dial In, VoiceRecording, ButtonProgramming, and Coverage. The "User" tab is active. The "Name" field contains "VM Port 1". Other fields include "Password", "Confirm Password", "Full Name", "Extension" (239), "Locale", "Priority" (5), and "Restrictions". Buttons for "OK", "Cancel", and "Help" are at the bottom.</p>
18.	<p>In the Voicemail tab of the User window, uncheck <i>Voicemail On</i>.</p>  <p>The screenshot shows the same window with the "Voicemail" tab active. The "Voicemail Code" field is empty, and the "Voicemail On" checkbox is unchecked and highlighted with a red box. Other options include "Voicemail Help", "Voicemail Ringback", and "Voicemail Email" (Off, Copy, Forward, Alert). Buttons for "OK", "Cancel", and "Help" are at the bottom.</p>

Step	Description
19.	<p>In the Telephony tab of the User window, uncheck <i>Call Waiting</i> and click OK.</p> 
20.	Repeat steps 13 – 19 for each analog station port connected to the DV2000. For the purposes of these Application Notes, an 8-port DV2000 was used (extensions 239 - 246).
Configure Hunt Group	
21.	In the Manager window, go to the Configuration Tree and double-click Hunt Group to open the list of hunt groups on the IP Office.
22.	Select the Main hunt group by double-clicking it.

Step	Description																
23.	<p>In the Hunt Group window that appears, add the voicemail ports to the Extension List pane, set <i>Name</i> to DV2000 AA Hunt, <i>Extension</i> to 3000 (or the extension number desired for the hunt group), and <i>Hunt Type</i> to Circular.</p>  <p>The screenshot shows the 'HuntGroup DV2000 AA Hunt' configuration window. The 'Name' field is set to 'DV2000 AA Hunt', the 'Extension' field is '3000', and the 'Hunt Type' is set to 'Circular'. The 'Extension List' table is as follows:</p> <table border="1" data-bbox="435 871 841 1075"> <thead> <tr> <th>Extension</th> <th>User</th> </tr> </thead> <tbody> <tr><td>239</td><td>VM Port 1</td></tr> <tr><td>240</td><td>VM Port 2</td></tr> <tr><td>241</td><td>VM Port 3</td></tr> <tr><td>242</td><td>VM Port 4</td></tr> <tr><td>243</td><td>VM Port 5</td></tr> <tr><td>244</td><td>VM Port 6</td></tr> <tr><td>245</td><td>VM Port 7</td></tr> </tbody> </table>	Extension	User	239	VM Port 1	240	VM Port 2	241	VM Port 3	242	VM Port 4	243	VM Port 5	244	VM Port 6	245	VM Port 7
Extension	User																
239	VM Port 1																
240	VM Port 2																
241	VM Port 3																
242	VM Port 4																
243	VM Port 5																
244	VM Port 6																
245	VM Port 7																

Step	Description
24.	<p>In the Voicemail tab of the Hunt Group window, uncheck <i>Voicemail On</i> and click OK.</p> 
Select Inbound Call Route	
25.	<p>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. Right click in the incoming call route window and select New.</p>

Step	Description
26.	In the Incoming Call Route window that appears, set the <i>Line Group ID</i> to 0 (or the desired number), set <i>Destination</i> to DV2000 AA Hunt and click OK .

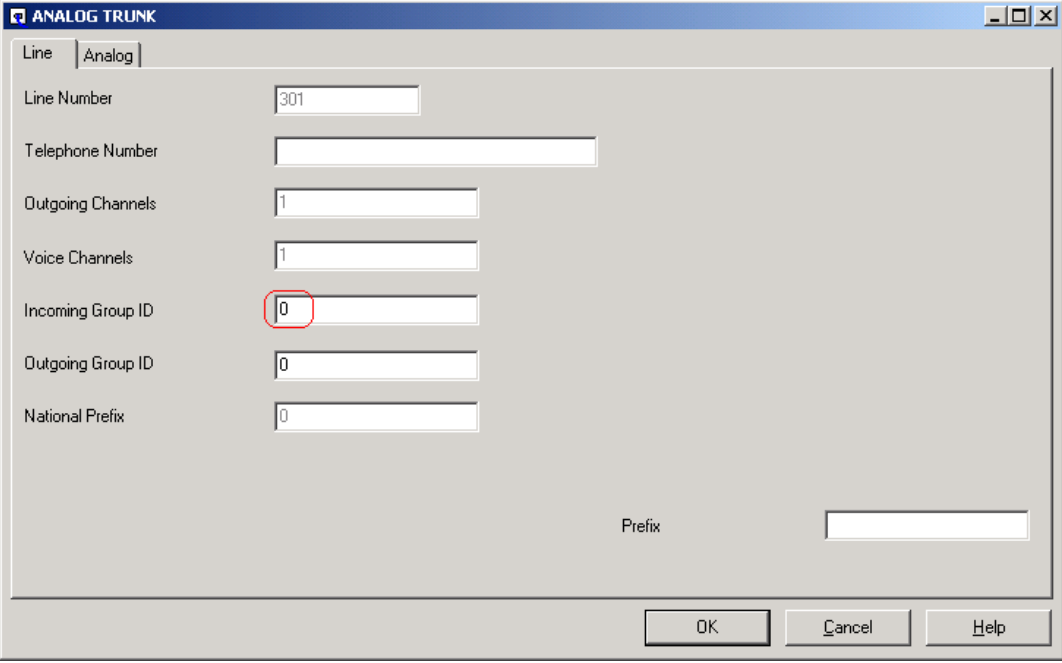
The screenshot shows the 'Incoming Call Route' dialog box. The 'Line group ID' field contains the value '0'. The 'Destination' dropdown menu is set to 'DV2000 AA Hunt'. On the right side, the 'Bearer Capability' section is expanded, showing several radio button options: AnyVoice (selected), Speech, Audio3K1, AnyData, Data64K, Data56K, DataV110, DataV120, Video, and Any. At the bottom, there are 'OK', 'Cancel', and 'Help' buttons.

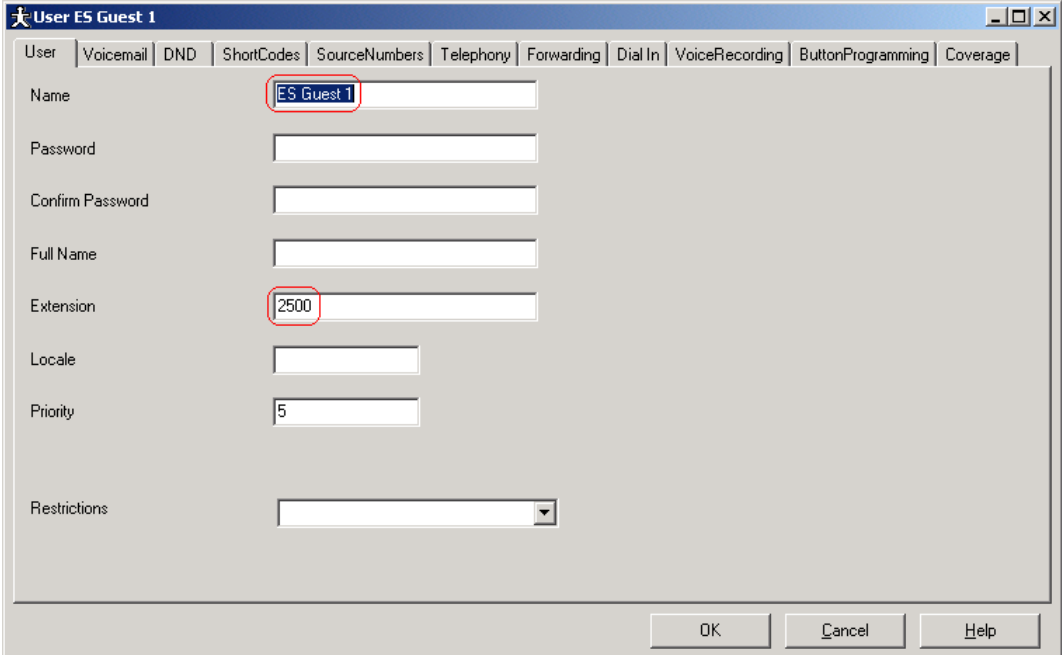
Assign Trunks to the Incoming Call Route

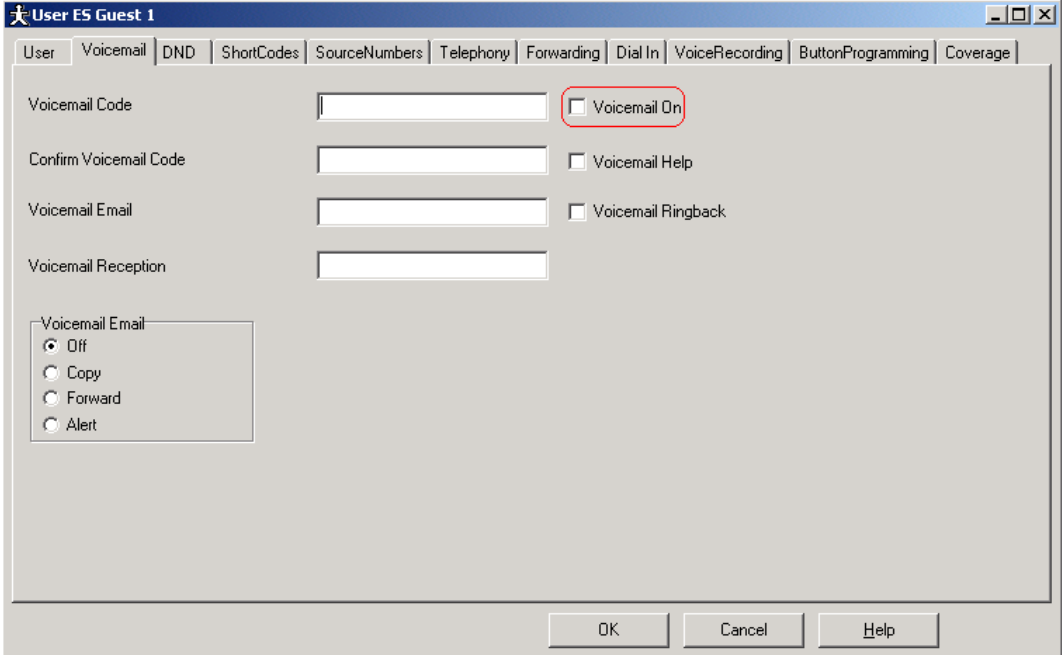
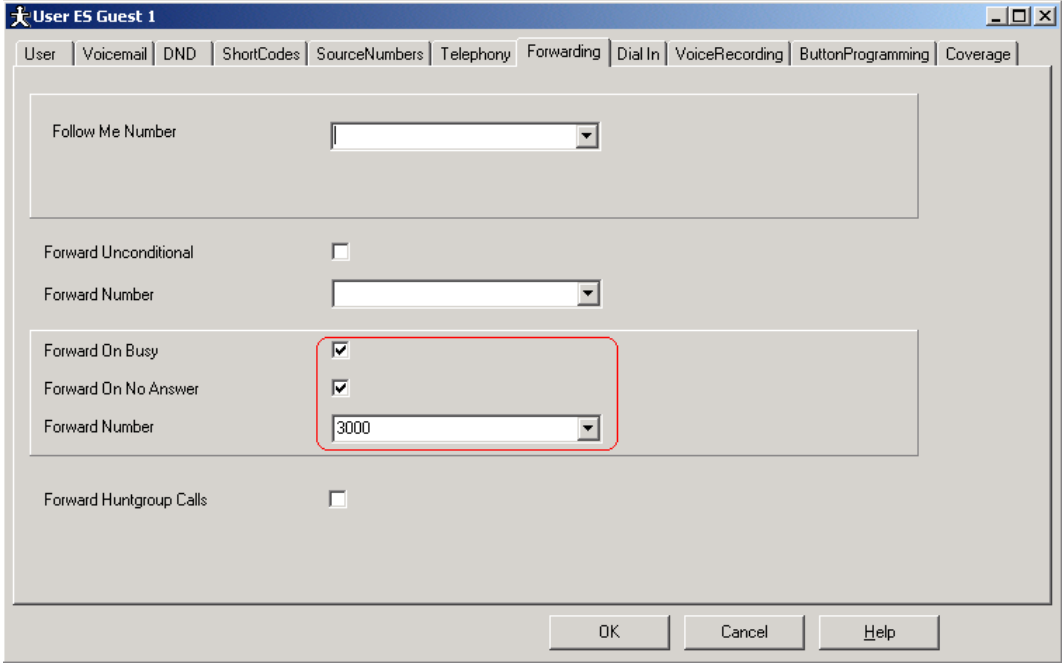
27.	In the Manager window, go to the Configuration Tree and double-click Line to open the list of lines (trunks) available on the IP Office. Double-click the Line (analog or digital) whose incoming calls are to be routed to the <i>Main</i> hunt group, e.g., 301 .
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The screenshot shows the 'Configuration Tree' window. On the left, a tree view shows the hierarchy of configuration elements, with 'Line (21)' expanded. On the right, a table lists the lines. Line 301 is highlighted in blue.

Line Number	Incoming Group ID	Outgoing Group Id	Number of Channels
01	0	0	1
02	0	0	1
03	0	0	1
04	0	0	1
05	0	1, 1, 1...	8
301	0	0	1
302	0	0	1
303	0	0	1
304	0	0	1
305	0	0	1

Step	Description
28.	<p>In the window that appears, set <i>Incoming Group ID</i> to the value used for <i>Line group ID</i> in Step 26, e.g., 0. A similar procedure is used on the T1/PRI lines. Click OK.</p> 
29.	Repeat Steps 27 - 28 for each line (trunk) assigned to the incoming call route.

Step	Description
	Setup DV2000 Voicemail for users
30.	<p>In the Manager window, go to the Configuration Tree and double-click User to open the list of users available on the IP Office. Double-click the user entry of one of the users on the system. In the User window that appears, set <i>Name</i> to ES Guest 1 for extended stay guest 1 and set <i>Extension</i> to the extension number to be assigned for this guest, e.g., 2500.</p> 

Step	Description
31.	<p>In the Voicemail tab of the User window, uncheck <i>Voicemail On</i>.</p>  <p>The screenshot shows the 'User ES Guest 1' window with the 'Voicemail' tab selected. The 'Voicemail On' checkbox is unselected and highlighted with a red box. Other fields include 'Voicemail Code', 'Confirm Voicemail Code', 'Voicemail Email', 'Voicemail Reception', and a 'Voicemail Email' section with radio buttons for 'Off', 'Copy', 'Forward', and 'Alert'. The 'OK', 'Cancel', and 'Help' buttons are at the bottom.</p>
32.	<p>In the Forwarding tab of the User window, check <i>Forward on Busy</i>, check <i>Forward on No Answer</i>, set <i>Forward Number</i> to 3000 and click OK.</p>  <p>The screenshot shows the 'User ES Guest 1' window with the 'Forwarding' tab selected. The 'Forward on Busy' and 'Forward on No Answer' checkboxes are checked, and the 'Forward Number' dropdown is set to '3000'. These three items are highlighted with a red box. Other fields include 'Follow Me Number', 'Forward Unconditional', and 'Forward Huntgroup Calls'. The 'OK', 'Cancel', and 'Help' buttons are at the bottom.</p>
33.	<p>Repeat steps 30 – 32 for each DV2000 voicemail user. For the purposes of these Application Notes, eleven users were created.</p>

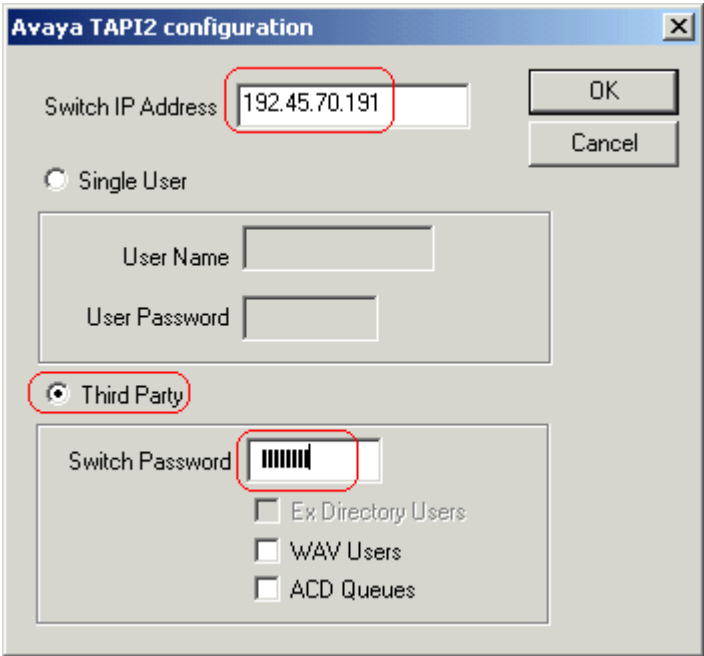
Step	Description
34.	In the Manager window, select File → Save to push the configuration to the IP Office and wait for the unit to reboot.

4. Configure DuVoice DV2000 Components

These Application Notes address provisioning of the DV2000 as it relates to the Avaya IP Office. For all other provisioning information, please refer to the DuVoice System Guide available on the Installation CD.

4.1. Install and Configure Avaya IP Office TAPI Service Provider

Please refer to the Avaya IP Office CTI Link Installation Manual, 40DHB0002UKAB – Issue 5 (10/28/2003) for additional information.

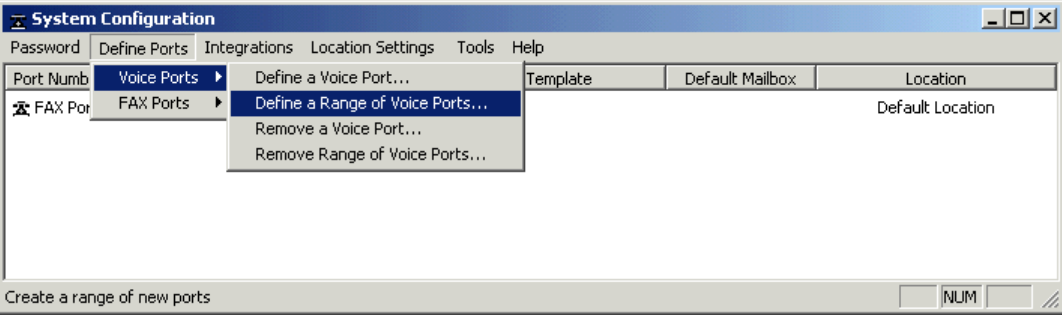
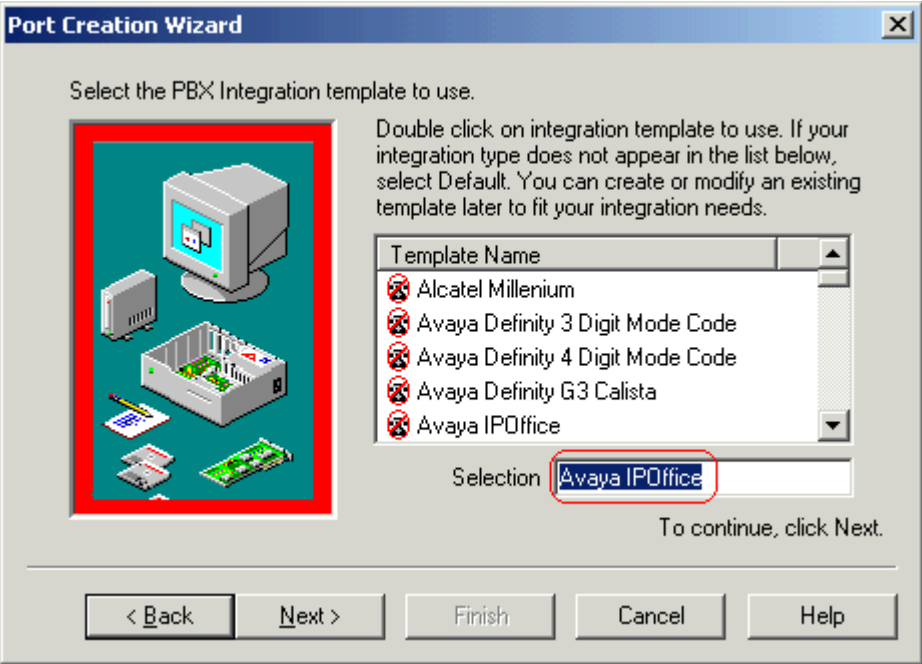
Step	Description
1.	Using the Avaya IP Office User Applications CD, install the Avaya IP Office TAPI Service Provider driver on the DV2000. Do not install the Phone Manager.
2.	After the system reboots, log in to the system again as administrator and go to Start → Settings → Control Panel . In the Control 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 .
4.	In the Avaya TAPI2 configuration window that appears, set <i>Switch IP Address</i> to the IP Address of the IP Office, select <i>Third Party</i> , set <i>Switch Password</i> to the password of the IP Office, verify <i>WAV Users</i> and <i>ACD Queues</i> are unchecked, and click OK .
	
5.	Reboot the DV2000.

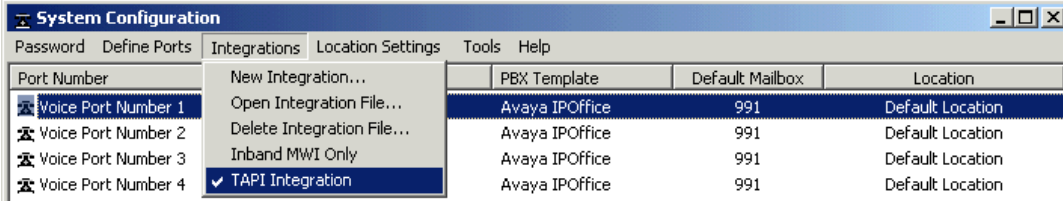
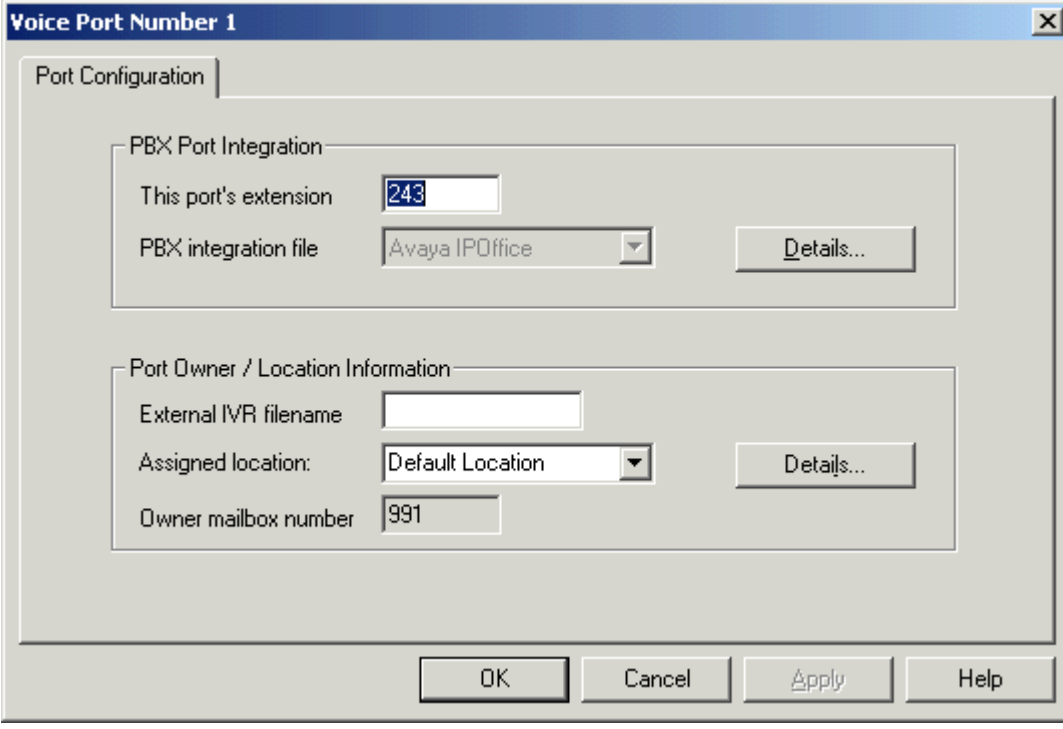
Step	Description
	Verify Connectivity with the IP Office
6.	After the system reboots, log in to the system and go to Start → Programs → Accessories → Communications → Phone Dialer .
7.	In the Phone Dialer window that appears, select Edit → Options .
8.	In the Lines tab of the Options window that appears, 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.

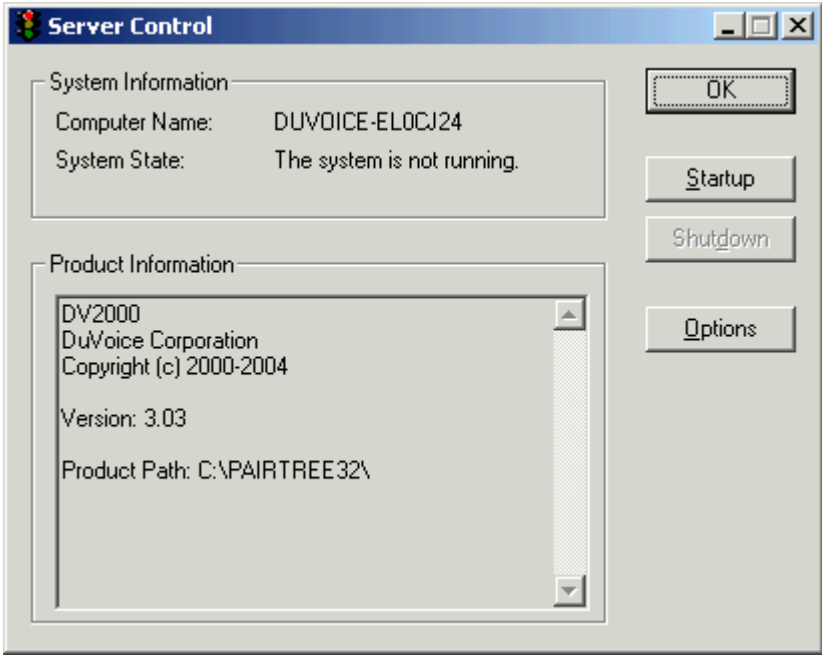
4.2. Configure DuVoice DV2000

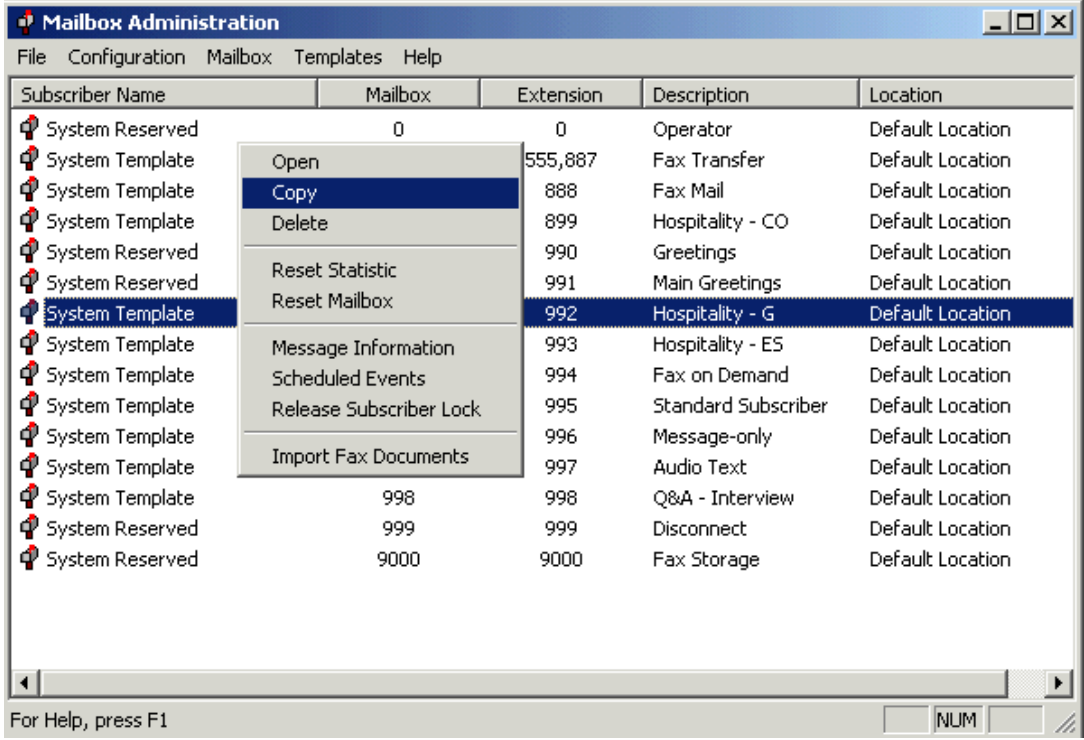
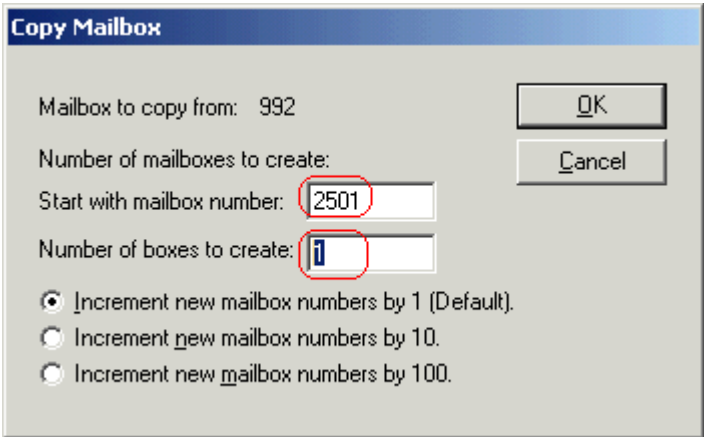
Step	Description
1.	Log in to the system again as administrator and go to Start → Programs → DuVoice → Server Control . In the Server Control window that appears, click Shutdown and click OK .

The screenshot shows the 'Server Control' window. It has a title bar with a red, yellow, and green icon and standard window controls. The window is divided into two main sections: 'System Information' and 'Product Information'.
 - **System Information:** Computer Name: DUVOICE-ELOCJ24; System State: The system is stopping...
 - **Product Information:** DV2000; DuVoice Corporation; Copyright (c) 2000-2004; Version: 3.03; Product Path: C:\PAIRTREE32\
 On the right side, there are four buttons: 'OK', 'Startup', 'Shutdown', and 'Options'. A 'Please wait...' dialog box is overlaid on the bottom of the window, and a progress bar is visible at the bottom.

Step	Description
2.	<p>Go to Start → Programs → DuVoice → System Configuration. In the System Configuration window that appears, go to the Define Ports → Voice Ports → Define a Range of Voice Ports... pull-down menu. (Remove any voice pre-configured ports prior to this step).</p>  <p>The screenshot shows the 'System Configuration' window with the 'Define Ports' menu open. The 'Voice Ports' sub-menu is expanded, and 'Define a Range of Voice Ports...' is highlighted. Other options in the sub-menu include 'Define a Voice Port...', 'Remove a Voice Port...', and 'Remove Range of Voice Ports...'. The main window has a table with columns for 'Port Num', 'Voice Ports', 'Template', 'Default Mailbox', and 'Location'. A 'NUM' input field is visible at the bottom right.</p>
3.	<p>In the Port Creation Wizard that appears, set <i>Selection</i> to Avaya IPOffice and click Next.</p>  <p>The screenshot shows the 'Port Creation Wizard' dialog box. It prompts the user to 'Select the PBX Integration template to use.' A list of templates is shown, with 'Avaya IPOffice' selected in the 'Selection' dropdown. The 'Avaya IPOffice' option is highlighted with a red box. The 'Next >' button is also highlighted with a red box. The dialog includes a 'Back <' button, 'Finish', 'Cancel', and 'Help' buttons at the bottom.</p>
4.	<p>Follow the instructions provided in the Port Creation Wizard to create 8 ports starting with port 1 and using PBX integration of Avaya IPOffice. At the end of the Port Creation Wizard, click Finish to create the ports.</p>

Step	Description																				
5.	<p>In the System Configuration window, go to the Integrations → TAPI Integration pull-down menu and check <i>TAPI Integration</i>.</p>  <p>The screenshot shows the 'System Configuration' window with the 'Integrations' menu open. The 'TAPI Integration' option is checked. The background table lists four voice ports, all with 'Avaya IPOffice' as the PBX Template, '991' as the Default Mailbox, and 'Default Location' as the Location.</p> <table border="1" data-bbox="365 394 1421 535"> <thead> <tr> <th>Port Number</th> <th>PBX Template</th> <th>Default Mailbox</th> <th>Location</th> </tr> </thead> <tbody> <tr> <td>Voice Port Number 1</td> <td>Avaya IPOffice</td> <td>991</td> <td>Default Location</td> </tr> <tr> <td>Voice Port Number 2</td> <td>Avaya IPOffice</td> <td>991</td> <td>Default Location</td> </tr> <tr> <td>Voice Port Number 3</td> <td>Avaya IPOffice</td> <td>991</td> <td>Default Location</td> </tr> <tr> <td>Voice Port Number 4</td> <td>Avaya IPOffice</td> <td>991</td> <td>Default Location</td> </tr> </tbody> </table>	Port Number	PBX Template	Default Mailbox	Location	Voice Port Number 1	Avaya IPOffice	991	Default Location	Voice Port Number 2	Avaya IPOffice	991	Default Location	Voice Port Number 3	Avaya IPOffice	991	Default Location	Voice Port Number 4	Avaya IPOffice	991	Default Location
Port Number	PBX Template	Default Mailbox	Location																		
Voice Port Number 1	Avaya IPOffice	991	Default Location																		
Voice Port Number 2	Avaya IPOffice	991	Default Location																		
Voice Port Number 3	Avaya IPOffice	991	Default Location																		
Voice Port Number 4	Avaya IPOffice	991	Default Location																		
6.	<p>In the System Configuration window, double-click Voice Port Number 1. In the Voice Port Number 1 window that appears, set <i>This port's extension</i> to the extension number recorded for the 1st DV2000 voicemail port on the IP Office (see Section 3).</p>  <p>The screenshot shows the 'Voice Port Number 1' configuration window. Under 'PBX Port Integration', 'This port's extension' is set to 243 and 'PBX integration file' is set to Avaya IPOffice. Under 'Port Owner / Location Information', 'Assigned location' is set to Default Location and 'Owner mailbox number' is set to 991.</p>																				
7.	<p>Repeat the previous step for each of the DV2000 voicemail ports connected to the IP Office.</p> <p>For the purposes of these Application Notes, an 8-port DV2000 was used (ports 1 – 8 associated to IP Office extensions 239 – 246 respectively).</p>																				
8.	<p>Close the System Configuration window because it cannot be running during the DV2000 voicemail server startup or shutdown.</p>																				

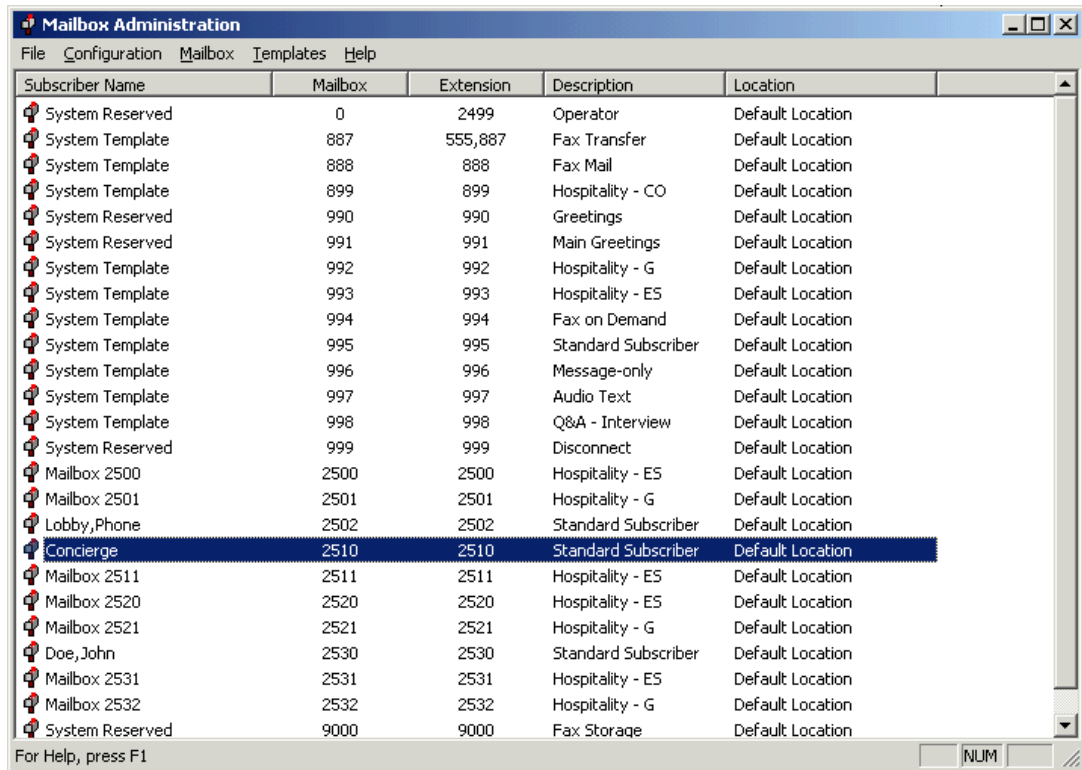
Step	Description
9.	<p>Go to Start → Programs → DuVoice → Server Control. In the Server Control window that appears, click Startup and click OK.</p> 

Step	Description																																																																																
	Create DV2000 Voicemail accounts																																																																																
10.	<p>Go to Start → Programs → DuVoice → Mailbox Administration. In the Mailbox Administration window that appears, right-click System Template Hospitality - G (Guest) and select Copy to create a Guest voicemail account.</p>  <p>The screenshot shows the 'Mailbox Administration' window with a menu open over the 'System Template Hospitality - G' entry. The menu options are: Open, Copy, Delete, Reset Statistic, Reset Mailbox, Message Information, Scheduled Events, Release Subscriber Lock, and Import Fax Documents. The 'Copy' option is highlighted.</p> <table border="1"> <thead> <tr> <th>Subscriber Name</th> <th>Mailbox</th> <th>Extension</th> <th>Description</th> <th>Location</th> </tr> </thead> <tbody> <tr> <td>System Reserved</td> <td>0</td> <td>0</td> <td>Operator</td> <td>Default Location</td> </tr> <tr> <td>System Template</td> <td></td> <td>555,887</td> <td>Fax Transfer</td> <td>Default Location</td> </tr> <tr> <td>System Template</td> <td></td> <td>888</td> <td>Fax Mail</td> <td>Default Location</td> </tr> <tr> <td>System Template</td> <td></td> <td>899</td> <td>Hospitality - CO</td> <td>Default Location</td> </tr> <tr> <td>System Reserved</td> <td></td> <td>990</td> <td>Greetings</td> <td>Default Location</td> </tr> <tr> <td>System Reserved</td> <td></td> <td>991</td> <td>Main Greetings</td> <td>Default Location</td> </tr> <tr> <td>System Template</td> <td></td> <td>992</td> <td>Hospitality - G</td> <td>Default Location</td> </tr> <tr> <td>System Template</td> <td></td> <td>993</td> <td>Hospitality - ES</td> <td>Default Location</td> </tr> <tr> <td>System Template</td> <td></td> <td>994</td> <td>Fax on Demand</td> <td>Default Location</td> </tr> <tr> <td>System Template</td> <td></td> <td>995</td> <td>Standard Subscriber</td> <td>Default Location</td> </tr> <tr> <td>System Template</td> <td></td> <td>996</td> <td>Message-only</td> <td>Default Location</td> </tr> <tr> <td>System Template</td> <td></td> <td>997</td> <td>Audio Text</td> <td>Default Location</td> </tr> <tr> <td>System Template</td> <td>998</td> <td>998</td> <td>Q&A - Interview</td> <td>Default Location</td> </tr> <tr> <td>System Reserved</td> <td>999</td> <td>999</td> <td>Disconnect</td> <td>Default Location</td> </tr> <tr> <td>System Reserved</td> <td>9000</td> <td>9000</td> <td>Fax Storage</td> <td>Default Location</td> </tr> </tbody> </table>	Subscriber Name	Mailbox	Extension	Description	Location	System Reserved	0	0	Operator	Default Location	System Template		555,887	Fax Transfer	Default Location	System Template		888	Fax Mail	Default Location	System Template		899	Hospitality - CO	Default Location	System Reserved		990	Greetings	Default Location	System Reserved		991	Main Greetings	Default Location	System Template		992	Hospitality - G	Default Location	System Template		993	Hospitality - ES	Default Location	System Template		994	Fax on Demand	Default Location	System Template		995	Standard Subscriber	Default Location	System Template		996	Message-only	Default Location	System Template		997	Audio Text	Default Location	System Template	998	998	Q&A - Interview	Default Location	System Reserved	999	999	Disconnect	Default Location	System Reserved	9000	9000	Fax Storage	Default Location
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11.	<p>In the Copy Mailbox window that appears, set <i>Start with mailbox number</i> to 2501 and <i>Number of boxes to create</i> to 1 and click OK. For the purposes of these Application Notes, room numbers and extension numbers will be the same, e.g., Room Number 2501 has extension number 2501.</p>  <p>The screenshot shows the 'Copy Mailbox' dialog box. The 'Mailbox to copy from' is set to 992. The 'Number of mailboxes to create' is set to 1. The 'Start with mailbox number' is set to 2501. The 'Number of boxes to create' is set to 1. The 'Increment new mailbox numbers by 1 (Default)' radio button is selected.</p>																																																																																

Step	Description
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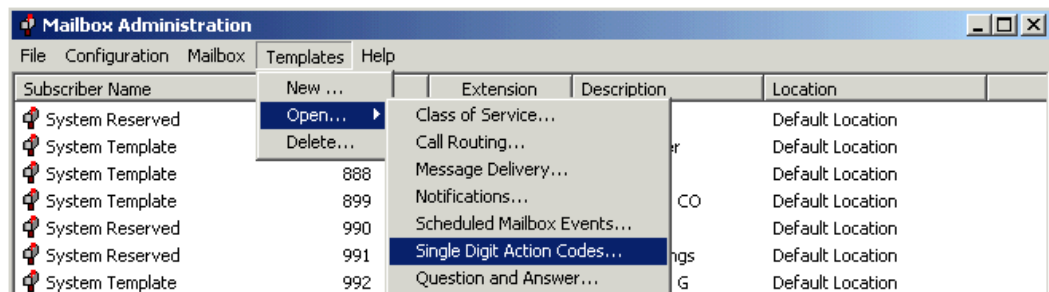
12. Repeat Steps 10 – 11 to create voicemail accounts for all extensions to be used. Select the appropriate System Template (*Hospitality – G* for Guest, *Hospitality – ES* for Extended Stay Guest, and *Standard Subscriber* for Staff) for the type of subscriber with which the extension will be associated.

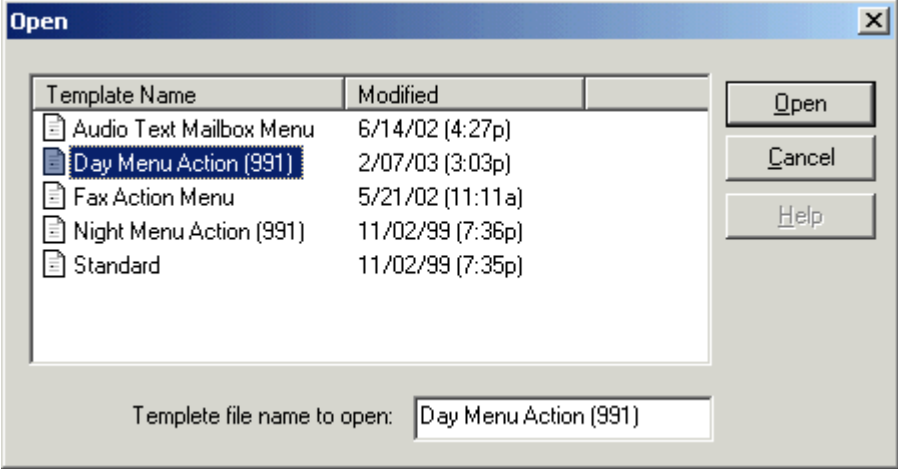
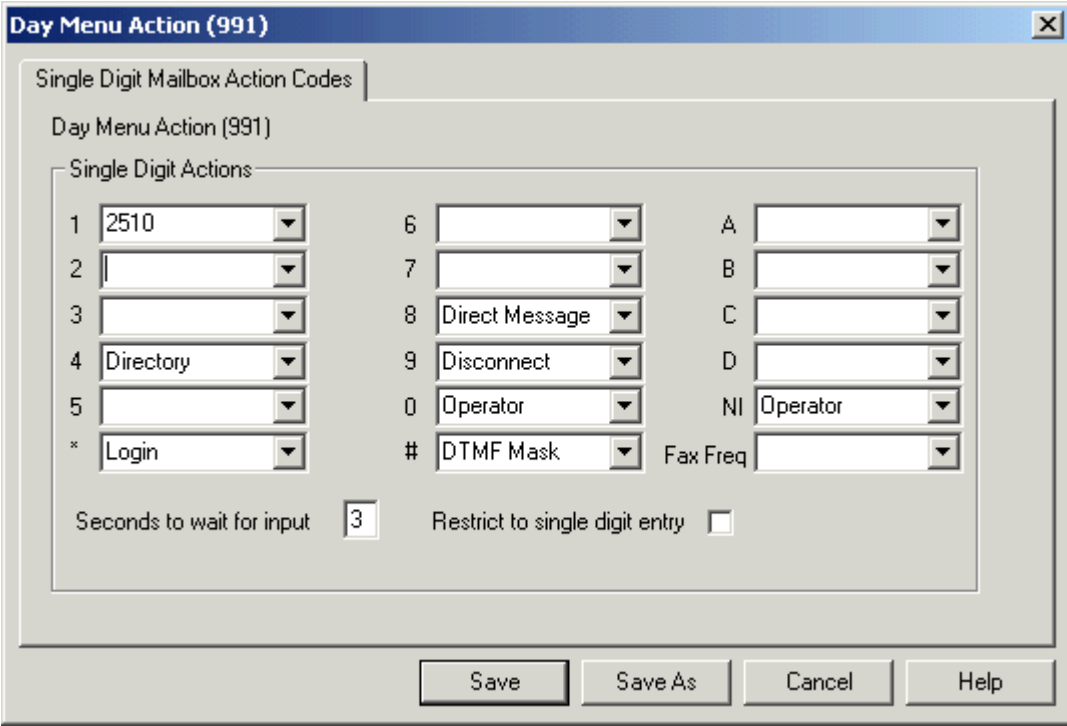
For the purposes of these Application Notes, eleven voicemail accounts were created (mix of guest, extended stay, and staff).



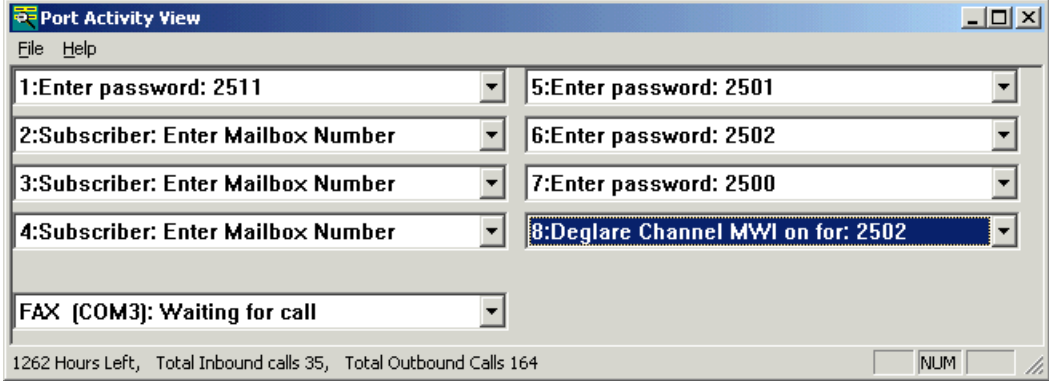
Define Daytime Automated Attendant Menu

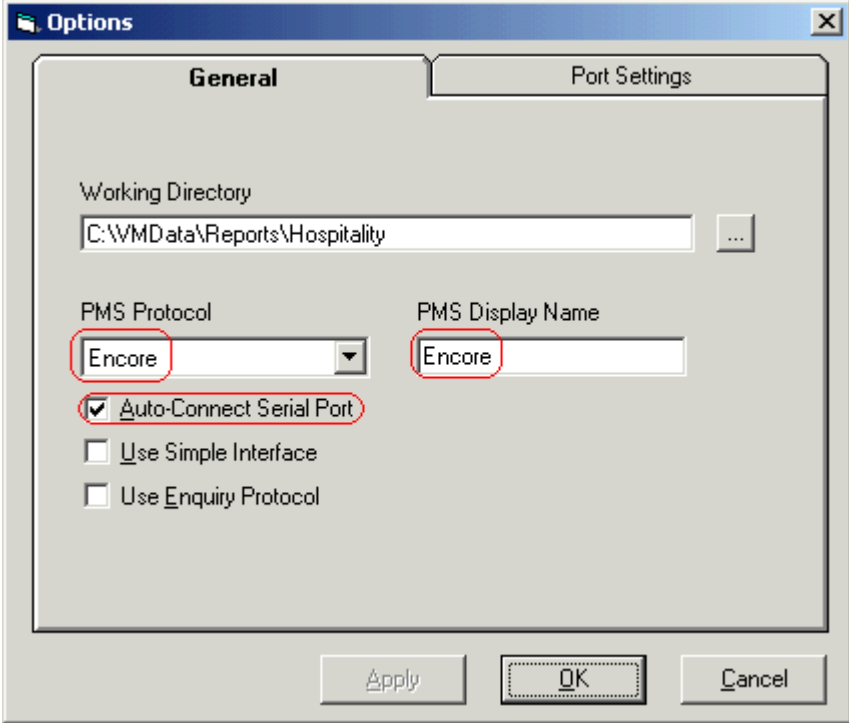
13. In the Mailbox Administration window, define the daytime automated attendant menu; go to **Templates** → **Open...** → **Single Digit Action Codes...**

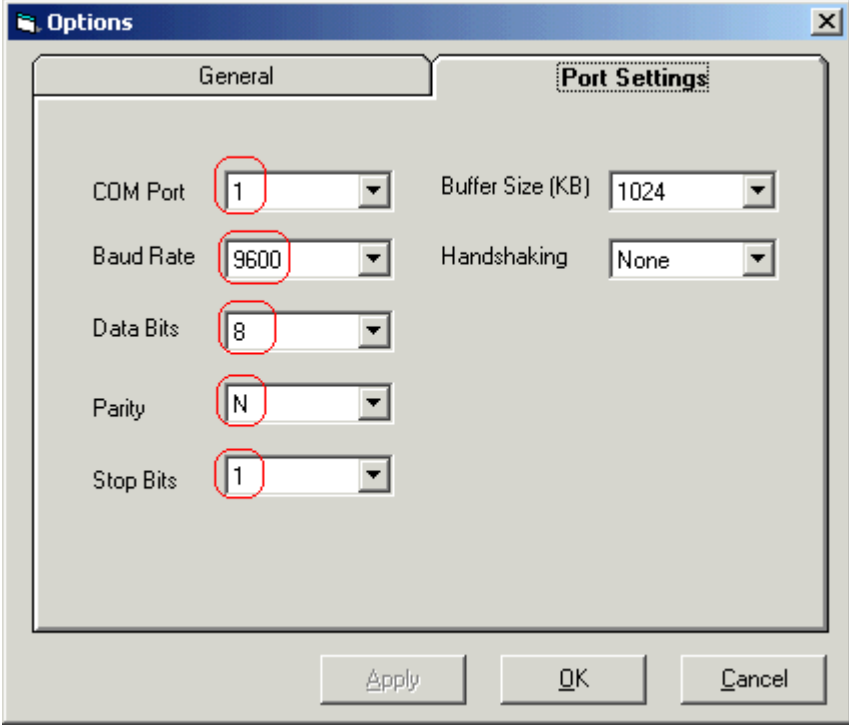
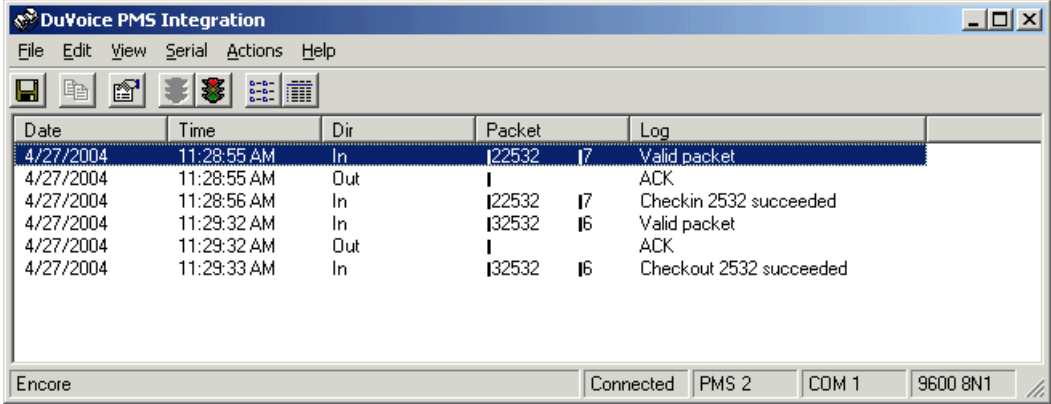


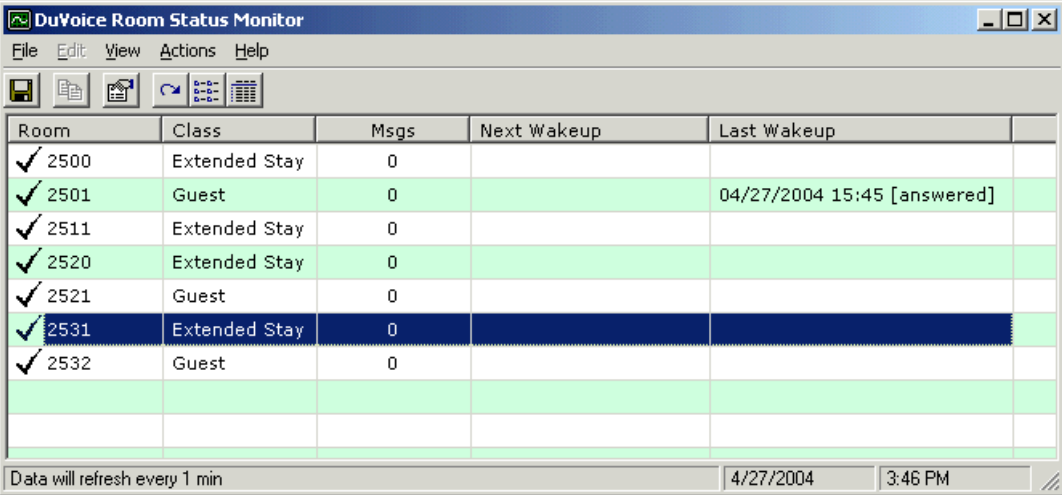
Step	Description																																
14.	<p>In the Open window that appears, click Day Menu Action and click Open.</p>  <p>The screenshot shows an 'Open' dialog box with a table of templates:</p> <table border="1" data-bbox="480 373 1156 657"> <thead> <tr> <th>Template Name</th> <th>Modified</th> </tr> </thead> <tbody> <tr> <td>Audio Text Mailbox Menu</td> <td>6/14/02 (4:27p)</td> </tr> <tr> <td>Day Menu Action (991)</td> <td>2/07/03 (3:03p)</td> </tr> <tr> <td>Fax Action Menu</td> <td>5/21/02 (11:11a)</td> </tr> <tr> <td>Night Menu Action (991)</td> <td>11/02/99 (7:36p)</td> </tr> <tr> <td>Standard</td> <td>11/02/99 (7:35p)</td> </tr> </tbody> </table> <p>Buttons: Open, Cancel, Help. Text field: Template file name to open: Day Menu Action (991)</p>	Template Name	Modified	Audio Text Mailbox Menu	6/14/02 (4:27p)	Day Menu Action (991)	2/07/03 (3:03p)	Fax Action Menu	5/21/02 (11:11a)	Night Menu Action (991)	11/02/99 (7:36p)	Standard	11/02/99 (7:35p)																				
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Standard	11/02/99 (7:35p)																																
15.	<p>In the Day Action Menu window that appears, define the daytime automated attendant options that will be presented to callers. Set 1 to 2510, set 4 to Directory and click Save.</p>  <p>The screenshot shows the 'Day Menu Action (991)' configuration window. The 'Single Digit Mailbox Action Codes' tab is active. The 'Single Digit Actions' section is visible with the following settings:</p> <table border="1" data-bbox="414 1056 1336 1367"> <thead> <tr> <th>Digit</th> <th>Action</th> <th>Letter</th> <th>Action</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2510</td> <td>A</td> <td></td> </tr> <tr> <td>2</td> <td></td> <td>B</td> <td></td> </tr> <tr> <td>3</td> <td></td> <td>C</td> <td></td> </tr> <tr> <td>4</td> <td>Directory</td> <td>D</td> <td></td> </tr> <tr> <td>5</td> <td></td> <td>NI</td> <td>Operator</td> </tr> <tr> <td>*</td> <td>Login</td> <td></td> <td></td> </tr> <tr> <td>#</td> <td>DTMF Mask</td> <td>Fax Freq</td> <td></td> </tr> </tbody> </table> <p>Additional settings: Seconds to wait for input: 3, Restrict to single digit entry: <input type="checkbox"/></p> <p>Buttons: Save, Save As, Cancel, Help</p>	Digit	Action	Letter	Action	1	2510	A		2		B		3		C		4	Directory	D		5		NI	Operator	*	Login			#	DTMF Mask	Fax Freq	
Digit	Action	Letter	Action																														
1	2510	A																															
2		B																															
3		C																															
4	Directory	D																															
5		NI	Operator																														
*	Login																																
#	DTMF Mask	Fax Freq																															
16.	Record the Day Menu Automated Attendant greeting from an IP Office extension.																																
17.	Once configuration is complete, reboot the DV2000.																																

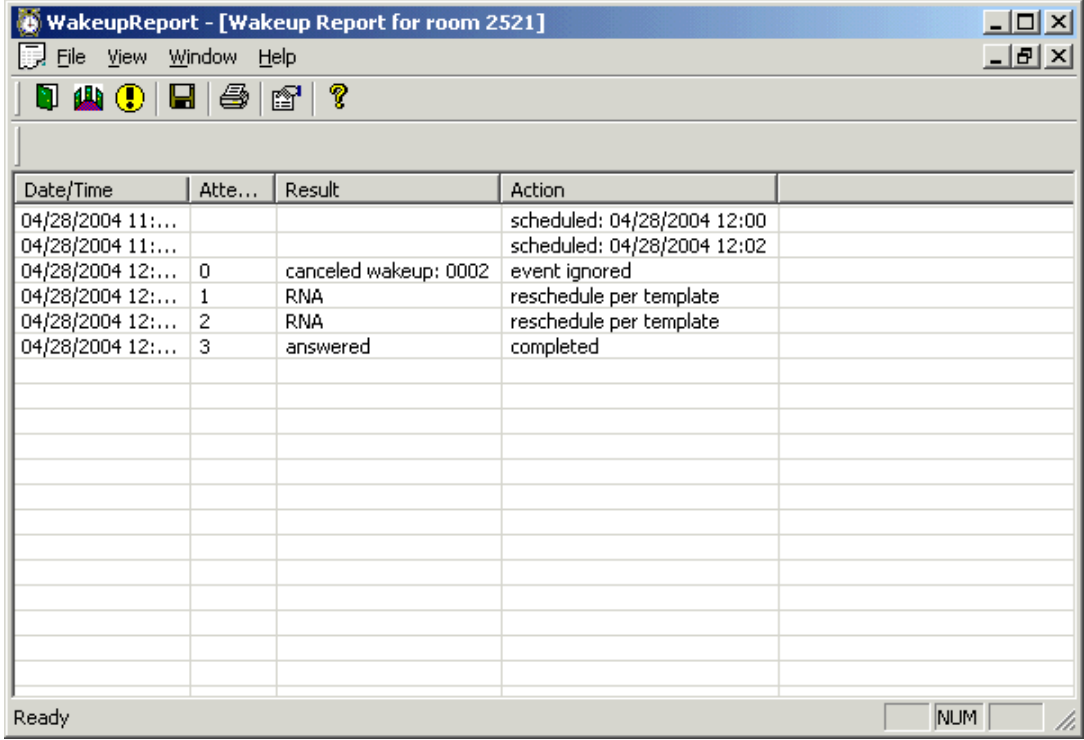
4.3. Use DuVoice DV2000

Step	Description
1.	<p>After the system reboots, log in to the system again as administrator and go to Start → Programs → DuVoice → Port Activity View to see the call activity to the DV2000 ports.</p>  <p>NOTE: This screen shot was taken during the load test.</p>
Perform guest room check-in / check-out using PMS Simulator	
2.	<p>On the DV2000, go to Start → Programs → DuVoice → Hospitality → PMSIntegration to launch the PMS Integration utility.</p>

Step	Description
3.	<p>Go to File → Options to define the Serial Port settings to use. In the Options window that appears, set <i>PMS Protocol</i> to Encore, set <i>PMS Display Name</i> to Encore, check <i>Auto-Connect Serial Port</i>.</p> 

Step	Description																																			
4.	<p>In the Port Settings tab of the Options window, set <i>COM Port</i> to the communications port being used, e.g., 1, <i>Baud Rate</i> to 9600, <i>Data Bits</i> to 8, <i>Parity</i> to N, and <i>Stop Bits</i> to 1 and click OK.</p> 																																			
5.	<p>Commands sent from the PMS Simulator application on the laptop (see Figure 1) through the RS-232 link to perform guest check in and check out are displayed in the PMS Integration tool.</p>  <table border="1" data-bbox="375 1367 1419 1612"> <thead> <tr> <th>Date</th> <th>Time</th> <th>Dir</th> <th>Packet</th> <th>Log</th> </tr> </thead> <tbody> <tr> <td>4/27/2004</td> <td>11:28:55 AM</td> <td>In</td> <td> 22532 7</td> <td>Valid packet</td> </tr> <tr> <td>4/27/2004</td> <td>11:28:55 AM</td> <td>Out</td> <td> </td> <td>ACK</td> </tr> <tr> <td>4/27/2004</td> <td>11:28:56 AM</td> <td>In</td> <td> 22532 7</td> <td>Checkin 2532 succeeded</td> </tr> <tr> <td>4/27/2004</td> <td>11:29:32 AM</td> <td>In</td> <td> 32532 6</td> <td>Valid packet</td> </tr> <tr> <td>4/27/2004</td> <td>11:29:32 AM</td> <td>Out</td> <td> </td> <td>ACK</td> </tr> <tr> <td>4/27/2004</td> <td>11:29:33 AM</td> <td>In</td> <td> 32532 6</td> <td>Checkout 2532 succeeded</td> </tr> </tbody> </table>	Date	Time	Dir	Packet	Log	4/27/2004	11:28:55 AM	In	22532 7	Valid packet	4/27/2004	11:28:55 AM	Out		ACK	4/27/2004	11:28:56 AM	In	22532 7	Checkin 2532 succeeded	4/27/2004	11:29:32 AM	In	32532 6	Valid packet	4/27/2004	11:29:32 AM	Out		ACK	4/27/2004	11:29:33 AM	In	32532 6	Checkout 2532 succeeded
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Step	Description																																								
	Using the Room Status Monitor																																								
6.	<p>Go to Start → Programs → DuVoice → Hospitality → RoomStatusMonitor. In the Room Status Monitor window that appears, all rooms are listed along with the room type (Class), total number of messages in the guest's voicemail, the Next Wakeup scheduled, as well as the Last Wakeup that occurred and its status (answered, not answered, etc.). If a guest is checked into a room, a check appears next to the room number. From this window, personnel can check in / check out a guest, move a guest to another room, schedule a wakeup, and perform other tasks. Please refer to the product documentation for details and more information.</p>  <table border="1" data-bbox="370 604 1425 1096"> <thead> <tr> <th>Room</th> <th>Class</th> <th>Msgs</th> <th>Next Wakeup</th> <th>Last Wakeup</th> </tr> </thead> <tbody> <tr> <td>✓ 2500</td> <td>Extended Stay</td> <td>0</td> <td></td> <td></td> </tr> <tr> <td>✓ 2501</td> <td>Guest</td> <td>0</td> <td></td> <td>04/27/2004 15:45 [answered]</td> </tr> <tr> <td>✓ 2511</td> <td>Extended Stay</td> <td>0</td> <td></td> <td></td> </tr> <tr> <td>✓ 2520</td> <td>Extended Stay</td> <td>0</td> <td></td> <td></td> </tr> <tr> <td>✓ 2521</td> <td>Guest</td> <td>0</td> <td></td> <td></td> </tr> <tr> <td>✓ 2531</td> <td>Extended Stay</td> <td>0</td> <td></td> <td></td> </tr> <tr> <td>✓ 2532</td> <td>Guest</td> <td>0</td> <td></td> <td></td> </tr> </tbody> </table>	Room	Class	Msgs	Next Wakeup	Last Wakeup	✓ 2500	Extended Stay	0			✓ 2501	Guest	0		04/27/2004 15:45 [answered]	✓ 2511	Extended Stay	0			✓ 2520	Extended Stay	0			✓ 2521	Guest	0			✓ 2531	Extended Stay	0			✓ 2532	Guest	0		
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Step	Description																												
	Wakeup Reports																												
7.	To generate a wakeup report, go to Start → Programs → DuVoice → Hospitality → Wakeup Report . In the window that appears, select the room number to generate the report.																												
	 <table border="1"> <thead> <tr> <th>Date/Time</th> <th>Atte...</th> <th>Result</th> <th>Action</th> </tr> </thead> <tbody> <tr> <td>04/28/2004 11:...</td> <td></td> <td></td> <td>scheduled: 04/28/2004 12:00</td> </tr> <tr> <td>04/28/2004 11:...</td> <td></td> <td></td> <td>scheduled: 04/28/2004 12:02</td> </tr> <tr> <td>04/28/2004 12:...</td> <td>0</td> <td>canceled wakeup: 0002</td> <td>event ignored</td> </tr> <tr> <td>04/28/2004 12:...</td> <td>1</td> <td>RNA</td> <td>reschedule per template</td> </tr> <tr> <td>04/28/2004 12:...</td> <td>2</td> <td>RNA</td> <td>reschedule per template</td> </tr> <tr> <td>04/28/2004 12:...</td> <td>3</td> <td>answered</td> <td>completed</td> </tr> </tbody> </table>	Date/Time	Atte...	Result	Action	04/28/2004 11:...			scheduled: 04/28/2004 12:00	04/28/2004 11:...			scheduled: 04/28/2004 12:02	04/28/2004 12:...	0	canceled wakeup: 0002	event ignored	04/28/2004 12:...	1	RNA	reschedule per template	04/28/2004 12:...	2	RNA	reschedule per template	04/28/2004 12:...	3	answered	completed
Date/Time	Atte...	Result	Action																										
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04/28/2004 12:...	2	RNA	reschedule per template																										
04/28/2004 12:...	3	answered	completed																										

5. Interoperability Compliance Testing

This Interoperability Compliance Test included feature, functionality and performance load testing. Feature and functionality testing examined DuVoice DV2000's ability to work with Avaya IP Office. The following features were verified: automated attendant, voicemail, wakeup call, and PMS-link interface. Performance load tests verified the configuration continued operating under load.

5.1. General Test Approach

Feature and functionality testing was performed manually. Inbound calls were made to the IP Office from analog, T1, and PRI trunks as well as internal extensions. The IP Office routed all calls to the *DV2000 AA Hunt* hunt group, which were answered by DV2000 voicemail ports connected to analog station ports assigned to the hunt group. On answering external calls, the

DV2000 would play a main welcome greeting which permitted the caller to transfer to an extension or access the voicemail menu to retrieve messages. Analog loop start trunks and PRI trunks from the central office were connected to the IP Office. The configuration was changed to T1 for the T1 test cases. In addition to using internal and inbound calls to exercise the automated attendant and voicemail capabilities of the DV2000, “guests” as well as “staff” scheduled wakeup calls via phone. The PMS-link interface, room check in/check out/moves which would purge voicemail accounts, turn on / turn off messaging waiting lamps, enable / disable call restrictions on an extension, and wakeup call reporting were verified through the various interfaces available from the DV2000.

Performance testing was accomplished by utilizing a call generation tool for placing calls from a PRI trunk to the IP Office. The PRI trunk port on the call generation tool was connected to the PRI trunk port on the IP Office. Call generation tool scripts were written to place calls to the DV2000 configured hunt group on the IP Office. The first script placed a call to the IP Office through a PRI channel. When the DV2000 answered the call, the script would enter the desired user extension for a transfer. Following transfer to the desired extension by the DV2000, the script would wait until the call was forwarded to the user’s voicemail on the DV2000, leave a message and hang up. The second script would place a call to the IP Office through a PRI channel. When the DV2000 answered the call, the script would access the voicemail account for the extension called in the first script and log in. After logging into the voicemail account, the script would review the message, delete it, and hang up. Both scripts were run sequentially. Throughout the performance test run, the DV2000 was configured to run both scripts repeatedly on PRI channels 1 through 7 to exercise the first 7 ports of the 8-port DV2000. The eighth DV2000 port was reserved for sending message waiting lamp notifications to the user extensions. In high traffic scenarios, the wakeup and message lamp notifications are sent through ports dedicated for the purpose. For instructions on how to dedicate a port for wakeup and message lamp notifications, please refer to the DuVoice documentation.

5.2. Test Results

Most feature, functionality, and performance test cases passed. All issues and/or observations noted during testing were presented in Section 1.1 of these Application Notes. Overnight performance testing at a rate of 420 BHCA² as reported by the call generation tool was conducted on the 8-port DV2000. Performance statistics were captured on the DV2000 to ensure that it was able to handle the call volume.

² The BHCA value of 420 BHCA reported by the call generation tool is equivalent to 630 BHCA experienced on the DV2000 because the first script placed 2 calls to the DV2000 – the first was to the main greeting, the second was once the call was forwarded to the user’s voicemail coverage.

6. Verification Steps

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

- To verify integration: Call the voicemail hunt group, e.g., 3000, from an IP Office extension that has been assigned a DV2000 voicemail account, e.g., 2501. The user should automatically be placed in the voicemail account for the extension.
- To verify incoming calls are properly routed to the voicemail hunt group (**DV2000 AA Hunt**): Connect analog phones to the ports assigned to the hunt group and place calls through the IP Office trunks assigned to the hunt group. Verify one of the phones rings.
- To verify correct operation of external calls: Place a call to the IP Office through one of the trunks assigned to the **DV2000 AA Hunt** hunt group. Verify the main greeting plays.
- To verify guest room check in, check out or room move, use either the Room Status Monitor or the PMS Integration tool described in Section 4.3 to perform the task.

7. Support

Customers should call the DuVoice Customer Service Center when having problems related to the DV2000 product components. DuVoice 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 DuVoice's discretion, on-site technical support.

For technical support on DV2000, contact the DuVoice Customer Service Center at (425) 250-2393. Technical support email can be sent to support@duvoice.com.

8. Conclusion

These Application Notes describe the required configuration steps for DuVoice DV2000 to successfully interoperate with Avaya IP Office. Features, functionality, and performance were successfully validated.

9. Additional References

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

Avaya IP Office CTI Link Installation Manual, 40DHB0002UKAB – Issue 5 (10/28/2003)

DuVoice System Guide

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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 DeveloperConnection Program at devconnect@avaya.com.