



Avaya Solution & Interoperability Test Lab

Application Notes for Loquendo Speech Suite with Avaya Interactive Response and Avaya Communication Manager - Issue 1.0

Abstract

These Application Notes describe the configuration steps required for Loquendo Speech Suite to successfully interoperate with Avaya Interactive Response (IR) and Avaya Communication Manager. Loquendo Speech Suite 7.0 uses the Media Resource Control Protocol (MRCP) version 1 for its text-to-speech (TTS) and advanced speech recognition (ASR) features to interface with TAS and VoiceXML applications running on Avaya IR 1.3. Information in these Application Notes has been obtained through compliance testing and additional technical discussions. Testing was conducted via the Developer*Connection* Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

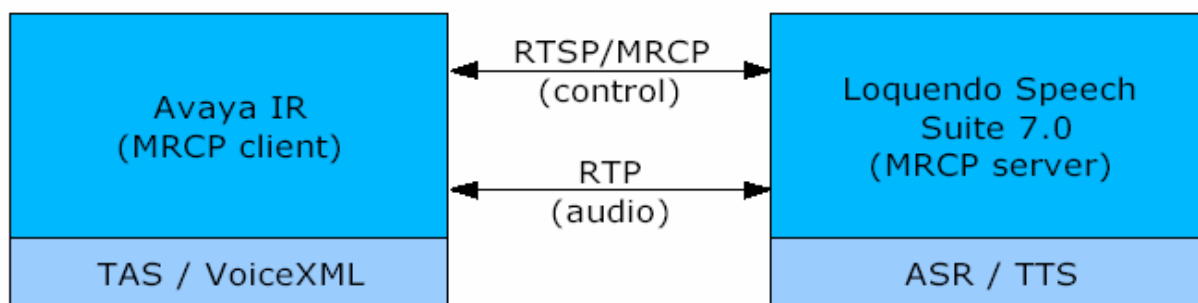
These Application Notes describe the compliance-tested configurations utilizing Avaya IR 1.3, Avaya Communication Manager 3.0.1 and Loquendo Speech Suite 7.0. Loquendo Speech Suite 7.0 uses the Media Resource Control Protocol (MRCP) version 1 for its text-to-speech (TTS) and advanced speech recognition (ASR) features to interface with TAS and VoiceXML applications running on the Avaya Interactive Response (IR) 1.3 platform.

Loquendo's Text-to-Speech (TTS) engine provides synthetic multilingual/multivoice for all types of voice applications such as e-mail reading, real-time news, and self-service applications. Loquendo's Advanced Speech Recognition (ASR) engine supports speech enabled applications such as automated directory assistance services, mobile public voice ports and embedded applications by providing speaker-independent, large scale vocabulary, barge-in facilities and multi-languages capability.

Loquendo Speech Suite 7.0 is a software solution running on Microsoft Windows Server 2000, 2003, XP or Linux RedHat 7.3. It provides flexible speech enabled services such as lifelike text-to-speech and speaker-independent speech recognition using multilingual speech technologies. MRCP is an emerging, open standard for speech interfaces that supports the interoperability of vendor systems. MRCP addresses the communications between interactive voice response systems such as Avaya IR 1.3 and specialized speech engines such as Loquendo Speech Suite 7.0 TTS and ASR engines.

The Loquendo Server supports interfaces with Avaya IR 1.3 via a TCP/IP connection. Avaya IR 1.3 communicates with the Loquendo server using two different protocols:

- Signaling requests for call set-up and teardown between servers use Real-time Streaming Protocol (RTSP) connections.
- Audio data (speech delivered to an ASR engine for recognition and synthesized speech delivered from a TTS engine) is carried over a Real-time Transport Protocol (RTP) connection.



Avaya IR and Loquendo Speech Suite interoperating.

Figure 1 illustrates the configuration used to verify the Loquendo Speech Suite 7.0 Solution. The Loquendo Speech Suite 7.0 was installed on a Windows Server with TTS and ASR Engines. VoiceXML and TAS Scripts that used the TTS and ASR engines were installed on Avaya IR 1.3. The Avaya G600 Media Gateway interfaced with the Avaya IR via a T1. The T1 channels were configured as DS1FD stations. Avaya IP phones were used to make calls that would run the Voice XML and TAS scripts on the Avaya IR. The scripts would use the TTS engine to play synthesized prompts and verify DMTF presses and barge-in attempts. The scripts would use the ASR engine to verify the speech recognition for user input and barge-in attempts.

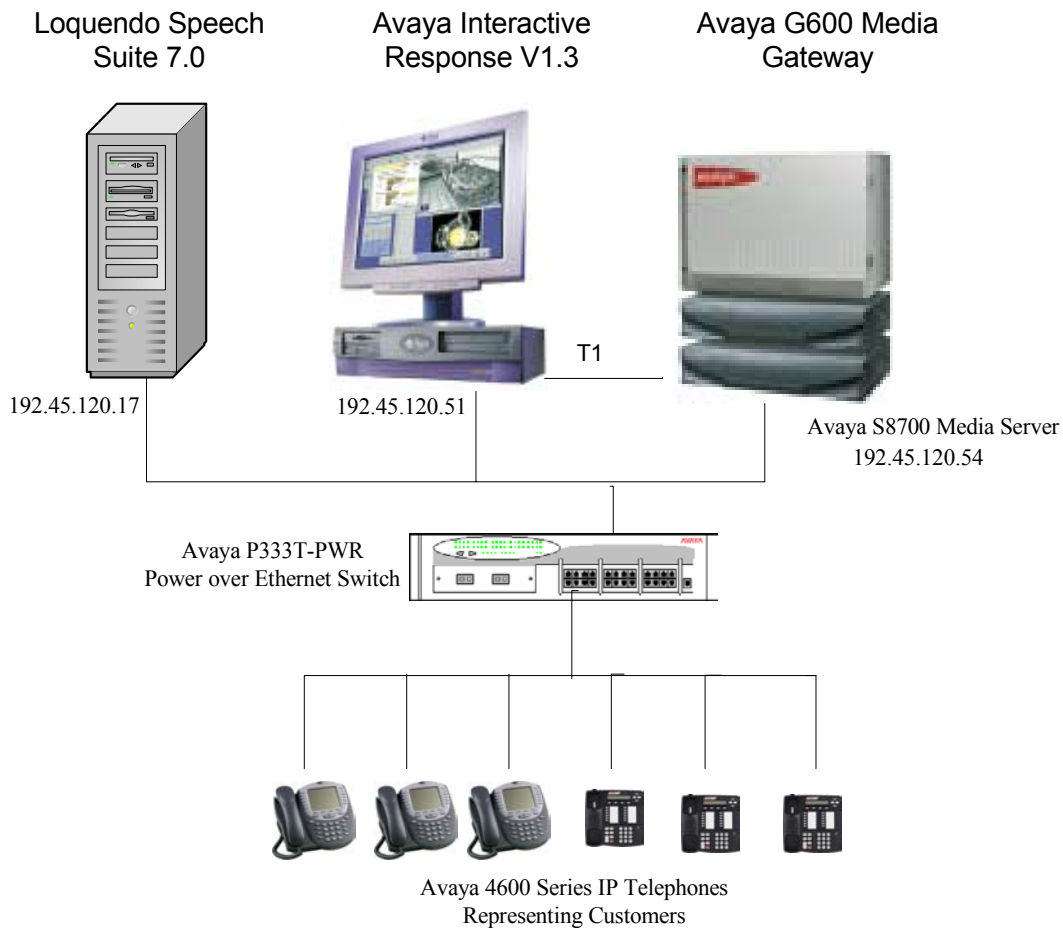


Figure 1: Loquendo Speech Suite 7.0 with Avaya IR 1.3 Configuration

2. Equipment and Software Validated

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

Equipment	Software
Avaya IR on SunBlade 150	1.3
Avaya S8700 Media Server	Avaya Communication Manager R013x.00.1.346.0 (3.0.1)
G600 Media Gateway TN799DP Control-LAN TN2312BP IP Server INTFC TN2302AP IP Media Processor	FW15 FW21 FW93
Avaya IR Designer	5.1
Avaya 4600 Series IP Telephones	1.8.3 (4612IP) 1.8.3 (4624IP)
Loquendo Speech Suite	7.0
PC (Pentium III, 1.0 GHz w/1.0 Gbyte RAM)	Windows 2000 Service Pack 4

3. Configure Avaya Communication Manager

This section presents the configuration required on Avaya Communication Manager to interface with Avaya IR. It is assumed that Avaya Communication Manager is enabled with feature licenses for Vectoring and Expert Agent Selection. This covers the following capabilities:

- Inbound calls are routed to **VDN 7910** that invokes **Vector 2**.
- **Vector 2** queues the incoming call to **Hunt Group 2** with IVR ports.
- IVR ports are configured as **Stations** (79101-79124).
- Stations associated with IVR ports automatically log into the hunt group via **Agent LoginIDs** (29101-29024).

The following configuration is performed via the System Access Terminal (SAT). It is assumed that the Avaya Media Server has already been assigned an IP address.

Step	Description
1.	<p>Use the add ds1 n command, where n is a valid board number. Configure the DS1 board that provides T1 connectivity to Avaya IR. The Signaling Mode of the DS1 board is set to <i>robbed-bit</i> signaling with a Line Coding and Framing Mode of <i>b8zs</i> and <i>esf</i>, respectively.</p> <pre> add ds1 1a09 Page 1 of 1 DS1 CIRCUIT PACK Location: 01A09 Name: Avaya IR Bit Rate: 1.544 Line Coding: b8zs Line Compensation: 1 Framing Mode: esf Signaling Mode: robbed-bit Interface Companding: mulaw Idle Code: 11111111 Slip Detection? n Near-end CSU Type: other </pre>
2.	<p>Use the add station n command, where n is a valid extension, to configure each IVR port as a station with the Type field set to <i>DS1FD</i>. Repeat this configuration for each IVR port. In this configuration, 24 IVR ports were configured with an extension range of 79101 to 79124. These stations will be members of Hunt Group 2 (configured in Step 5) and will automatically log into the split via the Agent LoginIDs (configured in Step 6)</p> <pre> add station 79101 Page 1 of 3 STATION Extension: 79101 Lock Messages? n BCC: 0 Type: DS1FD Security Code: TN: 1 Port: 01A0901 Coverage Path 1: COR: 1 Name: Avaya IR Port 1 Coverage Path 2: COS: 1 Hunt-to Station: Tests? y STATION OPTIONS Loss Group: 4 Off Premises Station? y R Balance Network? n </pre>

Step	Description
3.	<p data-bbox="362 233 1365 300">Use the add vdn n command, where n is an unused vdn number, to create the Vector Director Number (VDN) that will handle all incoming calls.</p> <pre data-bbox="362 338 1382 772"> add vdn 7910 Page 1 of 2 VECTOR DIRECTORY NUMBER Extension: 7910 Name: Avaya IR Vector Number: 2 Meet-me Conferencing? n Allow VDN Override? n COR: 1 TN: 1 Measured: none 1st Skill: 2nd Skill: 3rd Skill: </pre>
4.	<p data-bbox="362 812 1386 953">Use the change vector n command, where n is an unused vector number, to configure the vector. VDN 7910, configured above, will invoke vector 2 which will queue the call to the IVR hunt group via the queue-to skill step. Configure vector 2 as shown below.</p> <pre data-bbox="362 991 1414 1346"> change vector 2 Page 1 of 3 CALL VECTOR Number: 2 Name: Avaya IR Meet-me Conf? n Lock? n Basic? y EAS? y G3V4 Enhanced? y ANI/II-Digits? y ASAI Routing? y Prompting? y LAI? n G3V4 Adv Route? y CINFO? y BSR? y Holidays? y Variables? n 01 wait-time 2 secs hearing ringback 02 queue-to skill 2 pri m 03 04 </pre>

Step	Description
5.	<p>Enter the add hunt-group n command, where n is an unused hunt group number. The IVR ports, configured as DS1FD stations, will automatically log into Hunt Group 2. Set the Group Extension field to a valid extension and enable the ACD and Vector options.</p>
	<pre> add hunt-group 2 Page 1 of 3 HUNT GROUP Group Number: 2 ACD? y Group Name: Avaya IR Ports Queue? y Group Extension: 79200 Vector? y Group Type: ucd-mia TN: 1 COR: 1 MM Early Answer? n Security Code: ISDN Caller Display: </pre>
	<p>On Page 2 of the Hunt Group form, enable the Skill and AAS options. The AAS option will allow the IVR ports to automatically log into the hunt group via the Agent LoginIDs.</p>
	<pre> add hunt-group 2 Page 2 of 3 HUNT GROUP Skill? y Expected Call Handling Time (sec): 180 AAS? y Measured: none Supervisor Extension: Controlling Adjunct: none Redirect on No Answer (rings): Redirect to VDN: Forced Entry of Stroke Counts or Call Work Codes? n </pre>

Step	Description
6.	<p>Use the add agent-loginID n, where n is a valid extension, command to add an agent. Add an Agent LoginID for each IVR port. The AAS option is enabled and the Port Extension is set to the extension of the stations corresponding to each IVR port. Repeat this configuration for each DS1FD station. In this configuration, agent login IDs 29101 to 29124 was created.</p>
	<pre> add agent-loginID 29101 Page 1 of 2 AGENT LOGINID Login ID: 29101 AAS? y Name: Avaya IR Port 1 AUDIX? n TN: 1 LWC Reception: spe COR: 1 LWC Log External Calls? n Coverage Path: AUDIX Name for Messaging: Security Code: LoginID for ISDN Display? n Port Extension: 79101 Auto Answer: station WARNING: Agent must log in again before skill changes take effect </pre>
	<p style="text-align: center;">Figure 1: Agent LoginID for IVR Ports (Page 1)</p> <p>On Page 2 of the Agent LoginID form, set the skill number (SN) to hunt group 2, which is the hunt group (skill) that the IVR ports will log into.</p>
	<pre> add agent-loginID 29101 Page 2 of 2 AGENT LOGINID Direct Agent Skill: Service Objective? n Call Handling Preference: skill-level Local Call Preference? n SN RL SL SN RL SL SN RL SL SN RL SL 1: 2 1 16: 31: 46: 2: 3: 4: 5: 6: 7: 8: 9: 10: 11: 12: 13: 14: 15: </pre>

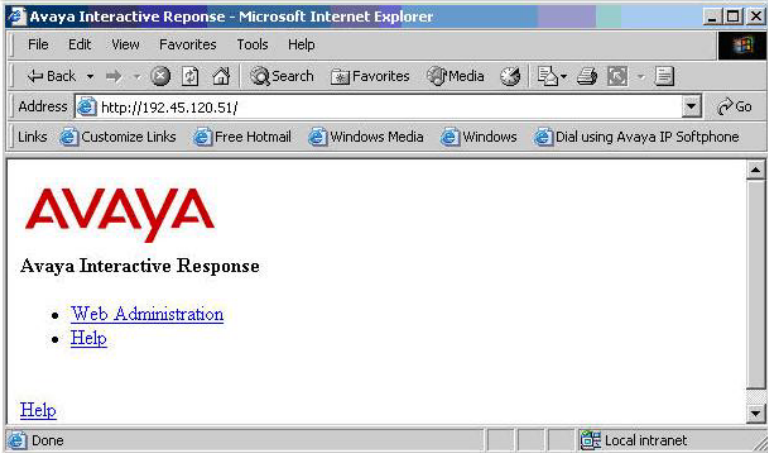
4. Configure Avaya Interactive Response (IR)


This section covers the configuration of Avaya IR. Avaya Communication Manager routes incoming calls to Avaya IR over a T1 interface. Each channel of the T1 interface is assigned a VXML or TAS application and a phone number that should match each extension configured on Avaya Communication Manager. The TAS/VXML applications were assigned to specific channels. The TAS applications were developed with Avaya IR Designer and transferred to Avaya IR. The VXML applications were developed by Loquendo and transferred (using FTP) to Avaya IR. Details of some sample VXML applications can be found in Appendix A. The configuration steps required on Avaya IR are summarized below.

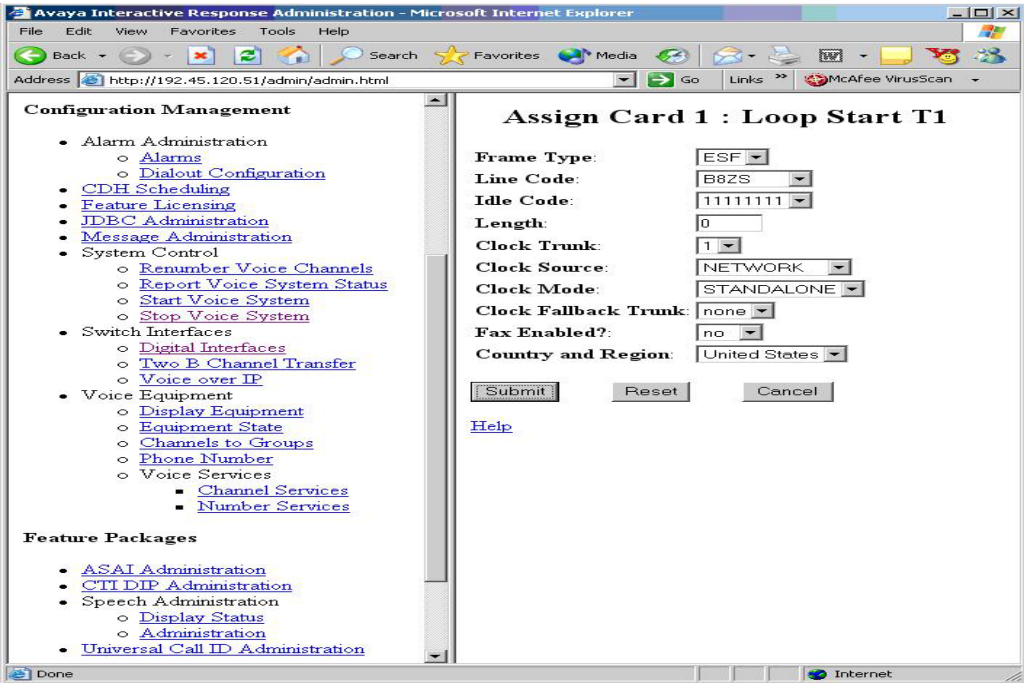
- Access Avaya IR via an Internet Web browser and log in.
- Stop the Voice System (i.e., Avaya IR) prior to configuring the T1 interface.
- Configure the T1 interface to Avaya Communication Manager.
- Start the Voice System.
- Assign channels to equipment groups.
- Assign phone numbers to channels.
- Assign services (TAS/VXML applications) to channels.
- Administer and assign Loquendo Text-to-Speech engine.
- Administer and assign Loquendo Speech Recognition engine.

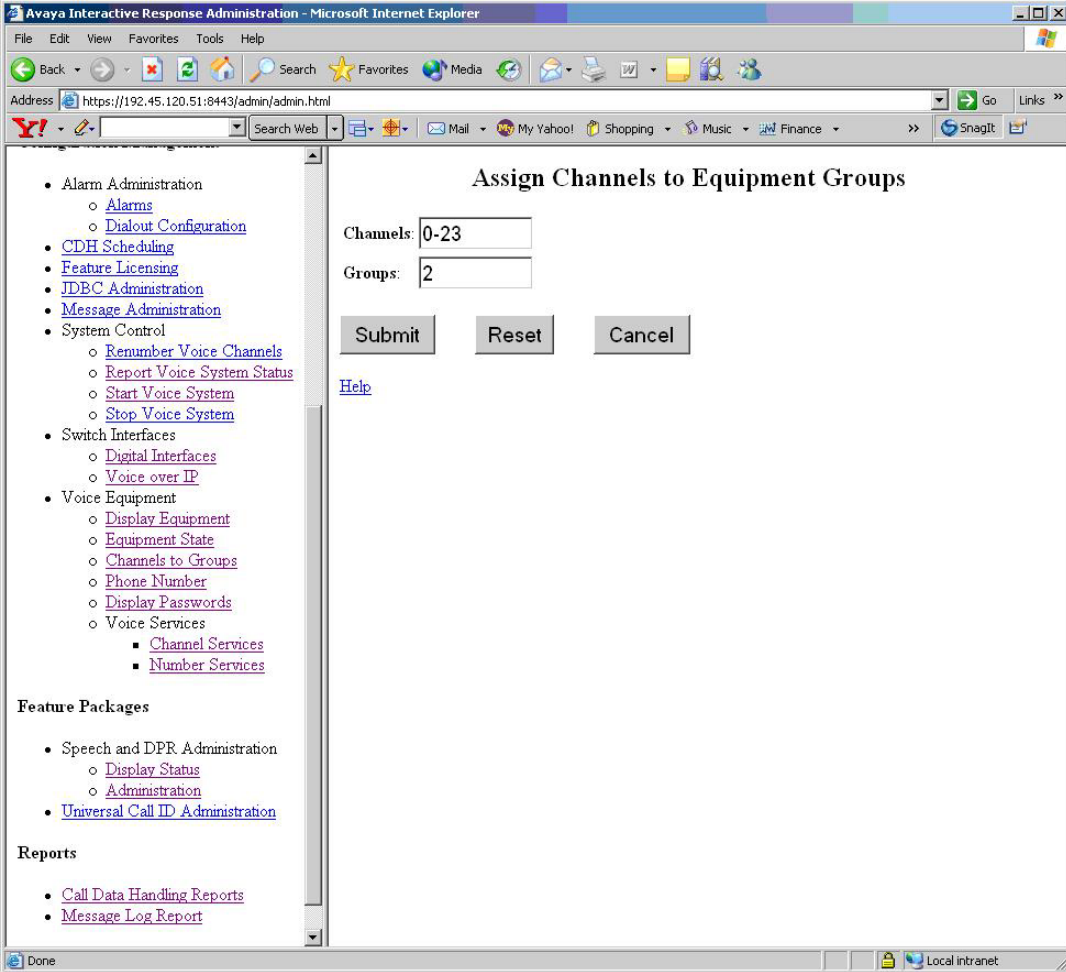
A single Loquendo Speech Suite 7.0 server was configured as an ASR and TTS server used to deliver both speech recognition and text-to-speech simultaneously.

Step	Description
1.	<p>The following packages need to be installed on Avaya IR to support MRCP Text to Speech and MRCP Advance Speech Recognition.</p> <ul style="list-style-type: none"> • Speech Proxy package (<i>AVsproxy</i>) • Speech Proxy SR - Speech Recognition package (<i>AVsrproxy</i>) • Proxy Text-to-Speech package (<i>AVttsprxy</i>) • MRCP Advanced Speech Recognition package (<i>AVmrcpasr</i>) • MRCP Text-to-Speech package (<i>AVmrcptts</i>) <p>To verify which packages are installed, use the “<code>pkginfo grep AV</code>” command from the Avaya IR command line.</p> <pre> devconnectivr(root)# pkginfo grep AV IVR AVbackrst Backup/Restore Utilities IVR AVftst Feature Test Script Package IVR AVir Interactive Response Base System IVR AVjdbcint JDBC Integration IVR AVmigr Migration Tools IVR AVmrcpasr MRCP ASR Proxy IVR AVmrcptts MRCP TTS Proxy IVR AVnms NMS Package IVR AVosr204 SpeechWorks OSR Client Libraries IVR AVsc Service Creation Integration IVR AVsproxy Speech Proxy Base Software IVR AVspw301 SpeechWorks Speechify 3.0.1 Proxy TTS IVR AVsrproxy Speech Proxy SR - Speech Recognition IVR AVtsm Transaction State Machine IVR AVttsprxy Proxy Text-to-Speech Package IVR AVucid Universal Call ID IVR AVval Avaya IR System Validation Package IVR AVvoicxml Voice XML Interpreter IVR AVvoip Voice Over IP IVR AVwebadm Web Administration IVR AVxfer Call Transfer and Bridge Package </pre>

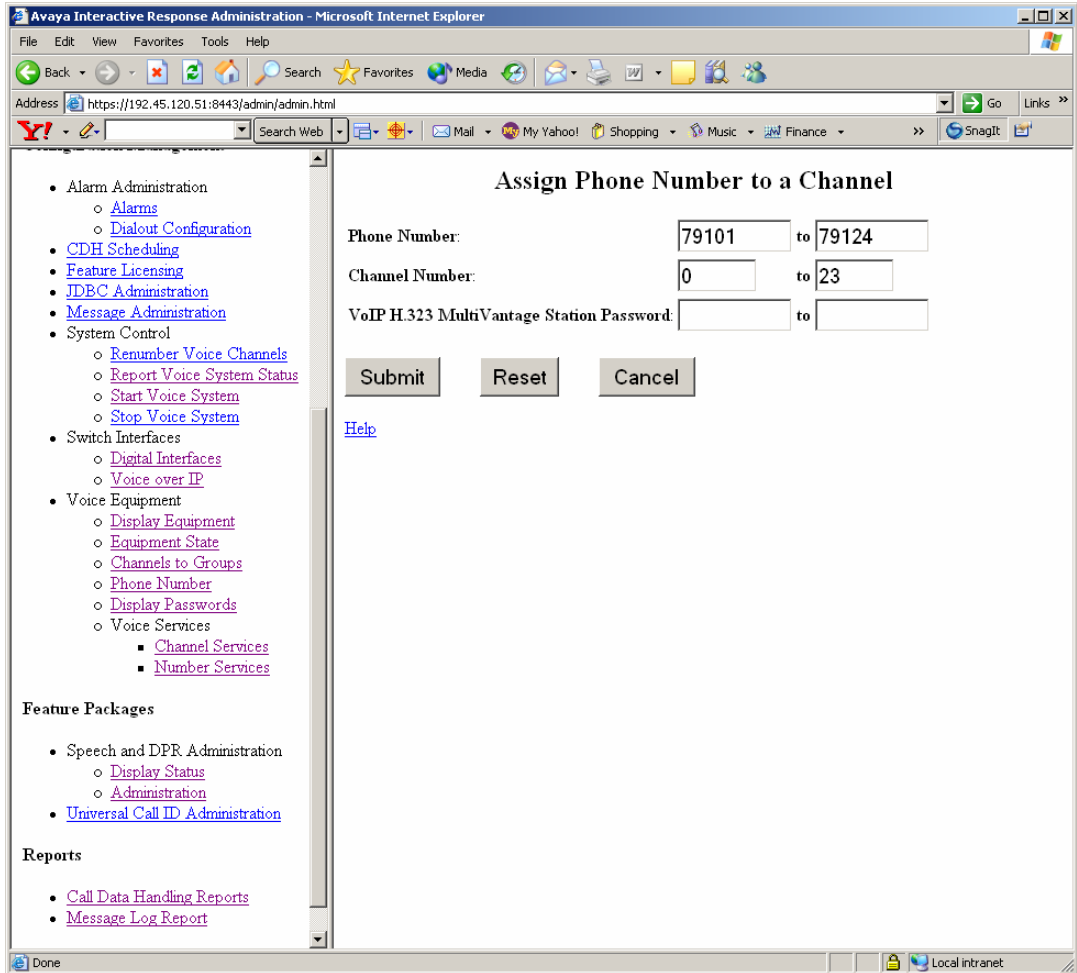
Step	Description
2.	<p>Avaya IR configuration was performed via a web browser. Enter the IP address of Avaya IR in the URL field of the web browser. The initial Avaya IR webpage is displayed. Select the Web Administration link to display the login screen (not shown), and log into Avaya IR as “root”.</p> 

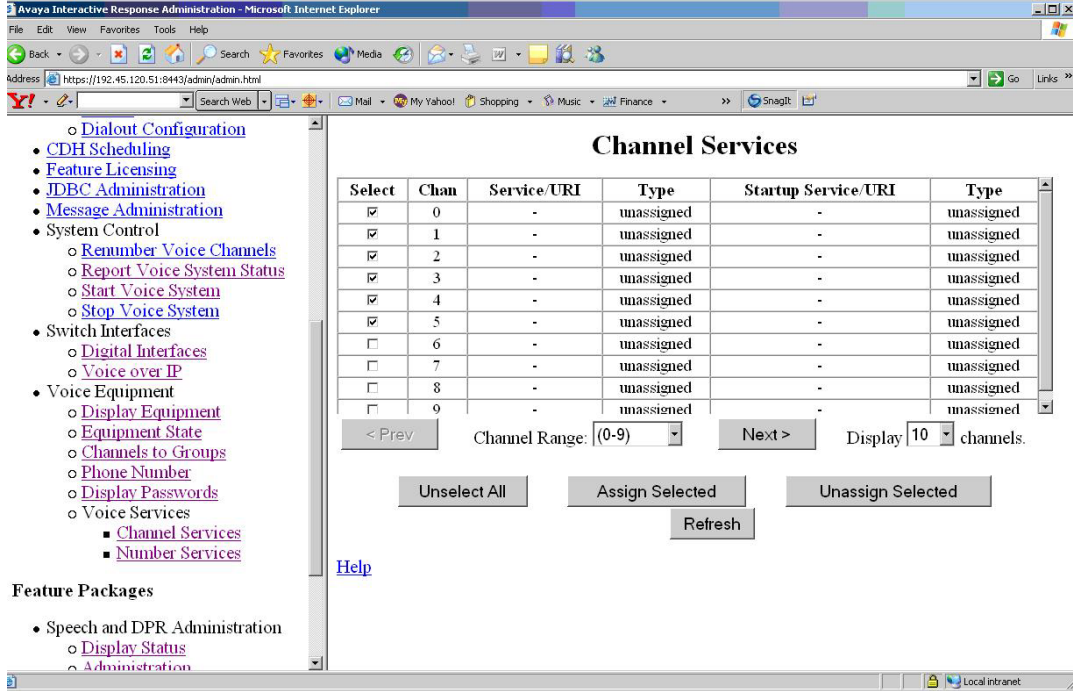
Step	Description
3.	<p>After successfully logging into Avaya IR, the main Avaya IR configuration webpage is displayed as shown.</p>  <p>Configuration Management</p> <ul style="list-style-type: none"> • Alarm Administration <ul style="list-style-type: none"> ◦ Alarms ◦ Dialout Configuration • CDH Scheduling • Feature Licensing • JDBC Administration • Message Administration • System Control <ul style="list-style-type: none"> ◦ Renumber Voice Channels ◦ Report Voice System Status ◦ Start Voice System ◦ Stop Voice System • Switch Interfaces <ul style="list-style-type: none"> ◦ Digital Interfaces ◦ Voice over IP • Voice Equipment <ul style="list-style-type: none"> ◦ Display Equipment ◦ Equipment State ◦ Channels to Groups ◦ Phone Number ◦ Display Passwords ◦ Voice Services <ul style="list-style-type: none"> ▪ Channel Services ▪ Number Services <p>Feature Packages</p> <ul style="list-style-type: none"> • Speech and DPR Administration <ul style="list-style-type: none"> ◦ Display Status ◦ Administration • Universal Call ID Administration <p>Reports</p> <ul style="list-style-type: none"> • Call Data Handling Reports • Message Log Report <p style="text-align: center;">AVAYA</p> <p style="text-align: center;">Copyright © 2002-2003 - Avaya Inc. All rights reserved.</p> <p>***** NOTICE *****</p> <p>No complete backup has been done.</p> <p>No partial backup has been done.</p> <p>It is recommended to perform a full system backup every 30 days. If you fail to do so, you risk losing information on the system in the event of a catastrophe.</p> <p>***** NOTICE *****</p>

Step	Description
4.	<p>Prior to configuring the T1 interface on the Avaya IR, stop Avaya IR by selecting the Stop Voice System link from the left pane. When the Stop Voice System page is displayed click the Submit button and wait until the system displays a message at the bottom of the page indicating that the voice system has completely stopped.</p> <p>To configure the T1 interface to Avaya Communication Manager, follow these steps:</p> <ol style="list-style-type: none"> 1. Under Switch Interfaces in the left pane, select the Digital Interfaces option to display the Digital Interfaces Protocols page. 2. Select the Assign Card link to display the Assign Card – Digital Services page. From this page, select the Loop Start T1 link to display the Assign Card: Loop Start T1 page. 3. Select T1 card '1' and click Submit to configure the T1 card identified by the number '1'. 4. Configure the T1 interface as shown and click Submit. The T1 card is configured with Frame Type set to <i>ESF</i> and Line Code set to <i>B8ZS</i>.  <ol style="list-style-type: none"> 5. After the T1 card is successfully configured, start Avaya IR by selecting the Start Voice System link located under Configuration Management. Before proceeding, wait for the system to display a message indicating that the startup of the voice system is complete.

Step	Description
5.	<p>Assign channels 0-23 to Group 2. Select the Channels to Groups link from the left pane and then select the Assign link to display the Assign Channels to Equipment Groups page. Assign equipment group '2' to channels 0-23 and click Submit. Although channels were assigned to groups in this configuration, it is not required.</p> 

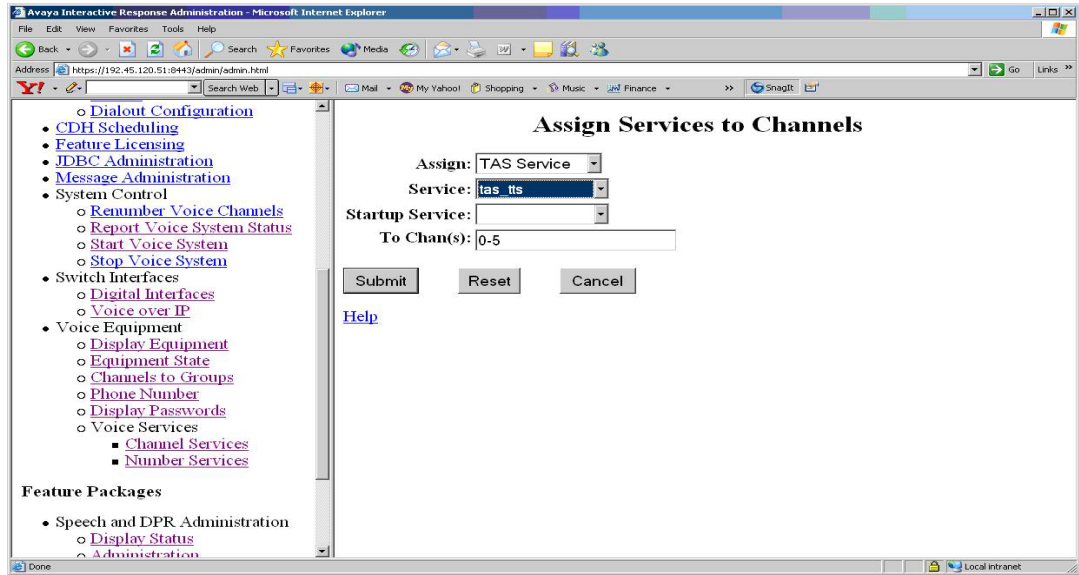
Step	Description
6.	<p>After assigning channels to groups, assign phone numbers to channels. Select the Phone Number link from the left pane to display the Phone Number – Channel Assignment page and select the Assign link. Assign phone numbers 79101 through 79124 to channels 0 through 23, respectively, and then click Submit. Essentially, each DS1FD station extension configured in Avaya Communication Manager is assigned to a T1 channel.</p>



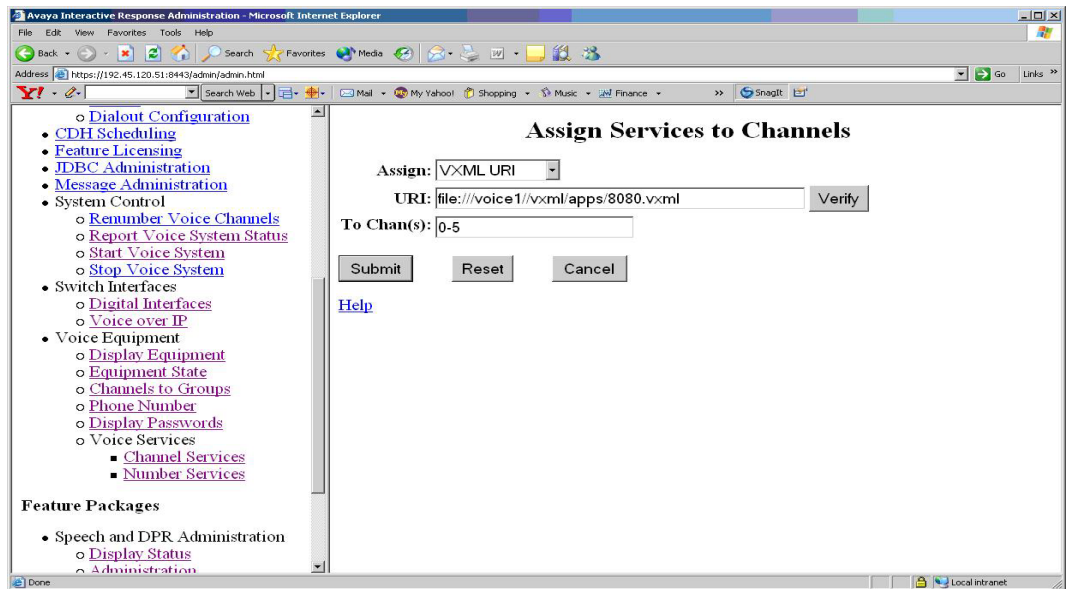
Step	Description
7.	<p>Assign a TAS or VXML application to each channel. This specifies which TAS/VXML application a particular IVR channel should run when it receives a call. Select Channel Services from the left pane to display the Channel Services. Select channels 0-5 for assignment. Six channels are used in this configuration because Loquendo Speech Suite 7.0 has 6 ports licensed for this configuration; more or less ports can be licensed as needed.</p> 

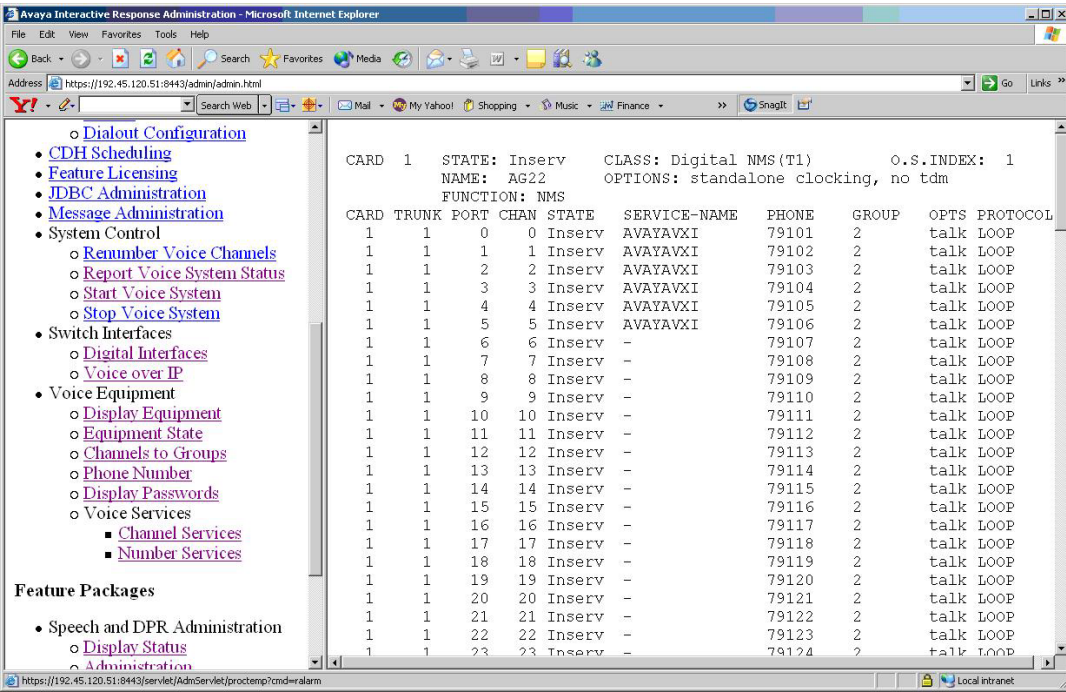
Step	Description
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8. **Assigning TAS applications to channels:**
 Click on the **Assign Selected** button (shown in Step 7) to display the Assign Services to Channel screen. This configuration assigns the TAS application named *tas_tts* to channels 0 to 5.

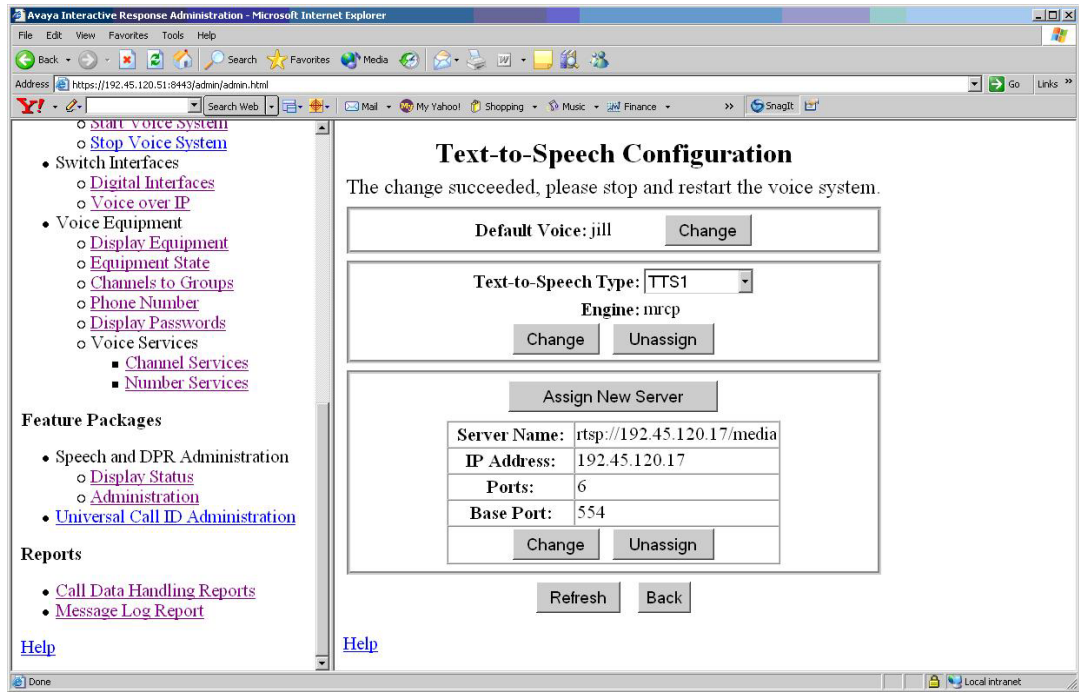


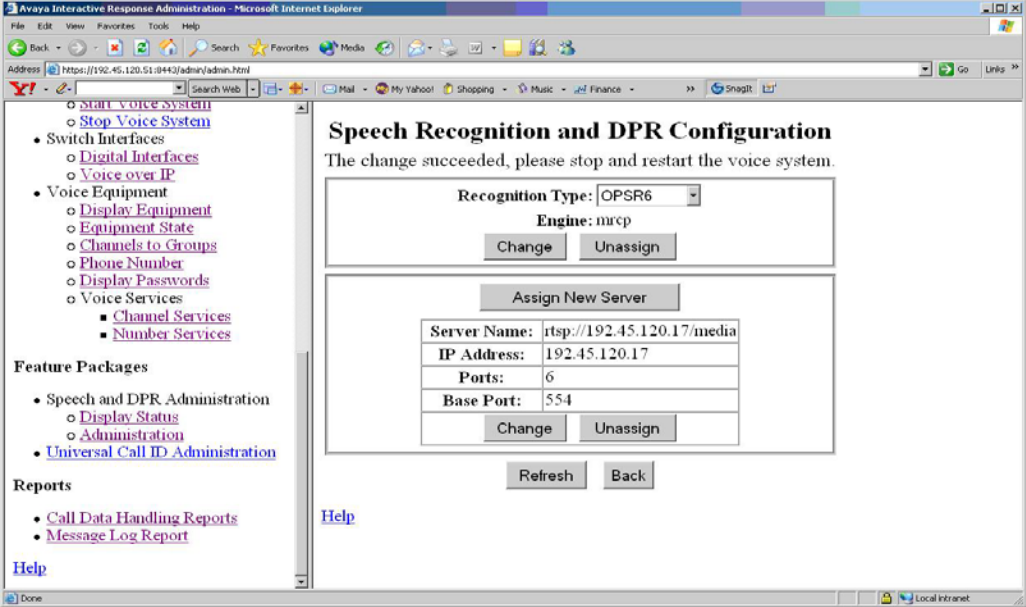
Assigning VXML applications to channels:
 Click on the **Assign Selected** button (shown in Step 7) to display the Assign Services to Channel screen. This configuration assigns the VXML application named *8080.vxml* to channels 0 to 5.



Step	Description																																																																																																																																																																																																																																																										
9.	<p>To view the status of the channels and their configuration details, select Display Equipment from the left pane. Verify the status of channels 0 to 5.</p>  <p>The screenshot shows the Avaya Interactive Response Administration web interface in Microsoft Internet Explorer. The left navigation pane is expanded to 'Voice Equipment' > 'Display Equipment'. The main content area displays a table of channel configurations for CARD 1. The table has columns: CARD, TRUNK, PORT, CHAN, STATE, SERVICE-NAME, PHONE, GROUP, OPTS, and PROTOCOL. The first row shows channel 0 in 'Inserv' state with service name AVAYAVXI and phone number 79101. Subsequent rows show channels 1 through 23, all in 'Inserv' state with service name AVAYAVXI and phone numbers ranging from 79102 to 79123. Channel 22 is in 'Inserv' state with phone number 79123. Channel 23 is in 'Inserv' state with phone number 79124.</p> <table border="1" data-bbox="706 478 1424 997"> <thead> <tr> <th>CARD</th> <th>TRUNK</th> <th>PORT</th> <th>CHAN</th> <th>STATE</th> <th>SERVICE-NAME</th> <th>PHONE</th> <th>GROUP</th> <th>OPTS</th> <th>PROTOCOL</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> <td>0</td> <td>0</td> <td>Inserv</td> <td>AVAYAVXI</td> <td>79101</td> <td>2</td> <td>talk LOOP</td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>Inserv</td> <td>AVAYAVXI</td> <td>79102</td> <td>2</td> <td>talk LOOP</td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td>2</td> <td>2</td> <td>Inserv</td> <td>AVAYAVXI</td> <td>79103</td> <td>2</td> <td>talk LOOP</td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td>3</td> <td>3</td> <td>Inserv</td> <td>AVAYAVXI</td> <td>79104</td> <td>2</td> <td>talk LOOP</td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td>4</td> <td>4</td> <td>Inserv</td> <td>AVAYAVXI</td> <td>79105</td> <td>2</td> <td>talk LOOP</td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td>5</td> <td>5</td> <td>Inserv</td> <td>AVAYAVXI</td> <td>79106</td> <td>2</td> <td>talk LOOP</td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td>6</td> <td>6</td> <td>Inserv</td> <td>-</td> <td>79107</td> <td>2</td> <td>talk LOOP</td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td>7</td> <td>7</td> <td>Inserv</td> <td>-</td> <td>79108</td> <td>2</td> <td>talk LOOP</td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td>8</td> <td>8</td> <td>Inserv</td> <td>-</td> <td>79109</td> <td>2</td> <td>talk LOOP</td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td>9</td> <td>9</td> <td>Inserv</td> <td>-</td> <td>79110</td> <td>2</td> <td>talk LOOP</td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td>10</td> <td>10</td> <td>Inserv</td> <td>-</td> <td>79111</td> <td>2</td> <td>talk LOOP</td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td>11</td> <td>11</td> <td>Inserv</td> <td>-</td> <td>79112</td> <td>2</td> <td>talk LOOP</td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td>12</td> <td>12</td> <td>Inserv</td> <td>-</td> <td>79113</td> <td>2</td> <td>talk LOOP</td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td>13</td> <td>13</td> <td>Inserv</td> <td>-</td> <td>79114</td> <td>2</td> <td>talk LOOP</td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td>14</td> <td>14</td> <td>Inserv</td> <td>-</td> <td>79115</td> <td>2</td> <td>talk LOOP</td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td>15</td> <td>15</td> <td>Inserv</td> <td>-</td> <td>79116</td> <td>2</td> <td>talk LOOP</td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td>16</td> <td>16</td> <td>Inserv</td> <td>-</td> <td>79117</td> <td>2</td> <td>talk LOOP</td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td>17</td> <td>17</td> <td>Inserv</td> <td>-</td> <td>79118</td> <td>2</td> <td>talk LOOP</td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td>18</td> <td>18</td> <td>Inserv</td> <td>-</td> <td>79119</td> <td>2</td> <td>talk LOOP</td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td>19</td> <td>19</td> <td>Inserv</td> <td>-</td> <td>79120</td> <td>2</td> <td>talk LOOP</td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td>20</td> <td>20</td> <td>Inserv</td> <td>-</td> <td>79121</td> <td>2</td> <td>talk LOOP</td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td>21</td> <td>21</td> <td>Inserv</td> <td>-</td> <td>79122</td> <td>2</td> <td>talk LOOP</td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td>22</td> <td>22</td> <td>Inserv</td> <td>-</td> <td>79123</td> <td>2</td> <td>talk LOOP</td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td>23</td> <td>23</td> <td>Inserv</td> <td>-</td> <td>79124</td> <td>2</td> <td>talk LOOP</td> <td></td> </tr> </tbody> </table>	CARD	TRUNK	PORT	CHAN	STATE	SERVICE-NAME	PHONE	GROUP	OPTS	PROTOCOL	1	1	0	0	Inserv	AVAYAVXI	79101	2	talk LOOP		1	1	1	1	Inserv	AVAYAVXI	79102	2	talk LOOP		1	1	2	2	Inserv	AVAYAVXI	79103	2	talk LOOP		1	1	3	3	Inserv	AVAYAVXI	79104	2	talk LOOP		1	1	4	4	Inserv	AVAYAVXI	79105	2	talk LOOP		1	1	5	5	Inserv	AVAYAVXI	79106	2	talk LOOP		1	1	6	6	Inserv	-	79107	2	talk LOOP		1	1	7	7	Inserv	-	79108	2	talk LOOP		1	1	8	8	Inserv	-	79109	2	talk LOOP		1	1	9	9	Inserv	-	79110	2	talk LOOP		1	1	10	10	Inserv	-	79111	2	talk LOOP		1	1	11	11	Inserv	-	79112	2	talk LOOP		1	1	12	12	Inserv	-	79113	2	talk LOOP		1	1	13	13	Inserv	-	79114	2	talk LOOP		1	1	14	14	Inserv	-	79115	2	talk LOOP		1	1	15	15	Inserv	-	79116	2	talk LOOP		1	1	16	16	Inserv	-	79117	2	talk LOOP		1	1	17	17	Inserv	-	79118	2	talk LOOP		1	1	18	18	Inserv	-	79119	2	talk LOOP		1	1	19	19	Inserv	-	79120	2	talk LOOP		1	1	20	20	Inserv	-	79121	2	talk LOOP		1	1	21	21	Inserv	-	79122	2	talk LOOP		1	1	22	22	Inserv	-	79123	2	talk LOOP		1	1	23	23	Inserv	-	79124	2	talk LOOP	
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Step	Description
10.	<p>Configure Avaya IR to use the Server installed with Loquendo Speech Suite 7.0 as a Text-to-Speech (TTS) Server.</p> <ol style="list-style-type: none"> 1. From web administration, go to the Speech Proxy Administration screen (Feature Packages > Speech and DPR Administration > Administration). 2. Select Text-to-Speech Configuration. 3. Select Assign New Server (“Assign New Server” can also be selected from the drop down on the Text to Speech Type menu pull down). In the Text-to-Speech Type field, select an available TTS port in the drop-down text box. Valid types are TTS0 through TTS9; simply choose the first available. In the Engine Field select “mrsp”. Then select Submit. 4. In the Text-to-Speech Configuration window, select “Assign New Server”. 5. In the Server Name field, type the name of the TTS Server with the following format: “rtsp://IP address of TTS Server/media” where the IP address is the IP address of Loquendo’s TTS Server. 6. In the IP address field, type the IP address of Loquendo’s TTS Server. 7. In the Ports field, type the number of ports supported and licensed by the Loquendo’s TTS Server. 8. In the Base Port field, type the number of base port to set for the server. (Default port for Loquendo Speech Suite 7.0 is “554”). 9. Select Submit. 10. Administration changes do not take effect until the voice system is stopped and started.

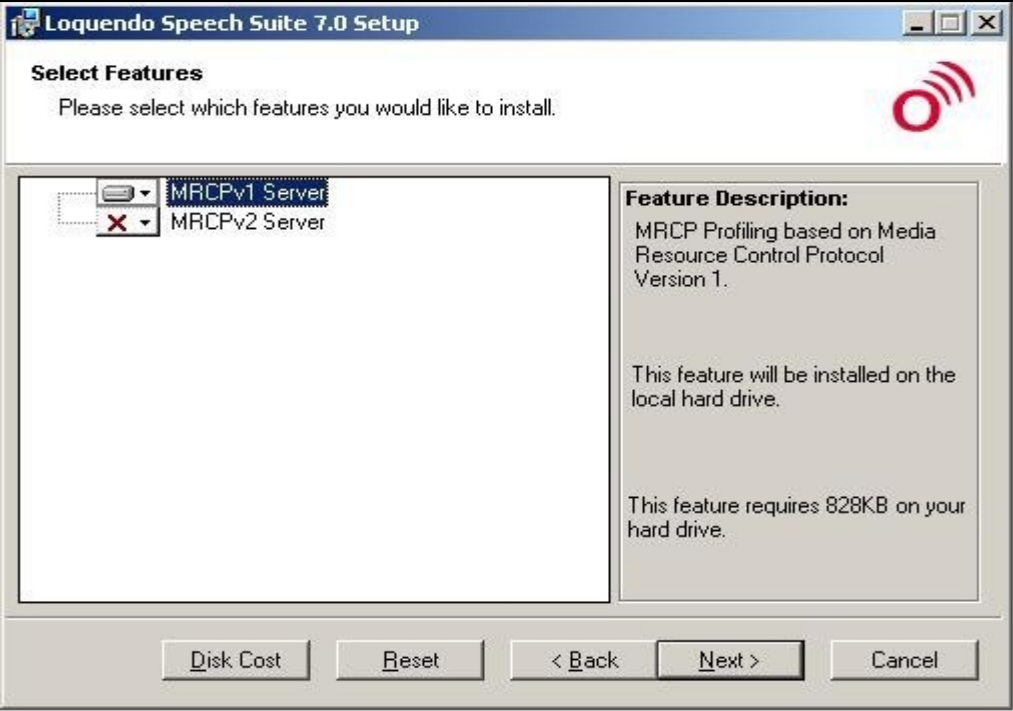


Step	Description
11.	<p>Configure Avaya IR to use the server installed with Loquendo Speech Suite 7.0 as an Advanced Speech Recognition (ASR) Server.</p> <ol style="list-style-type: none"> 1. From web administration, go to the Speech Proxy Administration screen (Feature Packages > Speech and DPR Administration > Administration). 2. Select Speech Recognition and DPR Configuration. 3. If a recognition type has not been previously assigned, select Assign New Recognition Type, or if a recognition type has been previously assigned, in the Recognition Type field select Assign New. In the Recognition Type field, select the speech recognition type to assign, valid types are OPSR0 through OPSR9; simply choose the first available. In the Engine field select “mrpc”. Then select Submit. 4. In the Speech Recognition and DPR Configuration window, select “Assign New Server”. 5. In the Server Name field, type the name of the ASR Server with the following format: “rtsp://IP address of ASR Server/media” where the IP address is the IP address of Loquendo’s ASR Server. 6. In the IP address field, type the IP address of Loquendo’s ASR Server. 7. In the Ports field, type the number of ports supported and licensed by the Loquendo’s ASR Server. 8. In the Base Port field, type the number of base port to set for the server. (Default port for Loquendo Speech Suite 7.0 is “554”). 9. Select Submit. 10. Administration changes do not take effect until the voice system is stopped and started.
12.	

5. Configure Loquendo Speech Suite 7.0

As a software product, the performance of Loquendo Speech Suite 7.0 is dependant upon the hardware platform. As a reference, the minimum hardware requirement for a server with two channels is a Pentium III 800 MHz, with 256 Mbytes RAM. In the test configuration, Speech Suite 7.0 was installed on a generic PC with a Pentium III 1.0 GHz processor with 1.0 GByte of RAM for 6 simultaneous channels with 2 languages and a small to mid-sized grammar. Communication between the Loquendo server and Avaya IR is via TCP/IP, it is strongly suggested that the Avaya IR and Loquendo server be placed on the same subnet with minimal other network traffic in order to minimize network latency between Avaya IR and the Loquendo server.

Step	Description
1.	Loquendo Speech Suite 7.0 can be installed on Microsoft Windows Server 2000, 2003, XP or Linux RedHat 7.3.
2.	<p>The Loquendo Speech Suite 7.0 is distributed on CD-ROM. To install, place the CD-ROM into the drive and run the file Setup.exe. The installation runs through the following steps:</p> <ol style="list-style-type: none">1. A welcome window will be displayed. Click on the “Next” button to continue.2. Read and accept the license agreement and then click on the “Next” button.3. Select the destination folder and click on the “Next” button. The default installation path is “C:\Program Files\Loquendo\Suite”4. Choose “MRCpv1 Server” as the profile to install and click on the “Next” button.

Step	Description
	 <p data-bbox="412 974 1256 1079"> 5. The installation wizard will install the product. 6. At the end of installation process click on the “Finish” button. 7. Restart the server after the installation. </p>

6. Interoperability Compliance Testing

This Interoperability Compliance Test included feature functionality and serviceability testing. Feature functionality testing focused on verifying that Loquendo Speech Suite 7.0 could successfully work with the Avaya IR for the use of synthesized voice in system responses via Text-to-Speech (TTS) and recognition of caller speech via Advanced Speech Recognition. Voice XML and TAS Scripts were used on Avaya IR to test TTS and ASR. Serviceability testing verified that Loquendo Server recovered from adverse conditions, such as rebooting the Loquendo server, Avaya IR, and Avaya Communication Manager and disconnecting the Ethernet cable to the Loquendo server.

6.1. General Test Approach

All feature functionality test cases were performed manually to verify proper operation. The general test approach entailed:

- Verifying Text-To-Speech Feature Functionality between Avaya IR and Loquendo Speech Suite 7.0.
 - Complete synthesized prompts could be heard by the caller.

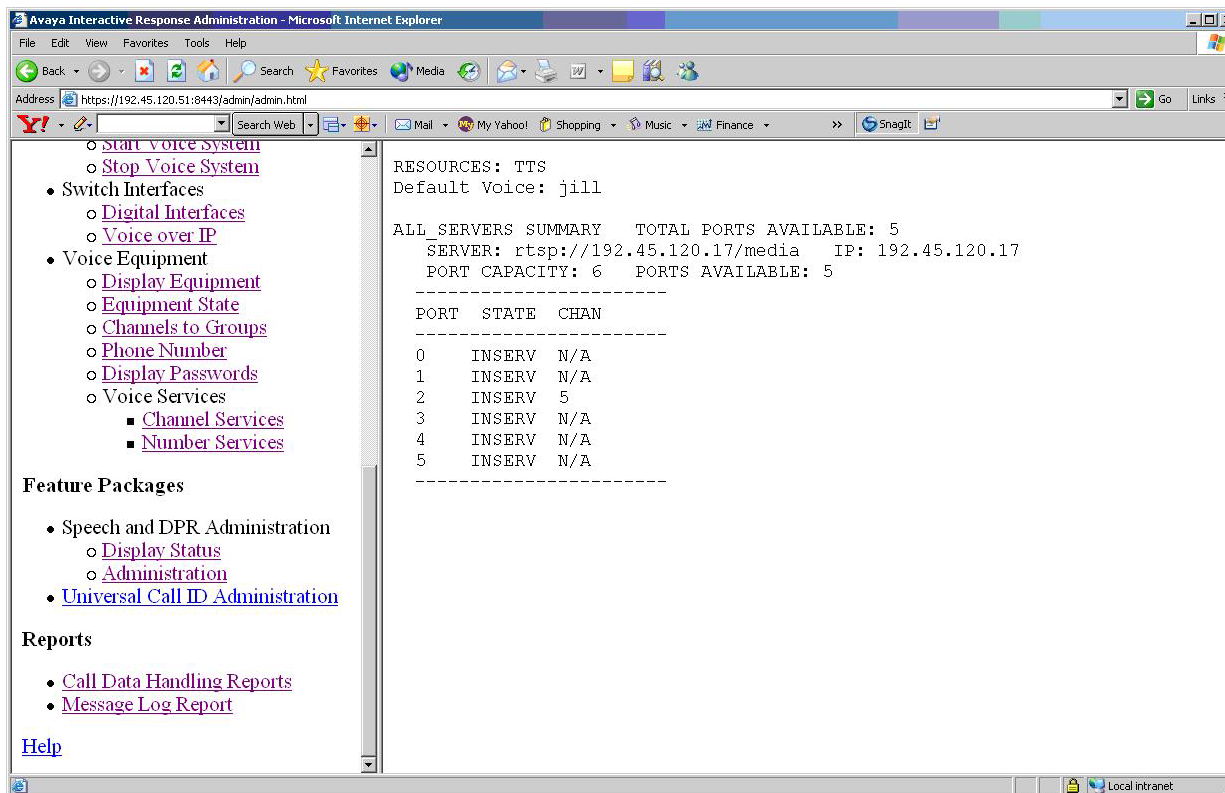
- The Barge-in feature worked when DTMF was pressed.
 - Six simultaneous users could access the synthesized prompts.
 - The synthesized prompts could be heard in English and Italian.
 - Multiple prompts with male and female voices could be heard.
- Verifying Advance Speech Recognition Functionality between Avaya IR and Loquendo Speech Suite 7.0.
 - Successful recognition of “no input”, “no match” and “match” events based on user input was provided.
 - Speech recognition could use a small size grammar (including numbers, days of the week, seasons of the year).
 - The Barge-in feature worked during speech recognition prompt.
 - Speech recognition could use different speakers.
 - Speech recognition could use different grammar sources (inline grammar, built-in grammar, self-generated menu grammar, external grammar).
 - Speech recognition could use multiple languages such as English and Italian.
 - Six simultaneous users could access the speech recognition server.

6.2. Test Results

All feature functionality and serviceability test cases passed. Loquendo Speech Suite 7.0 TTS and ASR engines successfully communicated with Avaya IR using both TAS and VoiceXML applications. For serviceability testing, Loquendo Server was able to recover after resets of the Loquendo Server, Avaya IR and Avaya Communication Manager. The Loquendo Server was also able to recover from network disconnects and reconnects.

7. Verification Steps

The status of the connectivity between the Loquendo Server and Avaya IR can be obtained by viewing the Speech Resource Status Window in Avaya IR (Web Administration -> Speech and DPR Administration -> Display Status -> Speech Resource Status). Select the **Resource Type** that was configured for TTS or ASR, then select “**Submit**”. Verify the states of the ports show “INSERV”. When a connection is being used to the Loquendo Server, the **CHAN** field will be populated.



8. Support

For information about the Loquendo Speech Suite 7.0 contact:

Loquendo – Vocal Technology and Services
Via Valdellatorre, 4-10149 Torino, Italy
www.loquendo.com
lss@loquendo.com

9. Conclusion

These Application Notes describe the required configuration steps for Loquendo Speech Suite 7.0 to successfully interoperate with Avaya IR and Avaya Communication Manager. The configuration described herein describes how to use Loquendo Speech Suite 7.0 ASR and TTS engines with TAS and VoiceXML applications running on Avaya IR. Features and functionality of this solution have all passed.

10. Additional References

This section references the Avaya product documentation that is relevant to these Application Notes. The following Avaya documentation is available at <http://support.avaya.com>.

- [1] *Avaya Interactive Response Online Documentation*.
- [2] *Administrator's Guide for Avaya Communication Manager*, Issue 1, June 2005, Document ID 03-300509.
- [3] *Avaya Communication Manager Release 3.0 Call Center Software Automatic Call Distribution (ACD) Guide*, Issue 1, June 2005 Document ID 07-300301.

Appendix A : Sample VoiceXML scripts for ASR and TTS testing

TTS VoiceXML Script :8090.VXML

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<vxml version="2.0" xmlns="http://www.w3.org/2001/vxml">
<property name='com.avaya.ASRresource' value='off'/>
<property name="interdigittimeout" value="0.5s" />

<form id="form1">
  <block>
    <log label="LOQUENDO_ICT_TTS_8090">Play prompt.</log>
  </block>

  <field name="f1">
    <grammar mode="dtmf" src="builtin:dtmf/digits"/>
    <prompt bargein="true" timeout="1s">Welcome! This is a test of Loquendo's M R C P TTS
server. If you hear my voice, your system is correctly configured!</prompt>

    <filled>
      <prompt>You just pressed: <value expr="f1"/>. Thank you!</prompt>
      <log label="LOQUENDO_ICT_TTS_8090">Filled by DTMF.</log>
      <exit/>
    </filled>

    <nomatch>
      <prompt>I didn't recognize any key within the timeout. Goodbye!</prompt>
      <log label="LOQUENDO_ICT_TTS_8090">Nomatch.</log>
      <exit/>
    </nomatch>

    <noinput>
      <prompt>You didn't press any key within the timeout. Goodbye!</prompt>
      <log label="LOQUENDO_ICT_TTS_8090">Noinput.</log>
      <exit/>
    </noinput>
  </field>
</form>

</vxml>
```

ASR VoiceXML Script :8081.VXML

```

<?xml version="1.0"?>
<vxml version="2.0" xmlns="http://www.w3.org/2001/vxml">

<property name="maxnbest" value="1"/>
<property name="inputmodes" value="voice"/>

<form id="form1">
  <field name="f1">
    <grammar type="application/srgs+xml" mode="voice" version="1.0" xml:lang="en-us"
    root="days">
      <rule id="days" scope="public">
        <one-of>
          <item>monday</item>
          <item>tuesday</item>
          <item>wednesday</item>
          <item>thursday</item>
          <item>friday</item>
          <item>saturday</item>
          <item>sunday</item>
        </one-of>
      </rule>
    </grammar>

    <prompt bargein="false" timeout="5s">
      <audio src="file:///vs/data/vxml/prompts/day.wav"/>
    </prompt>

    <filled>
      <log label="LOQUENDO_ICT_ASR_8081">Value entered:<value expr="f1$.utterance"/>.
      Mode: <value expr="f1$.inputmode"/></log>
      <prompt>
        <audio src="file:///vs/data/vxml/prompts/pass.wav"/>
      </prompt>
      <exit/>
    </filled>

    <nomatch>
      <log label="LOQUENDO_ICT_ASR_8081">Nomatch.</log>
      <prompt bargein="false">
        <audio src="file:///vs/data/vxml/prompts/nomatch.wav"/>
      </prompt>
      <exit/>
    </nomatch>

    <noinput>

```

```
<log label="LOQUENDO_ICT_ASR_8081">Noinput.</log>
<prompt bargein="false">
  <audio src="file:///vs/data/vxml/prompts/noinput.wav"/>
</prompt>
<exit/>
</noinput>

</field>
</form>
</vxml>
```

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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.