



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

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# **A Sample Run of IQ Services' Feature Function Test Service with Avaya Voice Portal – Issue 1.0**

### **Abstract**

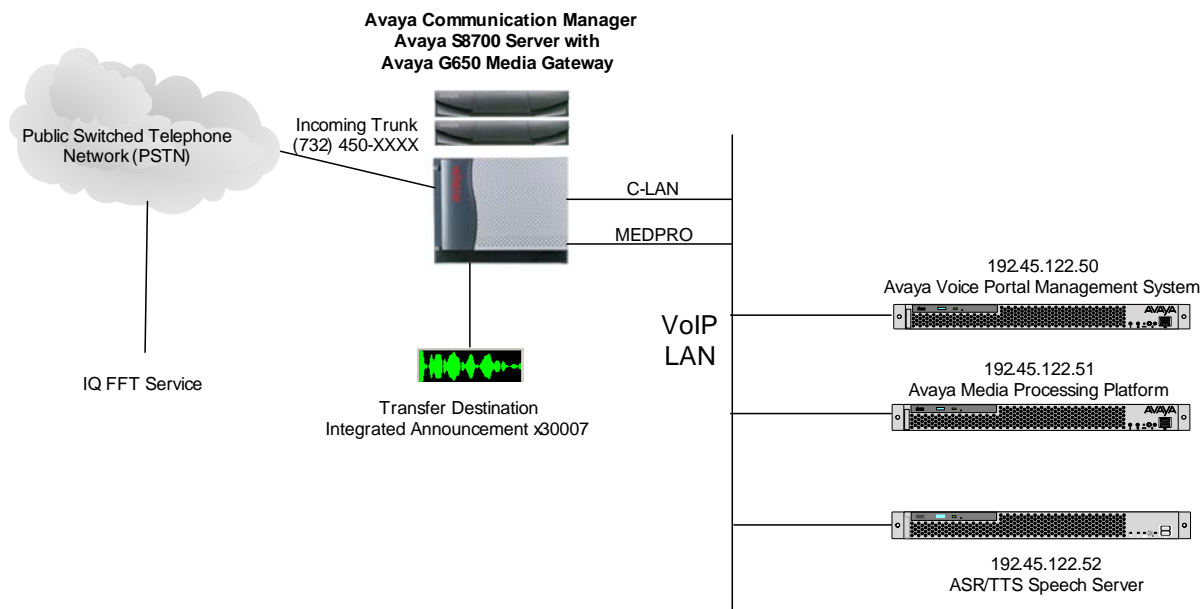
Feature Function Test is a service provided by IQ Services, Inc. that provides comprehensive and accurate verification of each feature of a voice business solution, such as an interactive voice response system application, against detailed design documentation or pre-defined call flows. These Application Notes document a basic run of this service with a sample self-service test script running on Avaya Voice Portal.

Information in these Application Notes has been obtained through DevConnect compliance testing and additional technical discussions. Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab.

# 1. Introduction

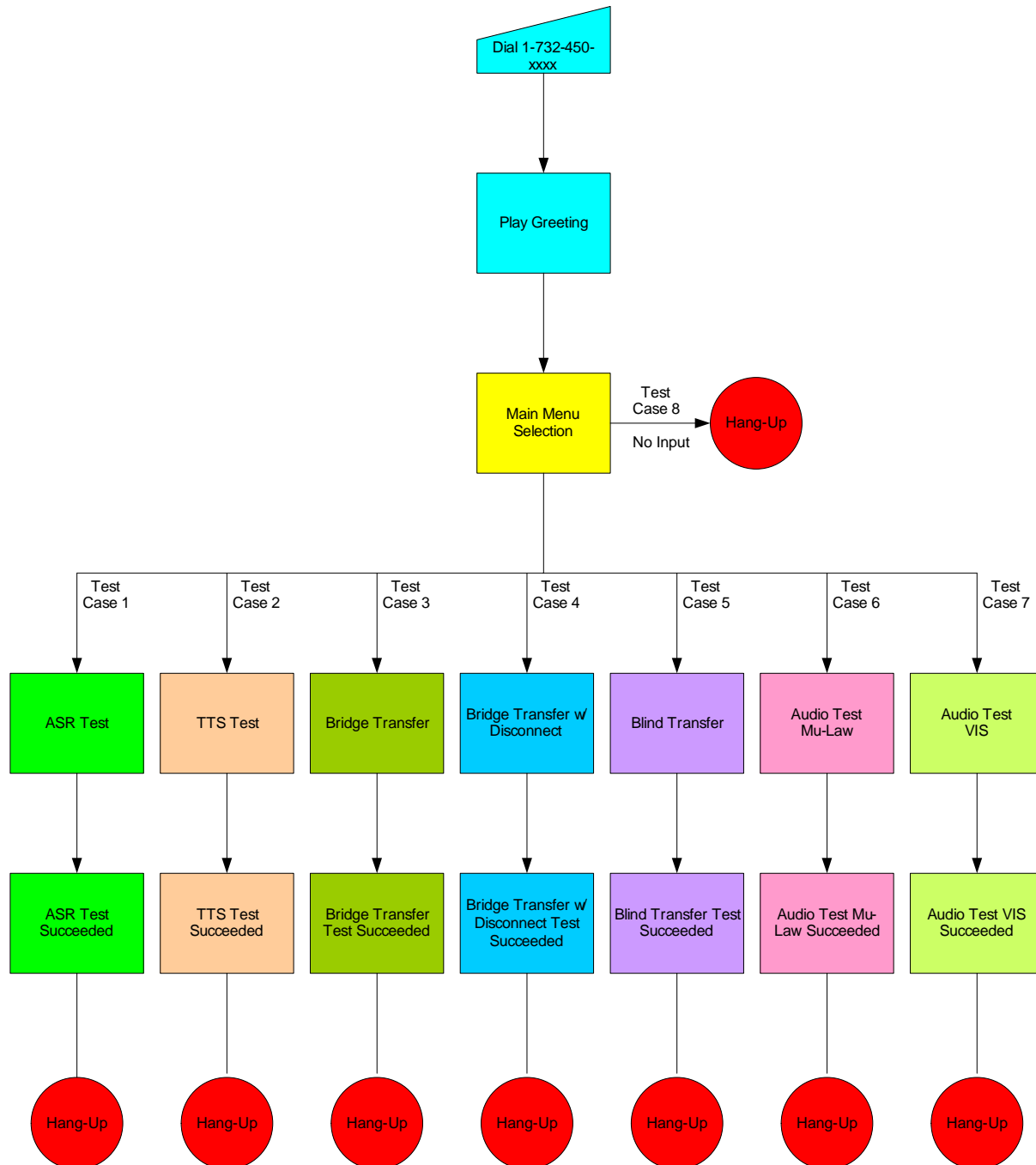
IQ Services' Feature Function Test (FFT) initiates test calls through the Public Switched Telephone Network (PSTN) that terminate on a target system, such as a self-service voice system. FFT utilizes automated and semi-automated processes to verify that the target system correctly responds to various user input. System responses, including errors, are documented and customers receive online access to all test results, test call audio recordings and call logs, as well as a variety of reports and statistics for each test run.

In the scenarios that were tested, the FFT service initiated test calls to an Avaya Voice Portal system through the PSTN and simulated user input by either playing DTMF tones or playing recorded speech files. **Figure 1** shows the test topology. Incoming calls arrived on the Avaya G650 Media Gateway and were routed to the Avaya Media Processing Platform or MPP using Voice over IP (VoIP). The MPP is managed by the Avaya Voice Portal Management System or VPMS. When needed, the MPP requested speech recognition and text-to-speech services from an automatic speech recognition and text-to-speech server.



**Figure 1: Avaya DevConnect Compliance Test Configuration**

The Avaya Voice Portal was pre-configured to run a sample self service application. The sample application call flow is shown in **Figure 2**. Calls were delivered over the PSTN to Avaya Communication Manager and routed to the Avaya Voice Portal system. The FFT service verified each branch of the call tree by sending DTMF tones or playing pre-recorded speech and listening for the expected outcome. **Test Cases 1 and 2** also utilized the resources of a speech recognizer and speech synthesizer, respectively.



**Figure 2: Sample Test Call Flow**

## 2. Equipment and Software Validated

The following equipment and software were used in the tested configuration:

Equipment	Version Information
Avaya S8700 Servers	Avaya Communication Manager 4.0, load 730.5 with updates 12514 and 13566
Avaya G650 Media Gateway <ul style="list-style-type: none"><li>TN2312BP IP Server Interface</li><li>TN799DP C-LAN Circuit Pack</li><li>TN2302AP IP Media Processor</li><li>TN2501AP VAL Announcement Board</li></ul>	HW03 FW039 HW01 FW024 HW03 FW094 HW02 FW007
Avaya Voice Portal Management System (VPMS)	4.0.0.0.2901
Avaya Voice Portal Management System (MPP)	4.0.0.0.2903
ASR/TTS Speech Server	Speechworks Media Server 3.1-10 OpenSpeech Recognizer Client 3.0-11 ScanSoft RealSpeak 4.0 MRCP
IQ Services' Feature Function Test	1.0

### 3. Customer Deliverables

Customers must provide IQ Services the expected call flow information. **Figure 3** shows a sample spreadsheet used to convey the expected interaction for the first branch of the call flow and is documented in the spreadsheet as **TestCase1** as seen in cell **B1**. Each of the test cases is documented on its own worksheet. **Column B** dictates the various inputs for each of the steps in the test case while **Column D** shows the expected result. With this information, IQ Services then creates automated test scripts as part of Feature Function Test to perform the indicated steps as well as to check for the expected outcome.

1	A	B	C	D	E	F	G	H	I
2	Case ID	TestCase1	Scope	DevConnect Test Cases - ASR Test	Setup	Notes about test case			
3	Step	FFT Input	Input Notes	Expected Result/Recording	Recording #	Barge-In	Minimum Delay	Time Of Day	Notes
3	1	732450XXXX	Dial System TFN	Welcome to Avaya Voice Portal Verification Application		n			
4	2	nothing	Wait for english	Please press 1 for ASR Test. Press 2 for TTS test. Press 3 for Bridge Transfer. Press 4 for Blind Transfer. Press 5 for Consultative Transfer. Press 6 for Audio Test. Press 7 to Exit.		y			
5	3	1	DTMF	Welcome to Automatic Speech Recognition test page for Voice Portal. Please say open the window.		n			
6	4	Open the window	Speech	ASR Test Succeeded. Now I will take you to the beginning of the test application.		n			
7	5	Hang-up	End Test						
10		Identifies the TestCase Name along with the name of the worksheet	Input into the system, either Speech or DTMF	Notes about the input, also identifies if the input is speech or DTMF	Speech in text format. The Recording# may or may not be provided, optional.	Barge-In Allowed or do we have to wait for the entire message to play	If Barge-In is not allowed, what is the minimum time of delay we must wait	Can we only run this test case during a specific timeframe?	Any other notes about each step?
11		Each Testcase will be on its own worksheet within this workbook							

**Figure 3: Sample Test Case Input - Test Case 1**

## 4. Feature Function Test Results

Once the Feature Function Test service has been generated and has completed, the results are posted to an Internet web server. The following procedures are used to access these results and the following screens offer a sampling of the results that were generated as part of the compliance test.

### 4.1. Access the Web Interface

Navigate to the IQ Services' Feature Function Test web interface by using the URL and login credentials as supplied by IQ Services. For the compliance test, the following URL was used: <http://www.featurefunction.com/>. Click *Proceed*.

The screenshot shows a Microsoft Internet Explorer window titled "Client Sign In - Microsoft Internet Explorer". The address bar displays "http://www.featurefunction.com/". The page features a header with the IQ Services logo and the text "IQ Services, Inc. Proactive Testing for Confident Customer Interactions". Below the header is a "Feature Function Sign In" section with three input fields: "Company:" (containing "IQS"), "Project:" (containing "fftcompliance"), and "Password:" (containing masked characters). A "Proceed" button is located below the password field. On the left side of the page, there is a contact information block for IQ Services, including the address "6601 Lyndale Ave South, Suite 330, Minneapolis, MN 55423", phone number "+1 612.243.6700", fax number "+1 612.869.6200", and copyright notice "Copyright © 2007 Interactive Quality Services, Inc."

## 4.2. Job Summary Test

The first screen that is presented is the **Job Summary Test** screen. This screen provides job summary data specific to the test run such as “Test Start Time”, “Test End Time”, and “Job Number”. Notice that this screen is comprised of static text as well as data presented as hyperlinks. These hyperlinks allow the user to quickly drill down to specific points of interest in the test results.

**Job Summary Test**

<b>Company</b>	IQS
<b>Project</b>	FFTCOMPLIANCE
<b>Job Number</b>	2
<b>Phone Number</b>	817324501384
<b>Test Status</b>	active
<b>Automated Test Time (h:m)</b>	0:12
<b>Test Start Time</b>	Tue Jul 17 12:05:16 CDT 2007
<b>Test End Time</b>	Tue Jul 17 12:21:35 CDT 2007 Central Time (GMT -6:00)
<b>Total Calls</b>	<u>8</u>
<b>Calls Passed</b>	<u>6</u>
<b>Calls With Discrepancy</b>	<u>2</u>
<b>Severity High</b>	<u>1</u>
<b>Severity Medium</b>	<u>0</u>
<b>Severity Low</b>	<u>1</u>
<b>Total Discrepancies</b>	<u>2</u>
<b>Unique Discrepancies</b>	<u>2</u>
<b>Total Interactions</b>	17
<b>IG Speech</b>	1
<b>IG DTMF</b>	15
<b>ODG Speech</b>	0
<b>ODG DTMF</b>	0
<b>Silence</b>	1
<b>Average Delay (secs)</b>	2.328571
<b>Minimum Delay</b>	1.13
<b>Maximum Delay</b>	23.17

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Minneapolis, MN 55423  
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### 4.3. Call Summary

On the left-hand navigation bar, click *Calls*. This presents the **Call Summary** screen which summarizes all of the calls that were executed for the test run. The **#** column indicates the call number. Time statistics are provided including the duration of calls and the maximum response delay. Note that the **Discr** column provides the overall result for each call.

**Call Summary**

Company: IQS  
Project: FFTCompliance  
Job Number: 2  
Start Date: Tue, July 17, 2007

Click on column header to sort

#	Inter. Cnt	Dur (mins)	Avg. Delay (secs)	Min. Delay (secs)	Max. Delay (secs)	Discr	Discr Code
1	3	1:09	1.4	1.4	1.4	pass	
2	2	1:04	1.3	1.3	1.3	pass	
3	3	1:37	1.2	1.2	1.3	pass	
4	4	1:54	8.6	1.2	23.2	high	1001
5	3	1:16	1.4	1.2	1.7	pass	
6	4	1:38	1.2	1.2	1.3	pass	
7	4	1:40	1.2	1.1	1.4	low	3030
8	2	0:51	0	0	0	pass	

**#** = Call Number  
**Dur (mins)** = Duration of Call  
**Min. Delay (secs)** = Minimum Response Delay  
**Discr** = Overall Result of Call

**Inter. Cnt** = Total Number of Interactions in Call  
**Avg. Delay (secs)** = Average Response Delay  
**Max. Delay (secs)** = Maximum Response Delay  
**Discr Code** = Discrepancy Code

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## 4.4. Sample Individual Call Result – Test Case 1

At the **Call Summary** screen, as shown in **Section 4.3**, click the hyperlink for call number **1** in the **#** column. The following screen is displayed. All of the test interactions for call number **1** are presented. Note that “pass” is present in the **Discr** column at each interaction of the test case. The results provided in the **Discr** column indicate that this test case executed successfully.

**Interaction Level Test Results - Microsoft Internet Explorer**

Address: <http://www.featurefunction.com/interactions.asp?jobid=38&callident=1&rownum=1>

**Passed Calls** | **Discrepancy** | **High Discrepancy** | **Medium Discrepancy** | **Low Discrepancy**

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**Company** IQS  
**Project** FFTCompliance  
**Job Number** 2  
**Call Number** 1  
**Call Start Time** Tue, July 17, 2007, 12:05  
Central Time (GMT -6:00)  
**Call Duration (m:s)** 1:09  
**Result** Passed

[Listen to full recording of call](#)  
Click on interaction number to hear audio or column header to sort

#	Expected State	Test Type	B/I	Say	Expect to Hear	Del (sec)	Dur (sec)	Discr	Discr Code	Discr Desc
1	INITIAL	INITIAL	off	NONE	[TC-T1-ASR] Welcome to Avaya Voice Portal Verification Application. Please press 1 for ASR Test. Press 2 for TTS test. Press 3 for Bridge Transfer. Press 4 for Blind Transfer. Press 5 for Consultative Transfer. Press 6 for Audio Test. Press 7 to Exit.	8.6	30	pass		
2	MSG2	IGDTMF	off	DTMF 1	Welcome to Automatic Speech Recognition test page for Voice Portal. Please say open the window.	1.4	8	pass		
3	MSG3	IG	off	FFTCertification_OpenTheWindow	ASR Test Succeeded. Now I will take you to the beginning of the test application.	1.4	25	pass		

**#** = Interaction Number  
**Test Type** = Test Type  
**Say** = Say Text  
**Del (sec)** = Response Delay  
**Discr** = Interaction Result (pass, or severity of discrepancy)  
**Discr Desc** = Discrepancy Description

**Expected State** = State Identification  
**B/I** = Barge-in  
**Expect to Hear** = Expect to Hear Prompt  
**Dur (sec)** = Interaction Duration  
**Discr Code** = Discrepancy Code

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## 4.5. Sample Individual Call Result – Test Case 4

At the **Call Summary** screen, as shown in **Section 4.3**, click the hyperlink for call number **4** in the **#** column. The following screen is displayed. All of the test interactions for call number **4** are presented. Note that the results provided in the **Discr** column indicate a discrepancy in the expected outcome. The discrepancy code “1001” is present in the **Discr Code** column and the discrepancy description “Did not follow expected call flow” is present in the **Discr Desc** column. The hyperlink **Listen to full recording of call** that is present on the page allows a full audio recording of the call to be immediately downloaded and played back using any standard audio player. This allows the customer to listen to all of the interactions of the call and facilitates troubleshooting of the voice system.

**Interaction Level Test Results - Microsoft Internet Explorer**

Address: <http://www.featurefunction.com/interactions.asp?jobid=38&callident=4&rownum=4>

**Passed Calls** **Discrepancy** **High Discrepancy** **Medium Discrepancy** **Low Discrepancy**

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**Company** IQS  
**Project** FFTCOMPLIANCE  
**Job Number** 2  
**Call Number** 4  
**Call Start Time** Tue, July 17, 2007, 12:10  
Central Time (GMT -6:00)  
**Call Duration (m:s)** 1:54  
**Result** Discrepancy, High Severity

**Listen to full recording of call**  
Click on interaction number to hear audio or column header to sort

#	Expected State	Test Type	B/I	Say	Expect to Hear	Del (sec)	Dur (sec)	Discr	Discr Code	Discr Desc
1	INITIAL	INITIAL	off	NONE	[TC-T4-Bridge Transfer w/Disc] Welcome to Avaya Voice Portal Verification Application. Please press 1 for ASR Test. Press 2 for TTS test. Press 3 for Bridge Transfer. Press 4 for Blind Transfer. Press 5 for Consultative Transfer. Press 6 for Audio Test. Press 7 to Exit.	8.5	31	pass		
2	MSG2	IGDTMF	off	DTMF 3	Please provide the number that you would like to be transferred to.	1.2	6	pass		
3	MSG5	IGDTMF	off	DTMF 30007#	Performing the bridge transfer to the requested number. Press any key to drop the other party. Thank you for calling. The purpose of this announcement extension is to simulate a party that answers the call and speaks for a brief period of time. This announcement will now hang up. Announcement extension 30007. Thank you for calling.	1.3	54	pass		
4	MSG7	IGDTMF	off	DTMF 1	Received near end disconnect. Bridge Transfer test succeeded. Now I will take you to the beginning to the test application.	23.2	17	high	1001	Did not follow expected call flow

**Discrepancy Codes**  
1001 Did not follow expected call flow

**#** = Interaction Number  
**Test Type** = Test Type  
**Say** = Say Text  
**Del (sec)** = Response Delay  
**Discr** = Interaction Result (pass, or severity of discrepancy)  
**Discr Desc** = Discrepancy Description  
**Expected State** = State Identification  
**B/I** = Barge-in  
**Expect to Hear** = Expect to Hear Prompt  
**Dur (sec)** = Interaction Duration  
**Discr Code** = Discrepancy Code

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## 4.6. Sample Job History – Compare Test Results

On the left-hand navigation bar, click **Job History**. A list of completed jobs is presented. Next, click the check boxes under the **Compare** column next to Job 1 and Job 2<sup>1</sup>. Finally, click **COMPARE JOBS**.

**Job History - Microsoft Internet Explorer**

Address: [http://www.featurefunction.com/all\\_jobs.asp?x=72](http://www.featurefunction.com/all_jobs.asp?x=72)

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**Job History**

**Company** IQS  
**Project** FFTCompliance

**Completed Jobs** [Central Time (GMT -6:00)]

Job #	Test Set	Completion Time	Test Results	Compare
1	IQS - FFTCompliance - Test V 1.0	Jul 17, 12:21	Discrepancy	<input checked="" type="checkbox"/>
2	IQS - FFTCompliance - Test V 1.0	Jul 17, 12:21	Discrepancy	<input checked="" type="checkbox"/>

**COMPARE JOBS**

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<sup>1</sup> Note that actual job numbers will vary.

The **Compare Test Results** screen allows the user to compare the results from multiple jobs. The screen provided here is for illustrative purposes only as the data from the two jobs are identical.

**Compare Test Results**

	Job 1	Job 2
<b>Company</b>	IQS	IQS
<b>Project</b>	FFTCompliance	FFTCompliance
<b>Job</b>	1	2
<b>App Spec</b>	IQS - FFTCompliance - Spec V 1.0	IQS - FFTCompliance - Spec V 1.0
<b>Test Set</b>	IQS - FFTCompliance - Test V 1.0	IQS - FFTCompliance - Test V 1.0
<b>Test Result</b>	Discrepancy	Discrepancy
<b>Test Time</b>	0:12	0:12
<b>Start Date</b>		
<b>Total Calls</b>	8	8
<b>Passed</b>	6	6
<b>Discr</b>	2	2
<b>High</b>	1	1
<b>Medium</b>	0	0
<b>Low</b>	1	1
<b>Total Discr</b>	2	2
<b>Unique Discr</b>	2	2
<b>Interactions</b>	17	17
<b>IG Speech</b>	1	1
<b>IG DTMF</b>	15	15
<b>OOG Speech</b>	0	0
<b>OOG DTMF</b>	0	0
<b>Silence</b>	1	1
<b>Avg Delay</b>	2.3	2.3
<b>Min Delay</b>	1.1	1.1
<b>Max Delay</b>	23.2	23.2

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 6601 Lyndale Ave South, Suite 330  
 Minneapolis, MN 55423  
 Phone: +1 612.243.6700  
 Fax: +1 612.869.6200  
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## 5. Interoperability Compliance Testing

This interoperability compliance test included basic feature testing. The IQ Services Feature Function Test service was used to generate test calls into the Avaya Voice Portal running a sample self-service voice application.

### 5.1. General Test Approach

The Feature Function Test service used DTMF tones and recorded speech to interact with Avaya Voice Portal. A test case for each of the branches of the call flow was defined and implemented, including expected inputs and expected outputs. Test results were compiled and presented via the web.

### 5.2. Test Results

All test cases executed as expected.

## 6. Verification Steps

This section provides various checks that can be performed prior to initiating a test run with IQ Services' Feature Function Test.

### 6.1. Verify Avaya Voice Portal

Test cases will vary from target system to target system. However, basic manual verification involves selecting a sample test case. Next, from a telephone with access to the PSTN, dial the telephone number for the target voice system. Follow the defined test case, which might include either entering DTMF tones or speaking the requested information. Verify that the target voice system responds as expected.

## 7. Support

Technical support on IQ Services' Feature Function Test can be obtained through the following:

- **Phone:** 612.243.6700
- **Email:** [info@iq-services.com](mailto:info@iq-services.com)
- **Web:** [www.iq-services.com](http://www.iq-services.com)

## 8. Conclusion

These Application Notes describe the compliance test configuration, customer deliverables, and results that were collected as part of a sample run of IQ Services' Feature Function Test with Avaya Voice Portal. All test cases executed as expected.

## 9. Additional References

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

- *Administrator Guide for Avaya Communication Manager*, Document 03-300509, Issue 3.1, February 2007, available at <http://support.avaya.com>
- *Avaya Voice Portal Library, Installing and Configuring Avaya Voice Portal*, June 2007, available as on-line help and at <http://support.avaya.com>
- *IQ Services' Feature Function Test, Help Page*, available as on-line help

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