



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

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# **Application Notes for Delta Speech System with Avaya Voice Portal – Issue 1.0**

### **Abstract**

These Application Notes describe the steps for configuring Avaya Voice Portal with Delta Speech System. Delta Speech System is a standard-based speech recognizer that supports multiple languages, multiple channels, and can perform speech recognition from any audio sources. Delta Speech System uses the Media Resource Control Protocol (MRCP) version 1 to integrate with 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

These Application Notes describe the configuration steps required to integrate Delta Speech System with Avaya Voice Portal. Delta Speech System is a standard-based speech recognizer that supports multiple languages, multiple channels, and can perform speech recognition from any audio sources. Delta Speech System uses the Media Resource Control Protocol (MRCP) version 1 for its automatic speech recognition (ASR) features to interface with VoiceXML applications running on Avaya Voice Portal.

## 1.1. Interoperability Compliance Testing

The interoperability compliance test included feature and serviceability testing. The feature testing focused on placing calls to Avaya Voice Portal that ran VoiceXML applications that use the ASR engine on the Delta Speech System to verify its speech recognition features.

The serviceability testing focused on verifying the ability of the Delta Speech System to recover from adverse conditions, such as power failures and disconnecting cables to the network.

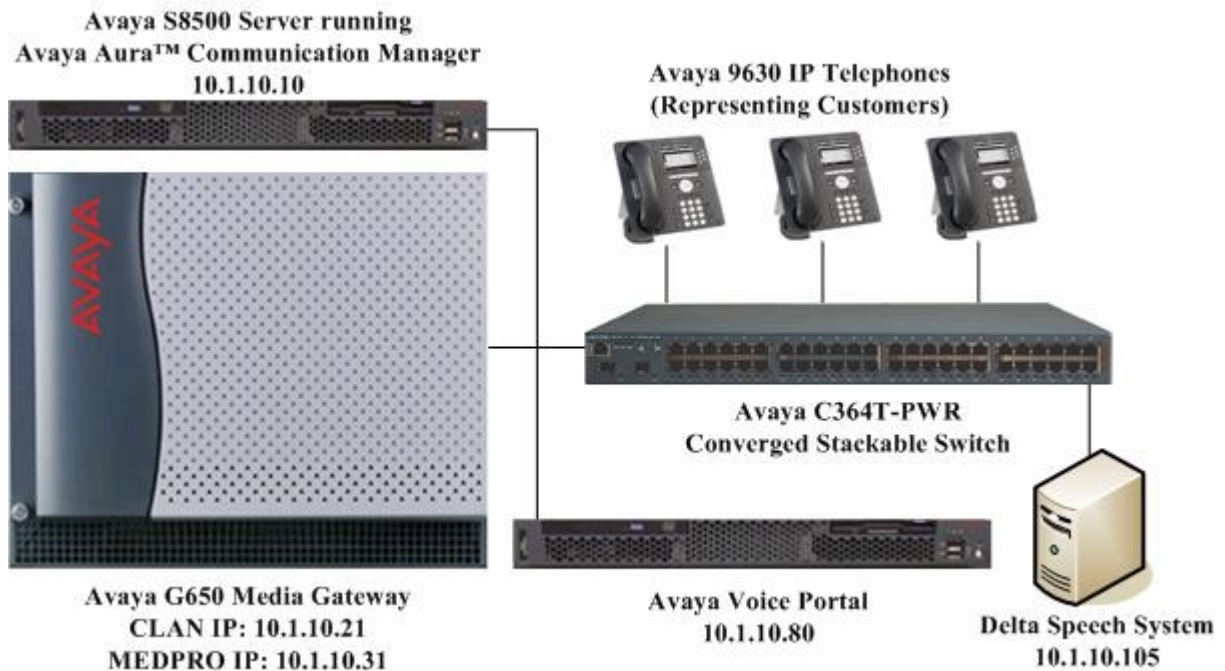
## 1.2. Support

For technical support on Delta Speech System, contact the Delta support team at:

- Phone: +886-2-8797-2088 ext. 5461
- Email: [hb.cheng@delta.com.tw](mailto:hb.cheng@delta.com.tw)

## 2. Reference Configuration

**Figure 1** illustrates the test configuration used to verify the Delta solution. Delta Speech System was installed on a Microsoft Windows 2003 Server with Service Pack 2. VoiceXML scripts were installed on the Delta Speech System Server running Apache Tomcat and accessed by Avaya Voice Portal. Avaya Voice Portal is connected to Avaya Aura™ Communication Manager running on the Avaya S8500 Server and Avaya G650 Media Gateway using H.323 Voice-over-IP (VoIP) Connections. Avaya IP telephones were used to place calls to Avaya Voice Portal, which would run the VoiceXML scripts. The VoiceXML scripts would use the Delta Speech System for speech recognition.



**Figure 1: Test Configuration**

### 3. Equipment and Software Validated

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

| Equipment   | Software   |
|---|--|
| Avaya Voice Portal running on<br>Avaya S8500C Server  | 5.0<br>(Version 5.0.0.1.0701)  |
| Avaya S8500 Server  | Avaya Aura™ Communication Manager<br>5.2 (R015x.02.0.947.3)<br>with Service Pack<br>(02.0.947.3-17579) |
| Avaya G650 Media Gateway <ul style="list-style-type: none"><li>• TN2312BP IP Server Interface</li><li>• TN799DP C-LAN Interface</li><li>• TN2302AP IP Media Processor</li></ul> | -<br>HW07, FW046<br>HW01, FW032<br>HW20, FW120   |
| Avaya 9630 IP Telephones  | 3.1 (H.323)  |
| Avaya C364T-PWR Converged Stackable<br>Switch   | 4.5.18   |
| Apache Tomcat   | 6.0.18   |
| Microsoft Windows Server 2003 Standard<br>Edition   | Service Pack 2   |
| Delta Speech System   | 2.0  |

### 4. Configure Communication Manager

This section presents the configuration required on Communication Manager to interface with Avaya Voice Portal. The configuration is performed via the System Access Terminal (SAT) on Communication Manager.

| Step | Description   |
|------|---|
| 1.   | Use the <b>display system-parameters customer-options</b> command to check that Communication Manager has the feature license enabled for Avaya Voice Portal connectivity. On page 10, verify that the Limit field for <b>IP_API_A</b> has a value greater than or equal to the number of ports configured on Avaya Voice Portal in <b>Section 5 Step 2</b> . In this configuration, thirty Voice Portal ports were configured for testing. |

| Step | Description   |
|------|---|
|      | <pre> display system-parameters customer-options MAXIMUM IP REGISTRATIONS BY PRODUCT ID  Product ID  Rel. Limit      Used IP_API_A    : 1000        30 IP_API_B    : 0           0 IP_API_C    : 0           0 IP_Agent    : 100         0 IP_IR_A     : 0           0 IP_Phone    : 18000       2 IP_ROMax    : 18000       0 IP_Soft     : 100         0 IP_eCons    : 5           0 oneX_Comm   : 18000       0               : 0         0 </pre> <p style="text-align: right;">Page 10 of 11</p>   |
| 2.   | <p>Enter the <b>change system-parameters features</b> command. On page 6, set the <b>7434ND</b> field to <b>y</b>.</p> <pre> change system-parameters features FEATURE-RELATED SYSTEM PARAMETERS Public Network Trunks on Conference Call: 5      Auto Start? y Conference Parties with Public Network Trunks: 6  Auto Hold? n Conference Parties without Public Network Trunks: 6 Attendant Tone? y Night Service Disconnect Timer (seconds): 180    Bridging Tone? n Short Interdigit Timer (seconds): 3              Conference Tone? n Unanswered DID Call Timer (seconds):             Intrusion Tone? n Line Intercept Tone Timer (seconds): 30          Mode Code Interface? n Long Hold Recall Timer (seconds): 0 Reset Shift Timer (seconds): 0 Station Call Transfer Recall Timer (seconds): 0   Recall from VDN? n DID Busy Treatment: tone  Allow AAR/ARS Access from DID/DIOD? n Allow ANI Restriction on AAR/ARS? n Use Trunk COR for Outgoing Trunk Disconnect? n 7405ND Numeric Terminal Display? n              7434ND? <b>y</b> DISTINCTIVE AUDIBLE ALERTING Internal: 1 External: 2 Priority: 3 Attendant Originated Calls: external DTMF Tone Feedback Signal to VRU - Connection:   Disconnection: </pre> <p style="text-align: right;">Page 6 of 17</p> |
| 3.   | <p>Enter the <b>add station n</b> command where <b>n</b> is a valid extension, to configure the Voice Portal port as a station with the <b>Type</b> field set to <b>7434ND</b>. Specify the <b>Security Code</b>, which will be used in <b>Section 5 Step 2</b> when doing the configuration on Avaya Voice Portal. Set <b>Port</b> to <b>X</b>, <b>Display Module</b> to <b>y</b> and <b>IP Softphone</b> to <b>y</b>.</p> <p>Repeat for each Voice Portal port. In this configuration, thirty Voice Portal ports were configured with an extension range of 10201 to 10230.</p>   |

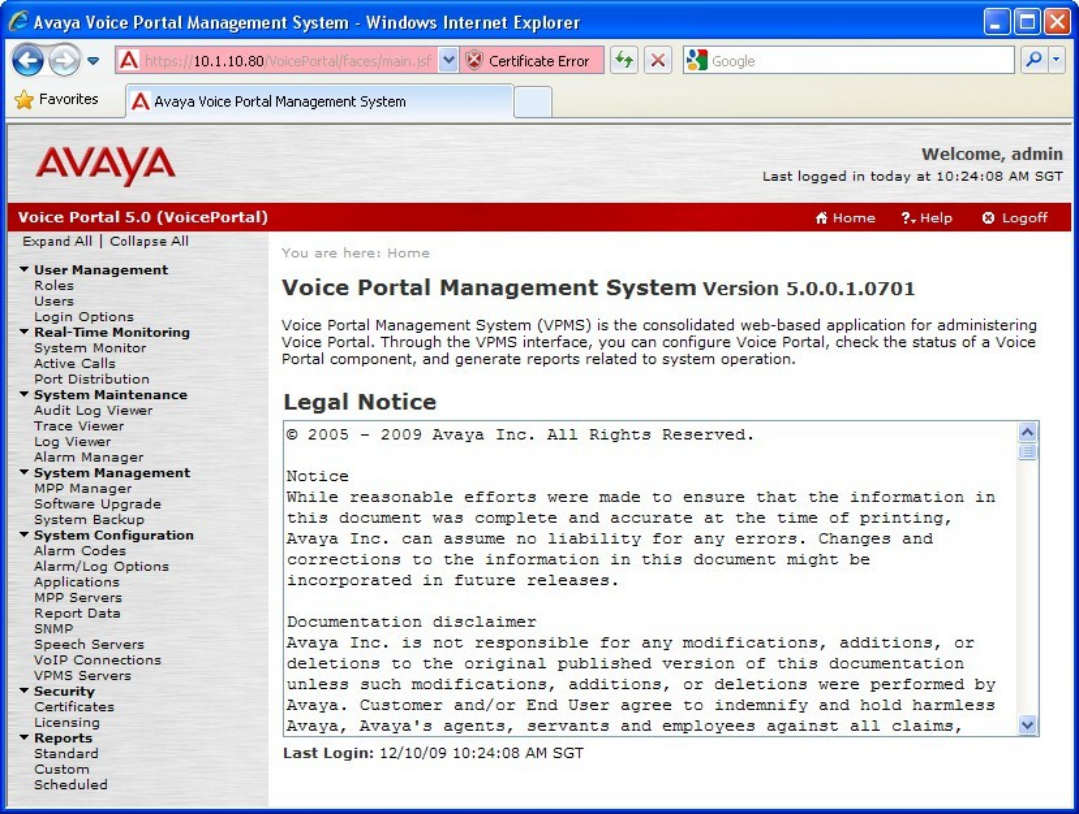
| Step | Description  |
|------|--|
|      | <pre> add station 102101                                      Page 1 of 6                                  STATION  Extension: 10201                    Lock Messages? n                BCC: 0   Type: 7434ND                      Security Code: 12345                TN: 1   Port: X                            Coverage Path 1:                COR: 1   Name: VP #1                       Coverage Path 2:                COS: 1                                      Hunt-to Station:  STATION OPTIONS                                  Time of Day Lock Table:                                 Personalized Ringing Pattern: 1                                 Message Lamp Ext: 10201                                  Loss Group: 2                                 Data Module? n                                 Display Module? y                                 Display Language: english                                 Coverage Module? n                                  Survivable COR: internal                                 Survivable Trunk Dest? y                                 Media Complex Ext:                                 IP SoftPhone? y                                 Remote Office Phone? n                                 IP Video Softphone? n </pre> |
| 4.   | <p>Enter the <b>change ip-codec-set n</b> command where <b>n</b> is a valid IP codec-set associated with the IP network region of the Voice Portal ports. Set <b>Audio Code</b> to an appropriate value supported by Voice Portal. In this configuration, the <b>G.711MU</b> codec was used and <b>Media Encryption</b> was set to both <b>aes</b> and <b>none</b>.</p> <pre> change ip-codec-set 1                                      Page 1 of 2                                  IP Codec Set                                  Codec Set: 1                                  Audio      Silence      Frames      Packet                                 Codec      Suppression  Per Pkt    Size (ms) 1:  G.711MU                            n           2          20 2: 3: 4: 5: 6: 7:                                  Media Encryption 1:  aes 2:  none 3: </pre>  |

## 5. Configure Avaya Voice Portal

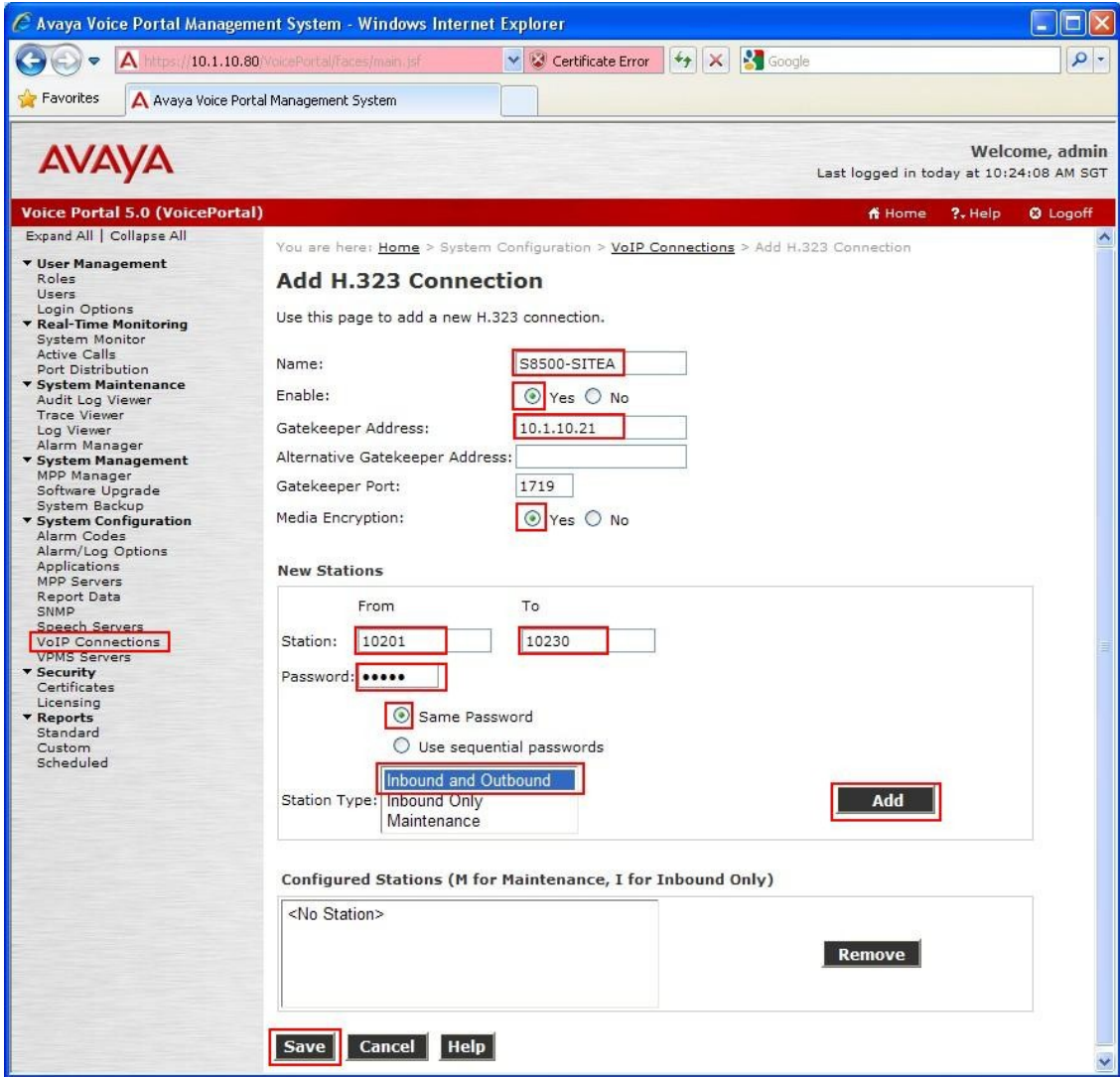
This section covers the configuration of Avaya Voice Portal. Communication Manager routes incoming calls to Avaya Voice Portal using Voice-over-IP (VoIP) over the data network. Each VoIP channel was assigned a phone number that matched a corresponding extension configured on Communication Manager in **Section 4 Step 3**. VoiceXML scripts were deployed to an Apache Tomcat server. Avaya Voice Portal was then configured to access the VoiceXML scripts.

The following areas will be covered:

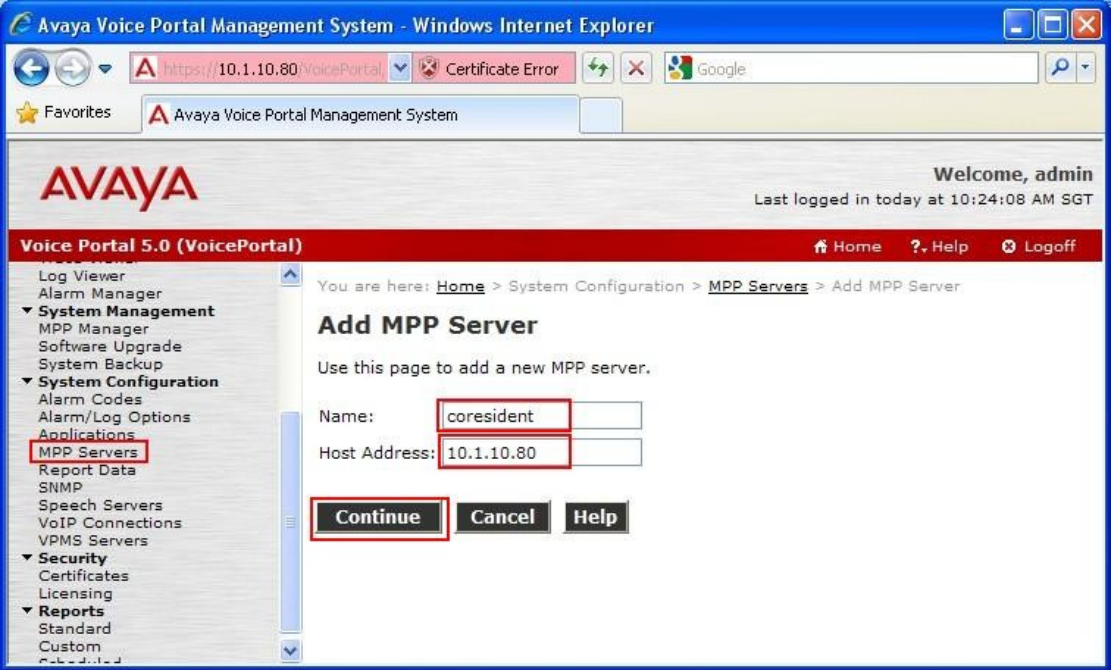
- Configuring an H.323 VoIP connection
- Adding an MPP server
- Configuring the VoIP audio format
- Adding a speech server
- Adding applications
- Starting the MPP server

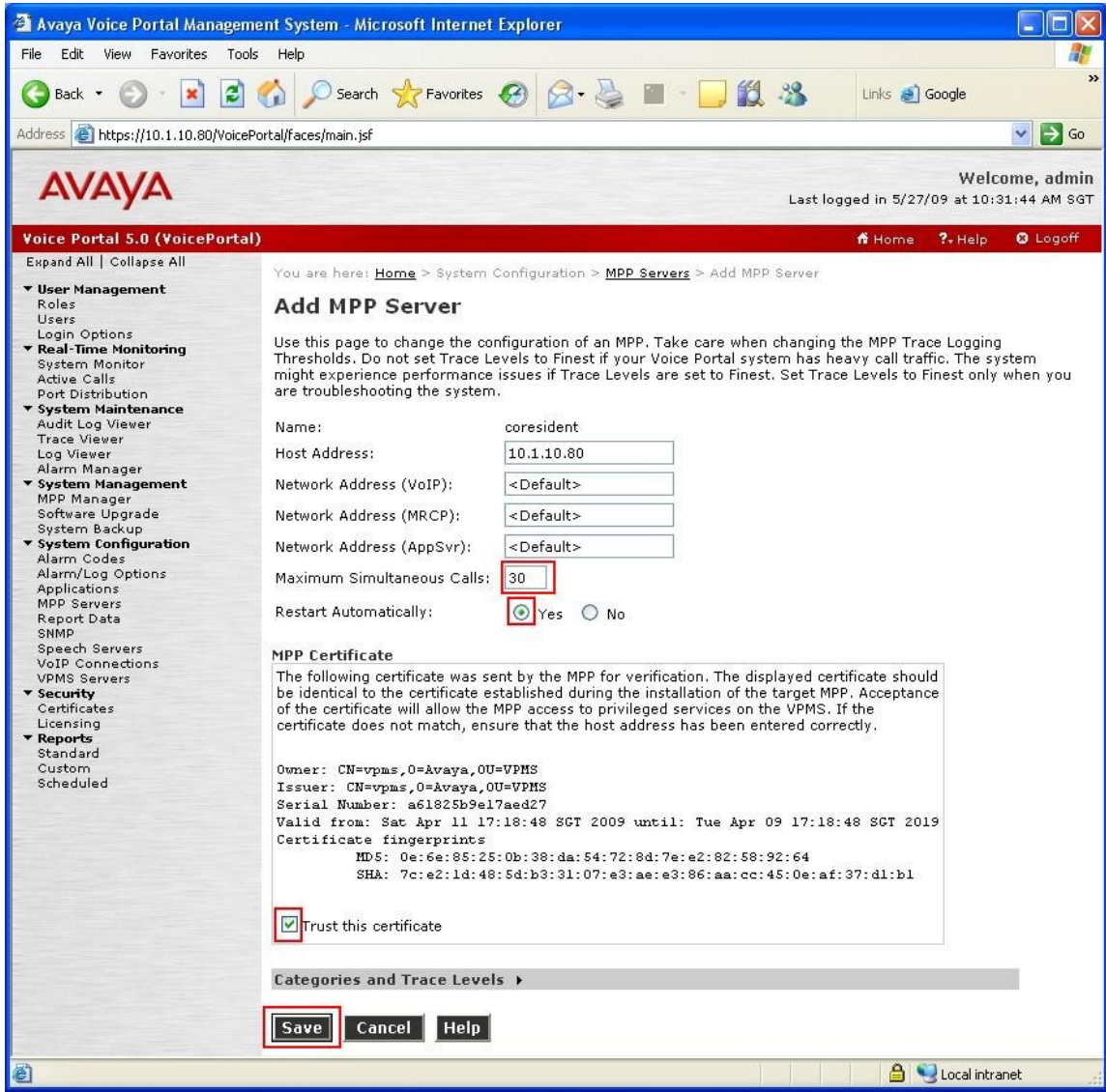
| Step | Description  |
|------|--|
| 1.   | <p>Avaya Voice Portal is configured via the Voice Portal Management System (VPMS) web interface. To access the web interface, enter <b>https://&lt;ip-addr&gt;/VoicePortal</b> as the URL in an internet browser, where <b>&lt;ip-addr&gt;</b> is the IP address of the VPMS. Log in using an account with the Administration role to display the main page.</p>  |


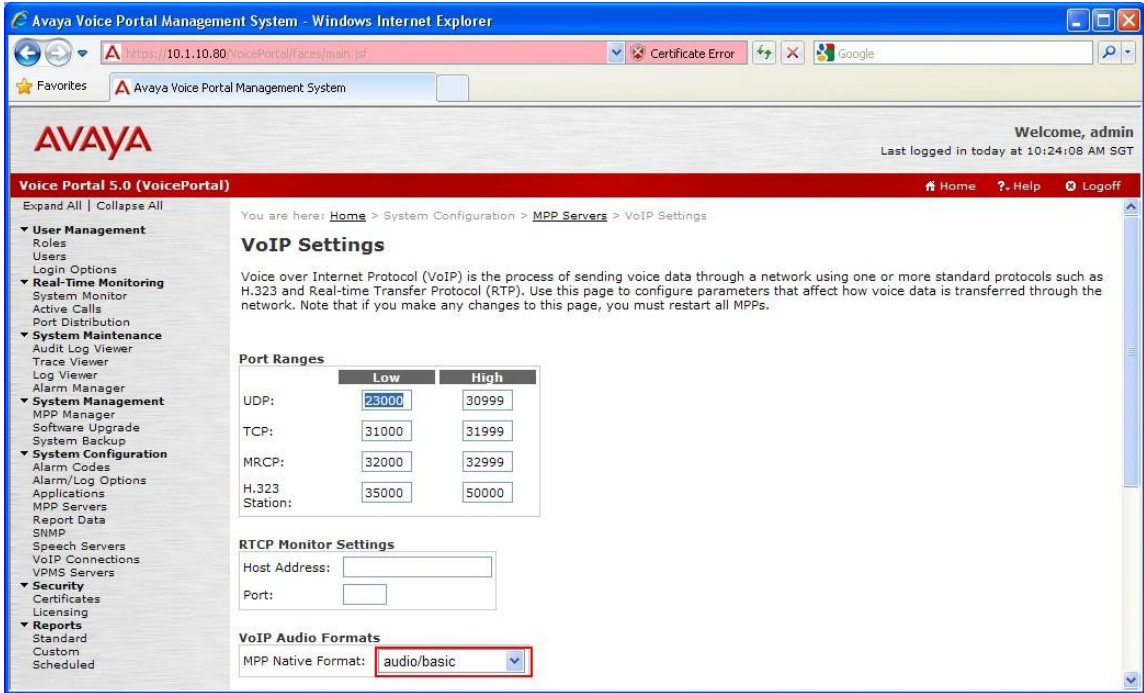


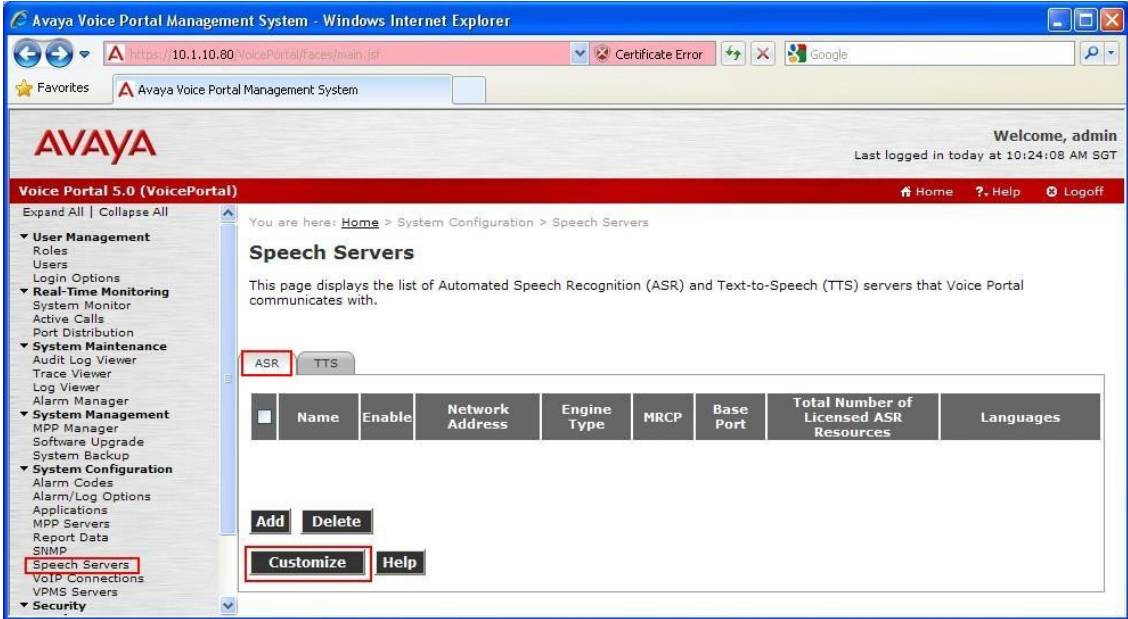
| Step | Description   |
|------|---|
| 2.   | <p>To configure the H.323 connection to Communication Manager, click <b>System Configuration &gt; VoIP Connections</b> in the left pane and click <b>Add</b> from the <b>H.323</b> tab (not shown). In the Add H.323 Connection page, specify the <b>Name</b>, set <b>Enable</b> to <b>Yes</b>, set <b>Gatekeeper Address</b> to the IP address of the CLAN Interface on the G650 Media Gateway (as shown in <b>Figure 1</b> in <b>Section 2</b>) and set <b>Media Encryption</b> to <b>Yes</b>. The default values are used for the remaining fields.</p> <p>To configure the Voice Portal ports, enter the range of extensions for <b>Station</b> and set the <b>Password</b> to match the 7434ND stations created in <b>Section 4 Step 3</b>. Set <b>Station Type</b> to <b>Inbound and Outbound</b> and click <b>Add</b>. Click <b>Save</b> to save the configuration on this page.</p>  |



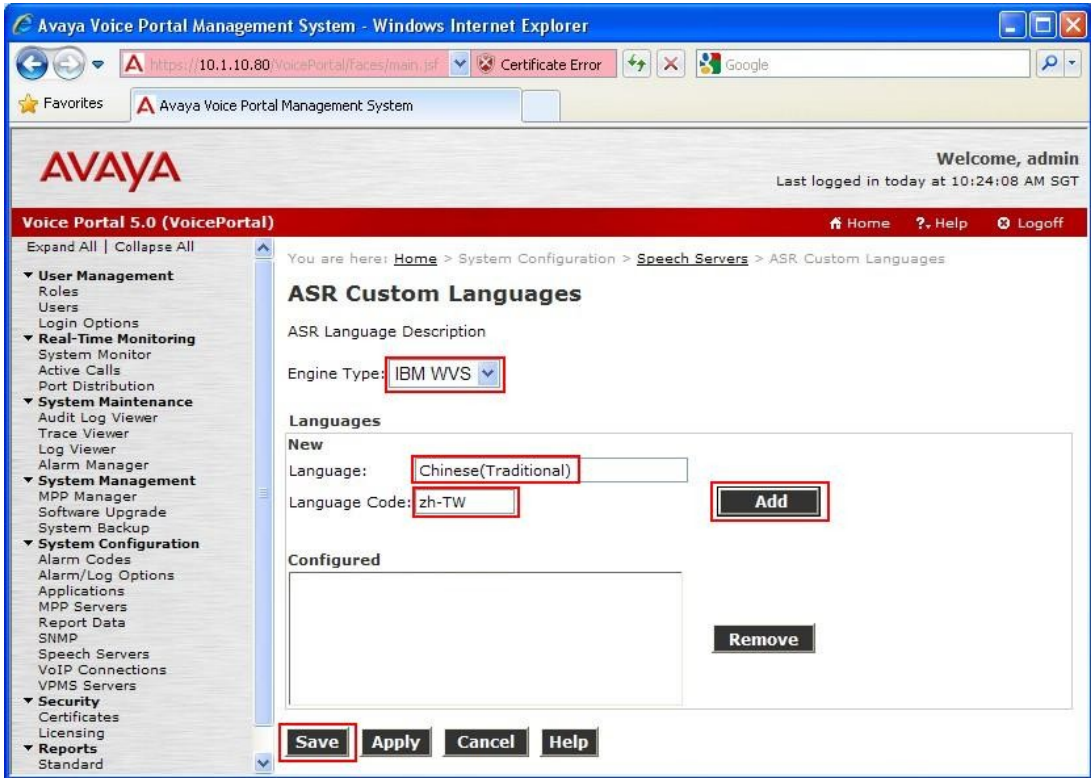
| Step | Description  |
|------|--|
| 3.   | <p>To add a new MPP server to process incoming and outgoing calls, click <b>System Configuration &gt; MPP Servers</b> in the left pane and click <b>Add</b> (not shown). In the Add MPP Server page, specify a <b>Name</b> and set <b>Host Address</b> to the IP address of the MPP server. In this configuration, both the VPMS and MPP server co-resides on the same machine. Click <b>Continue</b>.</p>  |

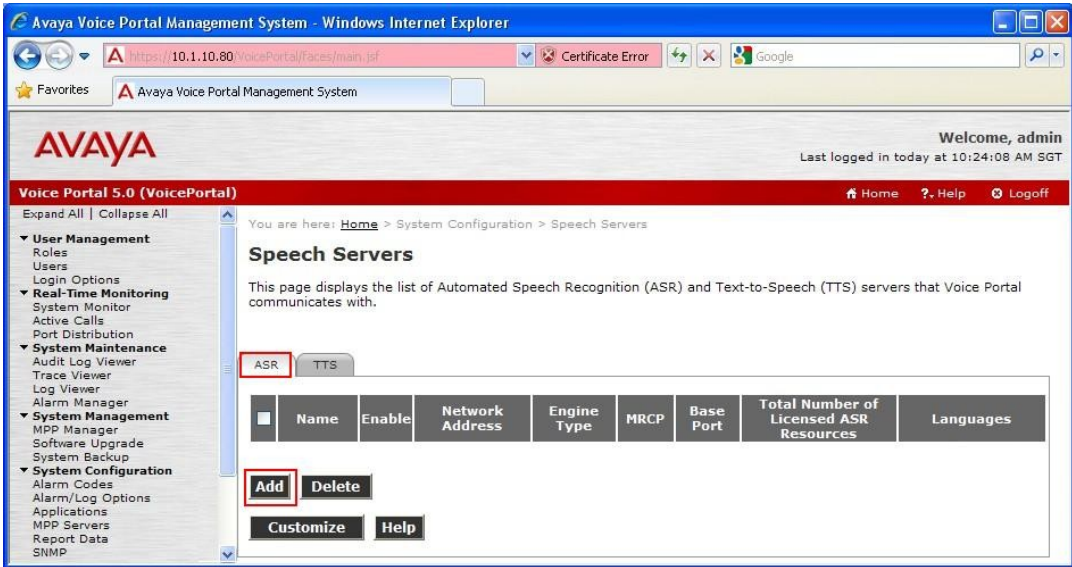
| Step | Description  |
|------|--|
| 4.   | <p>Specify <b>Maximum Simultaneous Calls</b> supported by the MPP server. In this configuration, <b>Maximum Simultaneous Calls</b> was set to <b>30</b> to assign the thirty Voice Portal ports created in <b>Section 4 Step 3</b> to the MPP server. Set <b>Restart Automatically</b> to <b>Yes</b> and check <b>Trust this certificate</b>. Click <b>Save</b>.</p>  <p>The screenshot shows the Avaya Voice Portal Management System interface in a Microsoft Internet Explorer browser. The address bar shows the URL: https://10.1.10.80/VoicePortal/faces/main.jsf. The page title is 'Avaya Voice Portal Management System - Microsoft Internet Explorer'. The user is logged in as 'admin' and the last login time is 5/27/09 at 10:31:44 AM SGT. The page is titled 'Voice Portal 5.0 (VoicePortal)' and shows a navigation menu on the left with categories like User Management, Real-Time Monitoring, System Maintenance, System Management, System Configuration, Security, and Reports. The main content area is titled 'Add MPP Server' and contains a form for configuring an MPP server. The form includes fields for Name (coresident), Host Address (10.1.10.80), Network Address (VoIP), Network Address (MRCP), Network Address (AppSvr), Maximum Simultaneous Calls (30), and Restart Automatically (Yes). There is also a section for the MPP Certificate, which includes the certificate text and a checkbox to 'Trust this certificate'. The 'Save' button is highlighted with a red box.</p> |

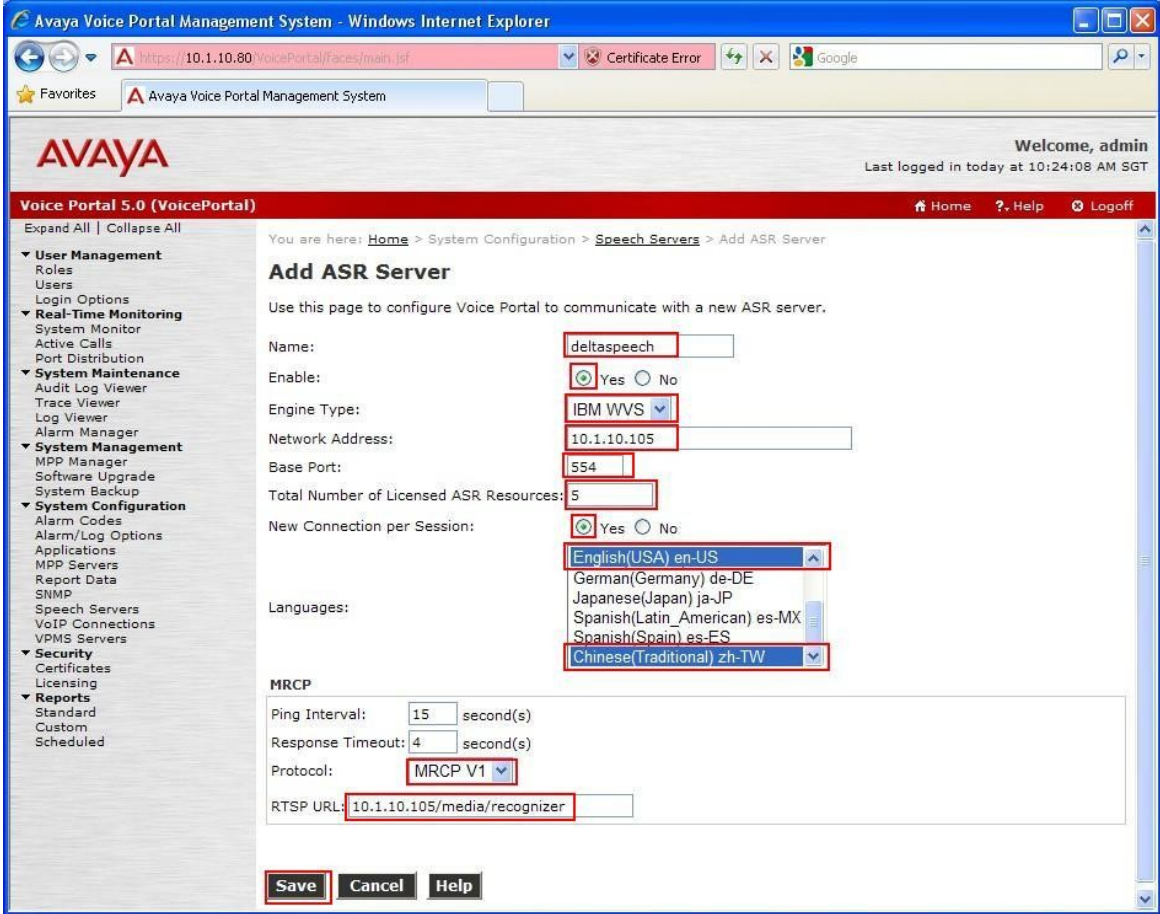
| Step | Description   |
|------|---|
| 5.   | <p>To configure the codec used by the MPP server, click <b>System Configuration &gt; MPP Servers</b> in the left pane and click <b>VoIP Settings</b>.</p>   |
| 6.   | <p>Set <b>MPP Native Format</b> to <b>audio/basic</b> to configure the MPP server for G.711 mu-law to match the configuration on Communication Manager in <b>Section 4 Step 4</b>. Scroll down the page and click <b>Save</b> (not shown).</p>  |

| Step | Description  |
|------|--|
| 7.   | <p>To configure the ASR server, click <b>System Configuration &gt; Speech Servers</b>. Click the <b>ASR</b> tab and click <b>Customize</b>.</p>  |

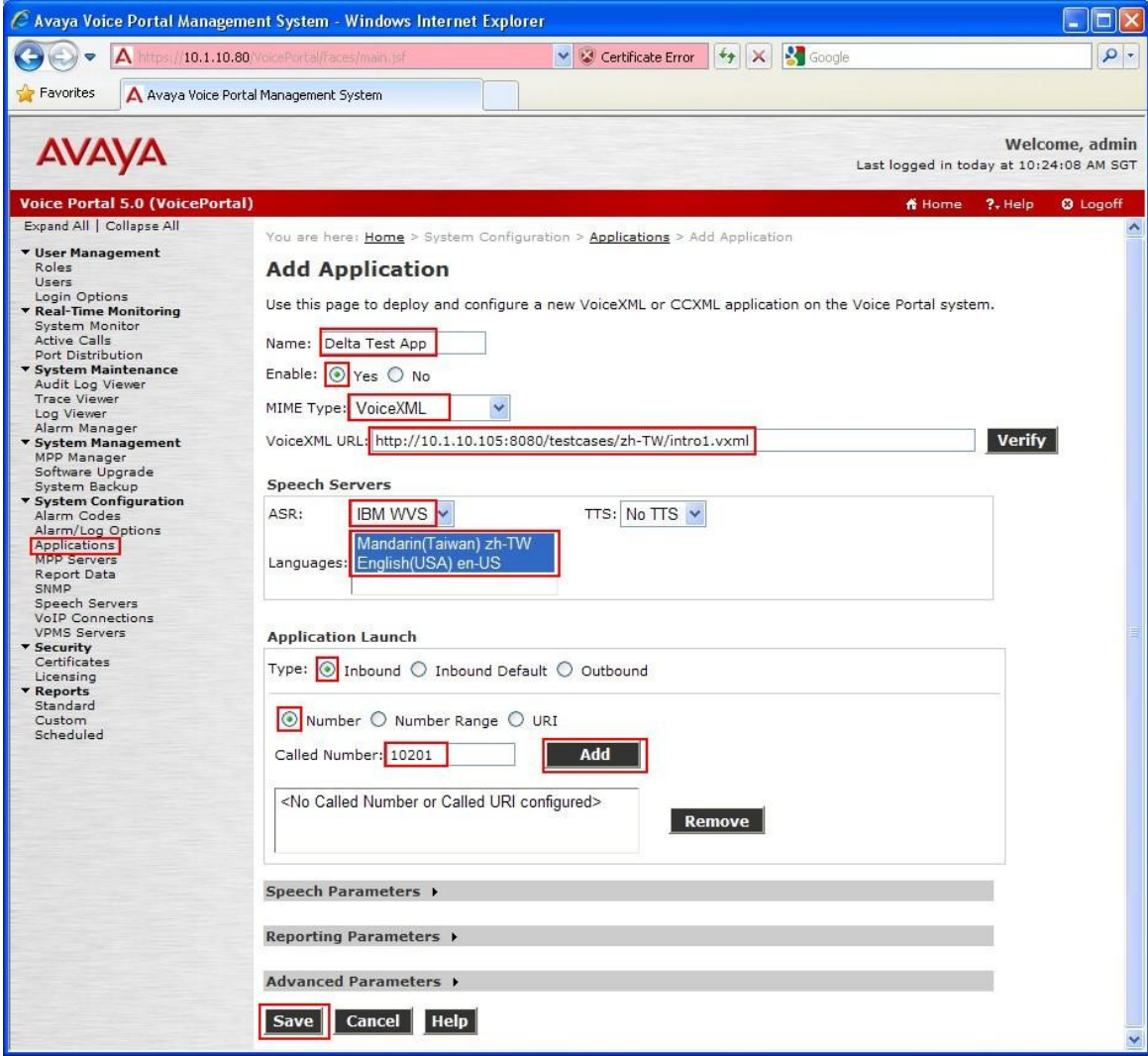


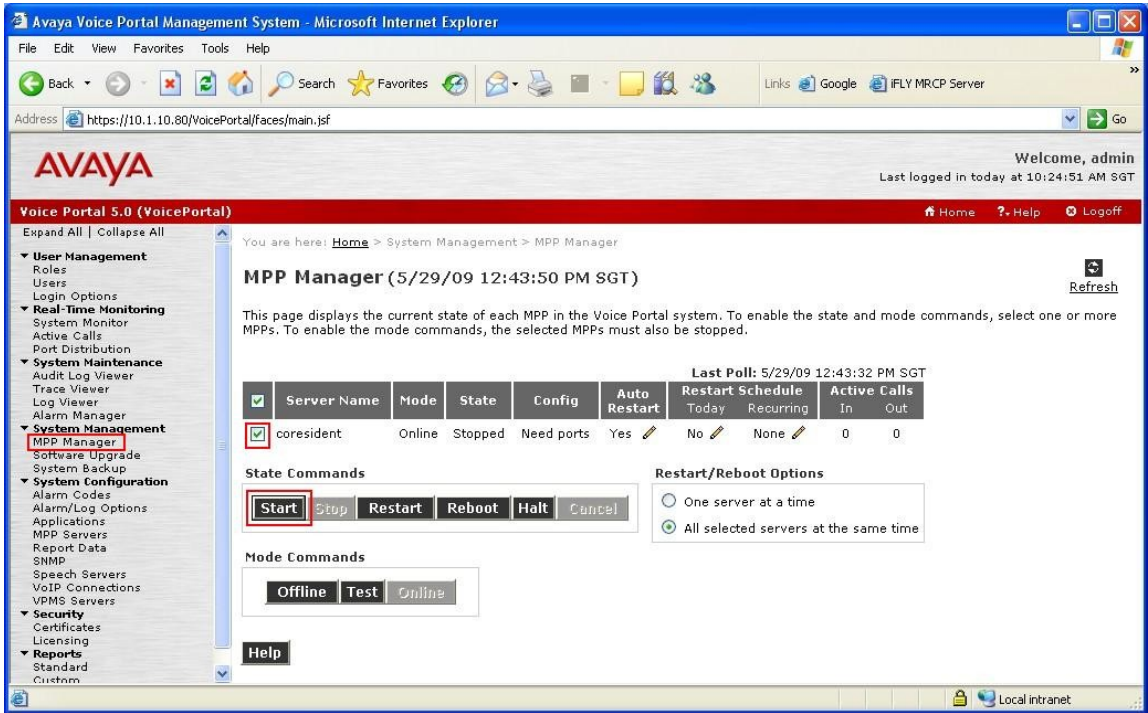
| Step | Description  |
|------|--|
| 8.   | <p>In the ASR Custom Languages page, add the desired language to the IBM WVS ASR engine. In this test configuration, Traditional Chinese language was added as it was not available in the default list of languages supported by IBM WVS. Select <b>IBM WVS</b> for <b>Engine Type</b>, specify the name for <b>Language</b> and set <b>Language Code</b> to <b>zh-TW</b>. Click <b>Add</b> and then click <b>Save</b>.</p>  |

| Step | Description  |
|------|--|
| 9.   | <p>Click the ASR tab again and click Add.</p>  |

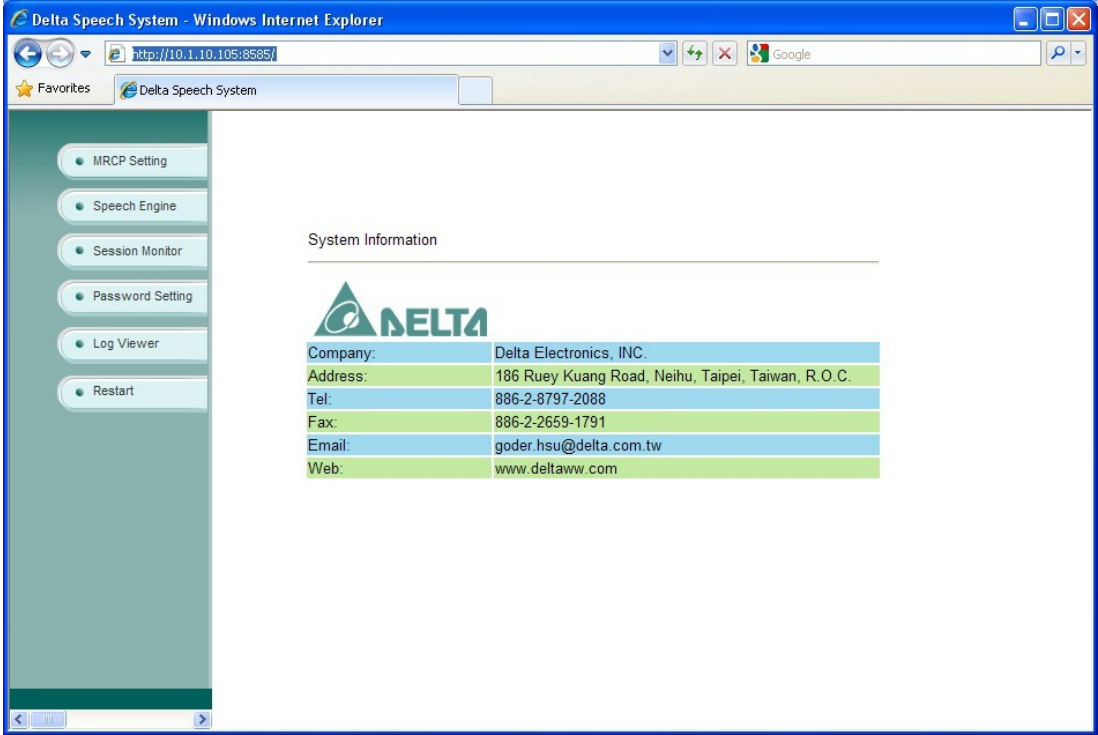
| Step | Description   |
|------|---|
| 10.  | <p>In the Add ASR Server page, select <b>IBM WVS</b> as the <b>Engine Type</b>. Delta Speech System uses this option without requiring any addition modifications to Voice Portal. In the MRCP section, set <b>Protocol</b> to <b>MRCP V1</b>. Specify the <b>Name</b>, select <b>Yes</b> for <b>Enable</b>, set <b>Network Address</b> to the IP address of the Delta Speech System Server and select the desired <b>Languages</b> used by the VoiceXML scripts. The <b>Total Number of Licensed ASR Resources</b> should also be set to the number of licenses available on the Delta Speech System. All other fields were left at their default values.</p> <p>Note down the values for <b>Base Port</b> and <b>RTSP URL</b>, which will need to match the values configured on Delta Speech System in <b>Section 6 Step 2</b>. Click <b>Save</b>.</p>  |

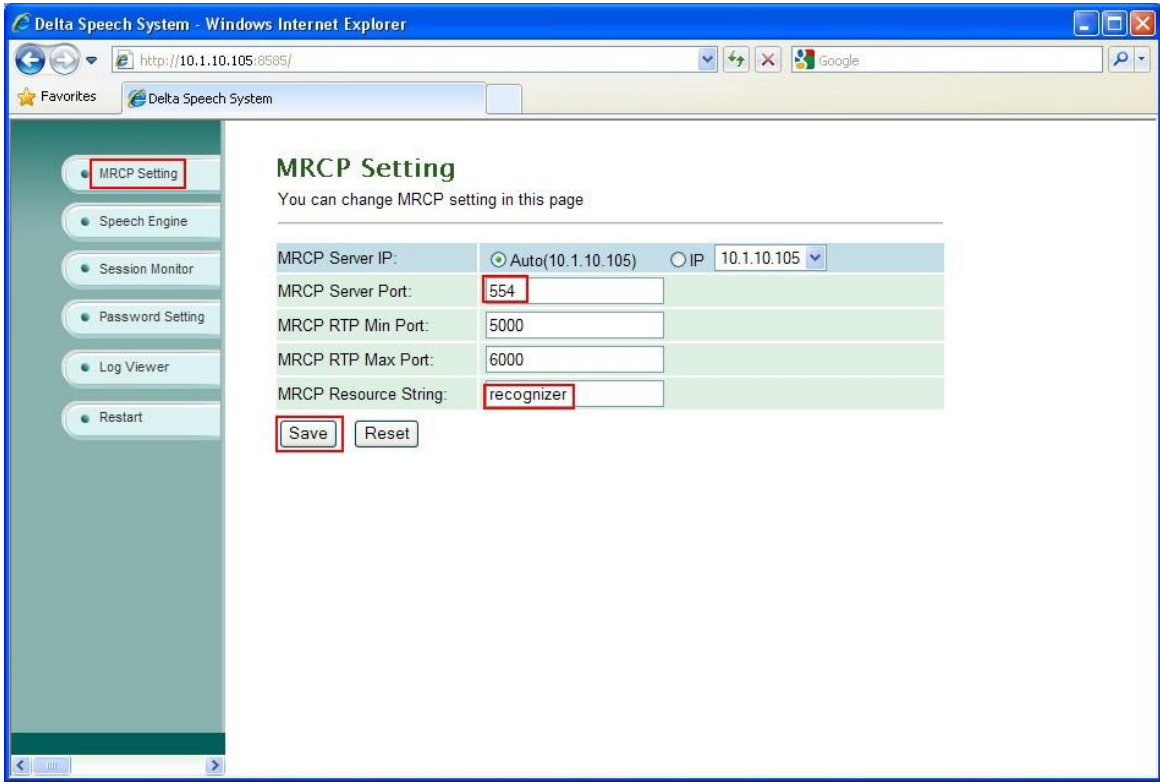


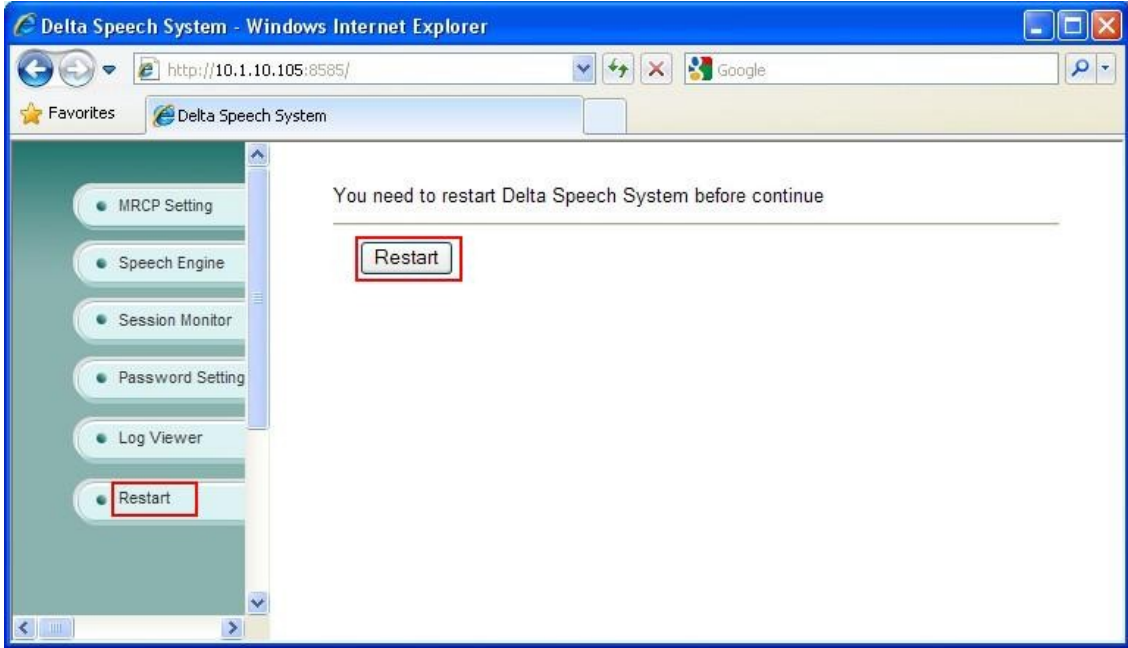
| Step | Description   |
|------|---|
| 11.  | <p>To add a Voice Portal application, click <b>System Configuration &gt; Applications</b> and then click <b>Add</b> on the Applications page (not shown). The configuration shown below assigns a VoiceXML application <b>Delta Test App</b> deployed on the Apache Tomcat Server on the Delta Speech System Server to the Voice Portal station <b>10201</b>. Specify the <b>Name</b>, select <b>Yes</b> for <b>Enable</b>, set <b>MIME Type</b> to <b>VoiceXML</b> and set <b>VoiceXML URL</b> to location of the VoiceXML script, e.g. <b>http://&lt;IP address of Apache Tomcat server&gt;:8080/testcases/zh-TW/intro1.vxml</b>. Select <b>IBM WVS</b> for <b>ASR</b> to use the Delta Speech System and then select the appropriate <b>Languages</b> to use for speech recognition.</p> <p>In the Application Launch section, select <b>Inbound</b> for <b>Type</b>, select <b>Number</b> and set <b>Called Number</b> to <b>10201</b>. Click <b>Add</b>. Repeat this procedure for all Voice Portal stations that should run this application. Note that the <b>Number Range</b> option may be used to assign the application to multiple Voice Portal stations in a single step. Click <b>Save</b>.</p>  |

| Step | Description  |
|------|--|
| 12.  | <p>To start the MPP server, click <b>System Management &gt; MPP Manager</b>. On the MPP Manager page, select the MPP and click <b>Start</b>. After the MPP is started, the <b>Mode</b> of the MPP should be <b>Online</b> and the <b>State</b> should be <b>Running</b>.</p>  |

## 6. Configure Delta Speech System

| Step     | Description  |          |                         |          |  |      |                 |      |                 |        |                        |      |                 |
|----------|--|----------|-------------------------|----------|--|------|-----------------|------|-----------------|--------|------------------------|------|-----------------|
| 1.       | <p>Delta Speech System is configured via its web interface. To access the web interface, enter <b>http://&lt;ip-addr&gt;:8585/</b> as the URL in an internet browser, where <b>&lt;ip-addr&gt;</b> is the IP address of the Delta Speech System Server. Log in using an account with the Administration role to display the main page.</p>  <table><tr><td>Company:</td><td>Delta Electronics, INC.</td></tr><tr><td>Address:</td><td>186 Ruey Kuang Road, Neihu, Taipei, Taiwan, R.O.C.</td></tr><tr><td>Tel:</td><td>886-2-8797-2088</td></tr><tr><td>Fax:</td><td>886-2-2659-1791</td></tr><tr><td>Email:</td><td>goder.hsu@delta.com.tw</td></tr><tr><td>Web:</td><td>www.deltaww.com</td></tr></table> | Company: | Delta Electronics, INC. | Address: | 186 Ruey Kuang Road, Neihu, Taipei, Taiwan, R.O.C. | Tel: | 886-2-8797-2088 | Fax: | 886-2-2659-1791 | Email: | goder.hsu@delta.com.tw | Web: | www.deltaww.com |
| Company: | Delta Electronics, INC.  |          |                         |          |  |      |                 |      |                 |        |                        |      |                 |
| Address: | 186 Ruey Kuang Road, Neihu, Taipei, Taiwan, R.O.C.   |          |                         |          |  |      |                 |      |                 |        |                        |      |                 |
| Tel:     | 886-2-8797-2088  |          |                         |          |  |      |                 |      |                 |        |                        |      |                 |
| Fax:     | 886-2-2659-1791  |          |                         |          |  |      |                 |      |                 |        |                        |      |                 |
| Email:   | goder.hsu@delta.com.tw   |          |                         |          |  |      |                 |      |                 |        |                        |      |                 |
| Web:     | www.deltaww.com  |          |                         |          |  |      |                 |      |                 |        |                        |      |                 |

| Step | Description  |
|------|--|
| 2.   | <p>Click <b>MRCP Setting</b> from the left navigation menu. On the MRCP Setting page, set <b>MRCP Server Port</b> to <b>554</b> and <b>MRCP Resource String</b> to <b>recognizer</b> to match the settings on Avaya Voice Portal in <b>Section 5 Step 10</b>. Click <b>Save</b>.</p>  |

| Step | Description   |
|------|---|
| 3.   | <p>Restart the Delta Speech System to effect the changes. From the left navigation menu, click <b>Restart</b>. Click the Restart button to initiate the restart.</p>  |

## 7. General Test Approach and Test Results

The interoperability compliance test included feature and serviceability testing. The feature testing focused on placing calls to Avaya Voice Portal which ran VoiceXML scripts that use the ASR engine in Delta Speech System. The testing includes multiple calls, barge-in, complex semantics and N-Best results. Testing was done using the US English and Traditional Chinese language.

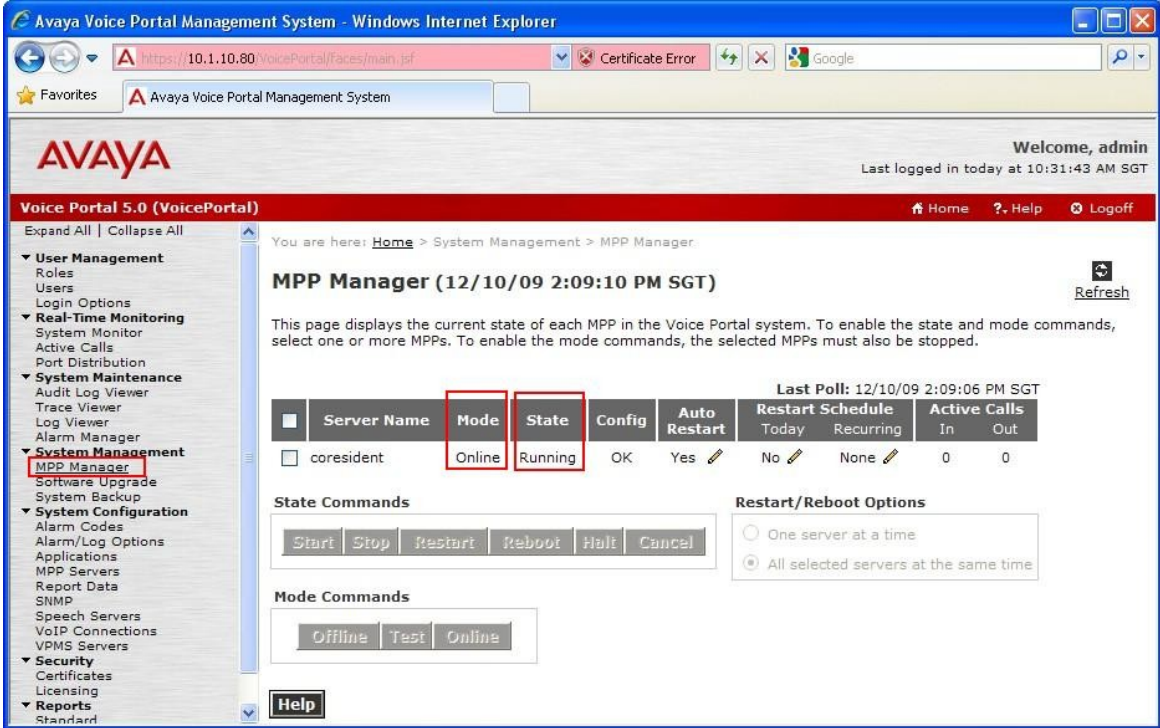
The serviceability testing focused on verifying the ability of the Delta Speech System to recover from adverse conditions, such as power failures and disconnecting cables to the IP network.

All test cases passed. Avaya Voice Portal was successful in running the VoiceXML scripts that use the ASR engine of the Delta Speech System.

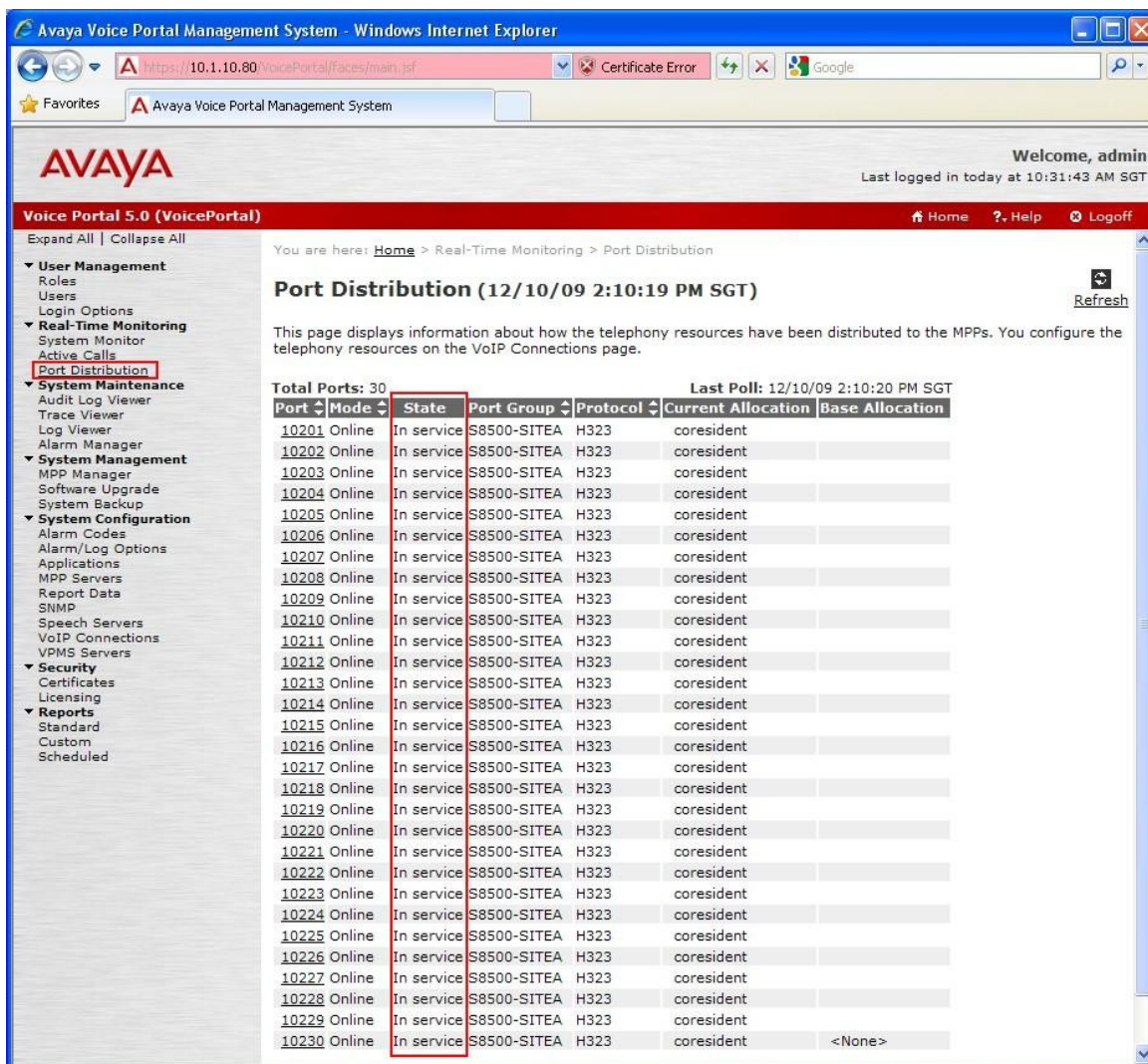
## 8. Verification Steps

This section provides the verification steps that may be performed to verify that Avaya Voice Portal can run VoiceXML applications that use the Delta Speech System for ASR functionality.

### 8.1. Verify Avaya Voice Portal

| Step | Description   |
|------|---|
| 1.   | <p>From the VPMS web interface, click <b>System Management &gt; MPP Manager</b>. On the MPP Manager page, verify that the MPP server is online and running.</p>  |

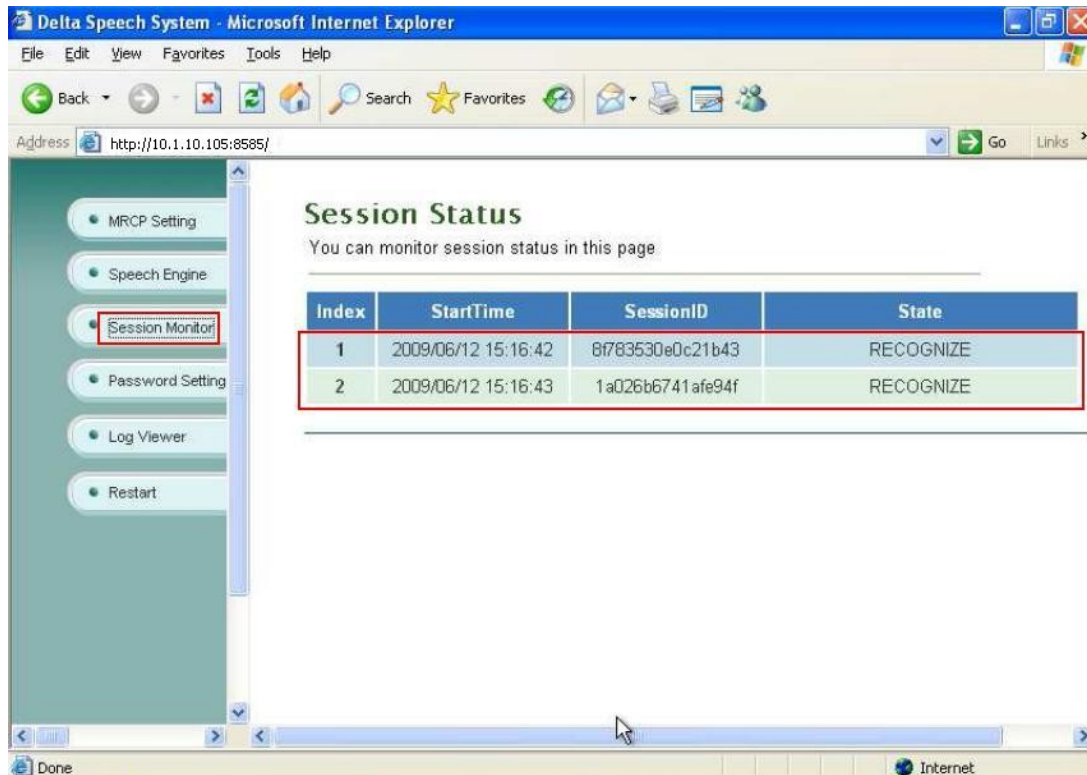


| Step | Description   |
|------|---|
| 2.   | <p>From the VPMS web interface, click <b>Real-Time Monitoring &gt; Port Distribution</b>. On the Port Distribution page, verify that the ports on the MPP server are in service.</p> <div></div> |
| 3.   | <p>Place a call to Avaya Voice Portal that runs a VoiceXML script which uses the Delta Speech System for speech recognition. Verify that the application answers the call and that the application is able to recognize speech from the caller.</p>                                 |



## 8.2. Verify Delta Speech System

From the Delta Speech System web interface, click **Session Monitor** from the left navigation menu. Make a call to the Avaya Voice Portal and verify that new sessions are created when ASR functionality is requested from the Delta Speech System.



## 9. Conclusion

These Application Notes describe the steps required to configure Delta Speech System with Avaya Voice Portal. All feature and serviceability test cases were completed successfully.

## 10. Additional References

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

[1] *Administering Voice Portal*, Release 5.0, March 2009

[2] *Administering Avaya Aura™ Communication Manager*, Release 5.2, Issue 5.0, May 2009, Document Number 03-300509.

The following documents are available from Delta Electronics:

[3] *Delta Speech System Installation and Administration Guide*, Version 2.0.

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