



Avaya Solution & Interoperability Test Lab

Application Notes for AmiVoice® (Power Voice) MRCP Server with Avaya Aura® Experience Portal 7.0, Avaya Aura® Communication Manager 6.3 and Avaya Aura® Session Manager 6.3 – Issue 1.0

Abstract

These Application Notes describe the configuration steps required for AmiVoice® (Power Voice) MRCP Server to successfully interoperate with Avaya Aura® Experience Portal, Avaya Aura® Communication Manager and Avaya Aura® Session Manager. The Avaya Aura® Experience Portal running VoiceXML applications hosted on Microsoft IIS utilizes the automatic speech recognition features of AmiVoice® (Power Voice) MRCP Server through the Media Resource Control Protocol Version 2.

Readers should pay attention to Section 2, in particular the scope of testing as outlined in Section 2.1 as well as the observations noted in Section 2.2, to ensure that their own use cases are adequately covered by this scope and results.

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 for AmiVoice® (Power Voice) MRCP Server to successfully interoperate with Avaya Aura® Experience Portal, Avaya Aura® Communication Manager and Avaya Aura® Session Manager.

The AmiVoice® (Power Voice) MRCP Server System, hereby called AmiVoice in short, is a voice recognition server system that supports both MRCP (Media Resource Control Protocol) version 1.0 and 2.0, which regulates communications between IVR and the speech recognizers and voice synthesis engines provided by various vendors.

2. General Test Approach

The general test approach was to place calls manually to Avaya Aura® Experience Portal running VXML applications that use the automatic speech recognition (ASR) resources of AmiVoice via MRCP version 2.0 protocol.

DevConnect Compliance Testing is conducted jointly by Avaya and DevConnect members. The jointly-defined test plan focuses on exercising APIs and/or standards-based interfaces pertinent to the interoperability of the tested products and their functionalities. DevConnect Compliance Testing is not intended to substitute full product performance or feature testing performed by DevConnect members, nor is it to be construed as an endorsement by Avaya of the suitability or completeness of a DevConnect member's solution.

2.1. Interoperability Compliance Testing

This Interoperability Compliance Test included feature and serviceability testing. The feature testing focused on placing calls to Avaya Experience Portal that ran Voice XML scripts in English only that uses the ASR engines on the AmiVoice. The compliance test focused on placing calls to verify the accuracy of ASR detection.

The serviceability testing focused on verifying the ability of AmiVoice to recover from adverse conditions such as rebooting of AmiVoice and Avaya Experience Portal 7.0 and disconnecting the LAN cables to the AmiVoice.

2.2. Test Results

All test cases passed. Avaya Aura® Experience Portal 7.0 was successful in running applications that use the ASR resources of the AmiVoice.

2.3. Support

For technical support on AmiVoice MRCP Server contact:

- Telephone : +66 2302-6337, +66 2664-1447
- Email : support@amivoicethai.com

3. Reference Configuration

Figure 1 illustrates the configuration used to verify the AmiVoice solution. The AmiVoice software was installed on Centos 6.5 64 bit server. VoiceXML scripts that used the ASR engine were hosted on another Windows 2003 Server with Service Pack 2 installed running IIS 6.0. Avaya Aura® Experience Portal is connected to Avaya Aura® Session Manager and Avaya Aura® Communication Manager using SIP VoIP Connections. Avaya H323 IP telephones were used to place calls to Avaya Aura® Experience Portal, which would run the VoiceXML applications. The applications would use the AmiVoice ASR engine for speech detection.

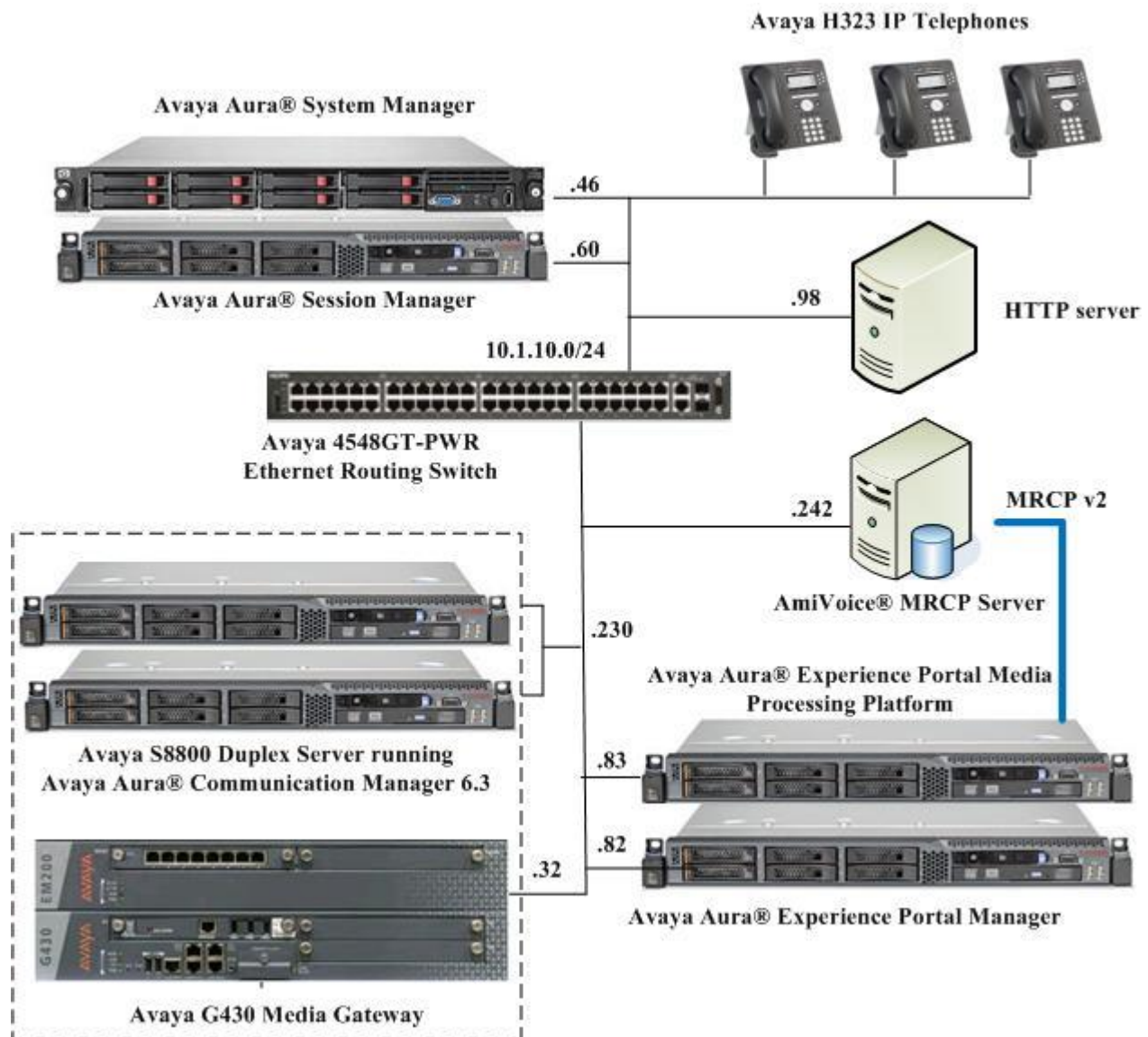


Figure 1: AmiVoice® MRCP Server with Avaya Aura® Experience Portal Configuration

4. Equipment and Software Validated

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

Equipment	Software
Avaya Aura® Experience Portal 6.0 on Avaya S8800 Server	R7.0
Avaya Aura® Communication Manager on Avaya S8800 Server (Duplex)	R6.3. SP4
Avaya G430 Media Gateway	34.5.1
Avaya Aura® System Manager on HP DL360 G7	6.3 SP7
Avaya Aura® Session Manager on Avaya S8800 Server	6.3 SP7
Avaya 96x1 H323 IP Telephones	6.4 (H.323)
Avaya 4548GT-PWR Ethernet Routing Switch	V5.6.1.052
AmiVoice MRCP Server running on CentOS 6.5 64 bit	2.0.06
Microsoft IIS on Windows Server 2003 Standard Edition SP2	6.0

5. Configure Avaya Communication Manager

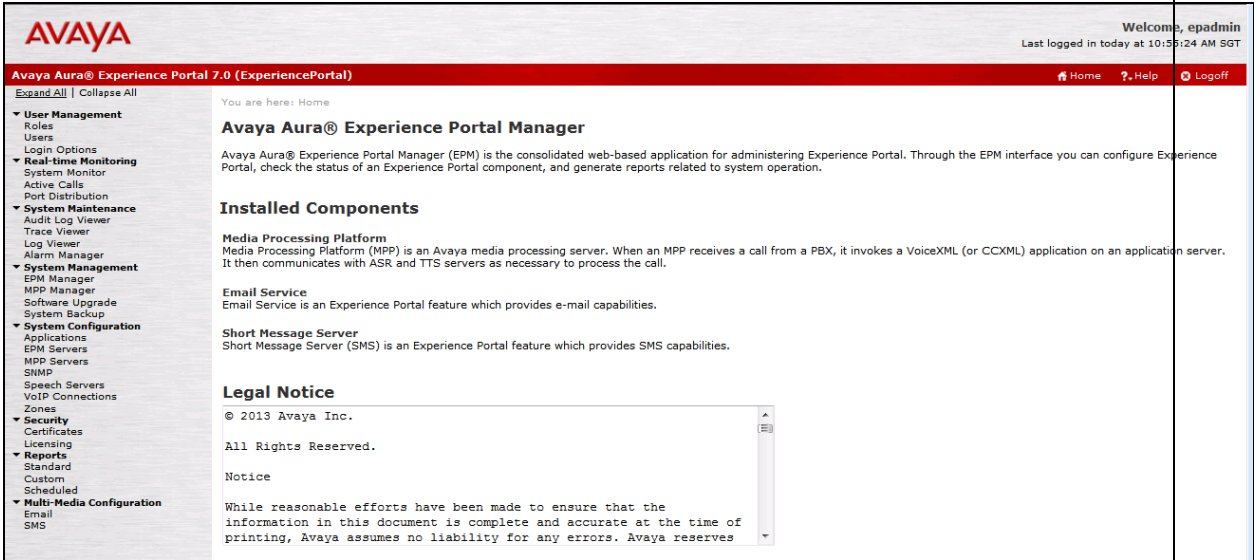
The configuration of the SIP Trunks between Communication Manager and Session Manager, and the routing of calls to Experience Portal are assumed to be in place and will not be discussed here. This section provides the additional procedures to configure Communication Manager for the purpose of administering AmiVoice. The configuration is performed via the System Access Terminal (SAT).

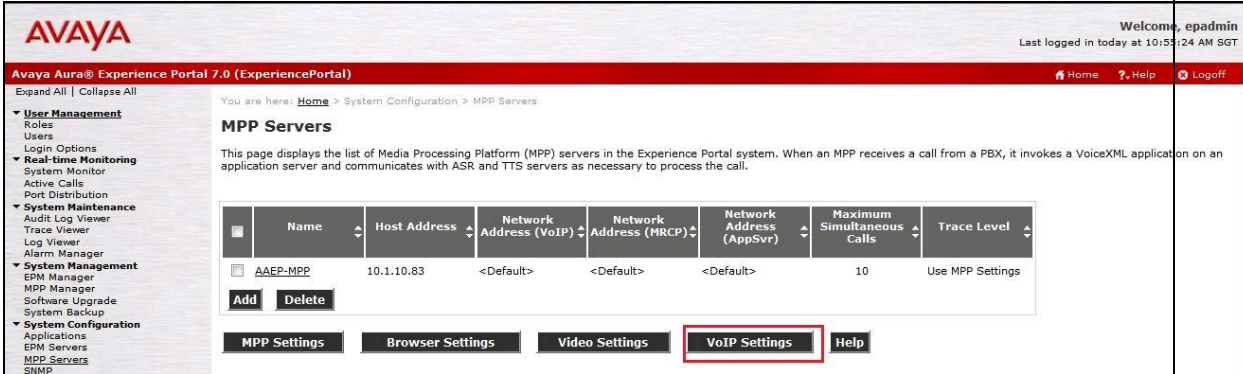
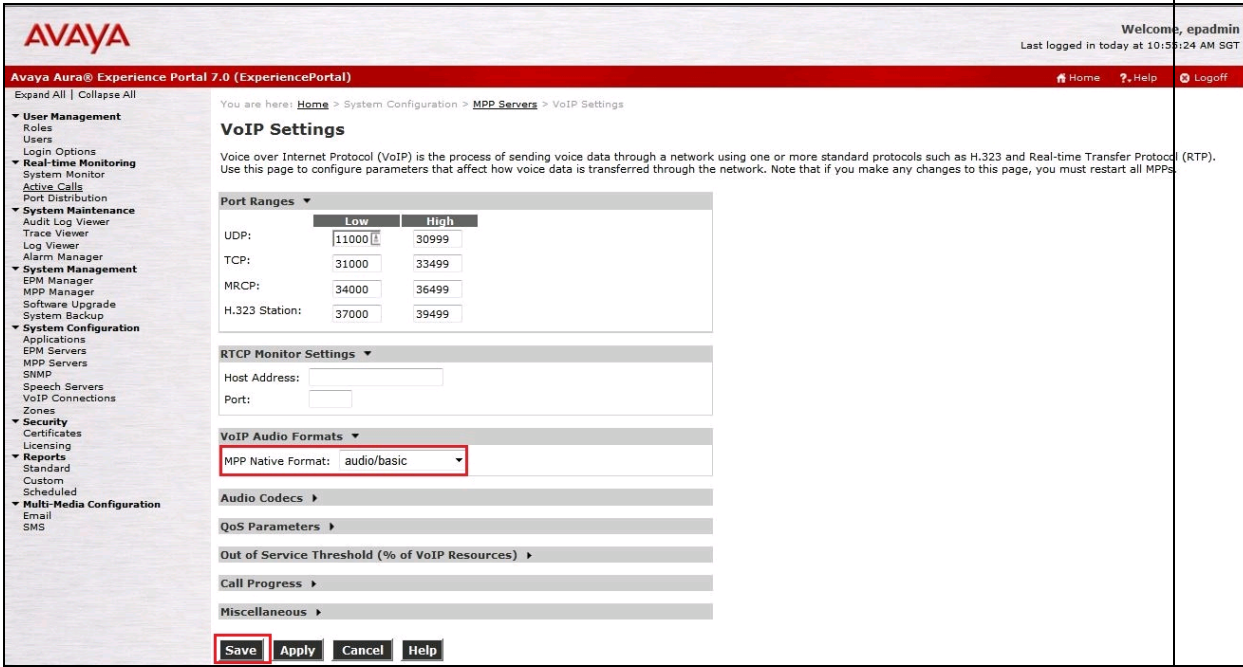
Step	Description
1.	<p>Enter the change ip-codec-set n command where n is a valid IP codec-set associated with the IP network region that is used by Experience Portal, typically the IP network region assigned to the Session Manager SIP Trunk signaling group. Set Audio Codec to an appropriate value supported by Avaya Experience Portal and AmiVoice. In this configuration, the G.711Mu codec was used.</p> <pre> change ip-codec-set 6 Page 1 of 2 IP Codec Set Codec Set: 6 Audio Silence Frames Packet Codec Suppression Per Pkt Size (ms) 1: G.711Mu n 2 20 2: 3: 4: 5: 6: 7: </pre>

6. Configure Avaya Aura® Experience Portal

The initial administration of Avaya Experience Portal and the configuration of the SIP VoIP Connection to Session Manager are assumed to be in place and will not be discussed here. This section covers the additional procedures of Avaya Experience Portal that is required for the purpose of administering AmiVoice. The following steps will be covered:

- Configuring the VoIP audio format
- Adding AmiVoice as a ASR server
- Adding applications

Step	Description
1.	<p>Avaya Experience Portal is configured via the Experience Portal Manager (EPM) web interface. To access the web interface, enter https://<ip-addr> as the URL in an internet browser, where <ip-addr> is the IP address of the EPM. Log in using an account with the Administration role to display the main page.</p> 

Step	Description
2.	<p>To configure the codec used by the Media Processing Platform (MPP) server, click System Configuration → MPP Servers in the left pane and click VoIP Settings.</p> 
3.	<p>Set MPP Native Format to audio/basic to configure the MPP server for G.711 mu-law to match the configuration on Communication Manager in Section 5. Scroll down the page and click Save.</p> 
4.	<p>AmiVoice is not natively included in the set of ASR engines supported by Avaya Experience Portal and will not initially appear in the ASR configuration screen. To add AmiVoice to the list of supported engines, log into the EPM server, either locally or remotely through Secure Shell (SSH), and locate the <code>languages.properties</code> file found in <code>/opt/Tomcat/apache-tomcat-6.0.37/webapps/VoicePortal/WEB-INF/classes/messages</code>. Edit the file and add the lines shown below to the appropriate section.</p>

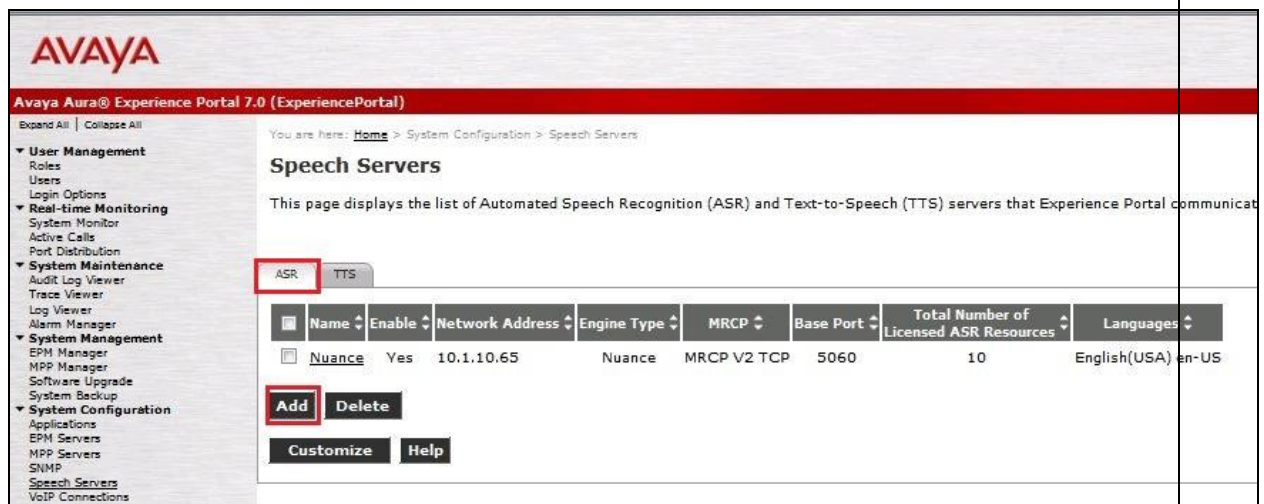
Step	Description
	<pre> < Some lines removed for brevity > #{{START:PROPERTIES:EXPERIENCEPORTAL_7.0 ##### # THIS SECTION IS SPECIFIC TO EXPERIENCE 7.0 # 1. ADD ANY NEW PROPERTIES FOR EXPERIENCE 7.0 TO ADDITIONS SECTION WITHIN 7.0 SECTION. # 2. TO MODIFY A PRE-EXISTING PROPERTY, MOVE IT TO MODIFICATIONS SECTION WITHIN 7.0 AND THEN MODIFY IT. # 3. TO DELETE A PRE-EXISTING PROPERTY, MOVE IT TO DELETIONS SECTION WITHIN 7.0 AND THEN COMMENT IT OUT. ##### #{{START:PROPERTIES:EXPERIENCEPORTAL_7.0:ADDITIONS # Specify any new properties for Experience Portal 7.0 here. AmiVoiceMRCPLabels=MRCP V1,MRCP V2 AmiVoiceTransportLabels=TCP,TLS #}}END:PROPERTIES:EXPERIENCEPORTAL_7.0:ADDITIONS < remaining lines removed for brevity > </pre>

Step	Description
5.	<p>Locate the <code>languages.properties</code> file found in <code>/opt/Tomcat/apache-tomcat-6.0.37/webapps/VoicePortal/WEB-INF/classes/config</code>. Edit the file and add the fields and lines shown below to the appropriate section.</p> <pre> # # Engine Type options displayed on the page # asrEngines=AmiVoice, IBM WVS, Loquendo, Nuance ttsEngines=InfoTalk, IBM WVS, Loquendo, Nuance asrEnginesAmsOnly=Nuance ttsEnginesAmsOnly=Nuance # Engine Type conversion from display to internal data in the databas < Some lines removed for brevity > AmiVoiceASR=amivoice asr IBMWVSASR=ibm wvs IBMWVSTTS=ibm wvs # Engine Type conversion from internal data in the database to display < Some lines removed for brevity > amivoiceasr=AmiVoice ibmwvs=IBM WVS nuanceosr=Nuance # # Languages # < Some lines removed for brevity > AmiVoiceASRlanguages=zh-CN, ja-JP, th-TH, ko-KR, en-US, fr-CA, de-DE, pt-BR, sv-SE # # Language Default # < Some lines removed for brevity > AmiVoiceASRlanguagesDefault=th-TH # # default base port # < Some lines removed for brevity > AmiVoiceBasePort=554 # # default New Connection per Session # < Some lines removed for brevity > AmiVoicePerPort=Yes # # default URL # < Some lines removed for brevity > AmiVoiceRtspUrlAsr=/media/recognizer </pre>

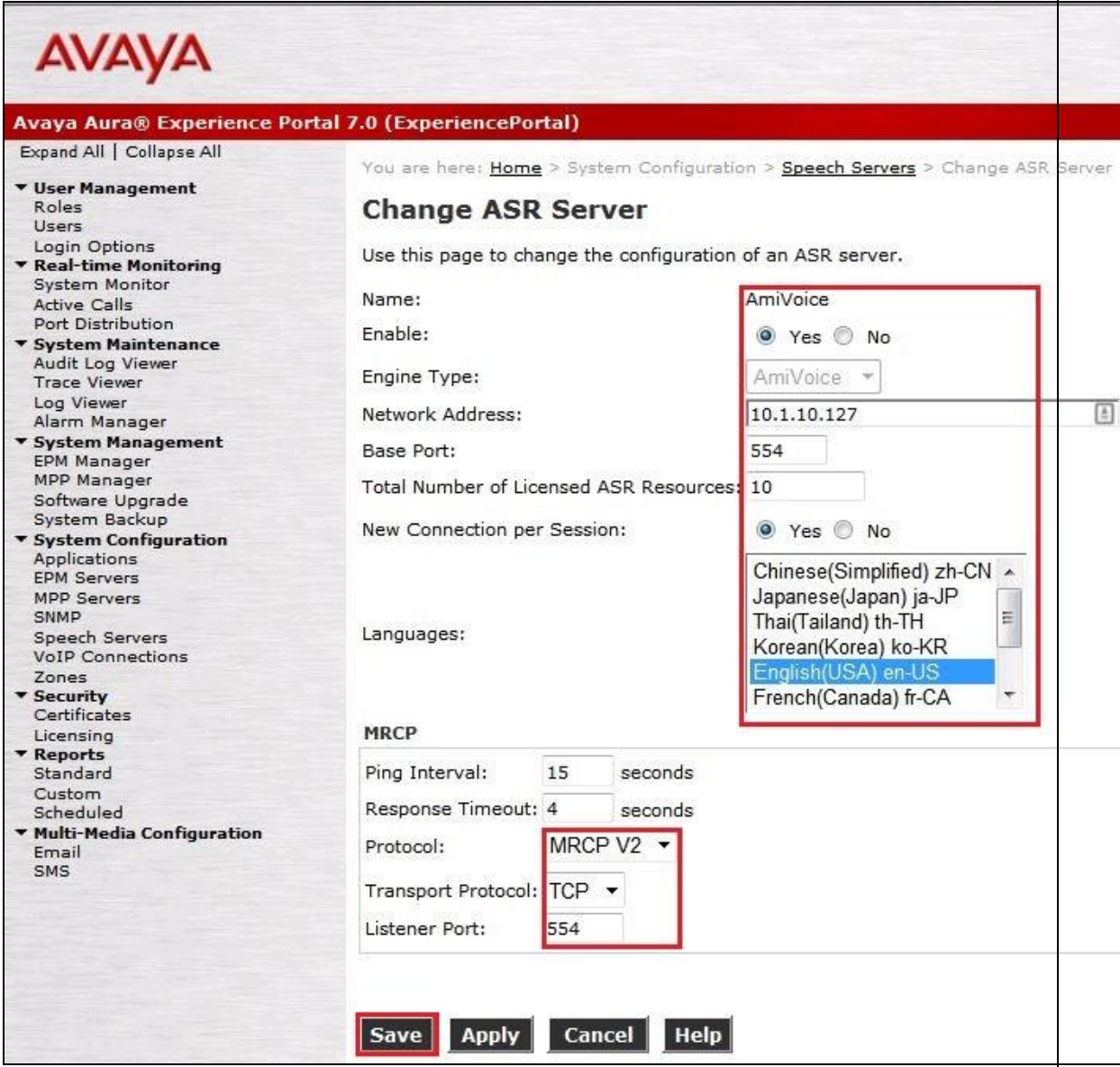
Step	Description
	<pre> # # Grammar Type # < Some lines removed for brevity > amivoiceasrGrammarType=srgs # # MRCP Protocol # < Some lines removed for brevity > AmiVoiceMRCPValues=mrCPv1,mrcpv2 # # Transport # < Some lines removed for brevity > AmiVoiceTransportValues=tcp,tls < remaining lines removed for brevity > </pre>

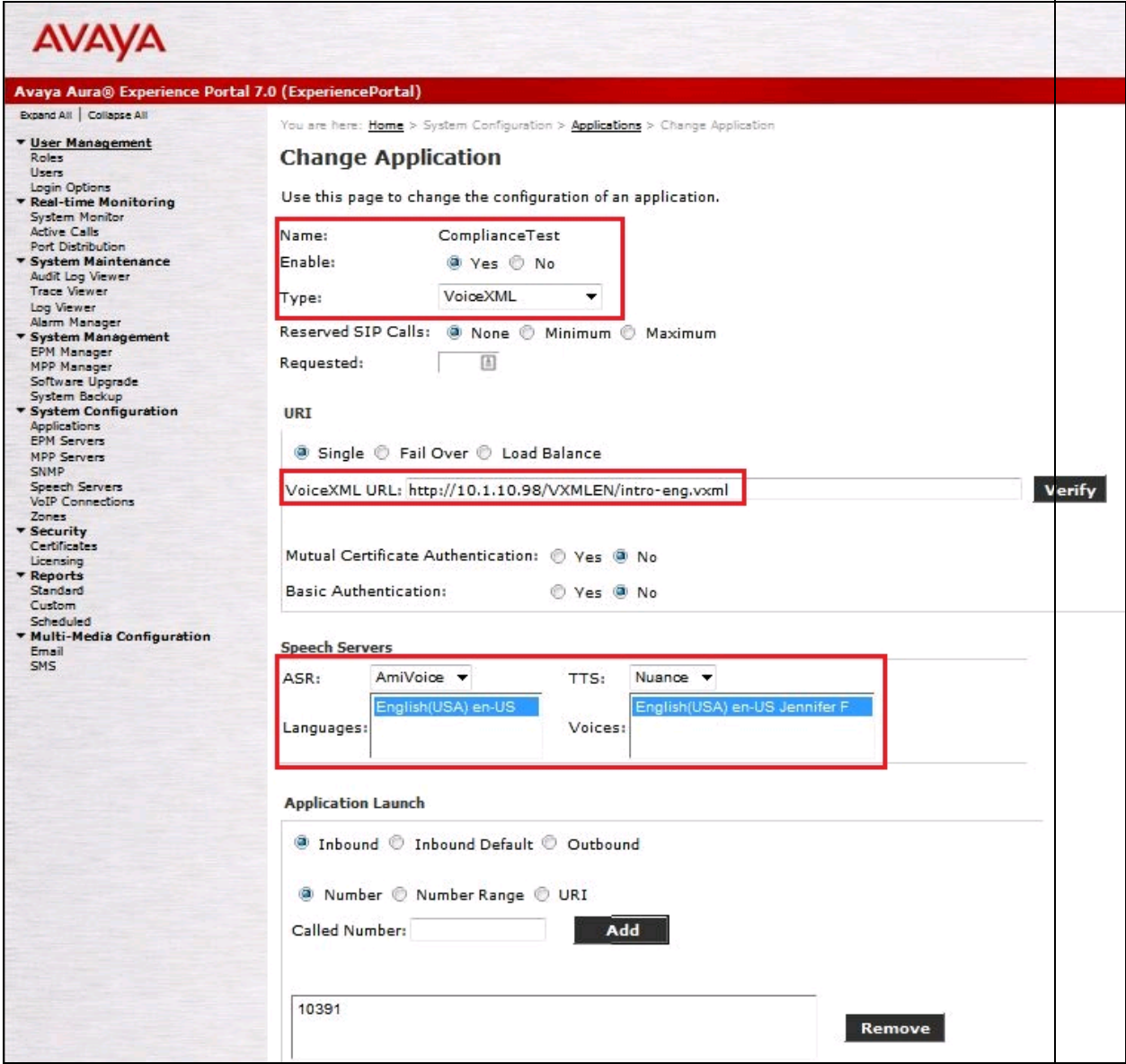
6. Reboot the EPM server for the above changes to take effect.

7. To configure the AmiVoice, click **System Configuration → Speech Servers**. Click the **ASR** tab and click **Add**.



8. In the **Add ASR Server** page, select **AmiVoice** as the **Engine Type**. This engine type option was added by modifying the `languages.properties` files in **Steps 4 and 5**. Specify the **Name**, select **Yes** to **Enable**, set **Network Address** to the IP address or Full FQDN of the AmiVoice server. Set the **Base Port** as **554**. Select the desired **Voices** used by the applications. The **Total Number of Licensed ASR Resources** should also be set to the number of licenses available on the AmiVoice. In the **MRCP** section, set **Protocol** to

Step	Description
	<p>MRCP V2. Set the Listener Port as 554. All other fields were left at their default values. Click Save.</p> 
9.	<p>To assign AmiVoice to an Avaya Experience Portal application, click System Configuration → Applications and then click Add on the Applications page (not shown). Configure the Add Application page as shown below. This configuration assigns the default Avaya Experience Portal test application deployed on the http server to the called number 10391. Specify the Name, select Yes to Enable, set MIME Type to VoiceXML and set VoiceXML URL to HTTP server address location of the VoiceXML script. Select AmiVoice for ASR and then select the appropriate Voices to use. In the compliance testing, Nuance is selected to provide the TTS (Text to Speech) with</p>

Step	Description
	<p>appropriate Voices. In the Advanced Parameters (scroll down to the bottom of the page), check that Support Remote DTMF Processing Yes radio button is selected. This is for the AmiVoice to support DTMF processing instead of MPP. Click Save (not shown). Repeat this procedure to assign AmiVoice to other Experience Portal applications.</p>  <p>The screenshot displays the 'Change Application' configuration page in the Avaya Aura Experience Portal 7.0. The left sidebar shows a navigation menu with categories like User Management, Real-time Monitoring, System Maintenance, System Management, System Configuration, Security, Reports, and Multi-Media Configuration. The main content area is titled 'Change Application' and includes a breadcrumb trail: 'You are here: Home > System Configuration > Applications > Change Application'. The page contains several sections: 'Name' (ComplianceTest), 'Enable' (Yes), 'Type' (VoiceXML), 'Reserved SIP Calls' (None), 'Requested' (1), 'URI' (Single), 'VoiceXML URL' (http://10.1.10.98/VXMLEN/intro-eng.vxml), 'Mutual Certificate Authentication' (No), 'Basic Authentication' (No), 'Speech Servers' (ASR: AmiVoice, TTS: Nuance, Languages: English(USA) en-US, Voices: English(USA) en-US Jennifer F), and 'Application Launch' (Inbound, Number, Called Number: 10391). Red boxes highlight the 'Name', 'Enable', 'Type', 'VoiceXML URL', 'Speech Servers', and 'Application Launch' sections.</p>

Step	Description
	<div> <div> EPM Manager MPP Manager Software Upgrade System Backup ▼ System Configuration Applications EPM Servers MPP Servers SNMP Speech Servers VoIP Connections Zones ▼ Security Certificates </div> <div> Speech Parameters ▶ Reporting Parameters ▶ Advanced Parameters ▼ Support Remote DTMF Processing: <input checked="" type="radio"/> Yes <input type="radio"/> No DTMF Type Ahead Enabled: <input type="radio"/> Yes <input checked="" type="radio"/> No </div> </div>

7. Configure AmiVoice

AmiVoice was installed on CentOS 6.5 64 bit server running on VMware ESXi 5.1 in this compliance testing. However, AmiVoice also can be installed on Windows platform.

As all communication between the AmiVoice and Avaya Experience Portal is via TCP/IP, it is strongly suggested that both systems be placed on the same IP subnet with minimal network traffic in order to minimize network latency.

This section will not detail the AmiVoice server installation and/or the license installation which can be found in the references [3] and [4]. Only the configuration will be documented here.

7.1. Configuring AmiVoice MRCP Server

7.1.1. Edit Configuration File

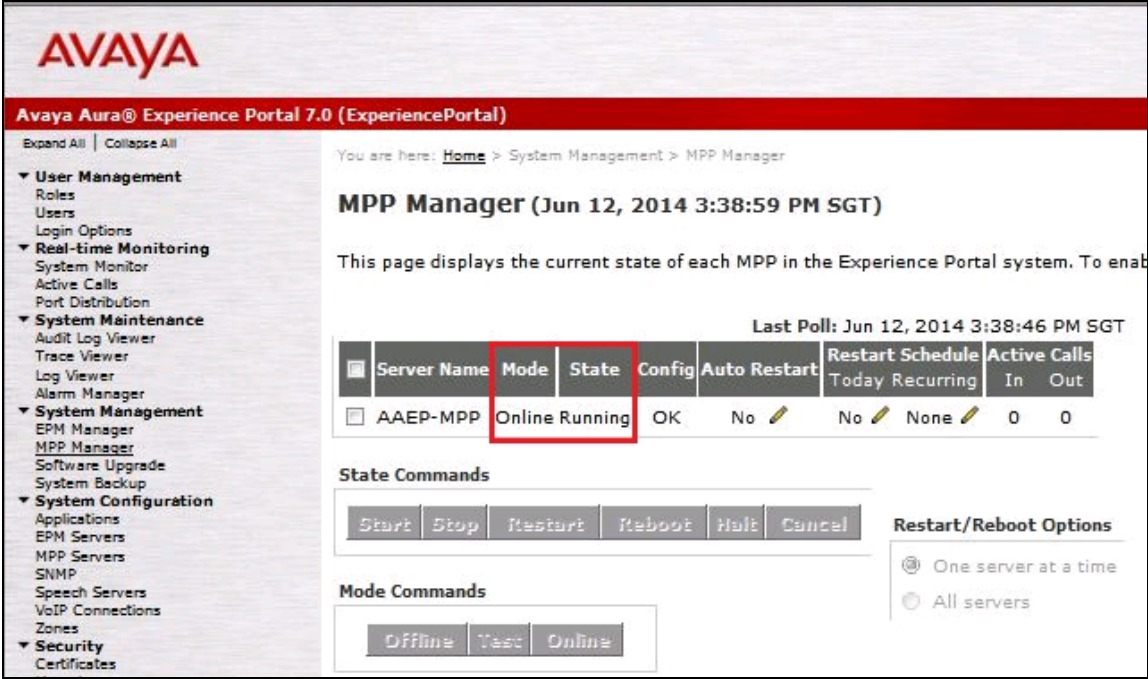
Step	Description
1.	<p>MRCPServer.ini is the file used for initial configuration.</p> <p>Normal location of the file on Linux/CentOS is at;</p> <p><code>/opt/AmiNets/mrcp/lib/MRCPServer.ini</code></p> <p>On Windows is at;</p> <p><code>C:\Program Files\AmiVoiceDSR\server\lib\MRCPServer.ini</code></p> <p>The following formats are edited during the testing for the default ini file. Details are shown in the Appendix.</p>

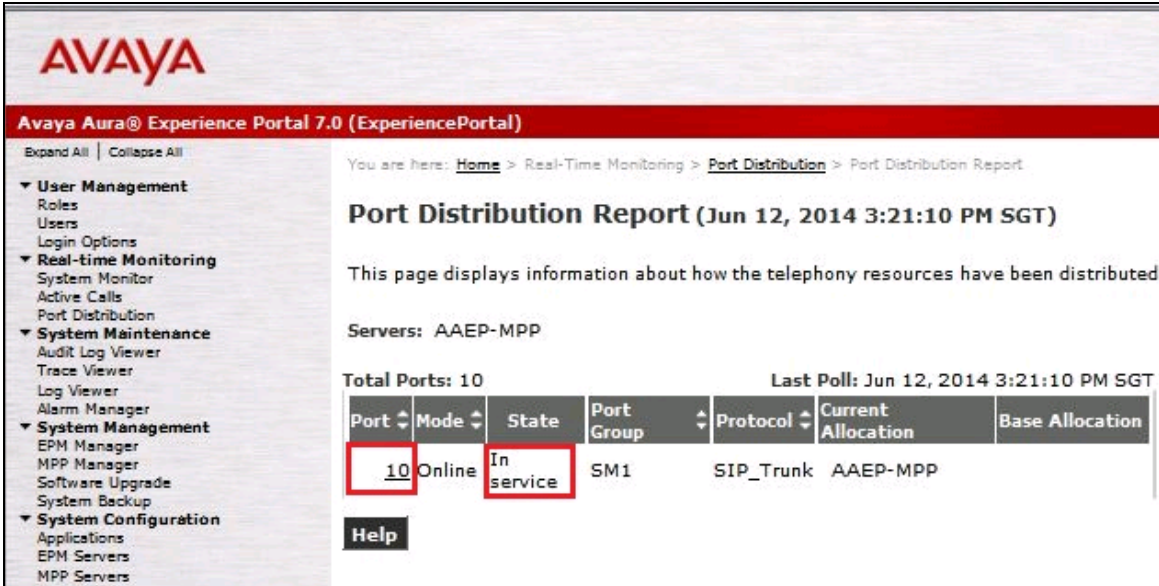
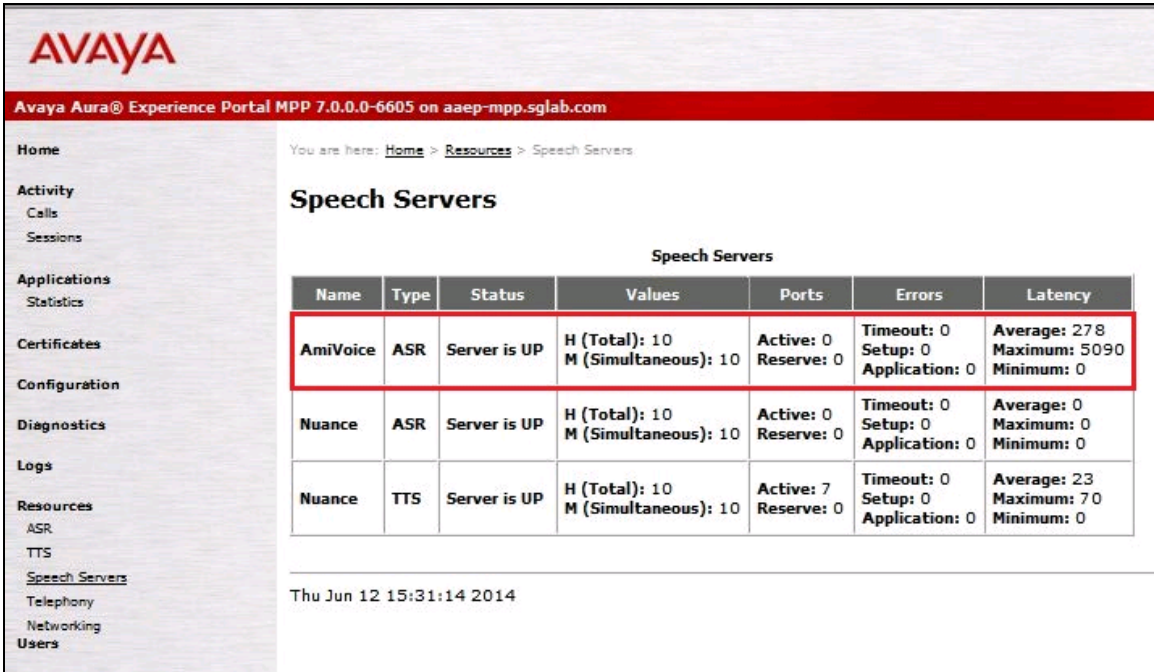
Step	Description
2.	<p>Change NLSML format.</p> <p>The following lines are edited for the NLSML format;</p> <pre> NLSMLTemplate_noMatch_speech=\ \<?xml version="1.0" encoding="%NLSMLEncoding%"?>\n\ \<result>\n\ \ <interpretation confidence="">\n\ \ <instance><nomatch></instance>\n\ \ <input mode="speech">nomatch</input>\n\ \ </interpretation>\n\ \</result>\n NLSMLTemplate_noMatch_dtmf=\ \<?xml version="1.0" encoding="%NLSMLEncoding%"?>\n\ \<result>\n\ \ <interpretation confidence="">\n\ \ <instance><nomatch></instance>\n\ \ <input mode="dtmf">nomatch</input>\n\ \ </interpretation>\n\ \</result>\n NLSMLTemplate_match_speech=\ \<?xml version="1.0" encoding="%NLSMLEncoding%"?>\n\ \<result>\n\ \ <interpretation grammar="%GRAMMAR_ID%" confidence="%CONFIDENCE%">\n\ \ <instance>\n\ \ %TAGS (AVAYA) %\n\ \ </instance>\n\ \ <input mode="speech">%WRITTEN_FORMS%</input>\n\ \ </interpretation>\n\ \</result>\n NLSMLTemplate_match_dtmf=\ \<?xml version="1.0" encoding="%NLSMLEncoding%"?>\n\ \<result>\n\ \ <interpretation grammar="%GRAMMAR_ID%" confidence="%CONFIDENCE%">\n\ \ <instance>\n\ \ %TAGS (AVAYA) %\n\ \ </instance>\n\ \ <input mode="dtmf">%TOKENS%</input>\n\ \ </interpretation>\n\ \</result>\n </pre>
3.	<p>Change DTMF Result Format.</p> <p>Note that it should not include any space after '='.</p> <pre> DTMFDelimiter= TagsDelimiter= </pre>
4	Restart of MRCP Server.

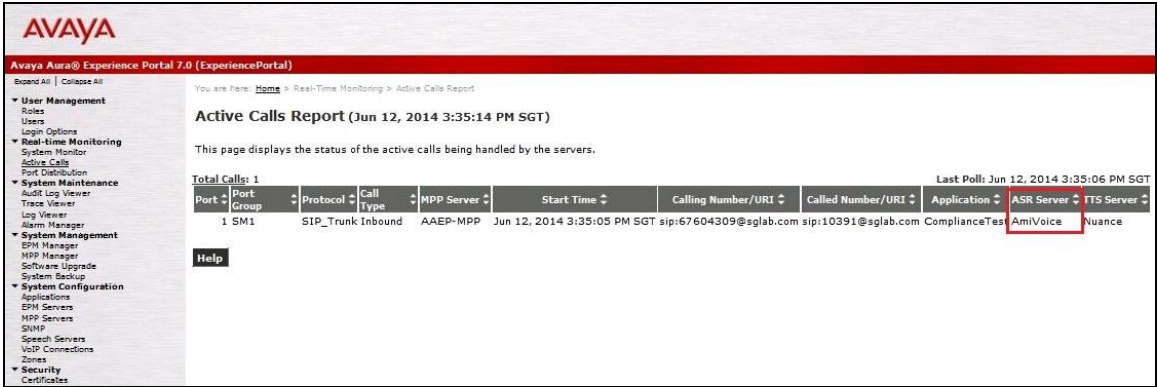
Step	Description
	<p>After the <i>MRCPServer.ini</i> changes, restart of the MRCP Server daemon service is required. For the default port</p> <p>On Linux/CentOS;</p> <div data-bbox="280 411 1433 543" style="border: 1px solid black; padding: 5px; background-color: #f0f0f0;"> <pre>\$ service MRCP Server554 stop \$ service MRCP Server554 start</pre> </div> <p>On Windows;</p> <div data-bbox="280 621 1433 753" style="border: 1px solid black; padding: 5px; background-color: #f0f0f0;"> <pre>\$ "C:\Program Files\AmiVoiceDSR\server\lib\MRCPServer.exe" -stop 554 \$ "C:\Program Files\AmiVoiceDSR\server\lib\MRCPServer.exe" -start 554</pre> </div>

8. Verification Steps

This section provides the verification steps that may be performed to verify that Avaya Experience Portal can run VoiceXML applications that use the AmiVoice for ASR speech detection.

Step	Description
1.	<p>From the EPM web interface, click MPP Manager on the left pane. On the MPP Manager page, verify that the MPP server is Online and Running.</p> 

Step	Description
2.	<p>From the EPM web interface, click Port Distribution on the left pane. On the Port Distribution page, verify that the State of all the ports on the MPP server is In service.</p>  <p>The screenshot shows the Avaya Aura Experience Portal 7.0 interface. The left navigation pane includes sections like User Management, Real-time Monitoring, System Maintenance, System Management, and System Configuration. The main content area displays the 'Port Distribution Report (Jun 12, 2014 3:21:10 PM SGT)'. It states 'Servers: AAEP-MPP' and 'Total Ports: 10'. A table lists port details, with the first row showing Port 10, Mode Online, and State In service. The 'In service' state is highlighted with a red box.</p>
3.	<p>From the EPM web interface, click System Monitor and click AAEP-MPP. Click Service Menu on the bottom right on the right pane. A new tab will show the MPP. Click Speech Servers under Resources. Verify that AmiVoice ASR is UP.</p>  <p>The screenshot shows the Avaya Aura Experience Portal MPP 7.0.0.0-6605 interface. The left navigation pane includes sections like Home, Activity, Applications, Certificates, Configuration, Diagnostics, Logs, Resources, and Users. The main content area displays the 'Speech Servers' page. It shows a table with columns: Name, Type, Status, Values, Ports, Errors, and Latency. The first row, representing AmiVoice ASR, is highlighted with a red box and shows a status of 'Server is UP'.</p>

Step	Description
4.	<p>To check the status of MRCP Server, run the following command;</p> <p>On Linux/CentOS;</p> <pre>\$ service MRCPServer554 status</pre> <p>On Windows;</p> <pre>\$ "C:\Program Files\AmiVoiceDSR\server\lib\MRCPServer.exe" -status 554</pre>
5.	<p>Place some calls to Avaya Experience Portal that runs a VoiceXML script which uses the AmiVoice for speech detection. Verify that the application answers the calls and that the application is able to announce the ASR synthesized prompts to the caller. From the Avaya Experience Portal web interface, click Active Calls on the left pane and verify that the ASR Server in use is AmiVoice.</p> 

9. Conclusion

These Application Notes describe the compliance-tested configuration used to validate Avaya Aura® Experience Portal 7.0 with AmiVoice® (Power Voice) MRCP Server.

10. Additional References

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

- [1] *Administering Avaya Aura® Communication Manager*, Release 6.3, Oct 2013, Document ID 03-300509.
- [2] *Administering Avaya Aura® Experience Portal*, Release 7.0, Issue 1, Dec 2013.

The following documents are available from Advanced-Media, Inc.:

- [3] *AmiVoice MRCP Server System User's Guide*, Version 2.1.0, 10 Jan 2014
- [4] *AmiVoice DSR Server System User's Guide*, Version 2.3, 12 July 2014

11. Appendix A: MRCPServer.ini

```
ServerIpAddress=10.1.10.127
#ServerBacklog=50
#SIPServerPort=5060
#SSLServerPort=
#SSLKeyStoreFileName=
#SSLKeyStorePassword=
#SSLKeyStoreType=
MaxSessions=200
MinRtpPortRange=25000
MaxRtpPortRange=26000
#UnusedSessionDeletionPeriod=0
#RtpSocketTimeout=1000
#RtpReceiveBufferSize=65536
#RtpPacketSize=1024
#DTMFDetectionEnabled=false
#DTMFDetectionThreshold=0.5
#DefaultConfidenceThreshold=0.5
DefaultSpeedVsAccuracy=0.9
#DefaultNoInputTimeout=10000
DefaultRecognitionTimeout=60000
#DefaultSpeechCompleteTimeout=600
DefaultHotwordEnabled=0
DefaultHumanAssistantEnabled=0
#MaxTimeout=30000
#MinThreshold=400
#MaxThreshold=12000
AcceptSpeechLanguage=true
SupportedSpeechLanguages=en-US
SupportedModeNames=AmiTelephony8kEn
#AcceptNewAudioChannel=false
#AcceptSpeechLanguage=false
#WrittenFormsDelimiter=\
#SpokenFormsDelimiter=\
## AAEP requires it should be empty string
## Default is space
#TagsDelimiter=\
#DTMFDelimiter=\
DTMFDelimiter=
TagsDelimiter=
#NLSMLMode=0
#NLSMLEncoding=UTF-8
#NLSMLTemplate_noInput=\
NLSMLTemplate_noInput=\
    \<?xml version="1.0" encoding="%NLSMLEncoding%"?>\n\
    \<result>\n\
    \ <interpretation>\n\
    \ <input><noinput/></input>\n\
    \ </interpretation>\n\
    \</result>\n\
#NLSMLTemplate_noMatch_speech=
NLSMLTemplate_noMatch_speech=\
    \<?xml version="1.0" encoding="%NLSMLEncoding%"?>\n\
    \<result>\n\
    \ <interpretation confidence="">\n\
    \ <instance>nomatch</instance>\n\
    \ <input mode="speech">nomatch</input>\n\
```

```

\ </interpretation>\n\
\</result>\n
#NLSMLTemplate_noMatch_dtmf=
NLSMLTemplate_noMatch_dtmf=\
\<?xml version="1.0" encoding="%NLSMLEncoding%"?>\n\
\<result>\n\
\ <interpretation confidence="">\n\
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\ <input mode="dtmf">nomatch</input>\n\
\ </interpretation>\n\
\</result>\n

#NLSMLTemplate_match_speech=\
NLSMLTemplate_match_speech=\
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\<result>\n\
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\ <instance>\n\
\ %TAGS (AVAYA) %\n\
\ </instance>\n\
\ <input mode="speech">%WRITTEN_FORMS%</input>\n\
\ </interpretation>\n\
\</result>\n

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NLSMLTemplate_match_dtmf=\
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\<result>\n\
\ <interpretation grammar="%GRAMMAR_ID%" confidence="%CONFIDENCE%">\n\
\ <instance>\n\
\ %TAGS (AVAYA) %\n\
\ </instance>\n\
\ <input mode="dtmf">%TOKENS%</input>\n\
\ </interpretation>\n\
\</result>\n

# <!-- please never change!
ServiceName=AmiVoiceMRCPMediaServer%ServerPort%
DisplayName=AmiVoice MRCP Media Server %ServerPort%
PathNames=.;.
ClassPathNames=MRCPServer.jar;XCalibur.jar;AmiDsrc.jar;ext/*.jar
MainClassName=Server
VmPathName=
VmOptions=-Xmx512m
# -->

```

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