



Avaya Solution & Interoperability Test Lab

Application Notes for VoiceKey with Avaya Aura® Experience Portal 6.0 and Avaya Aura® Communication Manager 6.3 – Issue 1.0

Abstract

These Application Notes describe the configuration steps required for VoiceKey to successfully interoperate with Avaya Aura® Experience Portal, Avaya Aura® Communication Manager and Avaya Aura® Session Manager. VoiceKey is a voice verification platform that processed voice samples and compared it to the voice etalon of a specific user that has been recorded before.

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 VoiceKey to successfully interoperate with Avaya Aura® Experience Portal, Avaya Aura® Communication Manager and Avaya Aura® Session Manager. The VoiceKey is a voice verification platform that processes voice samples and compares it to the voice etalon of a specific user that has been previously recorded

The VoiceKey platform consists of:

- 1) VoiceKey SRV, basically a HTTP server handling the following functions:
 - Building a voice model by means of speech samples recorded by users
 - Comparing one voice model to another
- 2) IVR application module (Apache Tomcat server, Database)

2. General Test Approach

The general test approach is to place calls manually to Avaya Aura® Experience Portal running VXML applications that uses the VoiceKey solution. VXML scripts are hosted on the VoiceKey platform that runs on Apache Tomcat. VoiceKey is simply a voice verification server that passes the results back to the VXML script. Hence, it does not depend on the type of Text-to-Speech (TTS) or Automatic Speech Recognition (ASR) server used in a solution. In this Compliance Testing pre-recorded voice prompts are installed on the VoiceKey platform.

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 that uses the VoiceKey to compare Voice Samples previously stored. The compliance test focused on placing calls to verify the accuracy of VoiceKey analysis and handling of failure conditions.

The serviceability testing focused on verifying the ability of VoiceKey to recover from adverse conditions such as rebooting of VoiceKey and Avaya Experience Portal 6.0 and disconnecting the LAN cables to the VoiceKey Server.

2.2. Test Results

All test cases passed. Avaya Aura® Experience Portal 6.0 was successful in running applications that use the VoiceKey in voice verification.

2.3. Support

For technical support on Speech Technology Center contact:

- Telephone : +7 (812) 325-8848
- Fax : +7 (812) 327-9297
- Web : http://speechpro.com/support_form
- Email: support@speechpro.com

3. Reference Configuration

Figure 1 illustrates the configuration used to verify the VoiceKey solution. VXML scripts are run on the VoiceKey Server on Apache Tomcat. Since VoiceKey is independent of TTS/ASR, the VXML scripts is only using local wav files for voice prompts in this Compliance Testing.

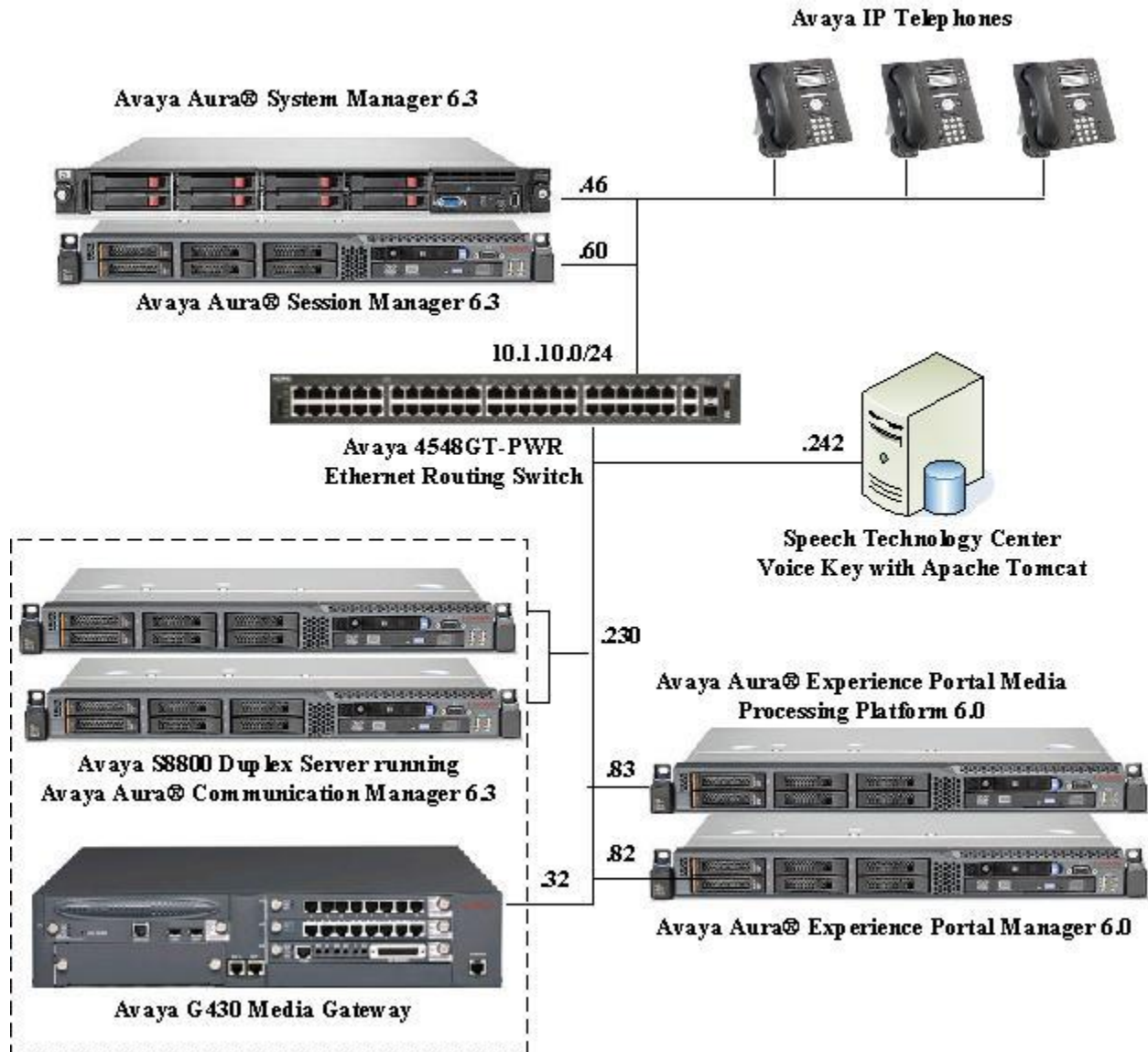


Figure 1: VoiceKey with Avaya Aura® Experience Portal Configuration

4. Equipment and Software Validated

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

Equipment/Software	Release/Version
Avaya Aura® Experience Portal 6.0 on Avaya S8800 Server	R6.0 SP2
Avaya Aura® Communication Manager on Avaya S8800 Server (Duplex)	R6.3 SP2.1
Avaya G430 Media Gateway	34.5.1
Avaya Aura® System Manager on HP DL360 G7	6.3 SP4
Avaya Aura® Session Manager on Avaya S8800 Server	6.3 SP5
Avaya 96x1 IP Telephones	6.3 (H.323)
Avaya 4548GT-PWR Ethernet Routing Switch	V6.2.4.010
VoiceKey SRV on Windows Server 2008 R2 x64 running on VMware ESXi 4.1	1.0.274

5. Configure Avaya Aura® Communication Manager

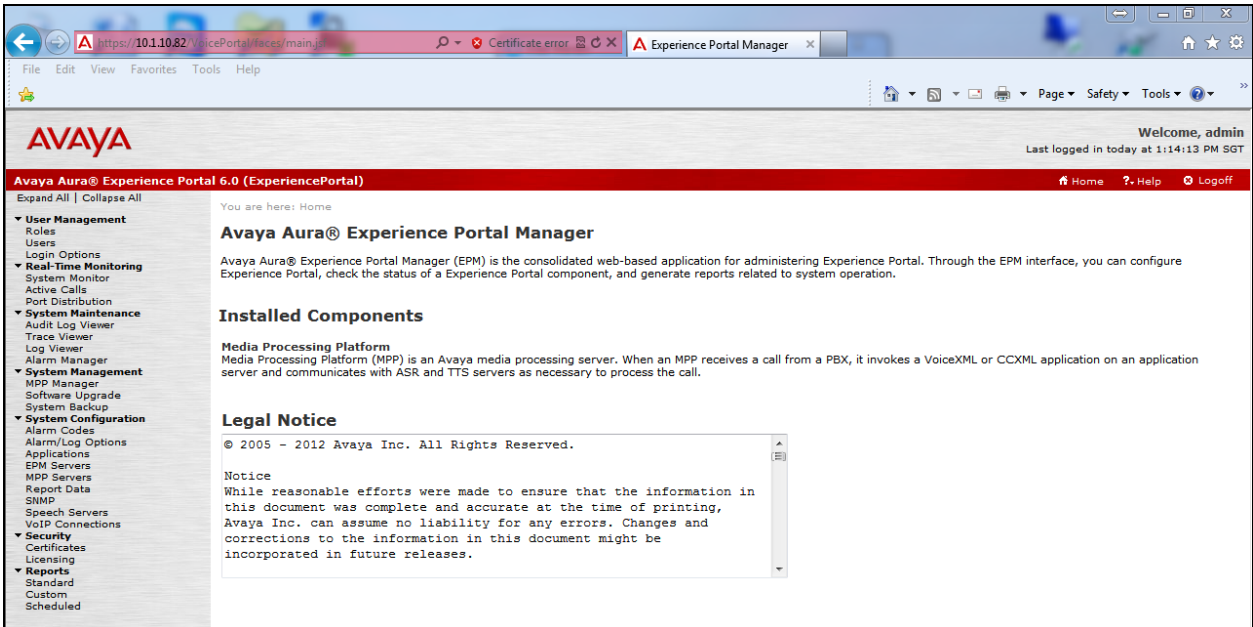
The configuration of the SIP Trunks between Communication Manager and Session Manager, and the routing of calls to Experience Portal are assumed to be in place and will not be discussed here. This section provides the additional procedures to configure Communication Manager for the purpose of administering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

Step	Description
1.	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 VoiceKey Server. In this configuration, the G.711Mu codec was used.
	<pre>change ip-codec-set 6</pre> <p style="text-align: right;">Page 1 of 2</p> <pre> 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

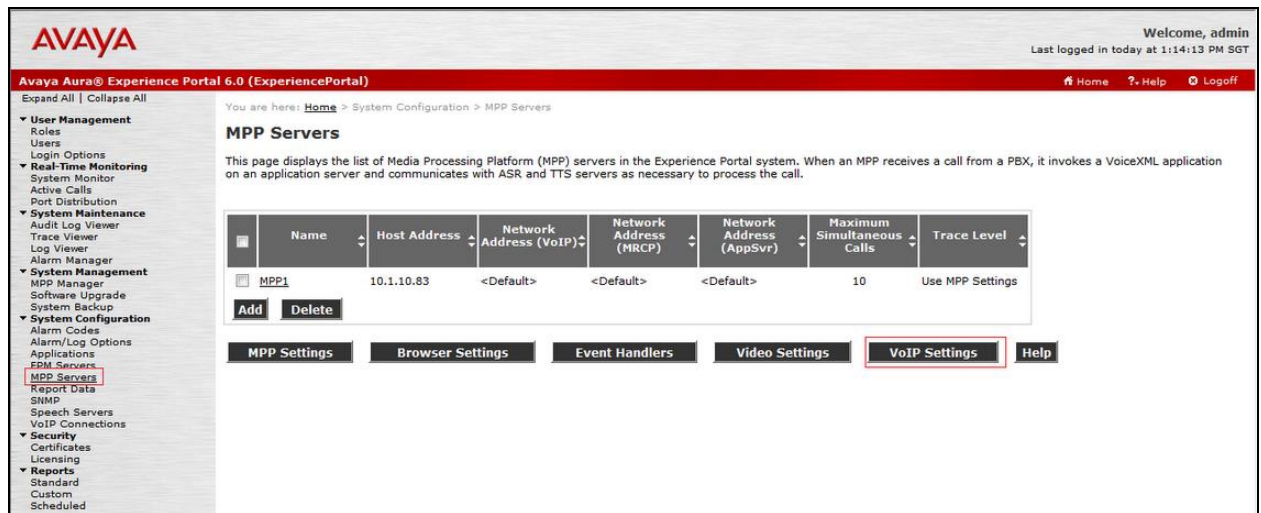
The initial administration of Avaya Experience Portal and the configuration of the SIP VoIP Connection to Session Manager are assumed to be in place and will not be discussed here. This section covers the additional procedures of Avaya Experience Portal that is required for the purpose of administering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

- Configuring the VoIP audio format
- Adding applications

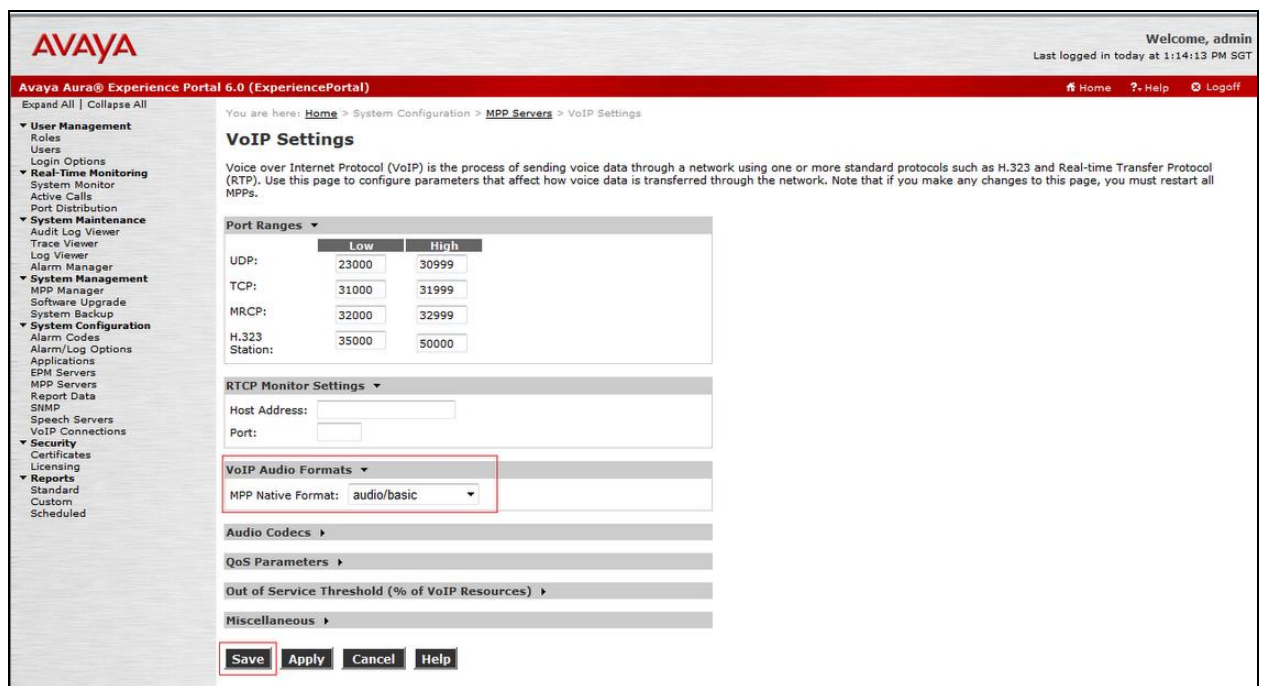
Step	Description
1.	<p>Avaya Experience Portal is configured via the Experience Portal Manager (EPM) web interface. To access the web interface, enter https://<ip-addr> as the URL in an internet browser, where <ip-addr> is the IP address of the EPM. Log in using an account with the Administration role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

Step	Description
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2. 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**.



3. 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**.



4. To assign the VXML script to an Avaya Experience Portal application, click **System Configuration** → **Applications** and then click **Add** on the Applications page (not shown).

Step	Description
	<p>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, set Type to VoiceXML and set VoiceXML URL to HTTP server address location of the VoiceXML script. In this Compliance Testing, the VoiceKey Server also serves as a HTTP server. Click Save (not shown).</p> <div data-bbox="277 449 1521 1713" style="border: 1px solid black; padding: 10px;"> <p>You are here: Home > System Configuration > Applications > Change Application</p> <h3>Change Application</h3> <p>Use this page to change the configuration of an application.</p> <div style="border: 1px solid red; padding: 5px; margin-bottom: 10px;"> <p>Name: VoiceKey Enable: <input checked="" type="radio"/> Yes <input type="radio"/> No Type: <input type="text" value="VoiceXML"/></p> </div> <p>URI</p> <p><input checked="" type="radio"/> Single <input type="radio"/> Fail Over <input type="radio"/> Load Balance</p> <p>VoiceXML URL: <input type="text" value="http://10.1.10.242:8080/voicekey/"/> <input type="button" value="Verify"/></p> <p>Mutual Certificate Authentication: <input type="radio"/> Yes <input checked="" type="radio"/> No Basic Authentication: <input type="radio"/> Yes <input checked="" type="radio"/> No</p> <p>Speech Servers</p> <p>ASR: <input type="text" value="No ASR"/> TTS: <input type="text" value="No TTS"/></p> <p>Application Launch</p> <p><input checked="" type="radio"/> Inbound <input type="radio"/> Inbound Default <input type="radio"/> Outbound</p> <p><input checked="" type="radio"/> Number <input type="radio"/> Number Range <input type="radio"/> URI</p> <p>Called Number: <input type="text"/> <input type="button" value="Add"/></p> <p><input type="text" value="10391"/> <input type="button" value="Remove"/></p> <p>Speech Parameters ▶</p> </div>

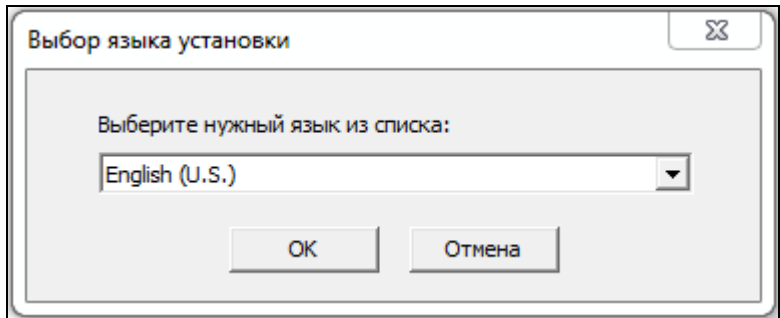
7. Configure VoiceKey Server

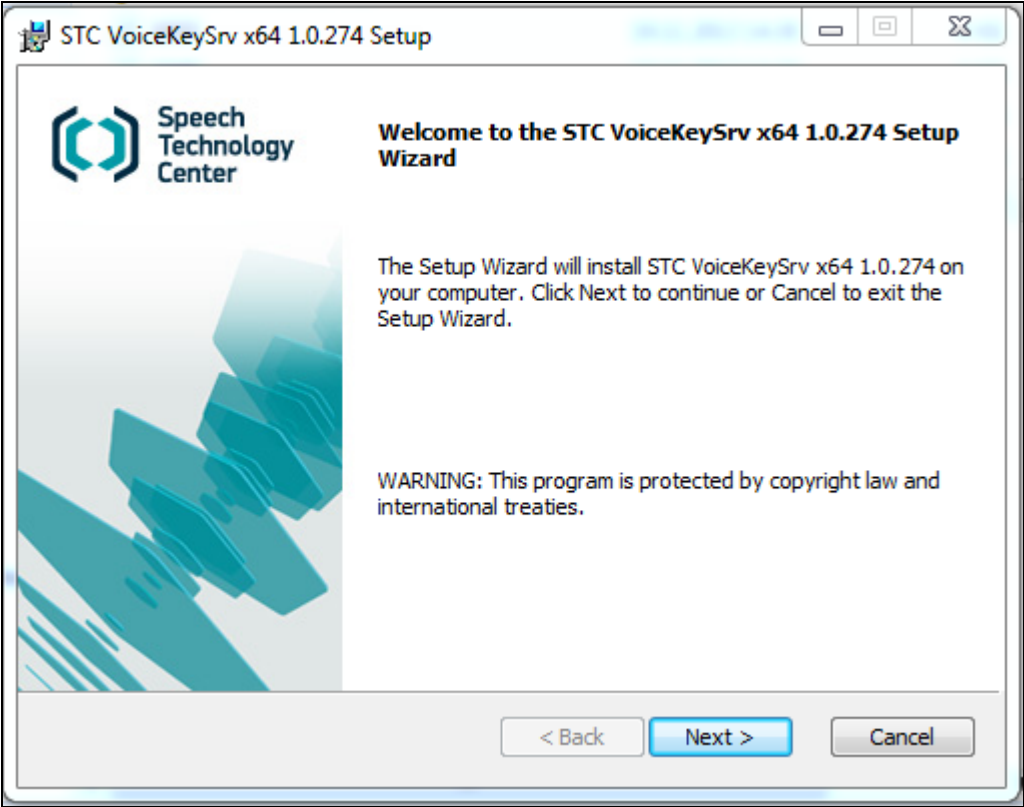
VoiceKey SRV and IVR application module were installed on Windows Server 2008 R2 x64 running on VMware Intel Xeon E5620, 2.93GHz processor, 8GB RAM. As all communication between the VoiceKey server and Avaya Experience Portal is via TCP/IP, it is strongly suggested that both systems be placed on the same IP subnet with minimal network traffic in order to minimize network latency.

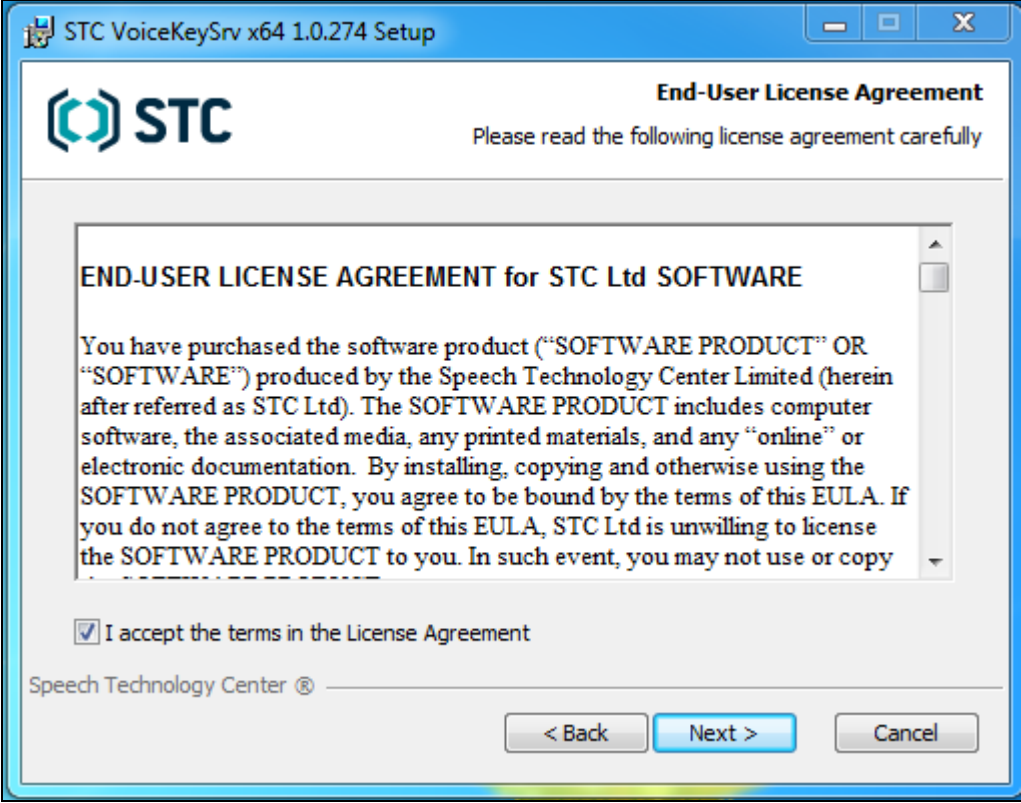
The sections that follow detail the **VoiceKey** setup.

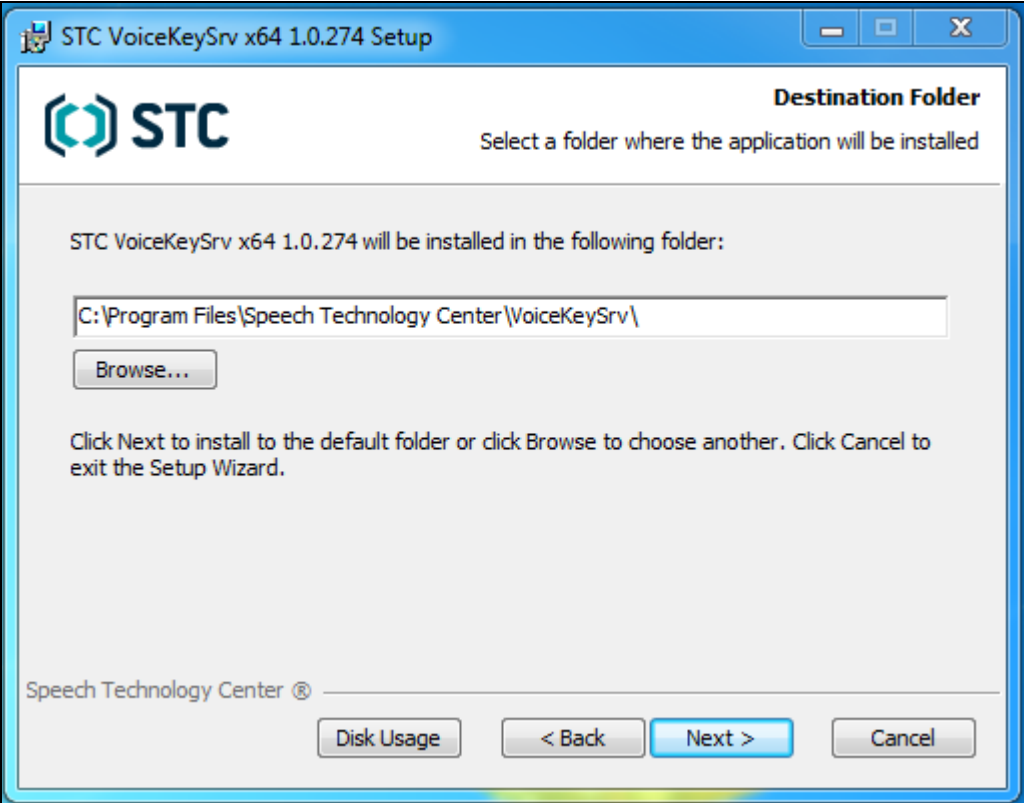
- Install and Configure software (VoiceKey SRV and IVR application module)
- Install License
- Verify Installation

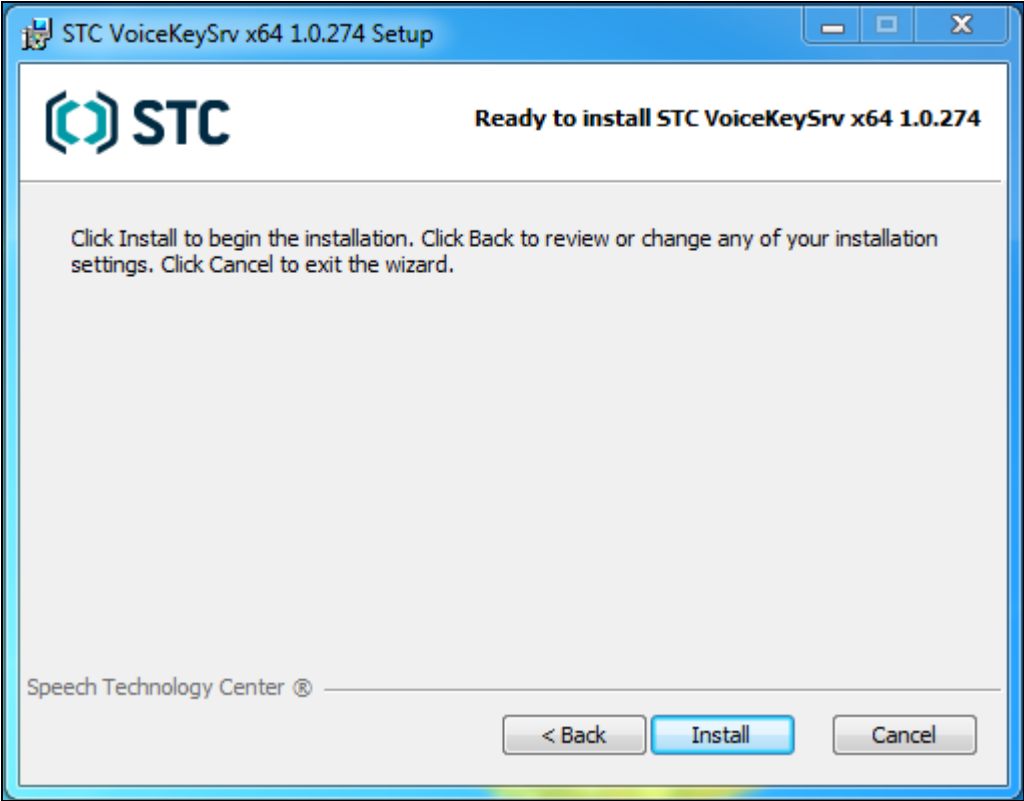
7.1. Install and Configure software

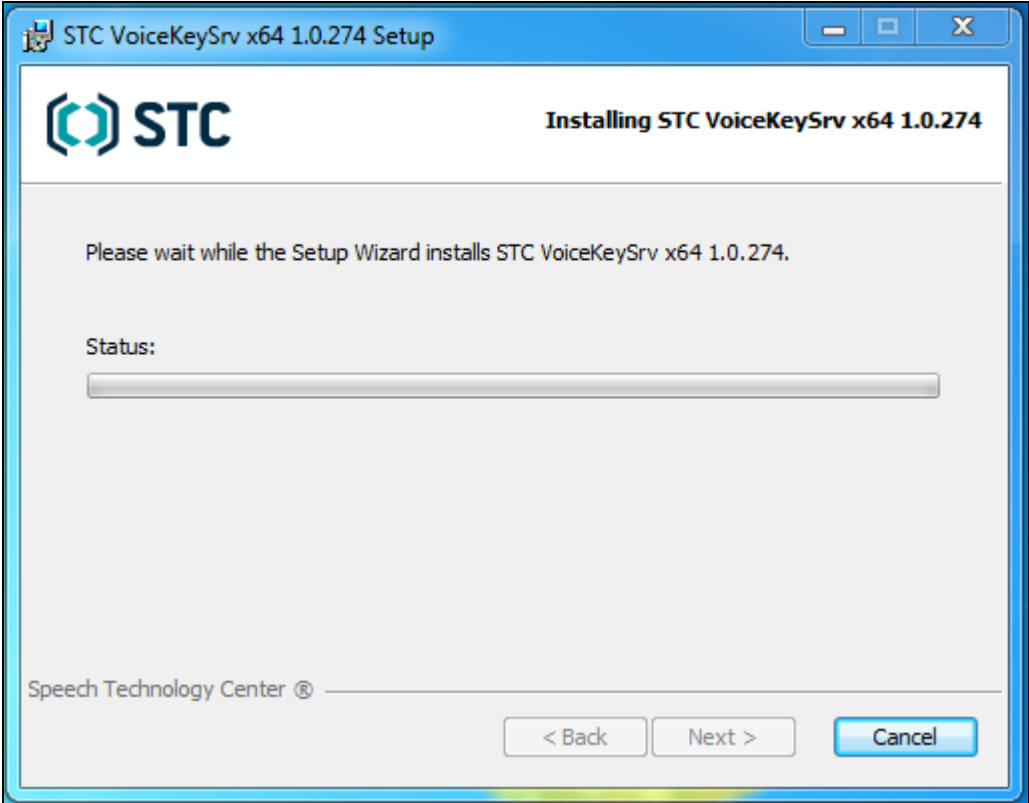
Step	Description
	Installing VoiceKey SRV software
1.	For Microsoft Windows machines, VoiceKey SRV is distributed as a setup file. To install, run the Setup.exe file.
2.	Select setup language and click OK .  <p>The following prerequisites will be automatically set up, if not already installed: Windows Installer, Microsoft Visual C++ 2010 Redistributable and HASP Driver.</p>

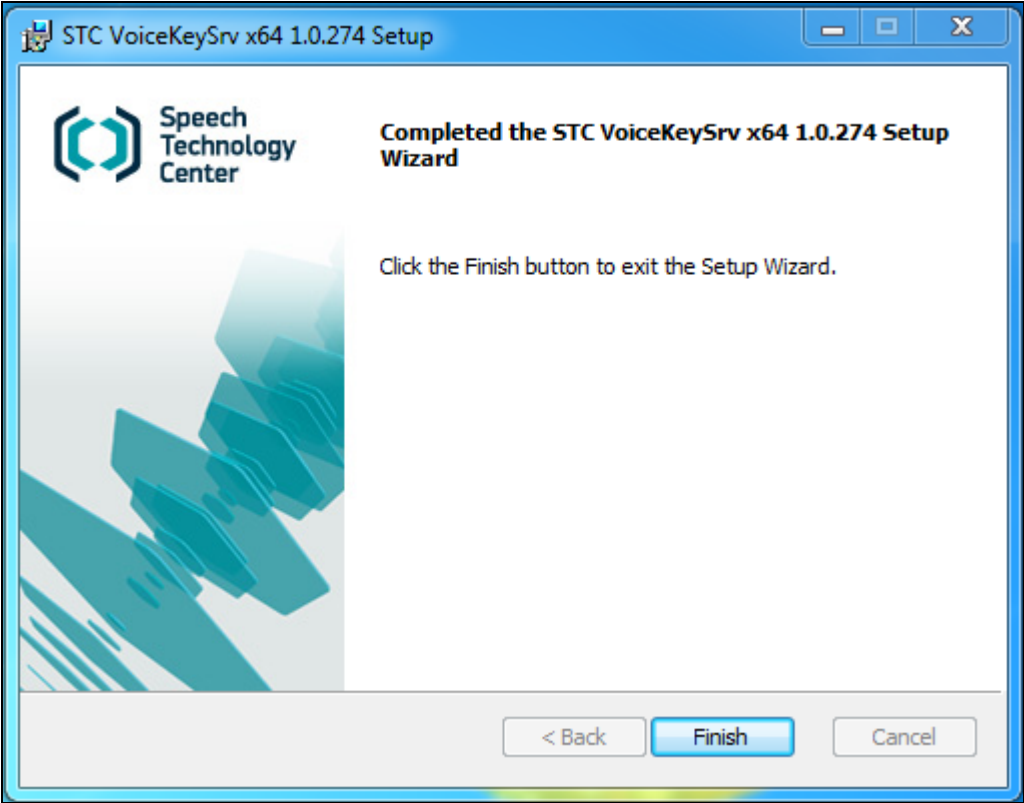
Step	Description
3.	<p>A welcome window will be displayed. Click Next to continue.</p> 

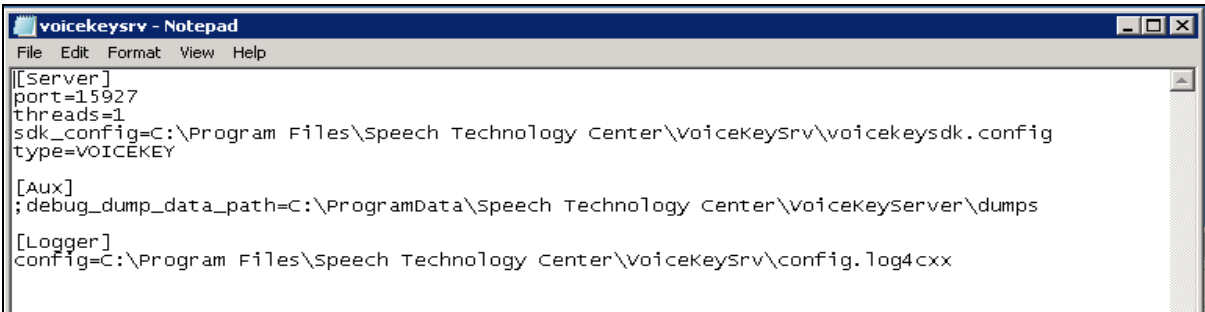
Step	Description
4.	<p>Read and accept the license agreement and click Next.</p> 

Step	Description
5.	<p>Select the destination folder and click Next. The default installation path is C:\Program Files\Speech Technology Center\VoiceKeySrv.</p> 

Step	Description
6.	<p>Click Install to begin the installation.</p> 

Step	Description
7.	<p>The installation wizard will install the product.</p> 

Step	Description
8.	<p>At the end of installation process, click the Finish button.</p> 
9.	<p>Restart the server after the installation.</p>

Configuring VoiceKey Srv software	
10.	<p>Modify the file voicekeysrv.config found at “%ProgramData%\Speech Technology Center\VoiceKeySrv\” folder.</p>  <pre> [[Server] port=15927 threads=1 sdk_config=C:\Program Files\Speech Technology Center\Voicekeysrv\voicekeysdk.config type=VOICEKEY [Aux] ; debug_dump_data_path=C:\ProgramData\Speech Technology Center\VoicekeyServer\dumps [Logger] config=C:\Program Files\Speech Technology Center\Voicekeysrv\config.log4cxx </pre> <p>The changeable values are:</p> <ol style="list-style-type: none"> 1. port: Server port number is determined by network structure. 2. threads: Number of execution threads is a number of concurrent clients (concurrently executed commands) determined by system performance and is restricted by HASP key.
Installing IVR Application Module	
11.	Install Integration module prerequisites: JRE 7, Apache Tomcat 7.0 and MySQL 5.6
12.	<p>Run provided voicekey.sql script from MySQL console. <i>mysql -e "C:\scripts\voicekey.sql"</i></p> <p>Make sure that output doesn't contain any errors.</p>

13. Login to the Tomcat manager interface using a web browser with the provided login and password. (<http://localhost:8080/manager/html>). Deploy provided voicekey.war file by selecting the file and pushing Deploy button.

Deploy

Deploy directory or WAR file located on server

Context Path (required):

XML Configuration file URL:

WAR or Directory URL:

WAR file to deploy

Select WAR file to upload voicekey.war

Make sure that war file is deployed and <http://localhost:8080/voicekey/> shows the correct VoiceXML page. Below is the VXML script used for testing.

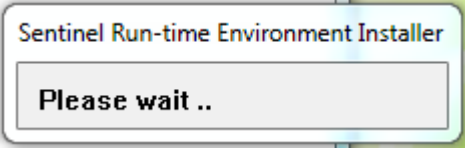
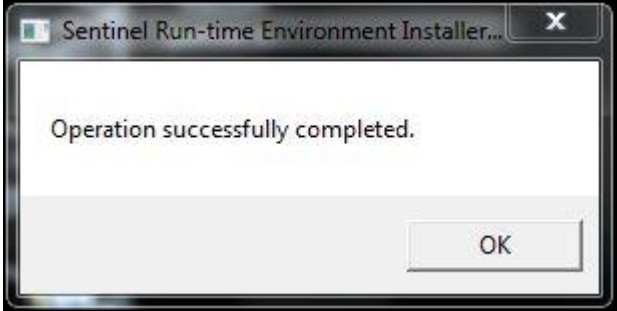
```

<?xml version="1.0" encoding="UTF-8"?>
- <vxml xml:lang="ru-RU" xmlns="http://www.w3.org/2001/vxml" application="approot.xml" version="2.1">
  - <form id="greeting">
    - <block>
      - <prompt bargein="false">
        <audio src="sounds/welcome.wav"> Welcome to speech pro biometrics demo! </audio>
      </prompt>
      <goto next="#index"/>
    </block>
  </form>
  - <form id="index">
    - <field>
      - <prompt>
        <audio src="sounds/index.wav"> For registration press asterisk. For verificaton enter your user ID. </audio>
      </prompt>
      - <grammar xmlns="http://www.w3.org/2001/06/grammar" root="top-top" mode="dtmf">
        - <rule id="top-top">
          - <one-of>
            <item> * </item>
            <item> 605 </item>
            <item> 815 </item>
          </one-of>
        </rule>
      </grammar>
      - <nomatch>
        <audio src="sounds/index_nomatch.wav"> Incorrect id. Please, try again. </audio>
      </nomatch>
      - <noinput>
        <reprompt/>
      </noinput>
      - <filled>
        <assign expr="application.lastresult$.interpretation" name="pin"/>
        - <if cond="pin == '*'">
          <submit next="registration.jsp"/>
        </if>
        <submit next="verification.jsp" namelist="pin"/>
      </filled>
    </field>
  </form>
</vxml>

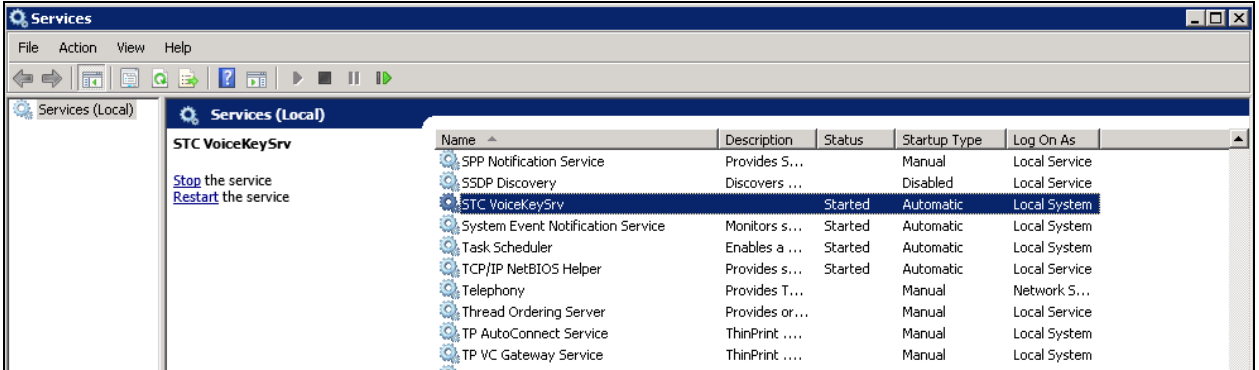
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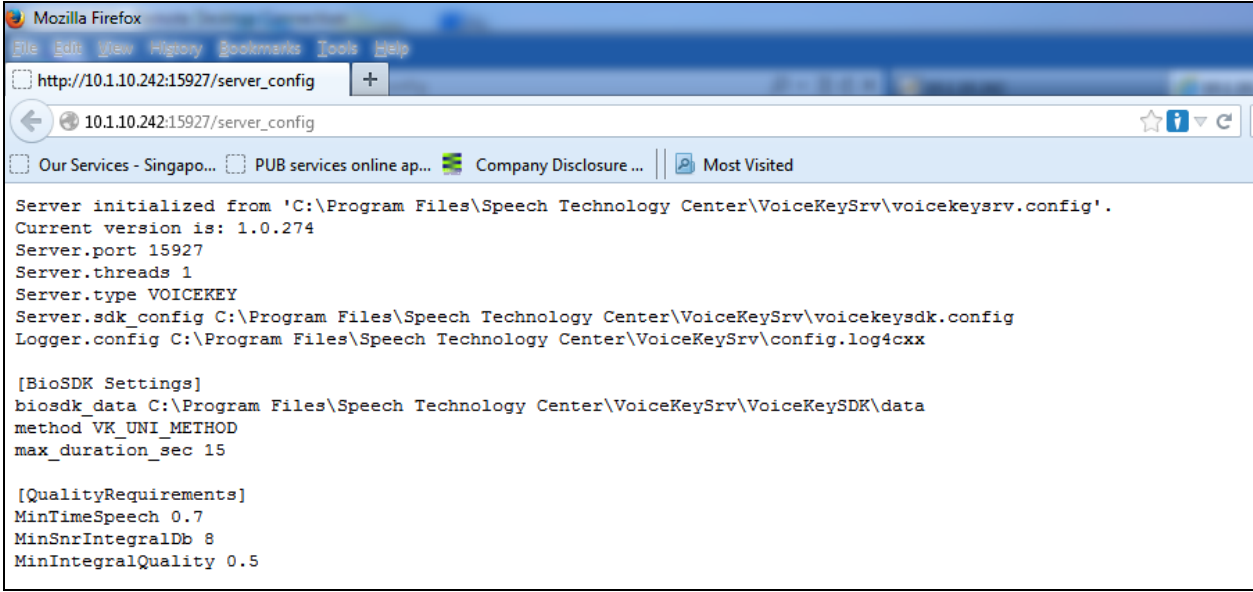
7.2. Install License

After installing the software, the next step is to install the license file.

Step	Description
Installing VoiceKey SRV License	
1.	Run the license file from the command line with -i option. The full path to the file must be specified.
2.	Wait while the installation completes. 
3.	At the end of installation process click OK . 

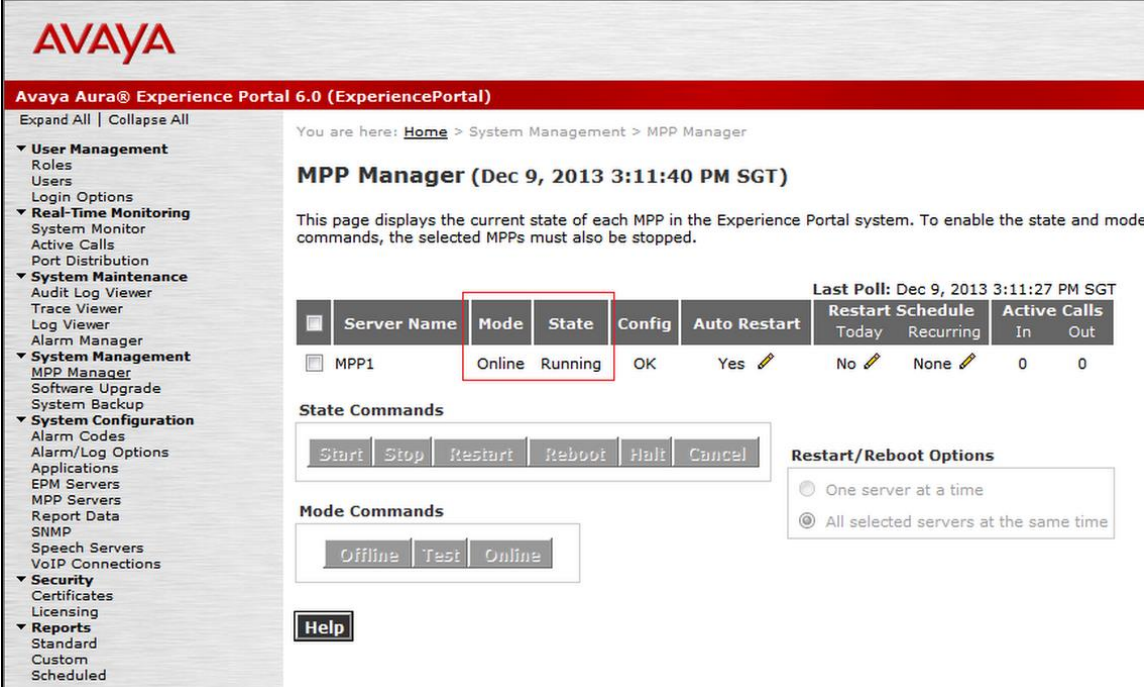
7.3. Verify Installation

Step	Description
1.	To verify that VoiceKey solution is running, go to Start → All Programs → Administrative Tools → Services . Confirm the STC VoiceKeySrv Status Mode is Started . 

Step	Description
2.	<p>The performance status can be verified by sending a GET request through entering the following into the browser address bar “http://localhost:15927/server_config”.</p>  <pre> Server initialized from 'C:\Program Files\Speech Technology Center\VoiceKeySrv\voicekeysrv.config'. Current version is: 1.0.274 Server.port 15927 Server.threads 1 Server.type VOICEKEY Server.sdk_config C:\Program Files\Speech Technology Center\VoiceKeySrv\voicekeysdk.config Logger.config C:\Program Files\Speech Technology Center\VoiceKeySrv\config.log4cxx [BioSDK Settings] biosdk_data C:\Program Files\Speech Technology Center\VoiceKeySrv\VoiceKeySDK\data method VK_UNI_METHOD max_duration_sec 15 [QualityRequirements] MinTimeSpeech 0.7 MinSnrIntegralDb 8 MinIntegralQuality 0.5 </pre>

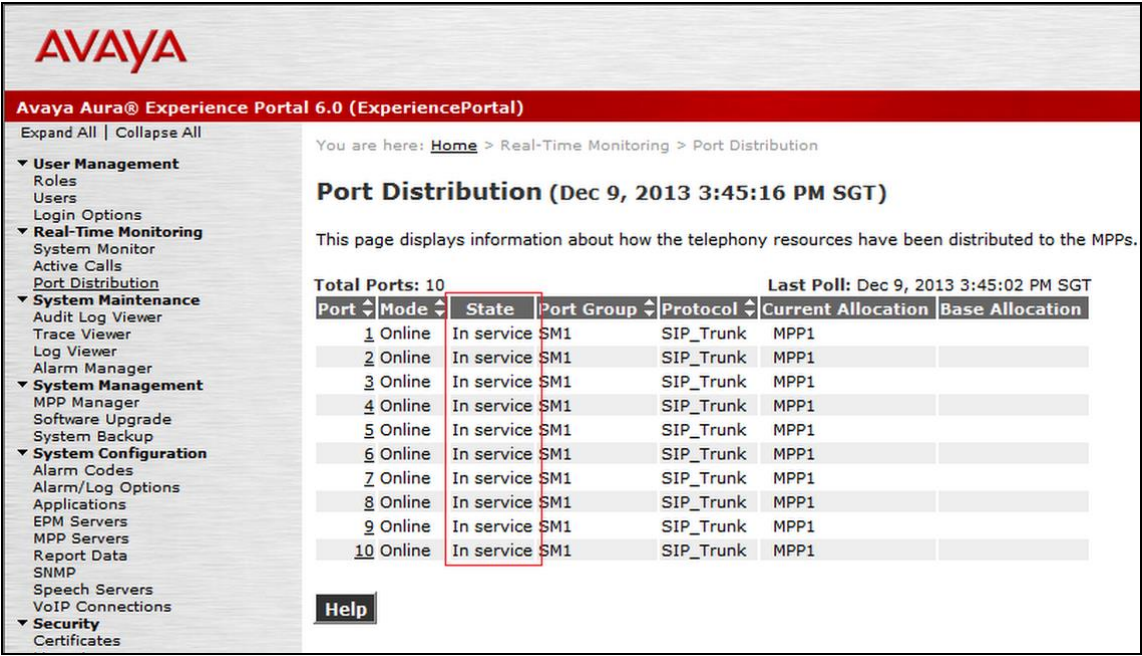
8. Verification Steps

This section provides the verification steps that may be performed to verify that Avaya Experience Portal can run VoiceXML applications that use VoiceKey for voice verification.

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>
	 <p>The screenshot shows the Avaya MPP Manager interface. The left sidebar contains a navigation menu with categories like User Management, Real-Time Monitoring, System Maintenance, System Management, System Configuration, Security, and Reports. The main content area displays the MPP Manager page for 'MPP1'. A table lists the server's status: Mode is 'Online' and State is 'Running'. Below the table are sections for State Commands (Start, Stop, Restart, Reboot, Halt, Cancel), Mode Commands (Offline, Test, Online), and Restart/Reboot Options (One server at a time, All selected servers at the same time). A 'Help' button is also visible.</p>

Step **Description**

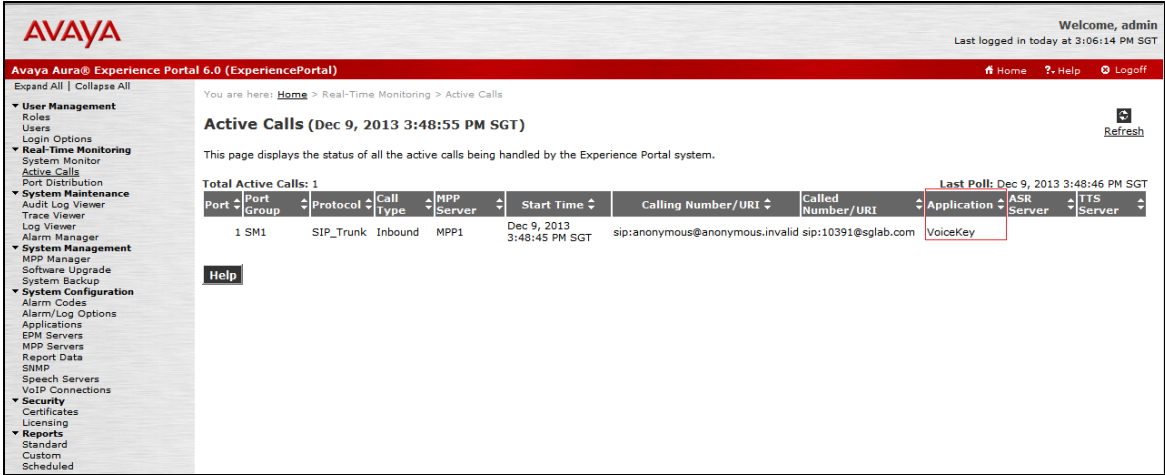
2. From the EPM web interface, click **Port Distribution** on the left pane. On the **Port Distribution** page, verify that the **State** of the ports on the MPP server is **In service**.



The screenshot shows the Avaya Aura Experience Portal 6.0 interface. The left navigation pane includes sections for User Management, Real-Time Monitoring, System Maintenance, System Management, System Configuration, and Security. The main content area is titled 'Port Distribution (Dec 9, 2013 3:45:16 PM SGT)'. It displays a table with the following data:

Port	Mode	State	Port Group	Protocol	Current Allocation	Base Allocation
1	Online	In service	SM1	SIP_Trunk	MPP1	
2	Online	In service	SM1	SIP_Trunk	MPP1	
3	Online	In service	SM1	SIP_Trunk	MPP1	
4	Online	In service	SM1	SIP_Trunk	MPP1	
5	Online	In service	SM1	SIP_Trunk	MPP1	
6	Online	In service	SM1	SIP_Trunk	MPP1	
7	Online	In service	SM1	SIP_Trunk	MPP1	
8	Online	In service	SM1	SIP_Trunk	MPP1	
9	Online	In service	SM1	SIP_Trunk	MPP1	
10	Online	In service	SM1	SIP_Trunk	MPP1	

3. Place some calls to Avaya Experience Portal that runs a VoiceXML script which uses the HTTP service on VoiceKey server. Verify that the application answers the calls and that the application is able to register and verify user voice passphrase. From the Avaya Experience Portal web interface, click **Real-Time Monitoring** → **Active Calls** on the left pane and verify that the **Application** in use is **VoiceKey**.



The screenshot shows the Avaya Aura Experience Portal 6.0 interface. The left navigation pane includes sections for User Management, Real-Time Monitoring, System Maintenance, System Management, System Configuration, and Security. The main content area is titled 'Active Calls (Dec 9, 2013 3:48:55 PM SGT)'. It displays a table with the following data:

Port	Port Group	Protocol	Call Type	MPP Server	Start Time	Calling Number/URI	Called Number/URI	Application	ASR Server	TTS Server
1	SM1	SIP_Trunk	Inbound	MPP1	Dec 9, 2013 3:48:45 PM SGT	sip:anonymous@anonymous.invalid	sip:10391@sglab.com	VoiceKey		

9. Conclusion

These Application Notes describe the compliance-tested configuration used to validate Avaya Aura® Experience Portal 6.0 with VoiceKey. All test cases were completed successfully.

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*, Apr 2012.

The following documents are available from Speech Technology Center:

- [3] *VoiceKey Srv Voice Verification Server Developer's Guide*

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