

Avaya Solution & Interoperability Test Lab

Application Notes for iFlyTek ASR/TTS IMS37 with Avaya Experience Portal 7.2.3 – Issue 1.0

Abstract

These Application Notes describe the configuration steps required to integrate iFlyTek ASR/TTS IMS37 with Avaya Experience Portal. iFlyTek ASR/TTS IMS37 is a speech server that provides Automatic Speech Recognizer (ASR) and Text-to-Speech (TTS) resources for applications launched by Avaya Aura® Enterprise Portal. IMS ASR/TTS uses Media Resource Control Protocol (MRCP) Version 2 to interface to Avaya Experience Portal.

Readers should pay attention to **Section 0**, 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 to integrate iFlyTek ASR/TTS IMS37 with Avaya Experience Portal. iFlyTek ASR/TTS IMS37 is a speech suite that provides Automatic Speech Recognizer (ASR) and Text-to-Speech (TTS) resources for applications launched by Avaya Aura® Enterprise Portal. iFlyTek ASR/TTS IMS37 uses Media Resource Control Protocol (MRCP) Version 2 to interface to Avaya Experience Portal.

2. General Test Approach and Test Results

Interoperability compliance testing included feature and serviceability testing. The feature testing focused on placing calls to Experience Portal to launch sample VXML applications that use IMS ASR and TTS resources. The testing verified that IMS could play TTS prompts and translate speech to text. IMS doesn't support DTMF processing nor recognize SRGS grammars. For the compliance test, DTMF processing was performed by Experience Portal.

The serviceability testing focused on verifying the ability of the IMS server recovering from adverse conditions, such as simulating loss to IP network and rebooting the IMS and Experience Portal servers.

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.

Avaya recommends our customers implement Avaya solutions using appropriate security and encryption capabilities enabled by our products. The testing referenced in this DevConnect Application Note included the enablement of supported encryption capabilities in the Avaya products only (private network side). Readers should consult the appropriate Avaya product documentation for further information regarding security and encryption capabilities supported by those Avaya products.

Support for these security and encryption capabilities in any non-Avaya solution component is the responsibility of each individual vendor. Readers should consult the appropriate vendor-supplied product documentation for more information regarding those products.

For the testing associated with these Application Notes, the interface between Avaya systems and the ASR/TTS IMS37 solutions did not include use of any specific encryption features.

2.1. Interoperability Compliance Testing

The interoperability compliance testing covered the following features and functionality:

- Experience Portal and ASR/TTS IMS37 communicating via MRCP V2.
- Calls to Experience Portal that invoke sample VXML applications and utilize IMS ASR and TTS.
- Sample VXML applications to play back prompts using male and female TTS voices.
- Sample VXML applications that require DTMF processing by Experience Portal and the DTMF played back by IMS using TTS.
- Sample VXML applications that accept voice input (speech) and gets converted to text by ASR/TTS IMS37 as it was heard.
- Proper system recovery after a restart of the ASR/TTS IMS37 server and loss of IP connectivity.
- Proper system recovery after a restart of the Experience Portal.

2.2. Test Results

All test cases passed with the following observations:

- ASR/TTS IMS37 doesn't support DTMF processing. Experience Portal applications should be configured to allow local DTMF processing (refer to **Section 5.4**).
- ASR/TTS IMS37 doesn't support SRGS grammars. Therefore, it can't determine whether DTMF or spoken words are valid input according to a grammar.
- Since IMS TTS cannot process TTS requests with VXML code, Experience Portal cannot control any attributes of the TTS playback, such as prosody, which may include changes to the speech rate volume, or pitch of the TTS voice.

2.3. Support

For technical support on ASR/TTS IMS37, contact iFlyTek Support:

■ Phone: +86-400-0199-199

• Web: https://www.iflytek.com/

3. Reference Configuration

Figure 1 illustrates the sample configuration used for testing. In this configuration, Experience Portal is connected to Session Manager via a SIP trunk and interfaced to ASR/TTS IMS37 via MRCP V2. There are four servers set up for iFlyTek i.e., IMS for TTS, TTS, IMS for ASR and ASR servers. Sample VXML applications were hosted in Windows HTTP Server for the VXML scripts.

Calls were placed from Avaya H.323 and SIP Deskphones to Experience Portal and routed through Communication Manager and Session Manager. The G430 Media Gateway and the Media Server were used for media resources and System Manager was used to configure Session Manager and SIP users.

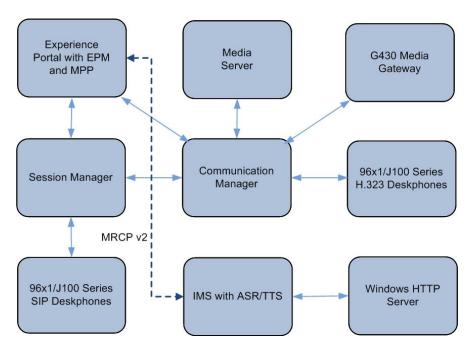


Figure 1: Configuration with Avaya Experience Portal and ASR/TTS IMS37

4. Equipment and Software Validated

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

Equipment/Software	Release/Version
Avaya Aura® Communication Manager	8.1.3
Avaya Media Server	80.2.138
Avaya Aura® System Manager	8.1.3
Avaya Aura® Session Manager	8.1.3
Avaya Experience Portal	7.2.3 7.2.3
J100 Series IP Deskphones	6.8402 (H.323) 4.0.7.0.7 (SIP)
96x1 Series Deskphones	6.8402 (H.323) 7.1.11.0.8 (SIP)
IMS for TTS on CentOS 7.2	3.7
IMS TTS on CentOS 7.2	30
IMS for ASR on CentOS 7.2	3.7
IMS ASR on CentOS 7.2	6.2

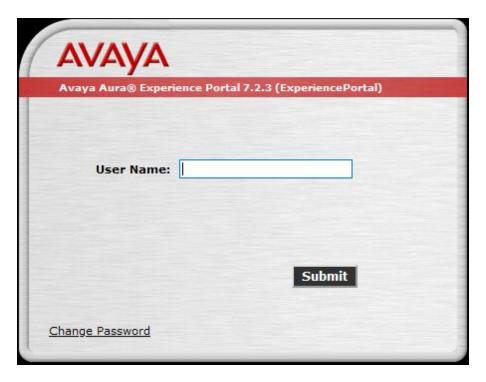
5. Configure Avaya Experience Portal

This section covers the configuration of Experience Portal using the Experience Portal Manager (EPM) web interface. The procedure includes the following areas:

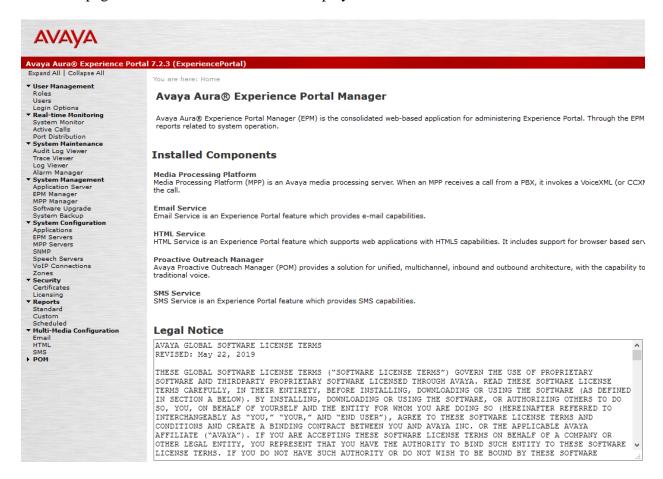
- Launch Experience Portal Manager
- Add TTS Custom Voices
- Add Speech Servers
- Add Application

5.1. Launch Experience Portal Manager

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 a web browser, where *<ip-addr>* is the IP address of EPM. Log in using the appropriate credentials.



The main page of the EPM web interface is displayed as shown below.



5.2. Add TTS Custom Voices

To add TTS custom voices supported by ASR/TTS IMS37, navigate to **System Configuration** → **Speech Servers** in the left pane. In the **Speech Servers** page (not shown), select the **TTS** tab and click **Customize**. Configure the following parameters in the **TTS Custom Voices** page.

• Engine Type: Select *Nuance*.

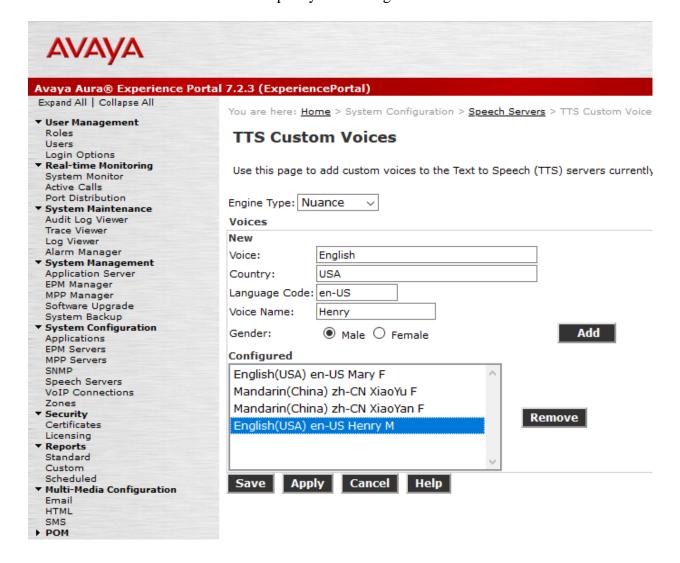
Voice: Set to appropriate language (e.g., English).
 Country: Set to appropriate country (e.g., USA).

■ **Language Code:** Set to appropriate language code (e.g., *en-US*).

• **Voice Name:** Specify voice name. For this compliance test, *Henry* and

Mary were used.

• **Gender:** Specify the voice gender.



5.3. Add Speech Servers

This section covers the configuration of ASR/TTS IMS37 as ASR and TTS servers in Experience Portal.

5.3.1. Add ASR Server

To add an ASR server, navigate to **Speech Configuration** → **Speech Servers** in the left pane. In the **Speech Servers** page (not shown), select the **ASR** tab and click **Add**. Configure the following parameters in the **Add ASR Server** page.

• Name: Provide a descriptive name (e.g., *IMS ASR*).

• **Enable:** Select **Yes** to enable the ASR server.

Engine Type: Set to *Nuance*. Option available per **Section** Error!

Reference source not found..

Network Address: Set to IMS for ASR IP address (e.g., 10.1.10.122).
 Base Port: Set to SIP port configured on IMS (e.g., 5060).

Total Number of Licensed

ASR Resources: Set to number of ASR resources per license.

New Connection per

Session: Select **Yes** to enable per Session.

• **Selected Languages:** Set to *English(USA) en-US* supported by IMS.

Protocol: Set to MRCP V2.Transport Protocol: Set to TCP.

• **Listener Port:** Set to SIP port configured on IMS (e.g., 5060).

Add ASR Server

Use this page to configure Experience Portal to communicate with a new ASR server.

Name:	IMS-ASR		
Enable:	● Yes ○ No		
Engine Type:	Nuance v		
Network Address:	10.1.10.122		
Base Port:	5060		
Total Number of Licensed ASR Resources: 10			
New Connection per Session:	● Yes ○ No		
Languages	Selected Languages		
Afrikaans(South_Africa) af-ZA ^	English(USA) en-US		
Arabic(Jordan) ar-JO			
Arabic(WorldWide) ar-WW			
Assamese(India) as-IN			
Basque(Spain) eu-ES			
Bengali(Bengladesh) bn-BD			
Bengali(India) bn-IN			
Bhojpuri(India) bh-IN			
Bulgarian(Bulgaria) bg-BG			
Cantonese(Hong_Kong) cn-HK 🗸			
MRCP			
Ping Interval: 15 seconds			
Response Timeout: 4 seconds			
Protocol: MRCP V2 V			
Enable Session XML: O Yes No			
Transport Protocol: TCP V			
Listener Port: 5060			
Save Cancel Help			

5.3.2. Add TTS Server

To add a TTS server, navigate to **Speech Configuration** → **Speech Servers** on the left pane. In the **Speech Servers** page (not shown), select the **TTS** tab and click **Add**. Configure the following parameters in the **Add TTS Server** page.

■ **Name:** Provide a descriptive name (e.g., *IMS-TTS*).

• **Enable:** Select **Yes** to enable the TTS server.

Engine Type: Set to *Nuance*. Option available per **Section** Error!

Reference source not found..

Network Address: Set to IMS for TTS IP address (e.g., 10.1.10.129).
 Base Port: Set to SIP port configured on IMS (e.g., 5060).

Total Number of Licensed

TTS Resources: Set to number of TTS resources per license.

New Connection per

Session: Select Yes to enable per Session.

Selected Voices: Select supported TTS voices.

■ **Protocol:** Set to *MRCP V2*.

Transport Protocol: Set to TCP.

• **Listener Port:** Set to SIP port configured on IMS (e.g., 5060).

Add TTS Server

Use this page to configure Experience Portal to communicate with a new TTS server.

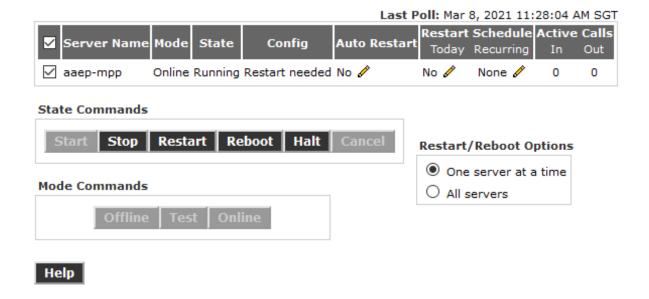
Name:	IMS-TTS	TS
Enable:	Yes	es O No
Engine Type:	Nuance	ce v
Network Address:	10.1.10	0.129
Base Port:	5060	
Total Number of Licensed TTS Resources:	10	
New Connection per Session:	Yes	es O No
Voices		Selected Voices
Afrikaans(South_Africa) af-ZA Tessa F	^	English(USA) en-US Henry M
Arabic(WorldWide) ar-WW Laila F		English(USA) en-US Mary F
Arabic(WorldWide) ar-WW Maged M		
Arabic(WorldWide) ar-WW Tarik M		0
Basque(Spain) eu-ES Arantxa F		9
Basque(Spain) eu-ES Miren F		0
Bulgarian(Bulgaria) bg-BG Daria F		
Catalan(Spain) ca-ES Jordi M		
Catalan(Spain) ca-ES Montserrat F		
Catalan(Spain) ca-ES Nuria F	~	· · · · · · · · · · · · · · · · · · ·
MRCP		
Ping Interval: 15 seconds		
Response Timeout: 4 seconds		
Protocol: MRCP V2 ∨		
Enable Session XML: O Yes No		
Transport Protocol: TCP V		
Listener Port: 5060		
Save Cancel Help		

5.3.3. Restart MPP Server

Navigate to **System Management** → **MPP Manager** (not shown) to restart the MPP server. Select the MPP and then click **Restart**. After the MPP is started, the **Mode** of the MPP should be *Online* and the **State** should be *Running*.

MPP Manager (Mar 8, 2021 11:28:25 AM SGT)

This page displays the current state of each MPP in the Experience Portal system. To enable the state



5.4. Add Application

This section covers the configuration of a sample VXML application that uses ASR and TTS resources from ASR/TTS IMS37.

On the left pane, navigate to **System Configuration** \rightarrow **Applications**. The **Applications** page is displayed (not shown). Click **Add**. In the **Add Application** page shown below, configure the application. For the compliance test, one of the sample VXML applications was configured as shown below.

■ Name: Provide a descriptive name (e.g., *iFlyTek*).

■ **Enable:** Set to **Yes** to enable the application.

• **Type:** Set to *VoiceXML*.

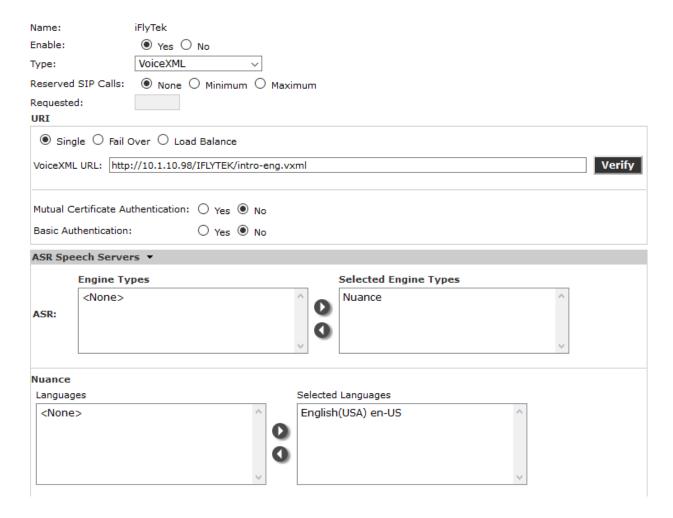
• **VoiceXML URL:** Specify the VXML application URL. For the compliance

test, the application was located in another Windows HTTP

server.

• **Selected Engine Types:** Select *Nuance*.

■ **Selected Languages:** Select the language (e.g., *English(USA) en-US*).



Scroll down to the TTS Speech Servers section. Select *Nuance* as the TTS server and select a supported TTS voice (e.g., *English(USA) en-US Henry M and Mary F*) as shown below.

In the **Application Launch** section, set the **Called Number** (e.g., 10390) associated with the application and click **Add**. The called number will be added to the text below the field.



Scroll down and expand the **Advanced Parameters** section. Disable **Support Remote DTMF Processing** to allow Experience Portal to perform local DTMF processing. ASR/TTS IMS37 doesn't support DTMF processing.

Advanced Parameters ▼	
Support Remote DTMF Processing:	○ Yes ● No
DTMF Type Ahead Enabled:	O Yes ● No
Converse-On:	O Yes ● No
Network Media Service:	O Yes ● No
Early Media:	○ Yes ● No
Sync FROM and PAI Headers:	O Yes ● No
Dialog URL Pattern:	
VoiceXML Event Handler:	<default> ~</default>
CCXML Event Handler:	<default></default>
Generate UCID:	O Yes ● No
Operation Mode:	Service Provider V
Transport UCID in Shared Mode:	○ Yes ◎ No
Maximum UUI Length:	128
Fax Detection Enabled:	○ Yes ● No
Fax Phone Number:	
Video Enabled:	O Yes ● No
Video Screen Format:	QCIF V
Video Minimum Picture Interval:	2

6. Configure ASR/TTS IMS37

The configuration of ASR/TTS IMS37 is performed by iFlyTek engineers. The **procedural** steps are presented in these Application Notes for **informational** purposes. The relevant software was loaded by iFlyTek engineers, which is not detailed here. For load balancing, the optional iFlyTek MRCP Resource Management Server software is required. For this compliance testing, the load balancing feature was not tested.

On the iFlyTek IMS Server for TTS, locate the file **mrs.cfg**. In the [sip] section of **mrs.cfg**, check the following parameters for the SIP transport.

Transport_type = **TCP**Port= **5060**

```
root@imsasr:/home/devconnect/ims/IMS37_RedHat_Build3106/cfg
                                                                       Х
[sip]
## format: sip:mrm@host.domain:port, if not set, system will generate one.
sip uri = sip:mrs@10.1.10.122:5060
## transport type used by SIP stack
transport type = TCP
## port used by SIP stack (1026~65534)
      = 5060
port
## now only support IPv4
ip version
            = IPv4
## SIP transaction thread number (1~64)
transaction threads = 50
## max allowed SIP sessions number (1~300)
max session
                      = 1000
## session inactive time after which mrs will destroy it, 30~3600 secs(300 defau
lt)
max inactive time = 90
## extranet ip Config for NAT
## enable is false by default
## ip is 0.0.0.0 by default
enable_extern = false
extern ip
               = 127.0.0.1
```

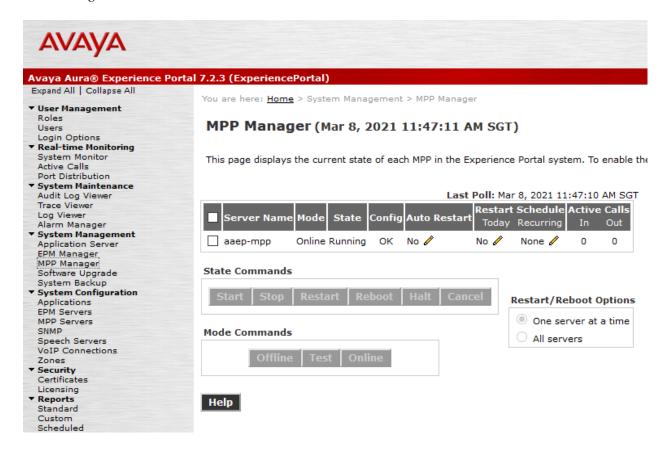
Similarly, on the iFlyTek IMS Server for ASR, locate the file **mrs.cfg**. In the [sip] section of **mrs.cfg**, check the same parameters for the SIP transport.

```
root@imstts:/home/devconnect/ims/IMS37_RedHat_Build2111/cfg
                                                                          [sip]
## format: sip:mrs@host.domain:port, if not set, system will generate one.
sip uri = sip:mrs@10.1.10.129:5060
## transport type used by SIP stack
transport type = TCP
## port used by SIP stack (1026~65534)
port = 5060
## now only support IPv4
ip version
                        = IPv4
## SIP transaction thread number (1~256)
transaction threads = 40
## max allowed SIP sessions number (1~4096)
max session
                        = 900
## session inactive time after which mrs will destroy it, 30~3600 secs(300 defau
lt)
max inactive time
## extranet ip Config for NAT
## enable is false by default
## ip is 0.0.0.0 by default
enable extern = false
extern ip = 0.0.0.0
```

7. Verification Steps

This section provides the tests that can be performed to verify proper configuration of Experience Portal and ASR/TTS IMS37 solutions.

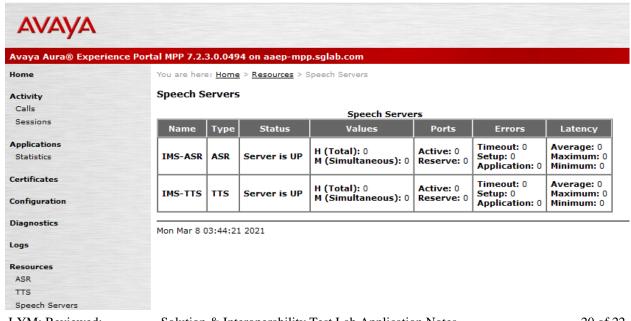
From the EPM web interface, verify that the MPP server is online by navigating to **System**Management → MPP Manager. The Mode of the MPP should be *Online* and the **State** should be *Running*.



From the EPM web interface, verify that the SIP Trunk ports on the MPP server are **In Service** and in **Online** mode by navigating to **Real-time Monitoring → Port Distribution** and selecting the MPP in the **Port Distribution** page (not shown).



Verify that the **Speech Servers** are UP. Navigate to **Real-time Monitoring** \rightarrow **System Monitor** and select the **ExperiencePortal Details** tab. Click on the appropriate MPP (not shown). In the **MPP Details** page, click **Service Menu**. Finally, navigate to **Resources** \rightarrow **Speech Servers** in the left pane to view the status of the speech servers as shown below. The **Status** of the speech servers should be UP as shown below.



LYM; Reviewed: SPOC 4/1/2021

After performing the verification above, place a call to an Experience Portal number that would launch a VXML application that uses the IMS ASR and TTS resources. Verify that the application answers the call, TTS prompts are heard, and ASR/TTS IMS37 plays back the voice input that was heard.

8. Conclusion

These Application Notes describe the configuration steps required to integrate ASR/TTS IMS37 with Avaya Experience Portal using MRCP V2. Sample VXML applications were used to verify ASR/TTS IMS37 ASR and TTS. ASR/TTS IMS37 was able to play TTS prompts and convert speech to text. All feature and serviceability test cases were completed successfully with observations noted in **Section 2.2**.

9. References

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

[1] *Administering Avaya Aura*® *Experience Portal*, Release 7.2.3, Issue 1, September 2019, available at https://support.avaya.com.

iFlyTek documentation can be obtained from the contact in **Section 2.3**.

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