Powered by Universal Speech Solutions LLC

MRCP

Google SS Plugin

Usage Guide

Revision: 2

Created: May 24, 2018

Last updated: June 9, 2018

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1 Overview

This guide describes how to configure and use the Google Speech Synthesis (GSS) plugin to the UniMRCP server. The document is intended for users having a certain knowledge of Google Cloud Speech Platform and UniMRCP.

1.1 Installation

For installation instructions, use one of the guides below.

- RPM Package Installation (Red Hat / Cent OS)
- Deb Package Installation (Debian / Ubuntu)

1.2 Applicable Versions

Instructions provided in this guide are applicable to the following versions.

UniMRCP 1.5.0 and above

UniMRCP GSS Plugin 1.0.0 and above

2 Supported Features

This is a brief check list of the features currently supported by the UniMRCP server running with the GSS plugin.

2.1 MRCP Methods

- ✓ SPEAK
- ✓ STOP
- ✓ PAUSE
- ✓ RESUME
- ✓ BARGE-IN-OCCURRED
- ✓ SET-PARAMS
- ✓ GET-PARAMS

2.2 MRCP Events

- ✓ SPEECH-MARKER
- ✓ SPEAK-COMPLETE

2.3 MRCP Header Fields

- ✓ Kill-On-Barge-In
- ✓ Completion-Cause
- ✓ Voice-Gender
- ✓ Voice-Name
- ✓ Prosody-Rate
- ✓ Prosody-Volume
- ✓ Speech-Language

2.4 Speech Data

- ✓ Plain text (text/plain)
- ✓ SSML (application/ssml+xml or application/synthesis+ssml)

3 Supported Voices

All the voices supported by Google Text-to-Speech API are listed in the following page:

https://cloud.google.com/text-to-speech/docs/voices

4 Configuration Format

The configuration file of the GSS plugin is located in */opt/unimrcp/conf/umsgss.xml*. The configuration file is written in XML.

4.1 Document

The root element of the XML document must be <*umsgss*>.

Attributes

Name	Unit	Description
license-file	File path	Specifies the license file. File name may include patterns containing '*' sign. If multiple files match the pattern, the most recent one gets used.
gapp-credentials-file	File path	Specifies the Google Application Credentials file to use. File name may include patterns containing '*' sign. If multiple files match the pattern, the most recent one gets used.

Parent

None.

Children

Name	Unit	Description
<synth-settings>	String	Specifies synthesis parameters employed via gRPC.
<monitoring-agent>	String	Specifies parameters of the monitoring manager.
<license-server>	String	Specifies parameters used to connect to the license server. The use of the license server is optional.

Example

This is an example of a bare document.

```
< umsgss license-file="umsgss_*.lic" gapp-credentials-file="*.json">
</ umsgss>
```

4.2 Synthesis Settings

This element specifies synthesis parameters.

Attributes

Name	Unit	Description
language	String	Specifies the default language to use, if not set by the client.
bypass-ssml	Boolean	Specifies whether transparently bypass or parse received content in order to determine voice parameters set in SSML. Available since GSS 1.1.0.
voice-name	String	Specifies the default voice name. Can be overridden by client. Available since GSS 1.1.0.
voice-gender	String	Specifies the default voice gender. Can be overridden by client. Available since GSS 1.1.0.

Parent

<umsgss>

Children

None.

Example

This is an example of synthesis parameters.

```
<synth-settings
  language="en-US"
  bypass-ssml="true"
  voice-name=""
  voice-gender=""
/>
```

4.3 Monitoring Agent

This element specifies parameters of the monitoring agent.

Attributes

Name	Unit	Description
refresh-period	Time interval [sec]	Specifies a time interval in seconds used to periodically refresh usage details. See <usage-refresh-handler>.

Parent

<umsgss>

Children

<usage-change-handler>
<usage-refresh-handler>

Example

The example below defines a monitoring agent with usage change and refresh handlers.

```
<monitoring-agent refresh-period="60">

  <usage-change-handler>
    <log-usage enable="true" priority="NOTICE"/>
  </usage-change-handler>

  <usage-refresh-handler>
    <dump-channels enable="true" status-file="umsgss-channels.status"/>
  </usage-refresh-handler >

</monitoring-agent>
```

4.4 Usage Change Handler

This element specifies an event handler called on every usage change.

Attributes

None.

Parent

<monitoring-agent>

Children

<log-usage>
<update-usage>
<dump-channels>

Example

This is an example of the usage change event handler.

```
<usage-change-handler>
  <log-usage enable="true" priority="NOTICE"/>
  <update-usage enable="false" status-file="umsgss-usage.status"/>
  <dump-channels enable="false" status-file="umsgss-channels.status"/>
</usage-change-handler>
```

4.5 Usage Refresh Handler

This element specifies an event handler called periodically to update usage details.

Attributes

None.

Parent

<monitoring-agent>

Children

<log-usage>
<update-usage>
<dump-channels>

Example

This is an example of the usage change event handler.

```
<usage-refresh-handler>
  <log-usage enable="true" priority="NOTICE"/>
  <update-usage enable="false" status-file="umsgss-usage.status"/>
  <dump-channels enable="false" status-file="umsgss-channels.status"/>
</usage-refresh-handler>
```

4.6 License Server

This element specifies parameters used to connect to the license server.

Attributes

Name	Unit	Description
enable	Boolean	Specifies whether the use of license server is enabled or not. If enabled, the license-file attribute is not honored.
server-address	String	Specifies the IP address or host name of the license server.
certificate-file	File path	Specifies the client certificate used to connect to the license server. File name may include patterns containing a '*' sign. If multiple files match the pattern, the most recent one gets used.
ca-file	File path	Specifies the certificate authority used to validate the license server.
channel-count	Integer	Specifies the number of channels to check out from the license server. If not specified or set to 0, either all available channels or a pool of channels will be checked based on the configuration of the license server.

Parent

<umsgss>

Children

None.

Example

The example below defines a typical configuration which can be used to connect to a license server located, for example, at 10.0.0.1.

```
<license-server
  enable="true"
  server-address="10.0.0.1"
  certificate-file="unilic_client_*.crt"
  ca-file="unilic_ca.crt"
/>
```

For further reference to the license server, visit http://unimrcp.org/licserver

5 Configuration Steps

This section outlines common configuration steps.

5.1 Using Default Configuration

The default configuration should be sufficient for the general use.

5.2 Specifying Synthesis Language

Synthesis language can be specified by the client per MRCP session by means of the header field *Speech-Language* set in a *SET-PARAMS* or *SPEAK* request, or inline in the SSML data. Otherwise, the parameter *language* set in the configuration file *umsgss.xml* is used. The parameter defaults to *en-US*.

5.3 Specifying Sampling Rate

Sampling rate is determined based on the SDP negotiation. Refer to the configuration guide of the UniMRCP server on how to specify supported encodings and sampling rates to be used in communication between the client and server. Either 8 or 16 kHz can be used by Google Cloud Text-to-Speech API for synthesis.

5.4 Specifying Voice Parameters

Global Settings

The default voice name and gender can be specified from the configuration file *umsgss.xml* using the *voice-name* and *voice-gender* attributes of the *synth-settings* element. This functionality is available since GSS 1.1.0 release.

MRCP Header Fields

The voice name and gender can be specified by the MRCP client in *SET-PARAMS* and *SPEAK* requests.

- Voice-Name

  This is an optional parameter indicating the name of the voice to use for synthesis.

- Voice-Gender

  This is an optional parameter indicating the preferred gender of the voice to use for synthesis, which can be set to either *male* or *female* or *neutral*.

SSML Content

The voice name and gender can also be specified using the corresponding attributes of the *voice* element in SSML content. In order to parse and determine the parameters and pass them forward to Google Text-to-Speech API accordingly, the *bypass-ssml* attribute of the *synth-settings* element must be set to *false* in the configuration file *umsgss.xml*. This functionality is available since GSS 1.1.0 release.

5.5 Specifying Prosody Parameters

The following prosody parameters can be specified by the MRCP client in *SET-PARAMS* and *SPEAK* requests.

- Prosody-Rate

  This is an optional parameter indicating the speaking rate, which can be set to one of the following labels: *x-slow*, *slow*, *medium*, *fast*, *x-fast*, *default*.

- Prosody-Volume

  This is an optional parameter indicating the speaking volume, which can be set to one of the following labels: *silent*, *x-soft*, *soft*, *medium*, *loud*, *x-loud*, *default*.

5.6 Specifying Speech Data

Speech data can be specified by the MRCP client in *SPEAK* requests using one of the following content types:

- plain/text
- application/ssml+xml (or application/synthesis+ssml)

6 Monitoring Usage Details

The number of in-use and total licensed channels can be monitored in several alternate ways. There is a set of actions which can take place on certain events. The behavior is configurable via the element *monitoring-agent*, which contains two event handlers: *usage-change-handler* and *usage-refresh-handler*.

While the *usage-change-handler* is invoked on every acquisition and release of a licensed channel, the *usage-refresh-handler* is invoked periodically on expiration of a timeout specified by the attribute *refresh-period*.

The following actions can be specified for either of the two handlers.

- log-usage

  This action logs the number of in-use and total licensed channels. The following is a sample log statement, indicating 0 in-use and 2 total channels.

```
[NOTICE] GSS Usage: 0/2
```

- update-usage

  This action writes the number of in-use and total licensed channels to a status file *umsgss-usage.status*, located by default in the directory *${UniMRCPInstallDir}/var/status*. The following is a sample content of the status file.

```
in-use channels: 0
total channels: 2
```

- dump-channels

  This action writes the identifiers of in-use channels to a status file *umsgss-channels.status*, located by default in the directory *${UniMRCPInstallDir}/var/status*.

7 Usage Examples

7.1 SSML

This examples demonstrates how to perform speech synthesis by using a SPEAK request with an SSML content.

C->S:

```
MRCP/2.0 309 SPEAK 1
Channel-Identifier: 4dde51f37d1a9546@speechsynth
Content-Type: application/ssml+xml
Voice-Age: 28
Content-Length: 163

<?xml version="1.0"?>
<speak version="1.0" xml:lang="en-US" xmlns="http://www.w3.org/2001/10/synthesis">
  <p>
    <s>Welcome to Uni MRCP.</s>
  </p>
</speak>
```

S->C:

```
MRCP/2.0 83 1 200 IN-PROGRESS
Channel-Identifier: 4dde51f37d1a9546@speechsynth
```

S->C:

```
MRCP/2.0 122 SPEAK-COMPLETE 1 COMPLETE
Channel-Identifier: 4dde51f37d1a9546@speechsynth
Completion-Cause: 000 normal
```

7.2 Plain Text

This examples demonstrates how to perform speech synthesis by using a SPEAK request with a plain text content.

C->S:

```
MRCP/2.0 155 SPEAK 1
Channel-Identifier: 85667d0efbf95345@speechsynth
Content-Type: text/plain
Voice-Age: 28
Content-Length: 20

Welcome to Uni MRCP.
```

S->C:

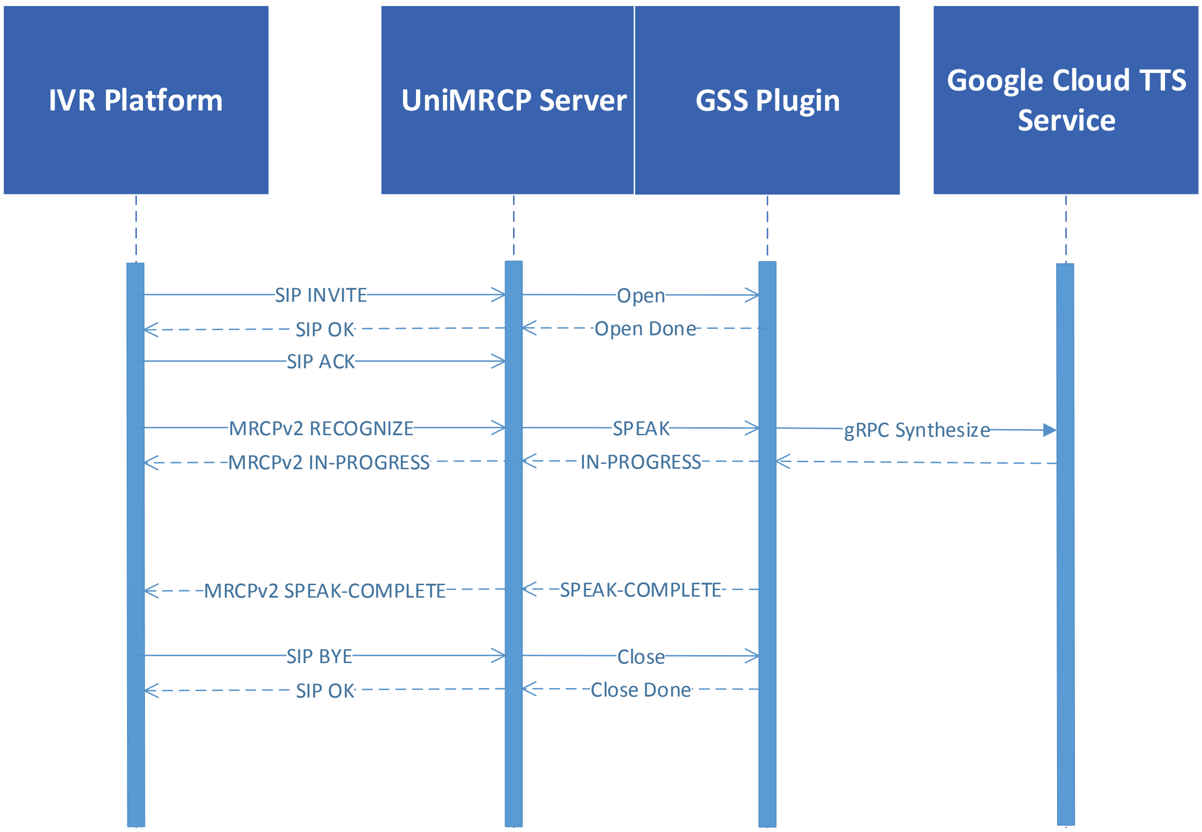
```
MRCP/2.0 83 1 200 IN-PROGRESS
Channel-Identifier: 85667d0efbf95345@speechsynth
```

S->C:

```
MRCP/2.0 122 SPEAK-COMPLETE 1 COMPLETE
Channel-Identifier: 85667d0efbf95345@speechsynth
Completion-Cause: 000 normal
```

8 Sequence Diagram

The following sequence diagram outlines common interactions between all the main components involved in a typical synthesis session performed over MRCPv2.



9 References

9.1 Google Cloud Platform

- Text-to-Speech API
- How-to Guides
- Best Practices

9.2 Specifications

- Speech Synthesizer Resource
- SSML