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# Google Dialogflow Plugin

## Administrator Guide

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# 1 Overview

This guide describes how to obtain and install binary packages for the Google Dialogflow (GDF) plugin to the UniMRCP server on Debian-based Linux distributions. The document is intended for system administrators and developers.

## 1.1 Applicable Versions

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

 UniMRCP 1.5.0 and above  
UniMRCP GDF Plugin 1.0.0 and above

## 1.2 Supported Distributions


UniMRCP deb packages are currently available for x86\_64 (64-bit) architecture only.

Operating System	Released	End of Support
Ubuntu 16.04 LTS (xenial)	December 2017	March 2021
Ubuntu 18.04 LTS (bionic)	May 2019	TBA
Ubuntu 20.04 LTS (focal)	March 2021	TBA

Note: packages for other distributions can be made available upon request. For more information, contact [services@unimrcp.org](mailto:services@unimrcp.org).

## 1.3 Authentication

UniMRCP binary packages are available to authenticated users only. In order to register a free account with UniMRCP, please visit the following page.

 <https://www.unimrcp.org/profile-registration>

Note: a new account needs to be verified and activated prior further proceeding.

## 2 Installing Deb Packages Using Apt-Get

Using the APT package handling utility (`apt-get`) is recommended for installation of UniMRCP binary packages.

### 2.1 Repository Configuration

Supply login information by creating a file `/etc/apt/auth.conf.d/unimrcp.conf` containing the following entry.

```
machine unimrcp.org
login username
password password
```

Note: the *username* and *password* fields must be replaced with the corresponding account credentials.

Configure a repository by creating a file `/etc/apt/sources.list.d/unimrcp.list` containing the following entry.

```
deb [arch=amd64] https://unimrcp.org/repo/apt/ distr main
```

Note: the *distr* field must be replaced with the corresponding distribution code name such as *xenial*, *bionic*, *focal*, etc. To determine the distribution code, use ``lsb_release -cs``.

### 2.2 GnuPG Key

For verification of binary packages, UniMRCP provides a public GnuPG key, which can be retrieved and installed as follows.

```
wget -O - https://unimrcp.org/keys/unimrcp-gpg-key.public | sudo apt-key add -
```

### 2.3 Repository Update

In order to check for updates and apply the changes in the APT configuration, use the following command.

```
sudo apt-get update
```

## 2.4 GDF Plugin Installation

In order to install the GDF plugin, including all the dependencies, use the following command.

```
sudo apt-get install unimrcp-gdf
```

As a result, *apt-get* will check and prompt to download all the required packages by installing them in the directory */opt/unimrcp*.

In order to install the additional data files for the sample client application *umc*, the following command can be used.

```
sudo apt-get install umc-addons
```

Note: this package is optional and provides additional data which can be used for validation of basic setup.

# 3 Installing Deb Packages Manually

UniMRCP deb packages can be installed manually using the *dpkg* utility. Note, however, that the system administrator should take care of package dependencies and install all the packages in appropriate order.

The deb packages have the following naming convention:

```
$packagename_${universion}-${distr}_${arch}.deb
```

where

- *packagename* is the name of a package
- *universion* is the UniMRCP version
- *distr* is the distribution code name (trusty, xenial, ...)
- *arch* is the architecture (amd64, i386, all, ...)

## 3.1 Package List

The following is a list of UniMRCP deb packages required for the installation of the GDF plugin.

Package Name	Description
<b>unimrcp-gdf</b>	GDF plugin to the server.
<b>unigrpc</b>	UniMRCP edition of the gRPC library.
<b>umc-addons</b>	Sample en-US data files used with umc. [Optional]
<b>unilicnodegen</b>	Node information retrieval tool, required for license deployment.
<b>unimrcp-server</b>	Shared library and application of the server.
<b>unimrcp-client</b>	Shared libraries and sample applications of the client. [Optional]
<b>unimrcp-demo-plugins</b>	Set of demo plugins to the server. [Optional]
<b>unimrcp-common</b>	Data common for the client and the server.
<b>uniapr</b>	UniMRCP edition of the Apache Portable Runtime (APR) library.

<b>uniapr-util</b>	UniMRCP edition of the Apache Portable Runtime Utility (APR-Util) library.
<b>unisofia-sip</b>	UniMRCP edition of the Sofia SIP library.

## 3.2 Package Installation Order

Packages for APR, APR-Util and Sofia-SIP libraries must be installed first.

```
sudo dpkg --install uniapr_${saprversion}-${distr}_${sarch}.deb
sudo dpkg --install uniapr-util_${sapuversion}-${distr}_${sarch}.deb
sudo dpkg --install unisofia-sip_${sofiaversion}-${distr}_${sarch}.deb
```

Then, a package containing common data for the client and the server, and a package for the server should follow.

```
sudo dpkg --install unimrcp-common_${suniversion}-${distr}_${sarch}.deb
sudo dpkg --install unimrcp-server_${suniversion}-${distr}_${sarch}.deb
```

Next, a package containing the utility tool *unilicnodegen*, required for license deployment.

```
sudo dpkg --install unilicnodegen_${stoolversion}-${distr}_${sarch}.deb
```

Next, a package containing the gRPC library.

```
sudo dpkg --install unigrpc_${sgrpcversion}-${distr}_${sarch}.deb
```

Finally, a package containing the GDF plugin should follow.

```
sudo dpkg --install unimrcp-gdf_${suniversion}-${distr}_all.deb
```

# 4 Obtaining License

The GDF plugin to the UniMRCP server is a commercial product, which requires a license file to be installed.

## 4.1 License Type

The following license types are available:

- Trial
- Production
- Test and Development

## 4.2 Node Information

The license files are bound to a node the product is installed on. In order to obtain a license, the corresponding node information needs to be retrieved and submitted for generation of a license file.

Use the installed tool *unilicnodegen* to retrieve the node information.

```
sudo /opt/unimrcp/bin/unilicnodegen
```

As a result, a text file *uninode.info* will be saved in the current directory. Submit the file *uninode.info* for license generation to [services@unimrcp.org](mailto:services@unimrcp.org) by mentioning the product name in the subject.

## 4.3 License Installation

The license file needs to be placed into the directory */opt/unimrcp/data*.

```
sudo cp umsgdf_*.lic /opt/unimrcp/data
```



# 5 Obtaining Service Credentials

In order to utilize the Google Cloud Dialogflow API, a corresponding service account credentials file needs to be retrieved from the Google Cloud Platform Console and further installed to the UniMRCP server.

## 5.1 Project Creation

Create a project in the Google Cloud Platform Console, if not already created. Projects allow to manage all Google Cloud Platform resources, including deployment, access control, billing, and services.

1. Open the Cloud Platform Console.  
<https://console.cloud.google.com>
2. In the drop-down menu at the top, select a project *My First Project* created by default or create a new project.

## 5.2 Project Billing

Enable billing for your project, if not already enabled. Enabling billing allows the application to consume billable resources such as Dialogflow API calls. See Cloud Platform Console Help for more information about billing settings.

## 5.3 Dialogflow API

In the Google Cloud Platform Console, navigate to API & Services and enable the Dialogflow API.

## 5.4 Credentials Retrieval

Download a service account credentials file.

1. In the Google Cloud Platform Console, navigate to API & Services > Credentials > Create credentials > Service account key
2. Under **Service account**, select *New service account*.
3. Under **Service account name**, enter a service account name of your choice. For example, *accessor*.
4. Under **Role**, select Project > Owner.  
To better understand the Cloud IAM roles that you can grant to your service account to access Cloud Platform resources, check out the following page.  
<https://cloud.google.com/iam/docs/understanding-roles>

5. Under **Key type**, leave JSON selected.
6. Click **Create** to create a new service account and download the json credentials file.

## 5.5 Credentials Installation

The downloaded json credentials file needs to be placed into the directory */opt/unimrcp/data*.

```
sudo cp *.json /opt/unimrcp/data
```

# 6 Configuring Server and Plugin

## 6.1 Plugin Factory Configuration

In order to load the GDF plugin into the UniMRCP server, open the file *unimrcpserver.xml*, located in the directory */opt/unimrcp/conf*, and add the following entry under the XML element *<plugin-factory>*. Disable other recognition plugins, if available. The remaining demo plugins might also be disabled, if not installed.

```
<!-- Factory of plugins (MRCP engines) -->
<plugin-factory>
  <engine id="Demo-Synth-1" name="demosynth" enable="true"/>
  <engine id="Demo-Recog-1" name="demorecog" enable="false"/>
  <engine id="Demo-Verifier-1" name="demoverifier" enable="true"/>
  <engine id="Recorder-1" name="mrcpreorder" enable="true"/>
  <engine id="GDF-1" name="umsgdf" enable="true"/>
</plugin-factory>
```

## 6.2 Logger Configuration

In order to enable log output from the plugin and set filtering rules, open the configuration file *logger.xml*, located in the directory */opt/unimrcp/conf*, and add the following entry under the element *<sources>*.

```
<source name="GDF-PLUGIN" priority="INFO" masking="NONE"/>
```

## 6.3 GDF Plugin Configuration

The configuration file of the plugin is located in */opt/unimrcp/conf/umsgdf.xml*. Default settings should be sufficient for generic use.

Refer to the *Usage Guide* for more information.

# 7 Validating Setup

Validate your setup by using the sample UniMRCP client and server applications on the same host. The default configuration and data files should be sufficient for a basic test.

## 7.1 Setting up Sample Dialogflow Agent

Follow the [instructions](#) to import a sample Dialogflow room reservation agent.

In order to identify the Dialogflow agent, an associated [project ID](#) must be specified in the configuration file of the plugin, located in `/opt/unimrcp/conf/umsgdf.xml`.

```
<streaming-recognition
  interim-results="false"
  language="en-US"
  max-alternatives="1"
  project-id="abcdefgh-ijklmn-123456"
/>
```

## 7.2 Launching Server

Launch the UniMRCP server application.

```
cd /opt/unimrcp/bin
sudo ./unimrcpserver
```

In the server log output, check whether the plugin is normally loaded.

```
[INFO] Load Plugin [GDF-1] [/opt/unimrcp/plugin/umsgdf.so]
```

Next, check for the license information.

```
[NOTICE] UniMRCP GDF License
```

```
-product name:  umsgdf
-product version: 1.0.0
-license owner:  Name
-license type:   trial
-issue date:    2017-12-28
-exp date:     2018-01-27
-channel count:  2
```

```
-feature set: 0
```

Next, check for the service account credentials.

```
[NOTICE] Set Google App Credentials /opt/unimrcp/data/My First Project-a78...c15.json
```

## 7.3 Launching Client

Note: the optional package *umc-addons* must be installed for this test to work.

Launch the sample UniMRCP client application *umc*.

```
cd /opt/unimrcp/bin  
./umc
```

Run a typical speech recognition scenario by issuing the command *run gdf1* from the console of the *umc* client application.

```
run gdf1
```

This command sends a RECOGNIZE request to the server and then starts streaming a sample audio input file *bookroom.pcm* to recognize.

Check for the NLSML results to be returned as expected.

```
<?xml version="1.0"?>  
<result>  
  <interpretation grammar="builtin:speech/transcribe" confidence="1">  
    <instance>  
      <query_text>book a room</query_text>  
      <action>room.reservation</action>  
      <parameters>  
        <guests></guests>  
        <duration></duration>  
        <location></location>  
        <time></time>  
        <date></date>  
      </parameters>  
      <fulfillment_text>I can help with that. Where would you like to reserve a  
        room?</fulfillment_text>  
      <fulfillment_messages>  
        <text>
```

```

    <text>I can help with that. Where would you like to reserve a room?</text>
  </text>
  <platform>FACEBOOK</platform>
</fulfillment_messages>
<fulfillment_messages>
  <text>
    <text>I can help with that. Where would you like to reserve a room?</text>
  </text>
</fulfillment_messages>
<output_contexts>
  <name>projects/abcdefgh-ijklmn-
    123456/agent/sessions/ee86f76015ee5943/contexts/e8f6a63e-73da-4a1a-8bfc-
    857183f71228_id_dialog_context</name>
  <lifespan_count>2</lifespan_count>
  <parameters>
    <duration></duration>
    <guests></guests>
    <location></location>
    <time></time>
    <date></date>
    <duration_original></duration_original>
    <time_original></time_original>
    <guests_original></guests_original>
    <location_original></location_original>
    <date_original></date_original>
  </parameters>
</output_contexts>
<output_contexts>
  <name>projects/abcdefgh-ijklmn-
    123456/agent/sessions/ee86f76015ee5943/contexts/room_reservation_dialog_params_
    location</name>
  <lifespan_count>1</lifespan_count>
  <parameters>
    <guests></guests>
    <duration></duration>
    <location></location>
    <time></time>
    <date></date>
    <duration_original></duration_original>
    <time_original></time_original>
    <guests_original></guests_original>
    <location_original></location_original>
    <date_original></date_original>
  </parameters>
</output_contexts>
<output_contexts>
  <name>projects/abcdefgh-ijklmn-
    123456/agent/sessions/ee86f76015ee5943/contexts/room_reservation_dialog_context<
    /name>
  <lifespan_count>2</lifespan_count>
  <parameters>

```

```
<duration></duration>
<guests></guests>
<location></location>
<time></time>
<date></date>
<duration_original></duration_original>
<time_original></time_original>
<guests_original></guests_original>
<location_original></location_original>
<date_original></date_original>
</parameters>
</output_contexts>
<intent>
  <name>projects/abcdefgh-ijklmn-123456/agent/intents/e8f6a63e-73da-4a1a-8bfc-
    857183f71228</name>
  <display_name>room.reservation</display_name>
</intent>
<intent_detection_confidence>1</intent_detection_confidence>
<diagnostic_info>
</diagnostic_info>
<language_code>en-us</language_code>
</instance>
<input mode="speech">book a room</input>
</interpretation>
</result>
```

Visually inspect the log output for any possible warnings or errors.

Note that utterances are stored in the *var* directory, if the corresponding parameter is enabled in the configuration file *umsgdf.xml* and/or requested by the client.