Galigeo Installation Guide - G24.0

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PUBLIC CONCERNED BY THIS GUIDE

This document is aimed at technical persons in charge of the preparation and execution of the Galigeo platform installation as well as persons doing the exploitation.

DOCUMENT GOAL

This document presents the technical architecture of the Galigeo Solution. It describes the technical pre-requisites and the installation steps.

READING CONVENTIONS

	Steps to follow
	Notice
	Advice
	Carefull
	Example

Chapter 1: Pre-requisites

In this chapter:

Architecture Schema

Supported DBMS

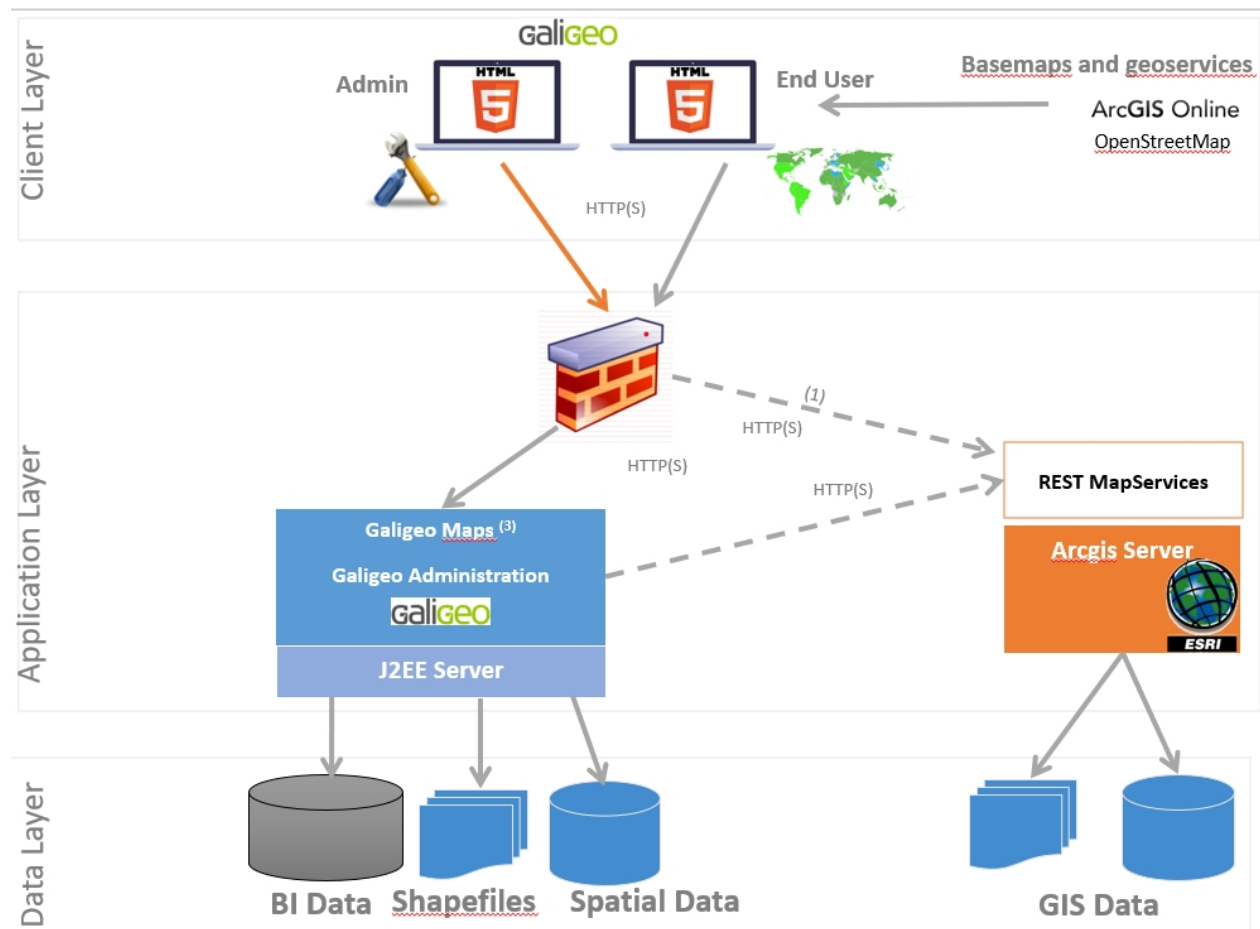Galigeo Server

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1.1 Architecture Schema

GENERAL ARCHITECTURE

Galigeo is designed as an n-tiers, client-server, architecture deployed on Intranet/Internet:

○ The top most layer is the "**presentation tier**" or the user interface. The Galigeo user interface is a thin Internet remote client.

○ The "**application tier**" or the business logic tier consists of the BI server, Galigeo server (and optionally ArcGIS Server). This tier controls the data exchange and connections between the presentation tier and the data tier (described below). **Note that the** BI server also controls the authentication/access.

○ The last layer is the "**data tier**" with database servers where information is stored in and retrieved from DBMS.

ARCHITECTURE SCHEMA FOR THE HTML CLIENT

(1) Optionnal - Used by by the user if the basemaps are stored on a local Arcgis Server
(3) Optionnal - Galigeo Maps needs to access arcgis.com for isochrones calculations

1.2 Supported DBMS

DBMS	Version	Notice
Oracle	**10g** **11g** **12c**	And the corresponding Spatial Cartridge if activated (depending on the customer Oracle License)
PostGreSQL (with PostGIS)	**9.3** (with **PostGIS 2.1**) **9.4** (with **PostGIS 2.3**) **10** (with **PostGIS 2.4**) **12** (with **PostGIS 3.0**)	NA
Microsoft SQLServer	**2017** **2019**	SQLServer Spatial Cartridge is not supported.
SAP IQ (Sybase IQ)	**16.1**	SAP IQ Spatial Cartridge is not supported.

1.3 ArcGIS - Optional

Galigeo application that embeds its own geographical data is fully independent and does not need any GIS server.

However, the Galigeo application is able to use data from ArcGIS Server.

ArcGIS Server

The ArcGIS server can be used as a map service and feature service for the BI / Galigeo reports.

Galigeo does not require to install any additional component on the ArcGIS server.

Item	Prerequisite	Notices	Check tests
ESRI Products ArcGIS Server	**ArcGIS Server 10.1x, 10.2x, 10.3x, 10.4x, 10.5x, 10.6x, 10.7x, 10.8x, 10.9x** With the following tools: • **ArcMap/ArcGIS for Desktop**: for creating map projects • **ArcGIS Manager** to publish and manage map services	The ArcSDE version is independent with Galigeo.	_1st test – Check ArcGIS Manager - launch its url:_ **Example**: **http://esri-srv:6080/arcgis/manager** - The login screen should display. - Connect with an arcgismanager account and access the map services page
Map Service	**ArcGIS Server Map service** published from a MXD or a MSD **with** in particular **the options "Export Map"** and "**Query**" (to set during the publishing) The **ArcGIS MapServices** used by Galigeo **must be available via REST from the Galigeo Server machine**	The use of MSD format is recommended. **Following secured MapServices are supported:** **- ArcGIS Server:** GenerateToken **- Portal & ArcGIS Online:** App Login	_1st test – Open the REST url:_ **Example**: http://esri-srv:**6080/arcgis/rest/services** The list of available mapservices should be displayed. _2nd test – Mapservice access via REST - click on a mapservice:_ **Ex of mapservice REST URL:** http://esri-gis:6080/arcgis/rest/services/**ggoMapService/MapServer** The mapservice properties and layers displays.

GIS Database	**Not important for Galigeo** Galigeo neither accesses directly to the GIS database	All ArcGIS supported formats	NA

The connection to ArcGIS Server is done both through Galigeo Server and the client. **This means that the application server, e.g. Tomcat, and the client (web browser) must see ArcGIS Server.**

ArcGIS Online

Galigeo offers the possibility to connect automatically to ArcGIS Online (AGOL) to use the Drive Time service, for example. The credentials are activated as soon as the appropriate license key is declared in Galigeo Administration console.

⚠️	The connection to ArcGIS Online is done through Galigeo Server, the one that hosts Galigeo cartographic viewer. **This means that the application server, e.g. Tomcat, must see arcgis.com without any proxy authentication.**

1.4 WFS - Optional

The Open Geospatial Consortium (OGC) **Web Feature Service** (WFS) Interface Standard provides an interface allowing requests for geographical features across the web using platform-independent calls

The OGC membership defined and maintains the WFS specification. Numerous commercial and open-source implementations of the WFS interface standard exist, including the open-source reference implementations GeoServer and deegree.

The WFS support comes has an extension to the product. Only versions 1.0.0 and 2.0.0 are supported. The supported output formats are GML3 or GeoJson.

Adding a WFS layer is done through the Galigeo Administration > Catalog tab > Add a layer then select an url. The specified url must a WFS request of type GetFeature. The returned entities must use the reference system EPSG:4326. For example:

https://data.gov.au/geoserver/ballarat-heritage-area-gutter-rails/wfs?request=GetFeature&typeName=ballarat-heritage-area-gutter-rails:ckan_04fdff50_c07d_4611_8871_2b4a5787de28&outputFormat=application/json&version=1.0.0

Some WFS servers become unstable when they return a large number of result. The maximum number of records can be limited by adding the url the parameter "maxFeatures" for versions 1.0.0 or "count" for versions 2.0.0.

1.5 Galigeo Server

The Galigeo server hosts the Galigeo web module.

Softwares pre-requisites:

Item	Prerequisite	Notices	Check tests
OS	**Windows Server 2016, 2019, 2022 all editions** **RedHat Enterprise Linux 7, 8, 9** **SUSE Linux Enterprise 12, 15**	NA	NA

Java Environment	**Java 1.8.0_xx**
	(JRE or JDK)
		NA	*1<u>st</u> test (basic): type in a shell command prompt :* **java – version**
			Example of expected result:
			`java version "1.8.0_72" …`
			2<u>nd</u> test: in the application server configuration console, check what Java version is used.
			Ex Tomcat - Check the parameter « Java Virtual Machine » in the tab « Java » of the configuration console:
			`C:\1.8.0_72\jre\bin\server\jvm.dll`

Application Server	**Tomcat 8.0.x (Java 1.8)** **Tomcat 8.5.x (Java 1.8)** **Tomcat 9.0.x (Java 1.8)**	NA	*Go to the application server URL. The version number usually displays:* **Ex Tomcat**: **http://ggo-srv:8080**

We recommend to use a 64 bits Tomcat application server and Java machine.

Minimum and recommended resources sizing for Galigeo Tomcat application server (64 bits):

Component	Minimum	Recommended for 5 concurrent users (concurrent sessions)
Processor **#core**	Type Intel Xeon 2 cores	Type Intel Xeon 4 cores multithread

Tomcat Memory	2 Go RAM	4 Go RAM
Disk space (Tomcat + Galigeo)	2 Go	10 Go SAS 15k rpm ou SSD

1.6 Network

This table lists the ports used for all the modules involved with Galigeo webapp. The ports must be available from the calling application, which might in some cases require some firewall adjustment.

The default port values might be different in the real situation.

Port	Protocol	Opened on	Used by	Default Value	Firewall rule
Galigeo Tomcat port	HTTP(S)	GGO Server	Galigeo Client (*from client to GGO server*)	8080	NA
HTTP Port used by the ArcGIS REST services **-** **Optional**	HTTP(S)	GIS Server	- Galigeo Admin (*from GGO server to ArcGIS server*) - Galigeo Server to query ArcGIS server mapservice (*from Galigeo server to ArcGIS server*) - Galigeo client: to query ArcGIS server basemaps if any	6080	Open in the direction Client → GIS The Galigeo Server must have access to the REST services with the same url as the client.
Access to ArcGIS Online **-** **Optional**	HTTPS	arcgis.com	to query ArcGIS Online (*from Galigeo server to ArcGIS Online*)	443	Open in the direction Galigeo Server → AGOL

1.7 Client

The web browser on the client machine is used to access BI Portal and the BI Reports / Galigeo maps.

Item	Recommended	Notices	Check tests
OS	**Windows 10, 11 desktop**	NA	NA
HTML5 Client **Web browser**	**Microsoft: Edge Chromium 128, 129** **FireFox: 129, 130** **Chrome: 128, 129**	Javascript activated Edge Chromium IE 11 mode is not supported	Go to web browser Menu > About to know its version
Excel	**2016, 2019**	For Excel Georeports	NA

⚠️	**For proper operation of Galigeo Application, it is important that the client browser has access to base maps, either on internet or intranet.**

Sizing the client machine

- We recommend to use Windows 11 with 4 to 8 Go of RAM

Chapter 2: Installation of Galigeo web application

In this chapter :

Global overview

Where the installation takes place?

Deploy the web application

Tomcat Configuration

Font installation

Finalize installation

Frontal Web Server

Cluster deployment

2.1 Global Overview

Below find a description of the Galigeo web application.

Web Application	Description	Notices
Galigeo.war	Galigeo HTML5 cartographic Portal + Administration	Installation and deployment process takes place at the Galigeo server.

2.2 Where the installation takes place?

The installation takes place on Galigeo server.

> ⚠️ The installation steps described in this chapter concern a new installation.
>
> **If Galigeo is already installed,** see **chapter Update an existing installation**.

<GGO_PACKAGE> is Galigeo package root directory.

Example of <**GGO_PACKAGE>** :

\\fileServer\GaligeoEnterprise_G24-eXperience

<GGO_TOMCAT_HOME> is the root directory of Tomcat Server.

Example of **<GGO_TOMCAT_HOME>** :

Windows: **D:\products\tomcat**

2.3 Deploy the web application

- Stop the Galigeo Tomcat Service

- Go to **<GGO_PACKAGE>** directory

- Copy **Galigeo.war** webapp to

<GGO_TOMCAT_HOME>/webapps

- Check that **unpackWARs** et **autoDeploy** Tomcat parameters from "**<Host ..**" tag are set to **true** in "<TOMCAT_HOME>/conf/**server.xml**" file

- o If not, set them to **true** (every modification server.xml file needs Tomcat to be restarted)

- o Example: <Host name="localhost" appBase="..." **unpackWARs="true" autoDeploy="true"**>

- Restart Galigeo Tomcat Service.

- This automatically deploys Galigeo.war file as Galigeo/ folder at the root of webapps/ folder.

2.4 Tomcat Configuration

Memory Configuration

In order to get some optimal performances in Galigeo, you need to modify Tomcat's default memory parameters.

Once this change is done, you need to restart Tomcat.

We recommend to use a 64 bits Tomcat application server and Java machine.

If Tomcat is installed as a service

- o Open the Tomcat configuration console,

- o Go to the tab "Java",

- o In the area « Java Options » add the two following lines:

```
-Xrs
```

```
-XX:MaxPermSize=256M
```

- Set the parameter "Initial memory pool" at **128**

- Set the parameter "Maximum memory pool" according to recommendations given in chapter 1.3 Galigeo Server

  - o 64 bits Tomcat+JVM example: 4096 (there is no limit for a 64 bits JVM)

  - o 32 bits Tomcat+JVM 32 example: 1024 (32 bits JVM is limited to 1536)

If Tomcat starts as a script "startup.bat"

- Edit the file **<GGO_TOMCAT_HOME>/bin/catalina.bat**

- At the beginning of the script, add the line:

  64 bits Tomcat+JVM example:

```
set JAVA_OPTS=%JAVA_OPTS% -Xmx4096m -Xrs -XX:MaxPermSize=256m
```

  32 bits Tomcat+JVM example:

```
set JAVA_OPTS=%JAVA_OPTS% -Xmx1024m -Xrs -XX:MaxPermSize=256m
```

Special characters

To display and print correctly special characters, you need to apply the following settings.

Once changes are done, you need to restart Tomcat.

Add parameter `-Dfile.encoding=UTF-8`

If Tomcat is installed as a service

- Open the Tomcat configuration console,

- Go to the tab "Java",

- In the area « Java Options » add the two following lines:

```
-Dfile.encoding=UTF-8
```

If Tomcat starts as a script "startup.bat"

- Edit the file **<GGO_TOMCAT_HOME>/bin/catalina.bat**

- At the beginning of the script, add the line:

```
set JAVA_OPTS=%JAVA_OPTS% -Dfile.encoding=UTF-8
```

<u>**Add parameter**</u> `URIEncoding="UTF-8"`

- Edit file **<GGO_TOMCAT_HOME>/conf/server.xml**,

- Go to tag <Connector port="8080".. corresponding to Tomcat port (by default 8080), and modify or add the parameter **URIEncoding="UTF-8"**

<u>Example:</u>

<Connector port="8080" protocol="HTTP/1.1" connectionTimeout="20000" redirectPort="8443" **URIEncoding="UTF-8"**/>

2.5 Font installation

Installation of the ESRI fonts *(deprecated)*

> ⚠ • **The ESRI fonts are not used since Galigeo G19.5 and are not provided in the Galigeo package. It is useless to install them on a virgin platform**. They will be replaced by the Galigeo proper SVG symbols.
>
> • **The only case when it is necessary to install the ESRI font is the following: the reinstallation of Galigeo on a new server with map transports that are using the ESRI fonts**. The following procedure is to be followed afterwards.
>
> • When updating a previous version to Galigeo G19.5 or greater, the maps, created with the previous version that are using the ESRI fonts will continue to work in G19.5 or greater. The ESRI font have actually been installed by the previous version Galigeo.

- Download ESRI fonts at: https://download.galigeo.com/download/fonts/font_esri.zip

- Unzip the zip file font_esri.zip in a folder on the Galigeo server

- On Windows, select all the .ttf file, right click then choose "Install"

- On Unix / Linux the font installation depends on the distribution

Installation of Windows fonts on Unix / Linux for print module

Windows fonts, by default "DejaVu Sans", are used by the HTML5 print module and may be missing on the Unix / Linux server. They need to be installed. This action can be easily accomplished via the native package installer for each Unix / Linux distribution.

For example, for a Red Hat distribution, the package to install is: *msttcorefonts-2.5-1.noarch.rpm*

2.6 Finalize installation

- The following operation takes place only once. This operation creates a <GALIGEO_HOME> folder that will be used to store the Galigeo resources. **Galigeo Tomcat user needs to have read/write access to <GALIGEO_HOME> folder.**

- In a browser, launch the following URL: **http(s)://<GGO_TOMCAT_SERVER>:<GGO_TOMCAT_PORT>/Galigeo/**

- Fill the text area with a valid path to <GALIGEO_HOME> folder at Galigeo Server, outside Tomcat directory. If the folder does not exist, it is created. Example:

C:\Program Files\Galigeo

- Click on [Continue]

2.7 Frontal Web Server

If BI portal is accessed from client web browsers trough a frontal web server, you may want that Galigeo web application is also accessed trough this frontal web server.

In such case, Galigeo frontal URL must be declared in Galigeo Administration console > "Proxy" Menu > "External URL" parameter.

For example, the Galigeo client URL could be:

http://my.organization.com/Galigeo

that must be declared in Galigeo Administration console > "Proxy" Menu > "External URL" parameter

2.8 Cluster deployment

Galigeo can be deployed in a cluster of Tomcat servers that are visible through a unique frontal web server in charge of load balancing and fail-over.

> **The Territory Management tool, that needs a separate license, does not support cluster deployment.**

In a cluster deployment, there is:
- **One Galigeo.war webapp per Tomcat Server**
- **A unique <GALIGEO_HOME> directory shared between all Galigeo webapps.**
    - This can be done, for example, by mounting the same Network Drive, for example "Z:", on each server
    - The path to <GALIGEO_HOME> directory must be the same on each server. *Example*: Z:\applications\Galigeo
    - Each Tomcat user must have RW rights on the shared <GALIGEO_HOME> and its subfolders and files.

Installation / configuration steps are detailed below:

NB: We describe below the sharing of a unique <GALIGEO_HOME> directory between all Galigeo webapps by mounting the same Network Drive on each server. This are other ways to do this sharing by using, for example, symbolic links.

- **0 - Prerequisites: on each Tomcat server there is a mount of the same Network Drive,** referencing the same network server.
    - *Example*: **the network drive "Z:" referencing** the same network path, **\ \<NAS_SERVER>**

- **1 - A standard installation is done on each Tomcat server** - see paragraphs 2.2 to 2.5 above - **with a point of attention when finalizing the installation,** see paragraph "2.6 Finalize installation":
    - **On each Tomcat server the same <GALIGEO_HOME> directory is defined using the network Drive**.
    - *Example*: On each Tomcat server, the path to <GALIGEO_HOME> directory is defined to "Z:\applications\Galigeo"
    - *Remark*: the "real" network path corresponding to the above path is "\ \<NAS_SERVER>\applications\Galigeo"

- **2 - Declare Galigeo client / frontal URL in Galigeo Administration**: see paragraph "2.7 Frontal Web Server".

Chapter 3: Update an existing installation

The procedure takes place on the Galigeo server.

A Galigeo webapp is already deployed in the Galigeo Tomcat.

<GGO_TOMCAT_HOME> is the root directory of Tomcat Server.

> **Example** of **<GGO_TOMCAT_HOME>** :
>
> Windows: **D:\products\tomcat**

- Stop Galigeo Tomcat service

- Go to **<GALIGEO_HOME>/config** (ex: D:\products\galigeo\config), and **inactivate current config.json file by renaming it config.json.old**, for example. The new config.json file is automatically generated on the first display of a map. If the old file has been customized (ex: custom basemaps), the customization has to be transferred to the new file

- Go to **<GGO_TOMCAT_HOME>/webapps** (ex: D:\products\tomcat\webapps\), **delete** or **move** in a backup directory outside tomcat the following elements:
    - **Galigeo** folder
    - **Galigeo.war** file

- Copy the new **Galigeo.war webapp** to **<GGO_TOMCAT_HOME>/webapps**

- **Empty Tomcat cache**: go to **<GGO_TOMCAT_HOME>/work/Catalina/localhost/** and remove **Galigeo** folder

- Restart Galigeo Tomcat service.

Chapter 4: Uninstall Galigeo

The procedure takes place on Galigeo Sever.

<**GALIGEO_HOME**> is the Galigeo installation directory.

Example of <**GALIGEO_HOME**> :

Windows: **D:\products\galigeo**

Unix / Linux : **/products/galigeo**

<GGO_TOMCAT_HOME> is the root directory of Galigeo Tomcat Server.

Example of **<GGO_TOMCAT_HOME>** :

Windows: **D:\products\tomcat**

- Stop Galigeo Tomcat service

- **Backup** <**GALIGEO_HOME**> **directory and all its content**

- Delete <**GALIGEO_HOME**> directory

- Go to **<GGO_TOMCAT_HOME>/webapps** (ex: D:\product\tomcat\webapps\), **delete** the following elements:
    - **Galigeo** folder
    - **Galigeo.war** file

- **Empty Tomcat cache**: remove the directory **Galigeo** located at **<GGO_TOMCAT_HOME>/work/Catalina/localhost**

- Restart Galigeo Tomcat Service

Chapter 5: Galigeo Portal and Administration

Managing Galigeo application ; users, geographical data catalog, license, etc ; is done in Galigeo web administration console. A full description of these steps is found in chapter "Galigeo Administration" of the user guide.

Galigeo Portal URL is the following:

<p align="center">http://<GGO_TOMCAT_SERVER>:<GGO_TOMCAT_PORT>/Galigeo/</p>

To access Galigeo Administration, click on "Administration" in the left menu of Galigeo Portal (this button may not be visible depending on user rights).

http://ggo-srv:8080/Galigeo/

Chapter 6 : Annexes

In this chapter:

[Backup of Galigeo Home](#)

6.1 Backup of Galigeo Home

The procedure takes place on Galigeo server.

<**GALIGEO_HOME**> is the Galigeo installation directory.

Example of <**GALIGEO_HOME**> :

Windows: **D:\products\galigeo**

Unix / Linux : **/products/galigeo**

Tomcat service is stopped and restarted during backup procedure.

- Stop Galigeo Tomcat service

- **Backup <GALIGEO_HOME> directory and all its content**

- Restart Galigeo Tomcat service