# Galigeo for Cognos Analytics Installation Guide - G23.0 eXperience

# Table des matières

Introduction	. 3
About this document	. 4
Chapter 1: Pre-requisites	5
1.1 Architecture Schema	. 6
1.2 Cognos Server	7
1.3 ArcGIS - Optional	. 8
ArcGIS Server	
ArcGIS Online	10
1.4 WFS - Optional	10
1.5 Galigeo Server	10
1.6 Network	12
1.7 Client	13
Chapter 2: Installation of Galigeo web application	14
2.1 Global Overview	
2.2 Where the installation takes place?	
2.3 Deploy the web application	
2.4 Tomcat Configuration	16
Memory Configuration	16
Special characters	16
2.5 Font installation	18
2.6 Finalize installation	18
2.7 Frontal Web Server	18
2.8 Cluster deployment	19
Chapter 3: Update an existing installation	21
Chapter 4: Uninstall Galigeo	
Chapter 5: Galigeo Administration	23
Chapter 6: Insert Maps In Cognos Reports	24
Chapter 6: Annexes	
6.1 Backup of Galigeo Home	25

# **Introduction**

# In this chapter:

Public concerned by this guide Document goal Reading conventions

#### **About this document**

#### **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.

Galigeo application is a web service used as a Cognos Analytics Custom Control, a new feature of the IBM Cognos Analytics platform.

#### **READING CONVENTIONS**



# **Chapter 1: Pre-requisites**

# In this chapter:

Architecture Schema
Cognos Server
Galigeo Server
Network
Client Machine

#### 1.1 Architecture Schema

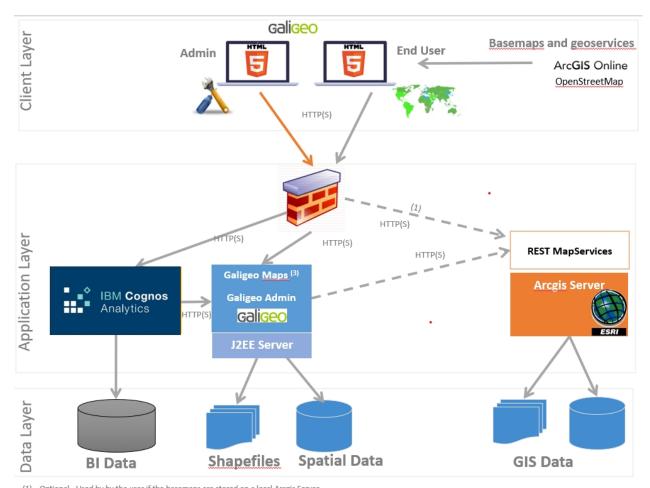
#### **GENERAL ARCHITECTURE**

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 Cognos Analytics 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 Cognos server also controls the authentication/access.
- The last layer is the "data tier" with database servers where information is stored and retrieved from DBMS.

The complete architecture includes the tools for managing and administering this system: The Galigeo Administration console, Cognos Administration and Designer.

#### ARCHITECTURE SCHEMA FOR THE HTML CLIENT



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

# **1.2 Cognos Server**

The Cognos server delivers the data for the Cognos reports that will be visualized and analyzed in the Galigeo maps. The maps are embedded into the Cognos reports.

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

Item	Pre-requisite	Notices	Check test	
IBM Cognos Analytics:			<u>1<sup>st</sup> test</u> – Cognos Portal present - launch Cognos Portal URL:	
11.0.8,			<b>Ex</b> : C11: http://cog-srv:9300/bi	
11.0.9, 11.0.10,			The Cognos login screen should appear.	
11.0.11, 11.0.12, 11.0.13, 11.1.1,	<ul> <li>New Cognos         Analytics HTML5         Portal:</li> <li>Cognos Viewer,         Report Studio,         Cognos         Administration</li> </ul>	1	2 <sup>nd</sup> _test - Access to Cognos Viewer - connect to Cognos Portal, open and refresh a Cognos report.	
11.1.2, 11.1.3, 11.1.4, 11.1.5,		analytics Custom Control Tool is not supported	3 <sup>rd</sup> test - Access to Report Studio - Cognos Portal > Launch Menu > Report Studio.	
11.1.6, 11.1.7,			4 <sup>th</sup> _test - Access to Cognos Administration - Cognos Portal > Launch Menu > Cognos	
11.2.0, 11.2.1, 11.2.3, 11.2.4			Administration.	
		Permissions on reports:		
	A Cognos user	• Read		
	account with the ad hoc permissions is necessary to run the tests.	• Write	Con the accord took above.	
Cognos User Account		• Execute	See the second test above: Open and refresh a Cognos	
	This account is used as Galigeo advanced user.	<ul> <li>For report +         maps PDF View:         Access to         capability         "Specification         Execution"</li> </ul>	report.	

# 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 Cognos / 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	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: GenerateToke n - 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	Not important for Galigeo	All ArcGIS	
Database	Galigeo neither accesses directly to the GIS database	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-gutterrails: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
	Windows Server 2016, 2019, 2022 all editions		
os	RedHat Enterprise Linux 7, 8, 9	NA	NA
	SUSE Linux Enterprise 12,		
Java Environme	Java 1.8.0_xx	NA	1 <sup>st</sup> test (basic): type in a shell command prompt : <b>java</b> –

nt	(JRE or JDK)		version  Example of expected result: java version "1.8.0_72"  2nd 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
Applicatio n 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.

# <u>Minimum and recommended resources sizing for Galigeo Tomcat application server</u> (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 + 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	- Cognos Client (from Cognos Portal to GGO server as a Cognos Custom Control) - 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 Cognos HTML5 Portal and the Cognos Reports / Galigeo maps.

Item	Recommended	Notices	Check tests
os	Windows 10, 11 desktop	NA	NA
HTML5 Client Web browser	Microsoft: Edge Chromium 121, 122 FireFox: 102 ESR, 122, 123 Chrome: 121, 122	Javascript activated IE 11 is no more supported Edge Chromium IE 11 mode is not supported	Go to web browser Menu > About to know its version



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 viewer + print module + 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 <u>Update an existing</u> <u>installation</u>.

<GGO\_PACKAGE> is Galigeo package root directory.



**Example** of **<GGO\_PACKAGE>** :

\\fileServer\Galigeo4Cognos11\_G23\_SP1-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

- 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,
- 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 1.5 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",
- o 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

#### Add parameter 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"**

#### Example:

<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: <a href="https://download.galigeo.com/download/fonts/font\_esri.zip">https://download.galigeo.com/download/fonts/font\_esri.zip</a>
- 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 Cognos Analytics 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 > Technical Settings > "Proxy" Menu > "External URL" parameter.



For example, if Cognos portal client URL is:

http://my.organization.com/bi

Then Galigeo client URL could be:

http://my.organization.com/Galigeo

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



**Chrome 84 or greater**. If Cognos Analytics portal is accessed from client, trough a frontal web server, using Chrome 84 or greater, it is then necessary that Galigeo web application is also accessed trough this frontal web server. If not, some Galigeo features - map authoring map print, georeports - could be blocked for cross-domain security reasons.

#### 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 G18 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:
  - o Galigeo folder
  - o 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:
  - o **Galigeo** folder
  - o 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 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 2 - Galigeo Administration" of the user guide.

Galigeo Administration URL is the following:

http://<GGO\_TOMCAT\_SERVER>:<GGO\_TOMCAT\_PORT>/Galigeo/



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

# **Chapter 6: Insert Maps In Cognos Reports**

The steps to insert Galigeo Maps in Cognos Reports, using Cognos Custom Control Tool, is found in the UserGuide. Galigeo 4e Xperience G2xen > Chapter 3: Map Reports.

**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