Galigeo for WebI Installation Guide - G18.0 - eXperience

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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.

Galigeo application is a web service used as a WebIntelligence Custom element service, a new feature of the SAP BI 4.2 SP3 platform.

READING CONVENTIONS

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Chapter 1: Pre-requisites

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1.1 Architecture Schema
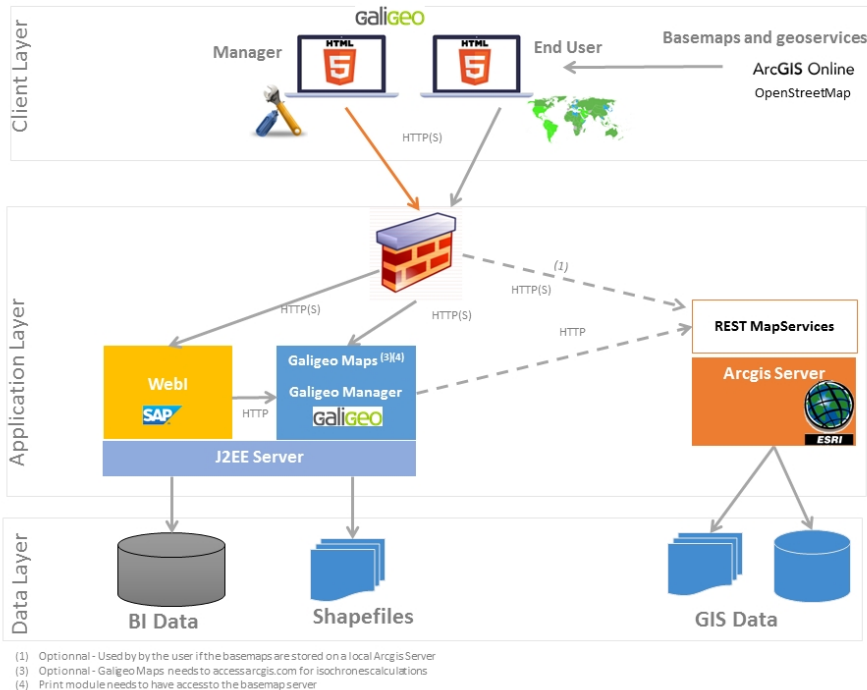
GENERAL ARCHITECTURE

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

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

- o The "**application tier**" or the business logic tier consists of the WebIntelligence 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** WebIntelligence server also controls the authentication/access through BusinessObjects security model.

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

The complete architecture includes the tools for managing and administering this system: The Galigeo Manager module, BusinessObjects Administration and Designer.

Galigeo webapp is deployed in BOE Tomcat Server.

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
(4) Print module needs to have access to the basemap server

1.2 BOE Server

The Business Objects server delivers the data from the Webi reports that will be visualized and analyzed in the Galigeo maps. The maps are embedded into the InfoView / WebIntelligence reports.

The BOE Tomcat server hosts the Galigeo webapp.

Item	Pre-requisite	Notices	Check test
OS **(see BO supported W2K8 operating systems)**	**Windows Server 2008, 2012 all editions** **RedHat Enterprise Linux 5, 6**	NA	NA
Java Environment	**Java Development Kit (JDK)** **1.7.0_xx** **1.8.0_xx**		_1st test (basic):_ *in a shell command prompt, type :* **java – 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:**jdk1.8.0_72**\jre\bin\server\jvm.dll
Applications Server	**Tomcat 7.0.x (jdk 1.7)** **Tomcat 8.0.x (jdk 1.8)** **Tomcat 8.5.x (jdk 1.8)**	Tomcat is installed by default with the server products BOE. The documentation describes the installation only for Tomcat.	*Launch the welcome page of the J2EE application server. The version can usually be displayed:* **Ex Tomcat**: **http://boe-srv:8080**
BOE BI 4.2 SP3, SP4, SP5, SP6	**Server Components**: **Core Services** **Web Intelligence Services** **CMC access** **BI Launchpad access**	CMC access is used to declare Galigeo web service as a WebIntelligence Custom element service. BI Launchpad is used to design / visualize WebI documents with Galigeo Maps	_1st test_ - Launch the BI Launch Pad url: **Ex**: http://boe-srv:8080/**BOE/BI** - The BI Launch Pad login screen should appear. - If a BO account is available, Open and refresh a Webi document _2nd test_ – CMC available:

			Ex: http://boe-srv:8080/**BOE/CMC**
BOE User Account	A Business Objects user account with the rights ad hoc is necessary to run the tests.	The BO user must have the following rights: **General:** Read/write the objects **Documents Web Intelligence :** Refresh report, Refresh prompts, Use prompts, Export report data **Universe:** Data access	_See the first test above:_ Open and refresh a Webi document.

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 WebI / Galigeo documents.

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** 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:* **Ex ArcGIS 10 java**: http://esri-srv:**8099/arcgismanager/ main/login.jsf** - 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 client machines and also from Galigeo Server machine**	The use of MSD format is recommended.	*1ˢᵗ test – Open the REST url:* **Ex ArcGIS 10**: http://esri-srv:**8399/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:8399/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 Manager > 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. The parameter WFSmaxRecordCount in <GALIGEO_HOME>/config/gaia.properties defines the default limit of features at a time on the map.

1.5 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
BI Tomcat port (Business	HTTP(S)	BI Server	- BI Server (*from BI server to GGO server as a WebI*	8080	NA

Intelligence)			*Custom Element*) - Galigeo Client (*from client to BI server*)		
HTTP Port used by the ArcGIS REST services - Optional	HTTP(S)	GIS Server	- Galigeo Manager (*from BI 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	8399	Open in the direction Client → GIS The BI connector and 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

1.6 Client

The web browser on the client machine is used to access BO InfoView and the WebIntelligence documents / Galigeo maps.

Item	Recommended	Notices	Check tests
OS	**Windows Seven, 8.1, 10 desktop**	NA	NA
HTML5 Client **Web browser**	**Internet Explorer: 11, Edge** **FireFox: 45 ESR, 52 ESR, 62, 63** **Chrome: 69, 70**	Javascript activated IE compatibility 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 Seven, 8.1 or 10 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 parameters and special characters

Font installation

Finalize installation

Declare the Galigeo service in the CMC

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 + Manager	Installation and deployment process takes place at the BOE server.

2.2 Where the installation takes place?

The installation takes place on BOE server.

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

<GGO_CD> is Galigeo CD root directory.

Example of <**GGO_CD**> :

\\fileServer\Galigeo4WebI-bi4_G18.0-eXperience_CD

<BOE_TOMCAT_HOME> is the root directory of BOE Tomcat Server.

Example of **<BOE_TOMCAT_HOME>** :

Windows: **D:\BOBI42\tomcat**

2.3 Deploy the web application

- Stop the BOE Tomcat Service

- Go to **<GGO_CD>** directory

- Copy **Galigeo.war** webapp to

> **<BOE_TOMCAT_HOME>/webapps**

- Restart BOE Tomcat Service.

2.4 Tomcat parameters and 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`

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`

Tomcat starts as a script "startup.bat"

- ○ Edit the file **<BOE_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 **<BOE_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

The fonts contains a library of symbols used by the thematics.

- Unzip the zip file Tools\font_esri.zip in a folder

- 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 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 Debian Linux distribution type (like Ubuntu), the following command needs to be issued:
sudo apt-get install ttf-mscorefonts-installer

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. **BOE Tomcat user needs to have read/write access to <GALIGEO_HOME> folder.**

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

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

    C:\Program Files\Galigeo

- Click on [Continue]

2.7 Declare the Galigeo service in the CMC

- Connect to BOE CMC

- Go to Applications > double click on Web Intelligence > Custom Elements

- Add a new service with following parameters:

    - **Service Name**: **Galigeo**

    - **Service URL**: **http(s)://<BOE_TOMCAT_SERVER>:<BOE_TOMCAT_PORT>/ Galigeo**

- Click on [Test], in "**Service Format**" keep "**text/html**"

- [OK] and check the service checkbox in the services list, then [Save]

Notice - SSL Service URL and failed test with message "*javax.net.ssl.SSLHandshakeException*..":

If the Tomcat Galigeo Service URL is SSL (**https**:// <BOE_TOMCAT_SERVER>:<BOE_TOMCAT_PORT>/Galigeo) and the test fails with the message "*javax.net.ssl.SSLHandshakeException*...", you need to do perform the following setup:

NB: this is a SAP BO setup required for any SSL Custom Element.

- Declare the SSL certificate used by Tomcat in the SAP JVM keystore. This step will probably involves your IT Security expert. To help we give some guidelines in annex "**6.2 Declare an SSL certificate in SAP JVM - Guidelines**"

- Restart the TOMCAT BOE service

- Connect to BO CMC and restart server <SERVER>.AdaptiveProcessingServer

- Declare the https url when creating Galigeo service as custom element. The test should now be OK.

2.8 Frontal Web Server

If SAP BI Launch Pad portal is accessed from client web browsers trough a frontal web

server, it is then necessary that Galigeo web application is also accessed trough this frontal web server.
If not, some Galigeo features - map print, georeports - could be blocked for cross-domain security reasons.

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

For example, if BI Launch Pad client URL is:

http(s)://my.organization.com/BOE/BI

Then Galigeo client URL must be:

http(s)://my.organization.com/Galigeo

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

2.9 Cluster deployment

Galigeo can be deployed in a cluster of BO Tomcat servers that are visible trough 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

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 BOE Tomcat server** - see paragraphs 2.2 to 2.6 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 Service in BO CMC: the URL of Galigeo Service is the client one, unique entry point accessed through frontal web server**. *Example*:
  - ○ Service Name: Galigeo
  - ○ **Service URL: http(s)://my.organization.com/Galigeo**
  - ○ **Notice**: each BOE Tomcat server must have access to the Galigeo client URL defined above

- **3 - Declare Galigeo client / frontal URL in Galigeo Manager**: see paragraph "2.8 Frontal Web Server".

Chapter 3: Update an existing installation

The procedure takes place on the BOE server.

A Galigeo webapp is already deployed in the BOE Tomcat dedicated to BI Launchpad.

<BOE_TOMCAT_HOME> is the root directory of BO Tomcat Server.

> **Example** of **<BOE_TOMCAT_HOME>** :
>
> Windows: **D:\BOBI42\tomcat**

- Stop BOE 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 G18.0 map. If the old file has been customized (ex: custom basemaps), the customization has to be transferred to the new file

- Go to **<BOE_TOMCAT_HOME>/webapps** (ex: D:\BOBI42\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 **<BOE_TOMCAT_HOME>/webapps**

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

- Restart BOE 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**

<**BOE_TOMCAT_HOME**> is the root directory of BO Tomcat Server.

Example of <**BOE_TOMCAT_HOME**> :

Windows: **D:\BOBI42\tomcat**

- Stop BOE Tomcat service

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

- Delete <**GALIGEO_HOME**> directory

- Go to **<BOE_TOMCAT_HOME>/webapps** (ex: D:\BOBI42\tomcat\webapps\, **delete** the following elements:
  - **Galigeo** folder
  - **Galigeo.war** file

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

- Restart BOE Tomcat Service

- Delete or uncheck Galigeo service in BOE CMC

Chapter 5: Galigeo Manager

Managing Galigeo application ; users, geographical data catalog, license, etc ; is done in Galigeo Manager web administration console. A full description of these steps is found in "Chapter 2 - Galigeo Manager" of the user guide.

Galigeo Manager URL is the following:

<div align="center">

http://<BOE_TOMCAT_SERVER>:<BOE_TOMCAT_PORT>/Galigeo/

</div>

 http://boe-srv:8080/Galigeo/

Chapter 6 : Annexes

In this chapter:

[Backup of Galigeo Home](#)

6.1 Backup of Galigeo Home

The procedure takes place on BOE 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 BOE Tomcat service

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

- Restart BOE Tomcat service

6.2 Declare an SSL certificate in SAP JVM - Guidelines

The best way to declare an SSL certificate in the SAP JVM is to involve the security team of the organization as they have the knowledge of the different kind of certificates they have generated for a given server or domain.
To help we give here some guidelines (adapted from https://help.sap.com/viewer/8b89e8119e044fb09357906b154afaf1/8.0/en-US/cb2aca0358bb41899386a3cbe676dea6.html).

Your Security Authority should have provide you an intermediary certificate file usually with the ".pem" extension (distinct from the one declared in Tomcat).
Example : bo4-my.organization.com_CER.pem

In the following guidelines we assume that <SAP_BOE_HOME> is E:\SAP BusinessObjects

- Copy "bo4-my.organization.com_CER.pem" into folder
"E:\SAP BusinessObjects\SAP BusinessObjects Enterprise XI 4.0\win64_x64\sapjvm\jre\lib\security"

- Open a DOS Command Prompt window

- Move to "E:\SAP BusinessObjects\SAP BusinessObjects Enterprise XI 4.0\win64_x64\sapjvm\jre\lib\security" :
> cd "E:\SAP BusinessObjects\SAP BusinessObjects Enterprise XI 4.0\win64_x64\sapjvm\jre\lib\security"

- Backup the default JVM keystore cacerts:
> copy cacerts cacerts.original

- Declare the certificate into the JVM keystore:

> "E:\SAP BusinessObjects\SAP BusinessObjects Enterprise XI 4.0\win64_x64\sapjvm\jre\bin\keytool" -import -alias <local certificate name> -file <certificate file> -keystore cacerts
Example:
"E:\SAP BusinessObjects\SAP BusinessObjects Enterprise XI 4.0\win64_x64\sapjvm\jre\bin\keytool" -import -alias my.organization.com_CER -file bo4-my.organization.com_CER.pem -keystore cacerts

You will be prompted for the keystore password. The default password is:
changeit

You will be prompted to trust the certificate. Answer is:
yes

If adding the certificate is successful, you will get something like:
Certificate was added to keystore