

CREATING WEB SERVICES FOR MACHU



Guidelines

CONCEPT

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CREATING WEBSERVICES FOR MACHU

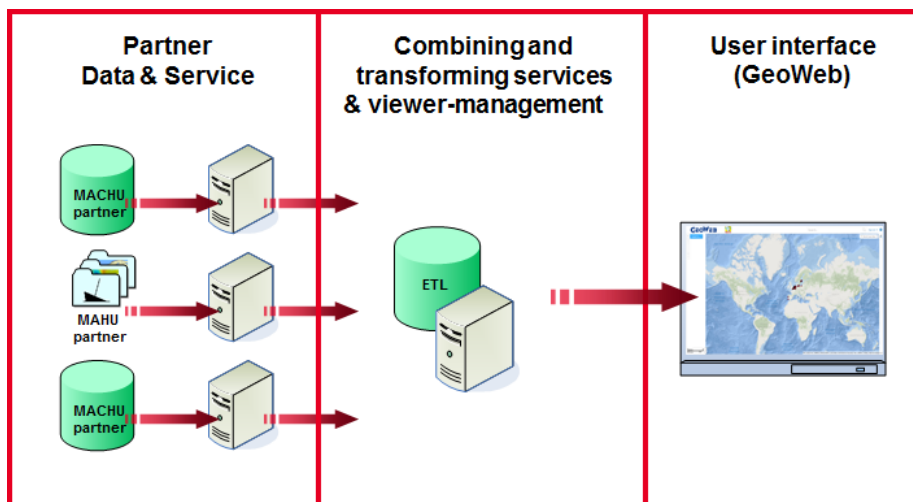
1. INTRODUCTION

This document contains guidelines for contributing web services to MACHU GIS on the GeoWeb platform. This document replaces the document 'Serving MACHU data using UMN Mapserver', which was created earlier for use on the MACHU GIS Mapviewer platform.

.For three main map layers in MACHU GIS, data models (data formats) have been created:

- Managing Cultural Heritage (Archaeology)
- Legislation
- Research areas

Datasets that are created according to these data models can be provided to MACHU GIS through web services. These web services can be collected, merged and transformed through an ETL-process (Extraction, Transformation and Load), which combines all provided services for each main map layer into a single map layer in MACHU GIS. A description of each data model can be found on the [MACHU-website](#)¹.



MACHU GIS principle model

It is also possible to provide services for other map layers, e.g. historic maps, if you have any data you would like to share as a default map layer through MACHU GIS, other than the main map layers mentioned above, please contact the MACHU organisation.

Note: Web services can also be added directly within a user session. These services however might not offer as much functionality as might be experienced using the default main map layers in MACHU GIS. This is usually caused due to limitations of the GeoWeb-platform or the way services are constructed.

¹ www.machuproject.eu

2. OGC-STANDARDS

[INSPIRE](http://inspire.ec.europa.eu/)² (Infrastructure for Spatial Information in Europe) is the European Commission initiative to build an European spatial data infrastructure (ESDI) and provides implementation rules to be implemented by national governments in the EU. MACHU has adapted the INSPIRE-guidelines for spatial information (except from maintaining access restrictions). This means MACHU GIS uses the standards of the Open Geospatial Consortium ([OGC](http://www.opengeospatial.org/))³ to access data from MACHU partners.

The Open Geospatial Consortium has defined several Open Web Services for accessing (usually geographic) data. There are two basic service sets – the Web Feature Services (WFS) and the Web Map Services (WMS). The WFS is concerned with direct access to your data (reading, writing, and updating). The WMS is concerned with transforming your data into a map (image).

MACHU GIS accesses Web Feature Services (WFS) when processing data for the three main map layers. Within this process, pre-defined symbolisation is added to create a default appearance of the data within MACHU GIS.

See the OGC-website for specifications on [Web Map Services \(WMS\)](http://www.opengeospatial.org/standards/wms/) and on [Web Feature Services \(WFS\)](http://www.opengeospatial.org/standards/wfs/).

3. SERVER

Web services can be created using different types of servers. Web services created by different server types produce small differences within the generated output. This may incidentally causes the ETL-process failing to process the web service. MACHU therefore recommends the use of [GeoServer](http://geoserver.org/)⁴ to create web services for MACHU GIS. Up to now, the services provided by GeoServer appear to give reliable results.

GeoServer is a Java-based software server that uses the open standards set forth by the Open Geospatial Consortium. GeoServer is built on Geotools, an open source Java GIS toolkit and free to use. GeoServer can be [downloaded](http://geoserver.org/download/)⁵ from the GeoServer website.

The GeoServer website also contains readable [references](http://geoserver.org/user/services/index.html)⁶ on how to handle WMS and WFS services.

4. SECURITY

Services that are provided to MACHU GIS can be secured to prevent unauthorized access outside the MACHU environment. This can be done by adding an authentication key or defining username and password. For MACHU, the use of username/password is preferred. At this moment, it is not possible as a user to add a secured web service during a user session, which is not registered within MACHU GIS.

Services can be provided using either an HTTP-protocol (HyperText Transfer Protocol) or an HTTPS-protocol (HyperText Transfer Protocol Secure). The second one uses a SSL (Secure Sockets Layer) or TLS (Transport Layer Security) protocol, adding encryption to communication between the web server and browser. To use a SSL or TLS, one has to purchase a certificate to add to the server. The use of HTTPS is recommended, but not necessary to provide services for the main map layers of MACHU GIS. For these layers, HTTPS-services are created within the ETL-process of MACHU. Other services, provided to use as a default map layer within MACHU GIS, or services which are to be added during a user session, should be HTTPS. HTTP-services are, for security reasons, not supported!

² <http://inspire.ec.europa.eu/>

³ <http://www.opengeospatial.org/>

⁴ <http://geoserver.org/>

⁵ <http://geoserver.org/download/>

⁶ <http://docs.geoserver.org/stable/en/user/services/index.html>

4. META DATA

Map layers in MACHU GIS should contain meta data information. Meta data contains source information like content description, data quality, restrictions on data use or contact information.

Each service provided to MACHU GIS should be accompanied by meta data, served as xml-file (Extensible Markup Language), according to the INSPIRE Metadata Implementing Rules.

Originally MACHU GIS uses the definitions of the ISO 19115 metadata profile for geography. This is a meta data standard for describing data sets. Meanwhile It has become possible to provide metadata on services, using ISO 19119 metadata standard for services.

One can use the metadata editor on the [INSPIRE geoportal](http://inspire-geoportal.ec.europa.eu/)⁷ to create metadata accordingly.

For data/service recovery purposes (through a search engine or metadata catalogue) it is recommended to add 'MACHU' as keyword in the meta data.

4. CONTRIBUTE

A short list when making a contribution to MACHU GIS:

1. Create data according to the MACHU data model for a contribution to the main map layers. If contributing other default map layers to MACHU GIS, contact MACHU organisation first.
2. Create WFS (and WMS) services according to OGC-standards.
 - a. Optionally add authentication (username/password).
 - b. Optionally add security certificate (SSL or TLS).
3. Create metadata file according to the INSPIRE Metadata Implementing Rules.
4. Send the following information to the MACHU organisation:
 - a. URL of the MACHU service (incl. username/password)
 - b. URL to metadata file

Note: Take in account that once services are provided, they still have to be implemented in the ETL-process of MACHU and the GeoWeb platform, before they become visible to MACHU GIS.

⁷ <http://inspire-geoportal.ec.europa.eu/>