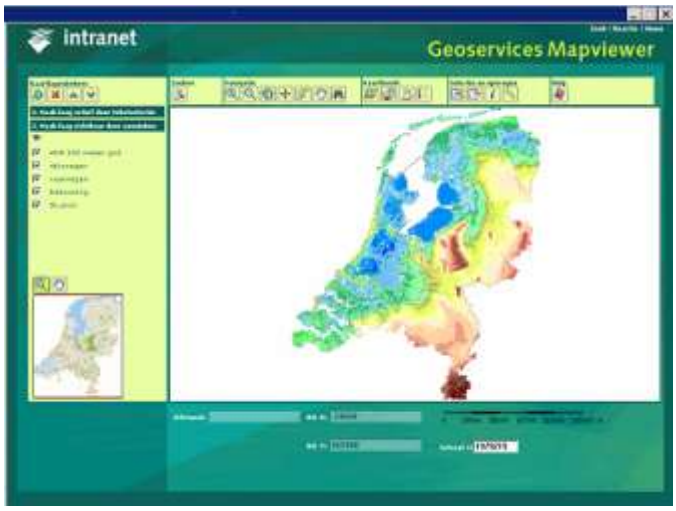
Dutch use open source for Geoservices in public works

In 2003 the Dutch Directorate for Public Works and Water Management, Rijkswaterstaat (RWS), which is responsible for the maintenance of dikes, roads, bridges and the navigability of canals, started the now very successful Geoservices project. Geoservices is a general term for the web based access to geo-information within Rijkswaterstaat using international open standards of ISO and OGC. Web based GIS applications make it possible to manage the data centrally and serve maps by using mapservices based on internet technology. This way, a more efficient and effective data management is possible.

Furthermore, geo information from different, distributed sources can be easily and quickly combined with InternetGIS. In addition, InternetGIS is an excellent way of making geo information available for a large audience in a transparent and easily accessible way.



In 2003, the RWS AGI (the advisory board for Geo information and ICT of Rijkswaterstaat) started setting up a central, web based GIS infrastructure. The reason for this was that the different RWS organizations unanimously indicated that a central InternetGIS infrastructure with service was needed for standardization and efficiency purposes. The implementation of the central InternetGIS infrastructure was based on OGC web services architecture. By choosing Open Geospatial (formerly OpenGIS), RWS AGI made sure they got (technical) interoperationality without being dependent on a single supplier.

Problem statement

In the area of web based geo-information systems of Rijkswaterstaat, the following problems occurred:

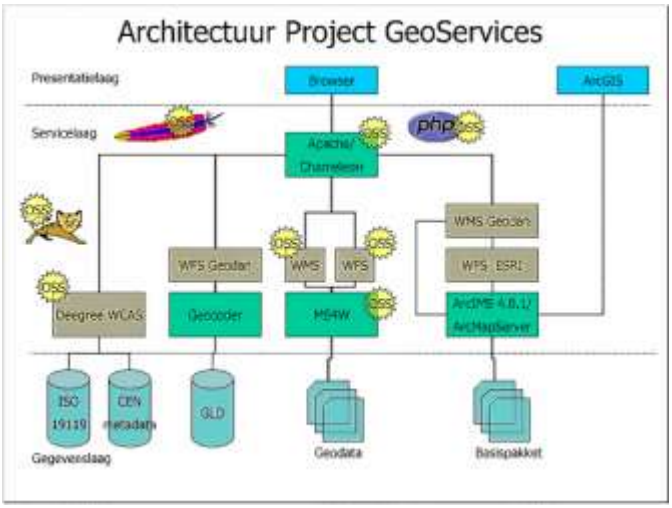
- The diversity of available web based GIS software
- The duplication of geo-information for the different applications (no interoperationality)
- Applications functionally the same for 70 to 80 %.
- Support and management not always sufficiently taken care of
- Lack of knowledge and time for setting up and supporting applications
- Limited budgets

Based on a inventory of needs and a cost analysis, the first steps towards a central, web based architecture based on open standards were taken.

The goal of the geoservices project is setting up a central web based infrastructure to make geo information available directly from the source. In doing so, the use of the open standards of ISO and OGC was a given, whereas the use of open source software to realise the OGC web architecture was a possible choice. In short, open standards were the starting point, open source software was a preference.

Execution

Rijkswaterstaat, and the Adviesdienst Geo-informatie and ICT (AGI) especially, is both the principal and executor of the geoservices project. The developments are supervised by a consultation group from Rijkswaterstaat. The company Geodan was hired to build the Geoservices application architecture. After the inventory of needs and cost analysis were made, Geodan made a proof of concept, on the basis of which full implementation was done. Eventually the architecture was set up, thereby bringing the project to completion. What remains for RWS AGI are management activities and the development of new activities. In the end, the GeoServices architecture was based on various OGC service standards, and an interesting combination of open and closed software.



Open standards used

The goal of using open standards resulted in the use of standards on two levels:

- GIS standards
- Metadata standards

Explanatory note for 1. GIS standards

The GIS standards are made up of web services standards that are published by the Open Geospatial Consortium (OGC), which is a not-for-profit collaboration of over 260 companies, governmental organizations and academies. OGC works together closely with ISO, because of

which part of the OGC standards have also become ISO standards. Using Open Geospatial standards guarantees interoperationality for geo-information. The most important functional part is “Publish-find-bind”, based on Web Services. With this application, the services of the GIS-system can be published in a catalogue, can be searched for, and ultimately can be bought. The OGC standards that are used are WMS, WFS, WCD, SLD, WMC and GML (see list of abbreviations for short description).

Explanatory note for 2. Metadata standards

Metadata enables the search for web services. Used metadata standards are ISO 19115 for geo-information and ISO 19119 for services. The standard GML (2.1.2) is also used as a possible output format for geodatasets.

Open source software used

An important open source part of the services oriented application architecture is the UMN Mapserver, developed by the University of Minnesota (UMN). The open standards WMS, WFS and WCS have been implemented in this product. The UMN mapserver also supports SLD and WMC. The open source product Deegree (Latlon) is used to implement the WCS. For Client functionality the open source software product Chameleon is used. Other open source software components on the central platform are Apache, PHP, Tomcat and Linux.

Lessons learned

The most important lessons learned from this project are:

- Open standards fully answer the expectations. They prove to be highly useful, in line with expectations.
- The initial expectations for open source were not as high, but the quality of the open source applications and the procedure of open source communities were positively surprising.
- The fast set up of the first proof of concept was another important factor for the success of the project. It worked as a booster for the project.
- Standardization requires time. When no definitive standard is at hand, it can even take too much time. This is a problem, since it slows down the project. However, in the end patience is rewarded.
- In some cases a “workaround” is necessary to make standard specifications applicable in specific situations. This requires membership of the management organizations to make sure that workarounds become part of the standard.
- The response speed of the open source community is impressive. It was very high, and usually it needed less time for bugfixes from the open source community than from regular software suppliers. Moreover, the community makes the problem more transparent, which means a better notion of the time/effort needed for possible solutions can be obtained. The transparency of problems was experienced as positive.
- Supplier dependency does decrease. The position in negotiations with closed software suppliers is much stronger.
- Management support turns out to be an important factor for success. In this project the management support definitely contributed to the success.

In conclusion, it can be said that the Geoservices project was a highly successful one, that clearly shows the way open source software can be used in addition to open standards.

Further information:

Rijkswaterstaat website

UMN Mapserver: University of Minnesota Mapserver: Open source mapserver product developed by the University of Minnesota

28 February, 2005

This case study was translated and prepared by David Duijnmayer based on text written by the Dutch government's OSOSS program. The Dutch version is available here