Interoperability Tests with Live Audience

Running a GML Relay

The fourth GML relay will be held at the Dutch Topographic Service in Emmen, The Netherlands on 26th January 2006. As explained exactly a year ago in GIM International, Geography Markup Language has many advantages for the exchange of information between different geo-information systems. The GML relay illustrates this during a 'live' event, in a non-laboratory environment, in front of an attentive audience. The authors explain the interoperability context for GML, and discuss experience gained during previous relays.

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Three GML relays have been held so far in The Netherlands: June 2001 in Wageningen, December 2002 in Emmen and November 2004 in Delft, all organised by Geo-Information Netherlands (GIN) and its predecessor, KvAG. A relay can take place only with a relay stick which is passed by one 'runner' in the sequence to the next after each finishes a stage. In the first three GML relays the 'stick' was a GML document developed as a prototype for the new TOP10NL product from the Dutch Topographic Service (TDKadaster). In 2006 TDKadaster will begin distributing its TOP10 vector data in GML. A demo GML dataset based on the final production version of TOP10NL will be used for the fourth relay.

GML dataset based on final version of TOP10NL for the fourth relay

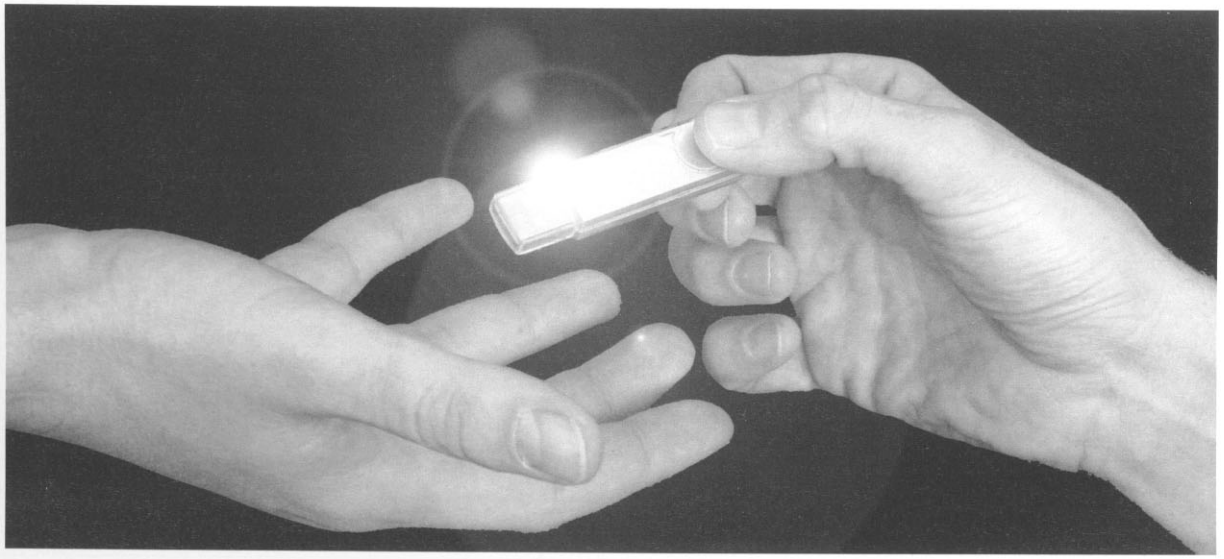
Basic Procedure

The procedure for the GML relays has remained unchanged since the first. One month prior to the day of the relay every participant receives the GML dataset and GML application schema describing the structure of the GML data. During the actual relay each participant has to:

- read GML data into their own GIS or CAD software environment
- edit this data by adding and modifying a few features
- save the edited data and export it to a GML document as input for the next.

2001 Relay

Two companies participated in the first relay: Laser-Scan and IONIC Software. Both were able to read and process the GML start data using their software. A few polygons posed a problem: those with self-intersecting boundaries, which are not allowed in most geo-database software. IONIC also showed how to edit GML data by deleting a road object and successfully exporting the data back to an output GML document. The 2001 GML relay took place perhaps rather too soon, for the ink on the GML 2.0 specification approved in April of that year was still wet. It was thus not



The 'relay stick' consists of a GML document stored on ... indeed, a real stick for easy transport from one system to the other.

yet really a relay, but the first GML results were promising and much experience was gained.

2002 Relay

Support for GML had clearly increased between 2001 and 2002. The second relay had seven participants: Intergraph (GeoMedia), eXQte (reseller of FME), Bentley (MicroStation), ESRI (ArcGIS), Snowflake (GO Loader), Oracle (Oracle Spatial) and Laser-Scan (Radius Topology). All companies were able to read the TOP10NL GML data (GML version 2.1.2) into their respective software environments, carry out some edits and export the GML data again. However, they did not succeed in reading each other's GML files. This was partly a result of the fact that the exported GML data was for some reason not valid, 'valid' here meaning that data is in accordance with application schema(s) describing the structure and constraints on the data. Also, loss of information occurred during import or export: in some exported GML files the unique 'fids' for each feature had disappeared or were not unique, or were zero. Interestingly, no support yet existed for XLink references that enable implementing relations between features.

Participant has to save edited data and export it to GML document as input for the next

2004 Relay

Since the third relay that took place in 2004 was held in conjunction with a one-day seminar, the number of participants was by necessity limited. Only software vendors with an office in The Netherlands were invited, resulting in the participation of Bentley, Autodesk, Geodan, ESRI and Intergraph. The structure of the GML data as defined in the application schema was the same as in 2002, but the GML dataset covered another area of The Netherlands. In general, the production of valid GML output still proved difficult. Also, information loss occurred: in two cases all polygons with inner boundaries - island polygons - were skipped, either during import or export. In another case the GML file that was exported was valid, but only the geometry was exported, not the non-spatial attributes such as names of roads, types of asphalt and status of buildings. On the other hand, all participants were again able to read the original TOP10NL GML file without difficulty, and more combinations between different participants worked well.

2006 Relay

During the forthcoming fourth relay to take place in Emmen a production version of the TOP10NL will be used for the first time. The main goal of the event is to show further progress in implementations. Further, for the first time GML 3(.1.1) will be used. Important here is harmonisation between ISO and OGC: GML 3.2 will become the first version of GML that will also be an official ISO standard (ISO 19136). The fourth GML relay is once again open to all participants. Since it will be a whole one-day event, more time will be available than during previous relays. After each participant has finished his 'run' the organisers will

Prof. van Oosterom as pivotal point in memory stick exchange during the 2004 relay.

check the exported GML documents against the TOP10NL schema, via XML validation.

Concluding Remarks

Although GML relays have taken place somewhat irregularly, they seem to be evolving into a biannual event with an international flavour. More information on the 2006 relay and on registration for attendance is available at www.gdmc.nl/relay.

Further Reading

- De Vries, M.E., Tijssen, T.P.M., Stoter, J.E., Quak, C.W., van Oosterom, P.J.M., 2002, The second GML prototype of the new TOP10vector object model, GISt Report no. 12, Delft.
- Quak, W., Lemmens, M., 2004, Exchanging Geo-data on The Web, Geography Markup Language: a 'de facto' standard, In: GIM International, vol. 18, nr. 12.◆

Biography of the Authors

All three authors are with the Delft University of Technology.

Marian de Vries has a MSc in Economic and Social History from the Free University Amsterdam. Her main research topics are distributed geo-information systems, data integration, Web services and open standards.

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Prof. Dr Peter van Oosterom has since 2000 held the chair in GIS Technology, after being employed by the TNO Physics and Electronic Laboratory (1985-1995) and the Netherlands Kadaster (1995-2000). His main research topics are geo-databases, generalisation, distributed GIS architectures and cadastral applications.

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