UNITED NATIONS	**Working Paper**
GROUP OF EXPERTS ON	**No. 85**
GEOGRAPHICAL NAMES	
Twenty-sixth session	**19 April 2011**
Vienna, 2-6 May 2011	

Item 9 of the provisional agenda

Activities relating to the Working Group on Toponymic Data Files and Gazetteers

The Development of a Web Feature Service-Gazetteer (WFS-G) for the US Board on Geographic Names *

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*Prepared by the Secretariat of the U.S. Board on Geographic Names.

Summary

As has been reported in the Canada-USA Division Report, the U.S. Board on Geographic Names (BGN) has been working on web services to deliver the data from both its domestic and foreign place-name databases. The most recent addition is Web Feature Service for Gazetteers (WFS-G). The service provides easy, real-time access to place-name databases, which may be referred to as gazetteers. One of BGN's primary goals for the WFS-G development is to allow the visualization of BGN's domestic and foreign names from a common geospatial client.

Background

The Open Geospatial Consortium (OGC) has developed the Web Feature Service (WFS) to allow the sharing and updating of geographic feature data across a standard web-based service interface. Some additional background on WFS and its capabilities was provided in Finland's paper submitted to the 25th session (Working Paper 27). A special profile of WFS is being developed to support geographic names information, namely the Web Feature Service-Gazetteer (WFS-G). WFS-G specifies a minimum set of feature types and operations required to support an instance of a gazetteer service. Instances within a collection of gazetteer features may be – as the terms in a thesaurus – related to each other and constitute a hierarchical vocabulary of geographic places. The information model is here implemented as a Geographic Markup Language (GML) application schema and is based on ISO 19112 - Spatial Referencing by Geographic Identifiers.

The United States Board on Geographic Names (BGN) authoritative set of place names is split into two parts: the National Geospatial-Intelligence Agency's (NGA) foreign place-name database (GNDB) and the United States Geological Survey's (USGS) domestic place-name database (GNIS). The foreign and domestic gazetteers combined contain approximately nine million names records, together with associated metadata. The foreign and domestic gazetteer databases have been developed separately and thus do not share a common model or schema. Any attempt to fit both into a unified database would be costly and difficult. Because of the benefit a unified database would be to the consumers of digital gazetteers, the consolidation of NGA and USGS's holdings has been a long-held goal. Although a physically unified database will not result from this effort, the WFS-G will allow a user to visualize the results of a search to both sets of data in a single viewer.

Progress

NGA and USGS have partnered with the OGC in the development of open standards to facilitate the interchange of geographic names data. The official OGC WFS-G working group published the 0.9.3 draft standard in 2005. In the past two years, an informal WFS-G working group with representatives from USGS, NGA, and others has been working to further improve the 0.9.3 draft. The group will present its proposal to the official OGC WFS-G working group later this year and work to move the WFS-G to a 1.0.0 standard. NGA and USGS strive to lead the way forward with both agencies standing up in-house WFS-G services to foster seamless access to the BGN's geographic names and features data. NGA has based its implementation on the 0.9.3 draft standard; USGS has adopted the latest proposals of the informal WFS-G working group in its

implementation. Also, the USGS service supports WFS transactions (WFS-T) to show the potential for its trusted agents to provide updates to the GNIS. Whereas WFS is an open-ended standard, the development of a WFS-G OGC standard will be able to provide a rigorous data model for the delivery of gazetteer data.

The USGS is responsible for the domestic names program for the BGN. Web Map Services and Web Feature Services have been offered through its GNIS since 2006 and 2009, respectively. Development of WFS-G capabilities began in 2008. The WFS-G service will be available via the GNIS (http://geonames.usgs.gov/) in the very near future. The USGS program has adopted the developing GML application schema being developed by an informal WFS-G working group.

In 2010 the NGA, which provides the staff and database support for the BGN's foreign names program, became involved in the development of a pilot in-house WFS-G. The dissemination service of the NGA's Geographic Names Database is the GEOnet Names Server (GNS) (http://earth-info.nga.mil/gns/html/index.html). Web Map Services and Web Feature Services have been offered through the GNS since 2007 and 2009, respectively. The WFS-G of the BGN's database of foreign place names became operational in March 2011. The GetCapabilities link to use the WFS-G is provided below.

A user may take advantage of WFS-G services through a variety of commercial and freeware client software. The development of an OGC standard for WFS-G would certainly widen the market of applications that would support this technology.

Outlook

NGA and USGS' fielding of the initial WFS-G capabilities is the first step towards realization of a number of objectives. Critical to the success of the WFS-G is the adoption of the application schema as an OGC standard. It is hoped that the work of the informal WFS-G working group can be capitalized by an official OGC Working Group.

Pending funding, both NGA and USGS have plans to take advantage building upon the initial WFS-G deployment. The related WFS-T service has potential for other uses such as the update of information from trusted partners. The USGS is looking to the WFS-T as a means to allow its trusted agents to update the GNIS. Development work is underway to explore how to perform a WFS-G query through web browsers and for mobile technology.

Links

Geographic Names Information System (GNIS): http://geonames.usgs.gov/domestic/index.html

GEOnet Names Server (GNS): http://earth-info.nga.mil/gns/html/index.html

GNS GetCapability:
http://geonames.nga.mil/nameswfsg/request.aspx?service=WFS&request=GetCapabilities

Open Geospatial Consortium:

 Best Practices: http://www.opengeospatial.org/standards/bp

 WFS Gazetteer Profile 1.0: http://www.opengeospatial.org/projects/groups/wfsgaz1.0swg

USGS WFS-G: http://frameworkwfs.usgs.gov/wfsg/

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