Sharing Data Assets through *The National Map* and ArcIMS
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Abstract

The National Map will serve as the Nation's topographic map for the 21st century. Partnerships with other organizations are essential to access and display existing geographic data. The U. S. Geological Survey and the Bureau of Land Management conducted a proof of concept to test the ability to access and use each other's online geographic information resources being served through ArcIMS. This paper will discuss the proof of concept and implementation of the resulting partnership.

Introduction

The U.S. Geological Survey (USGS) completed *The National Map: Topographic Mapping for the 21st Century* final report dated November 30, 2001. The report "describes the vision by which the … USGS, working with partners, will provide the National with current, accurate, and nationally consistent basic spatial data, including digital data and derived topographic maps, and deliver spatial information that is current. … *The National Map* will also provide means of access and using other data from Federal agencies . . . (one) method will be the combination of displays of *The National Map* data with themes available from other organizations, such as . . . Cadastral data from the Bureau of Land Management . . .".

USGS and the Bureau of Land Management (BLM) have a history of successful collaboration. Both agencies agreed to conduct a proof of concept to test the ability to access and use each other's online geospatial data resources. A team of technical experts, familiar with Web Mapping Service technology, developed an approach to integrating map services available through USGS and BLM websites. BLM was interested in using *The National Map* roads, rivers, lakes and shaded relief as reference layers. The USGS effort to access and display BLM cadastral information in *The National Map* viewer is the subject of this paper.

Early Notification of Service Change Proposal

Part of the responsibilities that have been agreed on by both the BLM and the USGS is the early notification of service changes. The BLM and USGS rely upon various connection parameters in order to properly access the ArcIMS services through an ArcIMS WMS connector. These parameters include the server name, the name(s) of the map services, the name(s) of the layers contained in the map service, layer symbology, layer scale setting and source data changes. If the provider agency finds it necessary to change any of the parameters, the provider agency will provide early notification to the consumer agency.

Technical Considerations

In order to accomplish the sharing of geographic information resources, both the BLM and USGS installed the ArcIMS Servlet Connector with the Web Mapping Service (WMS) functionality enabled. This allows the sharing of a map service through an Open GIS Consortium (OGC) WMS 1.0.0 compliant client. The Uniform Resource Locator(URL) to the map service, along with metadata describing the layers served by BLM is stored in a catalog that is queried by *The National Map* viewer. The viewer will display the BLM National Integrated Land System (NILS) cadastral data at the appropriate scale when requested by the user. BLM accesses certain base layer information from USGS map service(s) through an OGC compliant client.
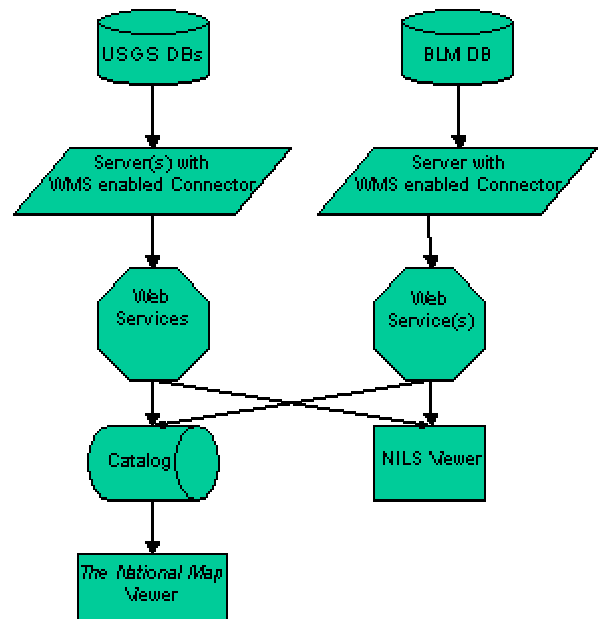

Figure 1. High level representation of process.

Addressing Potential Security Issues

This partnership complies with executive policy outlined in OMB Circular No. A-130 Appendix III, Security of Federal Automated Information Resources. The data within the BLM and USGS servers are accessed using WMS standards defined and endorsed by the Open GIS Consortium. All data and interfaces are currently publicly available and contain no sensitive information. If future potential security issues are identified, BLM and USGS agree to address issues and take necessary steps to resolve the issue in a timely manner.

Failover

In the event of system problems or planned system downtime of a provider system, failover mechanisms will be as follows:

The consumer system should be able to degrade gracefully and be able to continue to operate with the absence of the provider server. This is accomplished at the USGS by first checking the service and determining if it is available before adding it to *The National Map* application.

The provider will provide notification as to the nature of the problem, remedies, projected downtime and alternative data sources if available.

The provider may implement failover servers when additional resources are available. The base *The National Map* layers that are provided to the BLM are accessed through

an ArcIMS service that is replicated on two servers with a load-balancing switch. The switch automatically fails over to the operational server when the other server is down. Notification of a down server/service is sent to IT personnel who will correct the problem.

Data Publishing

Both parties agree to maintain an active account and current metadata record of their respective spatial data streaming services on the Geospatial One-Stop portal (http://geodata.gov/). *The National Map* data can be accessed through the Geospatial One-Stop portal by accessing the Image & Base Maps Category.

Success

USGS, Rocky Mountain Mapping Center, and the Bureau of Land Management conducted a proof of concept to test the ability to access and use each other's online geospatial data resources. The proof of concept successfully demonstrated the ability of *The National Map* to access and display the cadastral data being served by BLM's National Integrated Land System (NILS). The proof of concept also demonstrated NILS ability to access and display selected themes being served by *The National Map*. The relationship between *The National Map* and NILS is stated in the "Intra-Agency Agreement between the U.S. Geological Survey and the Bureau of Land Management for Coordination and Cooperation Pertaining to *The National Map* and the National Integrated Land System".
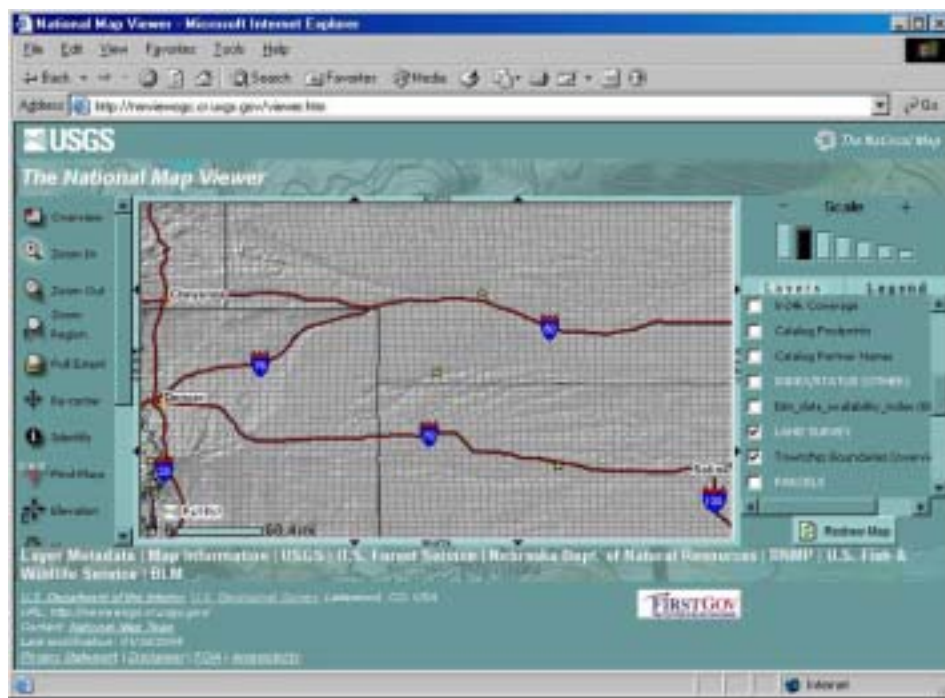

Figure 2. Township Boundaries displayed on The National Map viewer (http://nmviewogc.cr.usgs.gov)

USGS and BLM are leveraging investments in geospatial data and therefore are avoiding duplication. Both agencies may access Web Mapping Service data layers for a variety of applications. The use of each other's Internet based Web Mapping Services takes advantage of the current technology. Information is easily accessible and available through the Internet. These beneficial outcomes support E-Government.

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