The Public Health Distributed Geospatial Intelligence Network (PH-DGInet) Pilot

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1) BearingPoint 2) South Carolina Department of Health and Environmental Control (DHEC) 3) Centers for Disease Control and Prevention (CDC)

Introduction

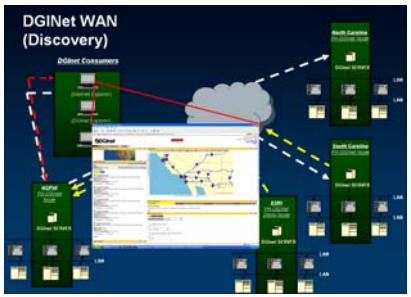
The Office of Management and Budget (OMB) is moving the federal government to a Service-Oriented Architecture (SOA) and released the Geospatial Line of Business to mandate consolidation of geospatial services across the federal government.

The CDC is currently pilot testing several shared services frameworks including a framework called the Public Health Distributed Geospatial Intelligence Network (PH-DGInet).

The pilot test of the PH-DGInet will include installation of 3 nodes:

1) National Center for Public Health Informatics
2) South Carolina Department of Health & Environmental Control
3) Environmental Systems Research Institute (ESRI)

PILOT TEST NODES:

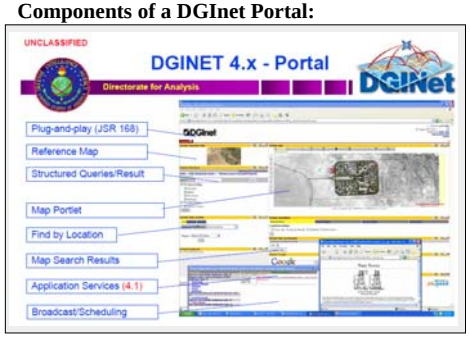


Background

DGInet History:

The Distributed Geospatial Intelligence Network (DGInet) was built by ESRI for the intelligence community (CIA, FBI, NSA, DIA) and has been operational since 1999.

Components of a DGInet Portal:



Method

A Shared Services Framework

The PH-DGInet has an SOA architecture that allows public health clients to author services and describe those services with Web Service Description Language (WSDL) metadata. The WSDL are published to a Universal Description Discovery and Integration (UDDI) registry. This allows partner nodes to discover and leverage services authored by other nodes and to reduce duplication of effort.

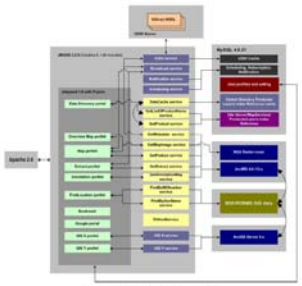
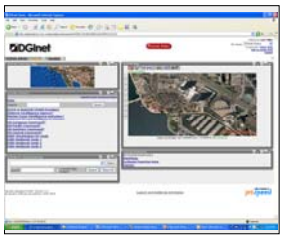
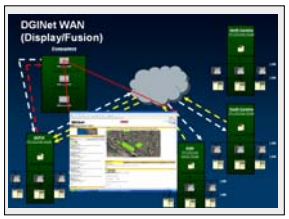


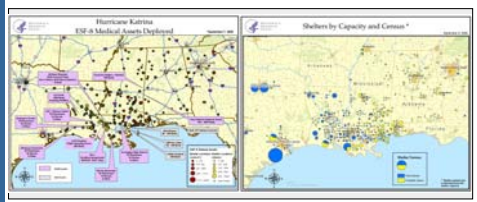
Figure 3 DGInet Architecture Detail



The DGInet portal viewer allows clients to search and discover shared geospatial data and services and fuse those data sources within a map portlet. The portals are customizable and can be tailored to meet specific client requirements.

Fusion of data and services operate across multiple partner nodes to leverage data from an enterprise or between entire agencies or organizations.





National disasters such as hurricane Katrina (2005) demonstrate the need for shared geospatial services and data fusion to provide situational awareness to all agencies responding to the crisis.

Results

Pilot Project Accomplishments

-Installation of 3 nodes of the PH-DGInet

-Communication between the 3 nodes

-Federated queries between the nodes

-Data fusion and overlay of nodal data

-Collaboration between node partners

-Basic epidemiological curve / histogram tool

-Foundational framework for new public health services

The Distributed Aggregation function allows clients to select federated data sources and to specify parameters for federated queries.

The customized PH-DGInet portal viewer allows clients to execute federated queries across the partner nodes and to produce choropleth maps of cases per county with a histogram of cases within the last 7 days.

Future Expansion of the Pilot

The future of the pilot project will involve the addition of several new nodes (both state and federal nodes). These additional nodes will allow for regional collaboration between nodes and will expand the utility of the basic pilot.

Agencies that have expressed interest in the expanded pilot:

VA

USDA

FDA

North Carolina Department of Health

Georgia Division of Public Health

California Department of Health

New York City Department of Health

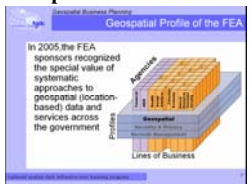
Florida Department of Health

Conclusion

PH-DGInet

The pilot of the PH-DGInet demonstrates the utility of a shared services framework for public health. Geospatial services, data, tools, models, and more can be shared and leveraged across multiple partner nodes. The ability to perform federated queries on distributed data stores is vital to the future of public health and biosurveillance. This framework will allow shared geospatial services across government agencies as outlined in the Geospatial Line of Business. The framework is mostly open-source (Apache, JBOSS, Python, etc) and works with non-ESRI clients such as Google Earth.

Geospatial Line of Business:



Support for Google Earth:

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Public Health Impact

The sharing of geospatial services across public health agencies will reduce duplication of effort, standardize services, provide rapid application development at lower cost, and increase situational awareness and capability to respond during times of regional or national disasters.