Service-based Approach to Connect Seismological Infrastructures: Current Efforts at IRIS DMC

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As part of the COOPEUS initiative to build infrastructure that connects European and US scientific research infrastructures, the Incorporated Research Institutions for Seismology (IRIS) has advocated for the development of federated services based upon internationally recognized standards using web services. By deploying web services conforming to the International Federation of Digital Seismograph Networks standard at multiple data centers in the US and Europe, we have shown that integration within the seismological domain can be realized. This approach of employing the same standard to invoke web services at multiple centers can significantly ease the methods through which a scientist can access seismic data (time series, metadata, earthquake catalogs, and higher level products) from distributed federated centers.

IRIS has developed an IRIS federator that helps a user identify where seismic data from global seismic networks can be accessed. The web-services-based federator can build the appropriate URLs and can return them to client software running on the scientist's own computer. The URLs are then used to directly pull data from the distributed center in a highly peer-based fashion.

IRIS is also involved in deploying web services across multiple scientific domains. As part of the EarthCube effort of the United States National Science Foundation (http://www.earthcube.org), an IRIS-led EarthCube Building Block project, called Geosciences Web Services (GeoWS), is underway. When completed, this project will aid in the discovery, access, and usability of data across multiple geosciences domains. The domains we are addressing include: seismology (IRIS), geodesy (UNAVCO[1]), marine geophysics (Integrated Earth Data Applications'[2] Marine Geoscience Data System), atmospheric sciences (Unidata), plate boundary reconstructions (California Institute of Technology), hydrology (Consortium of Universities for the Advancement of Hydrologic Science, Inc.), superconducting gravimeters (Global Geodynamics Project), surface gravity and magnetic measurements (University of Oklahoma and University of Texas at El Paso),

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[1] WDS Applicant
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international magnetic observatories (INTERMAGNET[3]), volcanology datasets (World Organization of Volcano Observatories: Database of Volcanic Unrest), structural geology (University of Kansas), ecological data (National Ecological Observatory Network), ocean observatories (Ocean Observatories Initiative), and various geophysical data (National Geophysical Data Center[4]).

The GeoWS partners are also working closely with two other EarthCube Building Block projects. BCube is a project advocating the use of brokers to mediate access to diverse data systems, and GeoWS partners are working with BCube to develop "accessors" that will assist in cross-domain interoperability. GeoWS is also working closely with the Community Inventory of EarthCube Resources for Geosciences Interoperability's Building Blocks project that is focused on the registration of various services.

This presentation will summarize current IRIS efforts in building vertical integration infrastructure within seismology, working closely with five centers in Europe and two centers in the US, as well as how we are taking the first steps toward horizontal integration of interdisciplinary data from 14 different domains in the US, in Europe, and around the world.

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[3] WDS Network Member
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