The S2S Search Interface Framework provides tools and services to build customizable user interfaces. It also serves as a focal point for repository managers to develop science data services and reusable components for search interfaces. The framework has been used to design a faceted browsing platform for web services, including OpenSearch and SAWSDL. This exemplar faceted browsing platform has been applied in our development of search interfaces for 1) an international open government dataset catalog and 2) a metadata catalog for biological and chemical oceanography.

S2S was designed from the ground up using open standards and technologies. The framework was initially created to develop "data dashboard" interfaces on top of OpenSearch services, but has been generalized to support web services and standards with semantic annotation capabilities. We apply OWL, a W3C standard for ontologies on the Web, to create a vocabulary for the description of framework metadata. Our faceted browsing platform is heavily focused on the use of open standards and technologies enabled rapid iterations over software development lifecycles, and has kept the framework agile as new use cases and ideas have emerged.

S2S has also been applied in the creation of an integrated MapServer and faceted browsing interface. BCO-DMO has been using MapServer to provide data access for a number of years. They have collaborated with the TWC to develop an RDF knowledge base for the contents of their metadata catalog. We used this knowledge base to develop an S2S OpenSearch interface for data access. We coordinated with BCO-DMO’s MapServer developer to establish a communication protocol through which S2S results are fed to their data access interface.

S2S has been used in the development of the International Open Government Data Search (IOGDS) interface. IOGDS searches nearly 500,000 datasets from 38 countries. We have developed an OpenSearch Web service that interacts with a SPARQL endpoint containing the data. The S2S Faceted Browser interacts with the OpenSearch service via the S2S Server. The faceted browser is embedded in a regular Drupal page. The interface offers 5 search facets, including free-text search, countries, catalogs, categories and agencies. IOGDS won the 2011 Triplification Challenge Open Government Data Track at the Seventh International Conference on Semantic Systems. Test IOGDS at:

http://logd.tw.rpi.edu/international_dataset_catalog_search

S2S as Open Technology

S2S is available for download at our SVN repository:

https://scm.esrience.rpi.edu/svn/public/s2s/

S2S is able to leverage open vocabularies and linked data for providing contextual search information. This reduces the amount of data duplication required for an individual provider. We have developed widgets for retrieving labels from vocabularies (e.g., WMS and WFS).

Towards an Application Integration Framework

We are shifting the focus of S2S development from a search interface framework to a broader application integration framework. The intent is to create vocabularies and rules that match user interface components with underlying data services and scientific intent. One of the first use cases is to extend the S2S framework to support a workflow system with rules regarding dataflow and scientific intent.

Open Standards and Technologies in the S2S Framework

Open technologies are used throughout S2S. The back-end is implemented using PHP. The front-end is developed using JavaScript and jQuery. UI widgets are intended to be open technologies as well, and we have developed some for OpenLayers maps and OGC-compliant services (e.g., WMS and WFS)

Open Vocabularies

S2S provides an OWL ontology for describing Web services, their operations, inputs and outputs. The ontology can be extended for different Web Service standards (such as SAWSDL or OpenSearch). Using an ontology and RDF allows us to perform simple reasoning tasks for matching UI “widgets” with Web service outputs. Our next version of the S2S server will support descriptions of Web Services provided as 5-star linked data.

We have implemented an OpenSearch adapter for the S2S Framework. We use URL template parameters and "rel" attributes to annotate the Web services with RDF and S2S vocabulary terms.