Deployment of the Planetary Data Tool Registry
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Abstract
During the 2015 Planetary Data Workshop, we presented a plan for taking the prototype Tool Registry developed by the International Planetary Data Alliance (IPDA) and upgrading it by increasing the visibility and enhancing its functionality along with incorporating the registered tools into PDS data search results. This work has been completed with the application deployed into operations by the PDS Engineering Node. The application enables search and discovery of tools, services, and APIs for working with data following the PDS standards. Tools have been submitted from the broad PDS community and multiple institutions, including those from members of the International Planetary Data Alliance (IPDA). This interface allows the user to search for and discover these tools. The interface also allows tool providers to submit their software for inclusion in the registry. Along with introducing the planetary data community to the Tool Registry, this poster describes and demonstrates how users interact with the application. For those users interested in the details, we will also take a brief dive into the architecture and design behind the application which is built on PDS4 software components.

Architecture
The architecture of the new Tool Registry consists of a web-based interface for browsing from and submitting entries to the registry. The cataloging and search functionality is satisfied by two components of the PDS4 software infrastructure. They are as follows:

Registry Service
- Provides functionality for tracking, auditing, locating and maintaining artifacts with the PDS system.
- Provides a REST-based API over HTTP for registration and retrieval of metadata.

Search Service
- Provides functionality that accepts queries for data and returns a set of matching results.
- The component is based on Apache Solr.
- Generation of search indices from registry metadata supports multiple query formats and is tailor-able for customized search interfaces.

See the architecture diagram below for the details.

Data Model
The Product_Service class below, from the PDS4 Data Model, captures the information for describing tools and services.

The Identification_Area class is standard for products in the PDS4 data model. It includes attributes for an identifier, version and title as well as optional subclasses for aliases, citation information and modification history.

The Service class allows the user to describe the tool or service. This is where the details of the software are provided including a release date, a URL for access, a category and interface type for the software and any system requirements for accessing or executing the software.

The Reference_List class allows for specification of references to other artifacts within the PDS system. This is particularly useful for associating tools and services with PDS Nodes, investigations, instruments and targets if appropriate.

The File_Area_Service_Description class allows the user to specify a service description in the form of an attached file. The file should be in one of the standard formats. They include the Web Application Description Language (WADL) and the Web Service Definition Language (WSDL) formats.

Deployment
The Tool Registry is hosted on the PDS web site and provides an interface for the PDS community to describe and submit their tools and services.

https://pds.nasa.gov/tools/tool-registry/

The default view (shown above) for the registry lists the currently registered tools and services and provides a button for submitting a new entry. Selecting that button provides the user with the following interface:

The submission interface offers several required and optional fields for describing a tool or service.