



Abstract

The Grid services paradigm followed by LEAD brings together resources from different institutions into a single virtual organization. It is important for LEAD users to register, search, and use these resources from within the portal in a secure manner, while adhering to security policies set out by the resource provider. The **Resource Catalog** and **XPOLA** are middleware that enable location of LEAD resources and allow access to them within an authorization framework.

Locating Portal Resources: Research Objectives & Functional Requirements

- Enable scalable registration and location of LEAD resources – Data and Services
- Register LEAD Service Templates and Service Instances
- Provide soft-state lifetime management of Service Instances
- Query for Service Templates and Service Instances
- Catalog public data within LEAD domain
- Catalog external public data and user provided data imported into LEAD
- Search for public data products

Using LEAD Resource Catalog for Resource Location

- Metadata repository for registering and querying for resources
- Resources include Service Templates and Instances, Public Data Products

Services Templates & Instances

- Service providers register *templates* (Service Map & Abstract WSDL) for creating services and composing workflows
- Running *service instances* register their location & metadata (Concrete WSDL)
- Soft-state lifetime* uses leases to remove expired service instances from Catalog
- XML metadata stored in native XML Database backend
- Portal interface and Web Service API for querying service resources using WSDL attributes (e.g. name, portType, description, etc.) and XQuery

Public Data Products

- Public LEAD Data sources* (e.g. from LDM) are cataloged by THREDDSS
- Resource Catalog periodically crawls registered THREDDSS catalogs and builds a *geospatial index* over metadata of available data *collections*
- External data sources* (e.g. from NCEP), *user-provided public data* (e.g. mesonet) with metadata *cross-walks*, and published myLead data are registered and indexed
- Metadata is represented using *LEAD Metadata Schema* based on FGDC schema
- Portal interface and Web Service API to query data based on spatial, temporal, and other *geospatial attributes*

Current and Proposed Publications

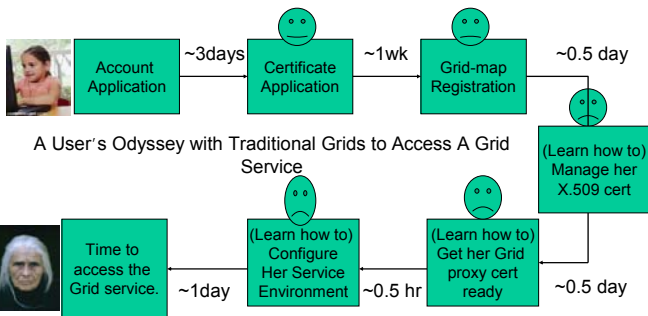
Conference / Journal Papers

A Survey of Data Provenance in e-Science, SIGMOD Record, September 2005, Y. L. Simmhan, B. Plale, D. Gannon

Ph.D. Dissertation:

Estimating Data Quality using Data Provenance, Y. L. Simmhan, Expected date of graduation: June 2006

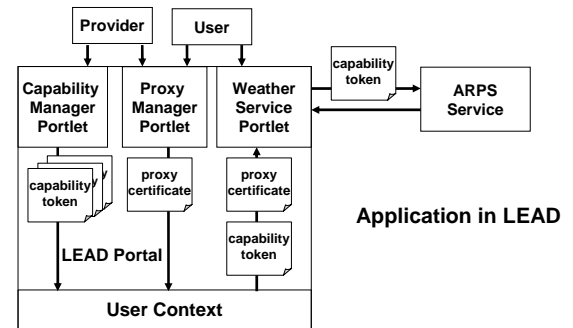
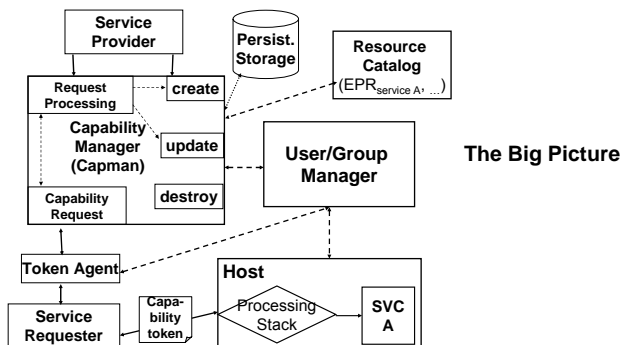
Service Authorization using XPOLA



The Solution: XPOLA, the Capability-based Fine-grained Authorization Infrastructure For Web Services and Grid Services, in compliance with the Principle of Least Authority (POLA)

A capability comprises of:

- Access Policy Document
- Bindings of the provider's distinguished name (DN), and the users' DNs
- Identifier of the Grid resource
- Operations of a Web service instance (optional)
- Life time
- The provider's signature generated with his private key.



Publications

XPOLA: An Extensible Capability-based Authorization Infrastructure for Grids, L. Fang, D. Gannon, F. Siebenlist, PKI R&D Workshop, April 2005

