

Project 2: Design and Development of a Grid Services

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CSE4/587 Information Structures

Due Date: 4/9/2005 by mid-night.

Purpose:

1. Understand the components and functions defined by Open Grid Services Architecture (OGSA).
2. Get hands-on experience, working with an implementation of OGSA in Globus Toolkit 3.0 (GT3).
3. Understand the concepts of virtual organization (VO), service definition and service oriented architectures (SOA).
4. Design and implement a non-trivial grid service: Follow the steps given by instructions in the enclosed document.
5. Build a grid service that will be a wrapper on the web services offered by amazon.com web services.

Preparation:

1. Download GT3 and install it project space. Work with the samples in the download. You should be able to run grid services in the samples directory by starting the GUI browser for Globus services.
2. Understand the technology underlying Globus: its architecture and application models.
3. Download the GT3 tutorial that explains how to write a real grid service.
4. All these can be done in your project space.
5. You are also given accounts on LinuxGlobusGrid put together by KenSmith at CSE department. Make sure you have accounts on this grid by logging into “cerf”, “mills” or “vixen” from host machine. You will “ssh” into these machines.

Technology details:

Open Grid Services Architecture ([OGSA](#)) defines the components of a grid service and Open Grid Services Infrastructure (OGSI) specifies the functionality. Globus Toolkit 3.0.2 is an implementation of the [OGSI](#). A virtual organization (VO) supports one or more grid services by sharing resources from various organizations.

A grid service is a web service with features as shown in Figure 1. Basic service is enhanced by standard functionality specified by OGSA. In other words, a grid service can provide in a standard way logging, notification, service data, routability, security etc. These standard functionalities enable the seamless interaction of grid services in a global large scale and high density distributed system. Basic application model is also enhanced by collaborative models, and competitive models with such higher level capabilities as negotiation and mediations. These are initial steps towards commoditization of services and their availability as transparent utilities similar to electricity and water utilities. Such a model will certainly impact the society in a very significant way. Benefits of computers will be experienced by masses without any need to explicitly learn about computers or computing.

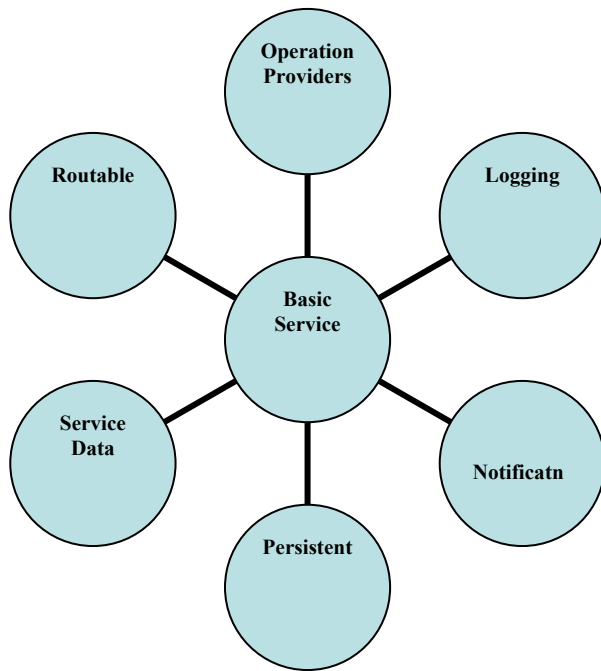


Figure 1 Features of a Grid Service

Project Implementation steps and details:

1. **Getting used to building grid services:** Work with Globus tutorial and understand building grid services. You may use directory structure used by the tutorial or Globus core.
2. **Building systems using build tools such as Ant:** In order to tackle complexities in configuration and deploying server-side applications, you will need to use special build tools. [Apache Ant](#) is a XML-based build tool which similar to “make” utility that most of you are familiar with. This topic will be covered during the recitation this week. Work on simple simple files to familiarize yourself with the Ant build tool.
3. **Study and understand grid services building and deployment.**
4. **Documents needed for the project are: basicNew.zip, setclasspath file and two command files for compile and run (c-javac, c-java). These are directory in gt3Bundle at /web/gridforce/spring2005**
 - 4a. gt3Bundle also has two sets of instructions (i) one for preparing and deploying a grid service and accessing it through a client on cseLinux grid, (ii) the second one for access the service deployed from a client on a non-grid machine such as pollux.
 - 4b. Naming conventions for deploy unit have your usernames as prefix to avoid name collisions with services. This will be automatically created using the script we have provided.
 - 4c. The bundle we have given will help create a grid service, deploy it, access it from within the grid and from outside.

5. Next you will write a non-trivial grid service of your own and test it using the steps described in the bundle.
6. As a last part of the project you will build a grid services that will be wrapper on the services offered webservice API of amazon.com
 - 6a. Register as a developer at amazon.com
 - 6b. Study the samples provided by amazon.com and the example that we will provide.
 - 6c. Based on the example we have provided you may write your grid service.
7. **Practice good programming style:** Finally, practice all the good programming styles that you learned in the lower-level courses.

Submission Details: Use the electronic submission program that corresponds to your class (cse4/587). Submit all .gar files.

submit_cse587 xyz.gar at the Unix prompt.

Documentation and Report: See [report details](#).