Grid Computing Environments Community Practice (CP) Document

Project Title: Corba Commodity Grid Toolkit (CoG)
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Project URL(s): www.caip.rutgers.edu/TASSL/CorbaCoG

1. Overview:

A. Description & Goals
The objective of this project is to design and implement a CORBA CoG Kit that will provide users and developers in a virtual organization with seamless access to Grid Services using the CORBA distributed computing technology.

B. Services provided
Access to Grid Services
   a. Authentication and Authorization
   b. Information Service
   c. Remote Job Submission

C. Systems/Sites/User Served
It is aimed towards users and developers so that they can access remote services from their desktop.

D. Status
Under development.

E. Other

2. Architecture

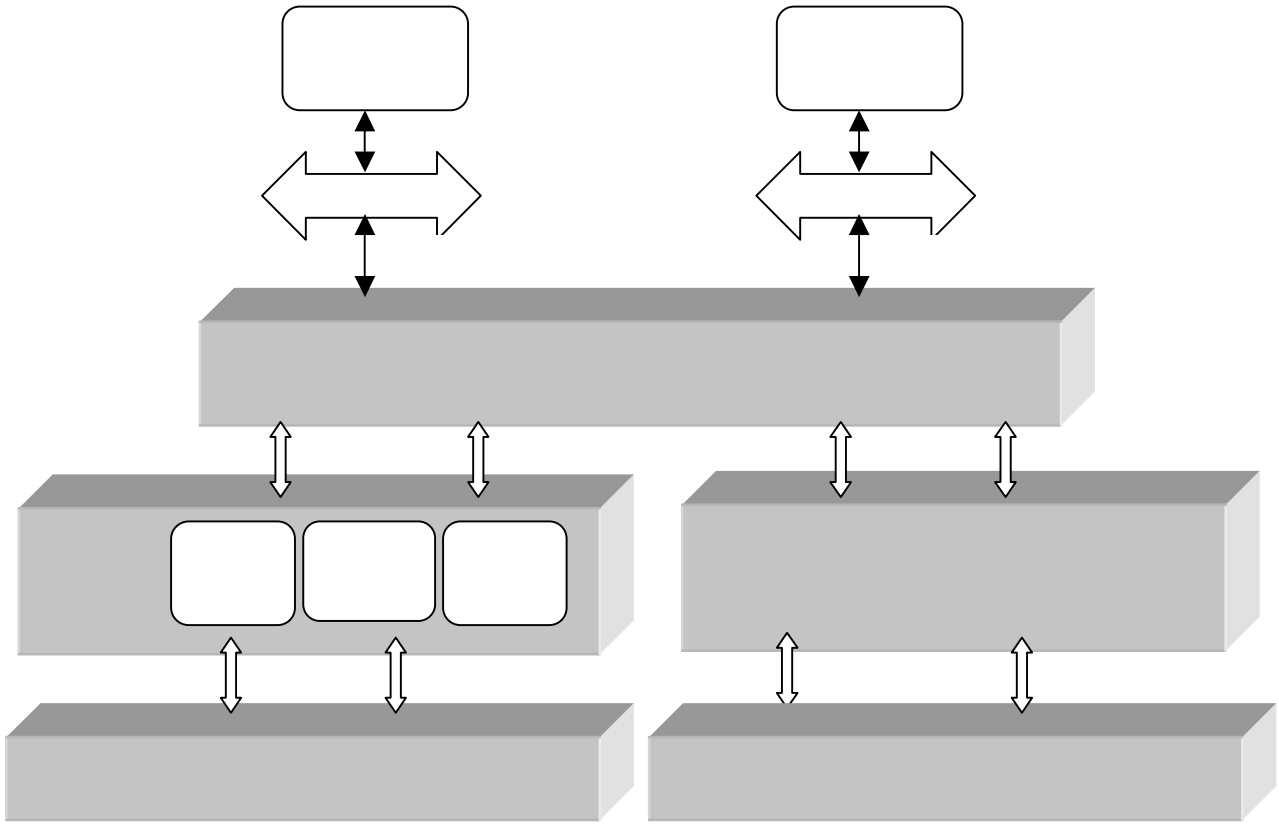
A. Define Grid software/services that the GCE currently depends upon and relationship to GF Working Group.
The CORBA CoG kit is an interface to enable application developers to access Globus Services. It is the communication middleware between the application layer and Globus.

B. Define Grid software/services that the GCE plans to make use of
The CORBA CoG kit plans to use the MDS, GRAM and GASS Services of Globus. MDS provides information about the structure and state of the grid resources and services using the LDAP Protocol. GRAM allows allocation of computational and other resources. GASS provides data access.
It will also allow integration with DISCOVER, service to collaboratively monitor, interact and steer remote applications.

C. Define Grid software/services that are needed by the GCE but are not supported by the Grid

D. Define software/services used/needed by the GCE that are outside the scope the Grid

E. Other
A schematic overview of the CORBA CoG architecture is shown in figure below. The middle tier consists of a network of IIOP orb, which provides access to CORBA POA that implement, the Grid Services. These objects in turn interacts with the Grid Computing Environment or Grid Service Provider.



3. Implementation

A. Commodity technologies/software used (e.g., EJB, JMS, JINI, Perl, XML, databases...)
CORBA CoG Kit is being developed using the ORB developed by IONA and JAVA as the implementation language. ORBIX 2000 ORB supports the latest CORBA 2.3 specifications and contains extensive security features along with the basic services such as the Naming Service, and Event Service.
B. Proprietary technologies/software developed that can be shared with others
C. Other

4. Supported Grid Services –

A. Security
A secure channel is established between the client and the server using CORBA Security Service, for the client to access remote resources. The client has to authenticate using private key and certificates to the server. Once the authentication is successful the client is allowed to access the Globus Gatekeeper.
B. Information services
The CORBA CoG Kit provides a remote object, which accesses the Globus MetaComputing Directory Service. It is connected to the MDS Server using JNDI libraries. The functions provided by the server are connection to the MDS Server, querying the contents depending upon the query and scope specified and disconnection from the MDS Server.
C. Scheduling
D. Data transfer
F. Additional Grid services
One of the main services provided by CORBA CoG Kit will be the access to Globus GRAM Services, which will interact with the Gatekeeper to manage remote computation. The client will be able to submit jobs, bind to existing jobs, cancel jobs on remote computer and monitor the different status of the job.

G. Other

Our end goal is to enable existing GCE and Service Providers to inter operate. For e.g. enabling applications to combine services provided by Globus with the collaborative monitoring, interaction and steering capabilities provided by DISCOVER(www.discoverportal.org).

5. Project Status and Future Plans

We have been successful in the implementation of the MDS Service. In this implementation, the client application looks up the CORBA Naming Service for the object named *MDSServer*. On instantiating this remote object the client is able to connect, disconnect and search the Globus MDS Server depending upon the query string. We are currently developing the GRAM POA and will and then work with GASS.

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