Using Resources of Multiple Grids with the Grid Service Provider

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Grid Service Provider

• The Grid Service Provider came as a result of research done within the PROGRESS project:
  – Project Partners
    • SUN Microsystems Poland
    • PSNC IBCh Poznań
    • Cyfronet AMM, Kraków
    • Technical University ?ód?
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PROGRESS Grid

- Cluster of 80 processors
- Networked Storage of 1,3 TB
- Software: ORACLE, HPC Cluster Tools, Sun ONE, Sun Grid Engine
Grid Service Provider

- the use of the grid resources most comfortable to the end users
- allows for easy building of numerous portals and other user interfaces; users can switch from one to another and use the same GSP services
- various web portals sharing the same distributed grid services and resources
- possibility of providing all clients (user interfaces) with computing resources belonging to two or more different grids
Grid Service Provider (2)

- Necessary services to provide:
  - job submission service
    - managing the creation of user jobs, their submission to the grid and the monitoring of their execution (typically through reverse reporting performed by the Grid Management System about events connected with the execution of jobs)
  - application management service
    - storing information about applications available for running in the grid
    - assisting application developers in adding new applications to the application repository
  - provider management service
    - keeping up-to-date information on the services available with the provider
Job submission service

- computing job building, submitting them to the grid for execution and viewing the results
- job description is prepared using the XRSL language and transferred to the grid resource broker for the execution of the job
- grid resource broker reverse reports on grid events connected with the job
- „workflowed” jobs: sequences and parallels
Application management srv.

- application repository management
- application descriptor contains a reference to the application executable: a reference to a file stored in the DMS or a path to a binary on grid computing server filesystems
- also included in the application descriptor: available (required or optional) arguments, required environment variables and required input and output files
- applications in PROGRESS may be unconfigured or configured: one executable -> multiple configured applications
- virtual applications
Provider management service

- enables keeping up-to-date information on services available in the grid service provider
- a service descriptor contains information on the Web Service interface: URL at which the service is available, the service namespace reference (URN) and the service WSDL reference
- services may have multiple instances: informational services
Informational services

- examples of instance enabled services
- intended for use by web portals
- PROGRESS example: short news service
- other: document directory, discussion forum (under development)
Other PROGRESS modules

• user interfaces
  – web portal: grid job management, application management, provider management, short news reading and editing, DMS file system management
  – migrating desktop: grid job management and DMS file system management

• grid resource broker: enables the execution of PROGRESS grid jobs in a cluster of three Sun computers; uses XRSL language for grid job descriptions

• data management system: storing the input and output files, metadata, multiple media data containers
Authorization within GSP

- **Logon**
- **Request**
- **Method Invocation**
- **Token Validation**
- **Resource Access Authorization**

**GRID SERVICE PROVIDER**

**RAD based authorization system**

**Identity server**

**Portal**
GSP Release & Future

- The Grid Service Provider software will be released under an open source license in the first half of October.
- We will continue the R&D on the Grid Service Provider (new features to be added in future releases):
  - cooperation with multiple grid resource brokers/grid management systems (e.g. the GridLab one)
  - additional functionality (e.g. OGSA interface, cooperation with virtual laboratories)

PROGRESS: GEW'2003
Enabling multiple grids

- To enable multiple grids within the GSP, we developed a concept of grid resource broker plug-ins
- The plug-in will be responsible for communication with the grid
- The job submission service will use the proper plug-in whenever there’s a need to submit a computing job to a particular grid
GRB plug-in

- A java class capable of communicating with and submitting computing jobs for execution to a particular grid
- To enable the GRB plug-in concept, there will be a set of entity beans prepared to manage the information about available plug-ins and grids
Available plug-ins

- The GRB plug-in mechanisms are under development
- One of the releases (1.1?) following up the version 1.0 will include a plug-in for the PROGRESS grid resource broker
- Next plug-ins to follow:
  - GridLab
  - SGE?
  - Globus?