Contribution ID: **59** Type: **Presentation**

GridWay interoperability through BES

Thursday, 20 September 2012 12:00 (30 minutes)

Description of the work

The interaction between grid infrastructures and middlewares is still a challenging problem. Therefore, interoperability is a desired capability of grid infrastructures to allow VOs access the resources provided by the existing infrastructures although based on different middlewares. Otherwise, interoperation techniques are needed.

GridWay provides support for some of the few established standards for interoperability, and it also provides components for interoperation. Its modular architecture is based on drivers, acting as adapters for different grid services providing resource discovery and monitoring, job execution and management, and file transfer.

GridWay now provides support for the OGF OGSA Basic Execution Service standard both as a client and as a server, by means of a new execution driver and a new interface, respectively. BES addresses interoperability between job management services and is pursuant toward job submission standardization. The OGSA BES specification defines WS interfaces for creating, monitoring, and controlling computational entities such as processes, Web Services or parallel programs, called activities, within a defined environment.

Given the importance of interoperating with BES-enabled endpoints, a BES driver for GridWay has been developed. The new BES driver provides an abstraction layer that enables users to submit jobs through GridWay to BES interfaces, and control and monitor their execution.

A BES service-level interface for GridWay is now also supported, which provides access to GridWay's job metascheduling capabilities using the BES implementation of GridSAM. Communication between both systems is based on the Java DRMAA API. It is worth noting that GridSAM provides a job submission interface for submitting computational jobs to many LRMS, but it does not provide metascheduling capabilities.

Both the BES driver and interface were demonstrated in March 2012, in the context of the Grid Interoperability Now OGF group.

Link for further information

http://gridway.org/doku.php?id=ecosystem:gridwaybes
http://www.omii.ac.uk/wiki/GridSAM
http://www.ige-project.eu

Wider impact of this work

This work is motivated by the need of interoperation and interoperability on grid environments, addressing the interoperation at the metascheduler level. The main contribution of this work is the support of a new standard for interoperability in GridWay, and presents new components based on BES to enable the interoperation of different grid technologies. It provides end-users a metascheduling tool able of interoperating with the most used grid technologies.

The BES driver for GridWay allows to users to submit, control and monitor their execution jobs to sites managed by a standard service. The BES interface for GridWay allows users to access metascheduling capabilities using an open-standards based interface for job submission.

Printable Summary

The GridWay metascheduler enables large-scale, reliable and efficient sharing of computing resources over different grid middlewares, providing a single point of access for them. The current development of GridWay is being supported by the IGE project.

This work addresses the problem of interoperability at the metascheduler level. The Basic Execution Service (BES) standard address interoperability between job management services and pursues for job submission standardization. GridWay provides support for BES both as a client and as a server, providing to end-users more possibilities of interoperability. Thus, a BES driver for GridWay that enables the interoperability with BES-enabled endpoints, and a BES-compliant interface that enables the remote access to GridWay's metascheduling capabilities through a standard interface, have been developed.

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Session Classification: Resource Infrastructure Services

Track Classification: Resource Infrastructure services (Peter Solagna: track leader)