Open Grid Forum HPC Grid Interoperability Demonstration at SC06

The Open Grid Forum's SC06 interop demonstration shows interoperability between multiple 3rd party resource managers and web service platforms using the OGF Open Grid Services Architecture (OGSA™) HPC Profile. The OGSA HPC Profile is a proposed standard for grid interoperability in HPC environments that references existing specifications including:
- OGF Job Submission Description Language (JSDL)
- OGF OGSA Basic Execution Service (BES)
- WS-I Basic Profile

Demo stations are setup at booths throughout the conference where tasks are submitted to compute clusters via the OGSA HPC Profile. The demonstration includes the submission of tasks to a resource manager, the retrieval of a task's execution status and the retrieval of information about an HPC system's resources.

The OGSA HPC profile leverages standard Web services protocols and development environments. It allows application and middleware software providers to target multiple HPC systems via a single protocol.
The demonstration clearly shows how organizations can benefit by:
- Integrating commercial and open source products into existing and new HPC systems
- Interfacing with HPC systems at remote locations
- Leveraging generic HPC utilities

Participating Organizations

Participant	Booth Number	Web Service Tooling	Resource Manager
Altair Engineering, Inc	1405	Axis (Linux) MS Web Services Enhancements	PBS Professional
Argonne National Lab	1925	Globus Toolkit /Axis (Linux)	Condor, Fork, GridWay, LSF, LoadLeveler, PBS, SGE
CROWN	2234	CROWN NodeServer	CROWN Scheduler
EGEE	948	GSOAP (Linux)	gLite WMProxy
Fujitsu Labs of Europe	Off Site	Jetty/Axis (Mac OS)	Unicore
HP	1505	GSOAP (Linux) Windows	LSF (XC software stack, Linux) MS Compute Cluster Server
Microsoft	305	Windows Communication Framework	MS Compute Cluster Server
Platform Computing	1423	GSOAP	LSF
Tokyo Institute of Tech	305	MS Web Services Enhancements	SGE (Linux)
UK eScience (OMII-UK)	2234	GridSAM (Axis on Linux)	Linux
University of Virginia	305	MS Web Services Enhancements	MS Compute Cluster Server
Genesis II (UVA)	2234	Jetty/Axis	Windows XP and Linux

Applications and Usage
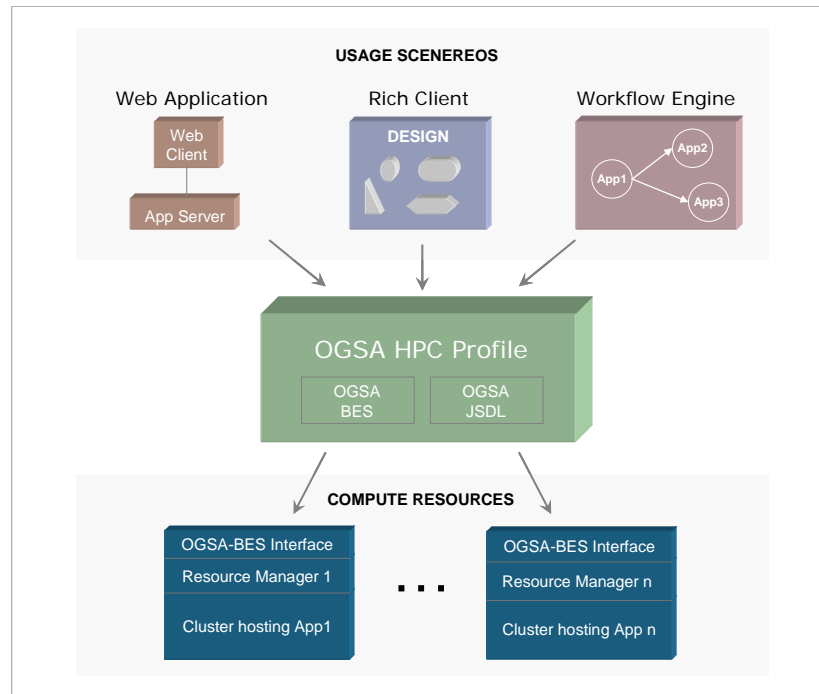
HPC Grid Interoperability Demonstration

The diagram illustrates how compute resources and their applications are accessed to support usage scenarios within the OGSA HPC Profile. The compute resources host a particular application that performs a processing function. In order to run the application, a user requests that a job be run through the resource manager that governs access. Each application is described using the OGSA-JSDL, an XML based language for describing the job to be run, while the OGSA-BES web services interface allows web services clients to access functions of a resource manager. Example usage scenarios include:

- **Web Application**: Users access applications with their web browser while the application server uses the OGSA-BES interface and a JSDL document to initiate running the application. The user does not need to be aware of the actual resource manager being provided.
- **Rich Client:** An engineer or scientist runs a "workbench" application that includes running simulations that test elements of the design. When the user runs a simulation, the rich client dispatches it to a compute resource using the OGSA-BES interface.
- **Workflow Engine:** Various applications are chained together into a workflow of computing tasks. Users define job nodes and their dependencies into a graph. The workflow engine does not need to be aware of the different resource managers and can execute each node in the graph based on the JSDL provided and by using the OGSA-BES interface.

About OGF and OGSA HPCP WG

Open Grid Forum (OGF) was formed in June, 2006 with the merger of the Global Grid Forum (GGF) and the Enterprise Grid Alliance (EGA). OGF works to accelerate grid adoption, providing an open forum for grid innovation and developing open standards for grid software interoperability. The OGSA High Performance Computing Profile Working Group, co-chaired by Marvin Theimer of Microsoft and Marty Humphrey of the University of Virginia, is part of compute area within the OGF Standards function. For more information on the OGSA HPC Profile, the activities of the working group and the interop demonstration, please visit http://www.ogf.org/hpc_profile.

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