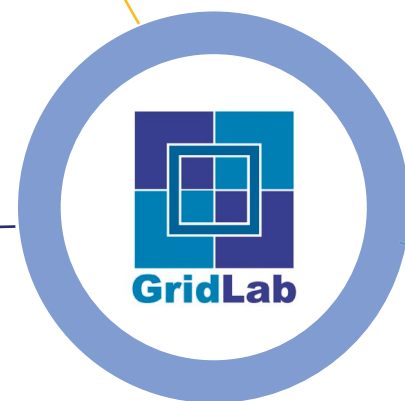


A Grid Application Toolkit and Testbed

GridLab



Scope

Computational Grids are becoming increasingly common and look set to change the way that global resources are accessed and used. Currently there is a dearth of real Grid users, in part because the concept is still new, but, also because few Grid-enabled applications exist to exploit Grid resources. The primary aim of the GridLab project is to provide users and application developers with a simple, yet robust, environment that would enable them to produce applications that can exploit the full power of the Grid.

Innovation and Functionality

GridLab has produced a set of application-oriented Grid services and toolkits, which provide capabilities such as dynamic resources brokering, Grid monitoring, data management, security and more. These services can be accessed through the innovative, user-friendly Grid Applications Toolkit (GAT) and the Grid-Portal development framework known as GridSphere. The GAT allows access to various GridLab services and resourced tools, in a way that allows end users and application developers to use and build applications on the Grid without needing to know the details of the run-time environment in advance.

Positioning

The GridLab project has focused on Grid applications and Grid enabling tools. These are areas in which Europe has established its strength and shown leadership. The project's efforts will lead not only to the widespread adoption of Grid technologies by applications in Europe and beyond, but will also enable solutions to problems such as adaptive application behaviour, optimal usage of resource, and optimising cost of application design and development. The main motivation for the development of the GAT has been to lower the barrier for scientific application developers to make use of Grids, by providing a small and consistent API.

Target Users and User Benefits

GridLab is primarily targeting scientists who are looking to develop and run Grid applications and to access Grids in an intuitive manner. Potential application areas for the GridLab technologies are: physics; environmental sciences; biology; engineering; and commercial applications such as the automotive and financial sectors. The anticipated business benefits of these dynamic computing solutions are five-fold:

- Capital cost savings via faster and easier dynamic grid application enabling;
- Capital cost savings via improved asset utilisation;
- Operational cost savings via extensive use of policy-based automation;
- End-to-end service-level improvements due to more reliable and

continued overleaf ▽

Contract number
IST-2001-32133

Type of project
Cost-shared Research and Technological
Development Action

Project coordinator
Poznan Supercomputing and Networking Centre
(PSNC)

Contact person
Jarek Nabrzyski
Instytut Chemii Bioorganicznej PAN w Poznaniu
Poznanskie Centrum Superkomputerowo-Sieciowe
Noskowskiego 12/14
61-704 Poznan
Poland

naber@man.poznan.pl

Project website
<http://www.gridlab.org>

Maximum Community contribution to project
EUR 5 085 998

Project start date
1 January 2002

Duration
40 months

continued overleaf ▽



- available systems; and
- Improved business agility based on the vastly improved ability to link IT investment, use and operation to business process requirements.

GridLab will bring to applications and workloads big benefits and advantages that fall into four broad categories:

- Performance – GridLab software makes it possible to spread out workloads over hundreds or thousands of processors leading to a reduction in processing times and increases in efficiency.
- Quality of Solution – GridLab allows businesses to improve the quality of their computational results and thus the quality of the end product.
- Flexibility & Resiliency – GridLab software is inherently flexible and can be run on both supercomputers and off-the-shelf computers, it is also resilient so that if a particular server goes down the GridLab software will simply reroute the workload to another system and continue on.
- Utilization & Cost – businesses will be able to get more out of systems they already own.

Maturity and Availability of Tools

The GridLab project tools are ready to use. All documentation, user manuals and source code is available from the GridLab website. The license for all software tools, which is open source, has already been published and is based on the General Public License (GPL) scheme. Support for many of the tools will be continued through further projects at the end of the GridLab project.

Compliance with Standards

GridLab software components use many existing and developing standard specifications. All communication between GridLab components is undertaken using secure (GSI-based) Web Services specifications.

Interoperability

Currently the GridLab software uses the Globus Toolkit (version 2.4 and the pre-Web Services version 3.2). GRMS and GAS, the central services of GridLab are compatible with the GT4. GRMS is able to submit and control the Grid jobs to GT4, while GAS is able to use the GT4 call outs mechanisms for authorization. The GAT (Grid Application Toolkit) will contain some adaptors to the GT4 by the end of the project.

Value-Added Services and Next Generation Development

PSNC, the coordinating partner of the GridLab project, plans to bring GridLab software, along with other chosen

European and US open source Grid solutions, to market by the middle of 2006. The final product will be called GridSuite and will be a complete “out-of-the-box” Grid solution delivering tools and services to science and business.

The GridLab consortium and its commercial partners, namely Sun Microsystems GmbH and HP (HPCC France), will work closely for the dissemination and exploitation of the project. In order to support potential GridLab users in Europe, PSNC and HP have become members of the European Grid Support Centre (EGSC). The EGSC has been set up to facilitate the introduction and use of Grid technologies that are currently under development at various institutions around Europe and combine these efforts into a larger more focused endeavour (www.grid-support.org).

Another strength of GridLab is its efforts in the creation of a strategic international alliance culminating in a Global Grid Application Alliance. This will establish a global partnership of major independently funded Grid projects,

Project Partners

Organisation name and country

ALBERT EINSTEIN INSTITUTE (AEI)	DE
ARGONNE NATIONAL LABORATORY *	US
COMPUTER AND AUTOMATION RESEARCH INSTITUTE (MTA SZTAKI)	HU
HEWLETT PACKARD (HP)	FR
KONRAD-ZUSE ZENTRUM (ZIB)	DE
MASARYK UNIVERSITY (MASARYK)	CZ
NATIONAL TECHNICAL UNIVERSITY OF ATHENS (NTUA)	GR
POZNAN SUPERCOMPUTING AND NETWORKING CENTRE (PSNC)	PL
SUN MICROSYSTEMS GMBH (SUN)	DE
UNIVERSITY OF LECCE (ISUFI)	IT
UNIVERSITY OF SOUTHERN CALIFORNIA *	US
UNIVERSITY OF WALES (CARDIFF)	UK
UNIVERSITY OF WISCONSIN *	US
VRIJE UNIVERSITEIT (VU)	NL

* Participating in the project under a collaboration agreement

