GridDemo: International Workshop on Live Demonstrations of Grid Technologies and Applications

Peter Kacsuk (MTA SZTAKI Research Institute, Hungary) and Rajkumar Buyya (Monash University, Australia)

Recently, the Grid has been getting more and more popular not only in the academic world but even large companies like IBM, Sun and Compaq have expressed their strong interest in developing and providing Grid technology. A significant number of large national and international projects were launched world-wide[1,2,3] to explore the possibilities of and advance this new technology. Large experimental scientific Grids, like physics, chemistry, biology, etc. Grids were built in the last couple of years with the hope that they will provide significant benefits for those communities in sharing and aggregating computing, storage and other resources, in achieving more intensive collaborative work and opening new ways of collaboration in the future.

Grid technology merges several important achievements of the past. Its roots came from distributed high-performance computing, parallel computing, high-throughput computing, network and Web computing. The current trends clearly show that the integration of these technologies will continue and will result in new standards in which new protocols, services and APIs for uniform access to resources, selection, and aggregation will be developed. The new efforts such as Open Grid Services Architecture (OGSA), Legion/Jxta, CPM/Jxta, and Bayanihan/.NET are expected to demonstrate this integration.

In organizing this workshop, a second meeting within the series of GridDemo events[4], we had two main important objectives. First, we wanted to demonstrate that Grid technology is an already feasible technology that can actively be used for the scientific and other communities. Second, by showing the results and problems of various existing Grids, we would like to provide some kind of feedback for the technology developer community to better understand what they have achieved so far and what are the significant weak links that represent serious obstacles in the usability of current Grid technology.

Our goals were well accepted by the Grid user and developer community and we received 13 excellent proposals for demonstrating different aspects of various application Grids and results of new Grid development projects. The subjects of the proposals fall into three main categories:

1. Grid Applications
2. Grid Technology and Grid Application Development
3. Grid and Networking

In the first category we received four proposals that represent various applications of the Grid: the use of web services for accessing life sciences application, data-intensive molecular modelling for drug design using the Virtual Laboratory toolset on the World-Wide Grid, application in fluid mechanisms, and two application oriented Grids: a BioGrid and the INFN Grid for physicists.

In the second category, the first project demonstrates the Grid technologies for resource finding, authentication, monitoring, steering, portal usage, etc. that are under development in a large EU project, called GridLab. The second demonstration is from IBM Research showing a Grid resource management system including dynamic resource allocation based on load and failure detection. The third presentation also shows a resource manager, the Condor system and its integration with a graphical parallel/distributed program development environment, called P-GRADE. The integrated system provides a powerful Grid application development environment for the users. Finally, another Application builder, called PAGIS is demonstrated on top of a Campus Grid.

Demonstrations in the third category prove that Grid technology is strongly related with other distributed and network programming technologies like the Web and peer-to-peer systems. The first presentation demonstrates how guaranteed QoS can be achieved in the Grid even in the case of multicast messaging. The second presentation shows a Grid network monitoring toolset developed in the EU DataGRID project. The third demonstration presents a P2P service platform with ad-hoc and secure communities. The fourth presentation

[1] Grid Infoware – http://www.gridcomputing.com
[2] Global Grid Forum – http://www.globalgridforum.org/
[3] IEEE DS Online – http://dsonline.computer.org/gc/
[4] GridDemo Workshop Series – http://www.buyya.com/griddemo/

demonstrates a Grid architecture for harnessing the computing power of thousands of remote computers to constantly scan selected websites, providing near-real-time search and content comparison. NewsToYou enables the Internet to become truly "self-aware". Finally, the TRASC system for accessing the remote supercomputers using the Web portals is demonstrated by the Victorian Partnership for Advanced Computing.

The detailed program of the workshop is as follows:

Session 1 Grid Applications

1. Accessing a Life Sciences Application on a Grid via Web Services
T. Gargya, W. Kriechbaum, S. Rost, G. Stenzel (IBM, Germany)

2. The Nimrod-G and Virtual Laboratory Toolset for Service Oriented Grid Computing – A Case Study in Molecular Modelling for Drug Design
R. Buyya (Monash Univ.), K. Branson (WEHI, Australia), J. Giddy, D. Abramson (Monash Univ., Australia)

3. EUROGRID - grid computing in Europe
P. Bala (Copernicus University, Poland) , M. Nazaruk (Warsaw University, Poland), V. Alessandrini, D. Girou, G. Grasseau (IDRIS, France), D. Erwin, D. Mallmann (Research Center Juelich, Germany), J. MacLaren, J. Brooke (Univ. of Manchester,UK), J. -F. Myklebust (University of Bergen, The Netherlands).

4. INFN Grid Project
G. Andronico(Instituto Nazionale di Fisica Nucleare, Italy), R. Barbera (INFN and and Universita' di Catania, Italy), A. Falzone, S. Maccarone, A. Rodolico (NICE s.r.l., Camerano Casasco, Italy)

Session 2 Grid Technology and Grid Application Development

5. Grid Tools for Applications
G. Allen, T. Dramlitsch, I. Kelley, G. Lanfermann, T. Radke, O. Wehrens (Max-Planck-Institute, Germany), M. Russell (University of Chicago, USA), E. Seidel (Max-Planck-Institute, Germany and NCSA, US), J. Shalf (Lawrence Berkeley National Laboratory, USA and Max-Planck-Institute, Germany)

6. Océano - Policy Based Management of a Computing Utility
T. Eilam (Advanced Cluster Technologies IBM Research - Hawthorne, USA)

7. Condor/P-GRADE
M. Livny, P. Keller (Univ. of Wisconsin-Madison, USA), Peter Kacsuk (MTA SZTAKI, Hungary and Univ. of Westminster, UK), J. Kovács (MTA SZTAKI, Hungary)

8. Campus Grid and PAGIS Application Builder
D. Webb, A. L. Wendelborn (University of Adelaide, Australia)

Session 3 Grid and Networking

9. Fully Scalable Multicast Messaging Based Serverless Data Communications With Serverless Guaranteed Quality of Service (GQoS) Compliant Communications
M. King (Quick Com AG, Switzerland)

10. Grid Network Monitoring Tools deployment in the DataGRID project
F. Bonnassieux, P. Clarke, R. Harakaly, R. Hughes-Jones, P. D. Mealor, P. Primet, R. Tasker, Y.T. Li (ENS-Lyon, France)

11. A P2P service platform with ad-hoc and secure communities
Y. Wada, T. Iwao, S. Yamasaki, M. Shiouchi, M. Okada (Fujitsu Laboratories Ltd., Japan)

12. NewsToYou
M. Morgan (Silvertip Technologies, Inc., USA)

13. TRASC Demo
D. Bannon (Victorian Partnership for Advanced Computing, Australia)