

Grid Applications: From Early Adopters to Mainstream Users

Thilo Kielmann (guest editor)
Vrije Universiteit, Amsterdam, The Netherlands

April 24, 2006

Grid computing has gained widespread attention, both in academic and commercial settings. As a result, the development of grid middleware infrastructure has made tremendous progress. But still, grids are mostly deployed by early adopters, asking for the move to the more mainstream users.

The Global Grid Forum (GGF) is a community-initiated forum working on grid technologies. GGF's primary objective is to promote and support the development, deployment, and implementation of grid technologies and applications via the creation and documentation of "best practices" – technical specifications, user experiences, and implementation guidelines.

The special issue presented here is the result of the joined efforts of two of GGF's research groups. The Application Developers and Users Research Group (APPS-RG) seeks to facilitate the exploitation of grid technologies by application developers and users, and to attract new application domains to the grid.

The Production Grid Services Research Group (PGS-RG) seeks to document experiences and identify best practices guiding organizations moving a grid to the persistent level. The group also explores new paradigms in supporting grids that aspire to become large scale grids with a large user or application base.

Together, the two groups aim at bridging the gap between early adopters of grids and the more mainstream use of grid technology. For fostering mature production environments, incentives by application users are vital. For this purpose, APPS-RG and PGS-RG had decided to organize a workshop which was held in conjunction with the GGF14 meeting, June 27, 2005, in Chicago, USA. We were seeking experience from early adopters who would like to become mainstream users, from mainstream users who would like to use grids, from those who already do, and from middleware developers and system operators in charge of providing working grid environments to user communities.

From the submissions, the programme committee selected eleven papers to be presented at the workshop. Together with two open discussion sessions, the presentations formed a highly interesting and inspiring assessment of the current state of grids maturing towards production quality. The workshop pro-

ceedings containing all presented papers have been published by the Global Grid Forum as document GFD.68.¹

The workshop organizers proudly present this special issue with extended and carefully revised versions of the strongest workshop presentations. The programme committee has selected the following six articles, describing both infrastructures for production-quality grids as well as “hands on” grid application experiences:

In Streamlining Grid Operations: Definition and Deployment of a Portal-based User Registration Service, Foster et al. describe a system for automated user credential management.

In Implementation of Fault-tolerant GridRPC Applications, Tanimura et al. investigate failure resilience support for long-running grid applications.

In Campus Grids Meet Applications: Modeling, Metascheduling and Integration, Yan and Chapman analyze the challenges of deploying an air quality forecasting application within a campus grid environment.

In GridSAT: Design and Implementation of a Computational Grid Application, Chrabakh and Wolski present an application that is explicitly designed to aggregate grid resources for application performance.

In From Proposal to Production: Lessons Learned Developing the Computational Chemistry Grid Infrastructure, Dooley et al. discuss technological issues of running a grid application infrastructure in production.

In GeneGrid: Architecture, Implementation and Application, Jithesh et al. provide insights into an infrastructure for seamless integration of numerous heterogeneous resources spanning multiple administrative domains.

As guest editor of this special issue, I would like to thank the colleagues who have helped organizing the workshop. These are the co-chairs of APPS-RG and PGS-RG, Tom Hinke (NASA Ames), Simon Cox (University of Southampton), David Wallom (University of Oxford), Judith Utley (Old Dominion University), and Laura McGinnis (Pittsburgh Supercomputing Center). In addition, the following colleagues served as members of the programme committee for both the workshop and this special issue: Pascal Kleijer (NEC, Japan), Ignacio Martin Llorente (Universidad Complutense, Madrid), André Merzky (Vrije Universiteit), Steven Newhouse (OMII-UK). Thanks a lot to all who have helped!

¹ The proceedings can be retrieved from <http://www.ggf.org/gf/docs/>