Topic 14
Meta- and Grid-Computing

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Topic Chairpersons

Since the origins of computer networks connecting spatially distributed resources, attempts have been made to create an infrastructure for distributing applications across regional, national and administrative boundaries. New paradigms have been introduced to support the programming and deployment of such computational networks, generally as extensions to existing parallel computing models (such as SPMD) and as distributed computing techniques based on distributed object technologies. The primary objective in many such systems is to achieve uniformity in programming and use, whilst supporting heterogeneity and transparency in architectures, operating systems and environments.

During the last couple of years, these effort have been culminating in the emerging field of Grid Computing. Grid Computing tries to turn Computational Networks into Computational Grids, that means to add an ubiquitous and consistent infrastructure to the distributed resources. This infrastructure provides generalized operations like caching, authentication, resource discovery, resource scheduling etc, and hence enables uniformity in programming and use.

This new emerging field of Grid Computing still finds many critizism, from "new name for old ideas", over "solution looking for a problem" to "yet another hype wthout any contents". But fact is that the Grid paradigm seems currently to be the only one available showing good chances for keeping its promises.

The strength of Grid Computing paradigm lies in the simplicity of its idea and in its consequent focus on standardization, for architecture, protocols and interfaces, and in its attempt to enclose all the known facets of classical distributed computing and meta computing. The Global Grid Forum (GGF) plays a crucial role here and provides substantial momentum to this field.

The papers in the Europar topic "Meta- and Grid Computing" illuminate various details of that huge area, and reflect the wide range of problems the community is facing and solving in this context today.

The paper by Vijay Dialani, Simon Miles, Luc Moreau, David De Roure, and Michael Luck, an infrastructure to implement fault tolerance services in Grid environments. As Web services are a major focus right now in the Grid community, and life cycle management of Grid Services get a real important issue in this context, the authors add valuable input to that topic.

The paper by P.H.J Kelly, S. Pelegatti and M. Rossitzer adds an interesting perspective to the well researched problem of idle CPU cycle utilization in a network of workstations, by focusing on response time and on minimal user interferenz instead of throughput.

The paper by Darin Nikolow, Renata Slota, Mariusz Dziewierz and Jacek Kitowski presents two approaches for access time estimations for tertiary storage

B. Monien and R. Feldmann (Eds.): Euro-Par 2002, LNCS 2400, pp. 861–862.

systems. These approaches fill a gap present in many Grid environments focusing on large scale data management problems.

The paper by Martin Alt, Holger Bischof and Sergei Gorlach adresses the widely neglected problem of algorithm design for Grid computing environments. It is based on high level components called skeletons, and focuses on Java applications.

The paper by Eddy Caron, Frédéric Desprez, Frédéric Lombard, Jean-Marc Nicod, Laurent Philippe, Martin Quinson and Frédéric Suter describes an distributed interactive engineering toolbox (DIET) which consists of a hierarchical set of components to build network enabled servers applications.

The paper by Jaroslaw Pytlinski, Lukasz Skorwider, Piotr Bala Miroslaw Nazaruk and Konrad Wawruch presents a case study for deploying an commercial application with the Unicore Grid environment.

The paper by J. Santon, S. Newhouse and J. Darlington describes the design and implementation of a component for 'collaborative scientific visualisation'. The component is part of the ICENI Grid middleware project. Some of its capability is explored by means of an astrophysical application simulating coronal mass ejections.