

Grid computing – from scientific toward business infrastructure

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Agenda

- What is grid computing
- Roads ahead
- Grid@MK
- Business opportunities
- ... and open issues
- Conclusion

What is grid computing?

- Different meaning to different people
- Sharing of resources (computing, storage, sensors) between users from different organizations
- Enabling an environment for execution of complex applications
- Integration of heterogeneous systems
- The foundation for collaborative research – eInfrastructures
- Primarily scientific use
 - The foundations for the e-Science
 - With great business potential

Roads ahead

- Different views and visions
- Different interest groups
- Sharing common goal – computing anywhere, anytime
- Main directions
 - Community grids
 - Agent based grids
 - Cloud computing

Community grids

<http://www.worldcommunitygrid.org/>

- ... in the past
 - Seti@Home
 - Folding@Home
- World Community Grid
 - Launched 2004
 - Based on cycle stealing
 - Different from the past (no single problem commitment)
 - Project approval done by advisory board

Agent based grids

www.ganzha.euh-e.edu.pl

- “Back to the basic idea”
- Agent +ontologies
- Resource brokerage based on sound business rules and principles
 - Commercial exchange of resources
 - Yellow pages, bargaining, service level agreements, penalties ...

Cloud computing

- Different (and often not so similar) definitions
- Commercial, very restrained form of grid computing
- Remove the computing out of the boundaries of the companies, into the area known as “the cloud”.
- Computing on demand
 - Virtualization and provisioning of computing and storage
 - Lacks support for advanced workflows, VOs
 - User to service over public network

<http://groups.google.com/group/cloud-computing/web/list-of-cloud-platforms-providers-and-enablers>

Challenges

- Sustainability
 - Project based financing
- Current status
 - “Better tools for understanding failures and increasing reliability”
 - “Policy, support, security, QoS”
(SUPER study, UK)
- Major issues: grid interoperability
 - Many, non interoperable middlewares
- Efforts to mitigate the problem
 - EU grid interoperability
 - InterGrid

Grid@MK

- MARGI – Macedonian Academic and Research Grid Initiative
 - UKIM is a founding member
- Member of the European Grid Initiative – EGI
- Previous projects
 - SEE-GRID series (3 FP projects, total 6 years)
- Current projects
 - EGI InSPIRE
 - HP-SEE
 - SEERA-EI



Business opportunities

- Apply greater computational power to a task and enable greater utilization of available infrastructure
- Enables cost savings in the IT departments of companies due to reduced total cost of ownership (TCO)
- Enables greater scalability of infrastructure by removing limitation inherent in the artificial IT boundaries existing between separate groups or departments
- Results in improved efficiency of computing, data and storage resources
- Furthermore enables a more efficient management of distributed IT resources of companies
- In combination with Utility Computing, Grid Computing enables the transformation of capital expenditure for IT infrastructure into operational expenditure and provides the opportunity for increased scalability and flexibility.

Business challenges

- Considerable change in processes but also in the mindset of involved people.
- The transformation of the existing scattered IT infrastructure into a Grid alone is not sufficient. In most cases, considerable investments need to be made for adjusting existing applications
- Lack of standards for Grid Computing makes investments decisions for Grid technology difficult and risky
- Security and privacy issues
- Long-term project, not an overnight solution.

Conclusion

- Powerful scientific infrastructure
- Many flavors
- Open issues
- Great business potential
- ...
- Working to make it worth the name - grid

Thank you for your attention

