



GridEcon - An Marketplace for Computing Resources

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GridEcon Project Facts

- ❑ **GridEcon – Grid Economics and Business Models is an EC-funded project**
 - ❑ Within the EU Sixth Framework Program, Priority IST
 - ❑ Objective “Advanced Grid Technologies, Systems, and Services”
 - ❑ Funding period is July 2006 to June 2009
 - ❑ Project size 3.89M Euro (EC funded 2.35M Euro)

- ❑ **9 consortium partners**
 - ❑ Athens University of Economics and Business
 - ❑ International University Bruchsal
 - ❑ Imperial College London
 - ❑ 451Group, Logica, ATC,
 - ❑ RealTimeEngineering,
 - ❑ Ernest&Young, Gigaspaces

1. Motivation: Outset

- GridEcon started by **analyzing the problem** of a lower-than-expected uptake of Grid Computing **from an economic perspective**

- The reasons for the limited uptake of Grid beyond enterprise boundaries are:
 - **Risk** of using external resources for running a business is perceived to be high
 - Required **changes in the current IT infrastructure** are costly
 - **Usage-based pricing schemes** introduce uncertainty about the total charge for a resource
 - **Sustainable business models** for Grid resource provisioning are missing

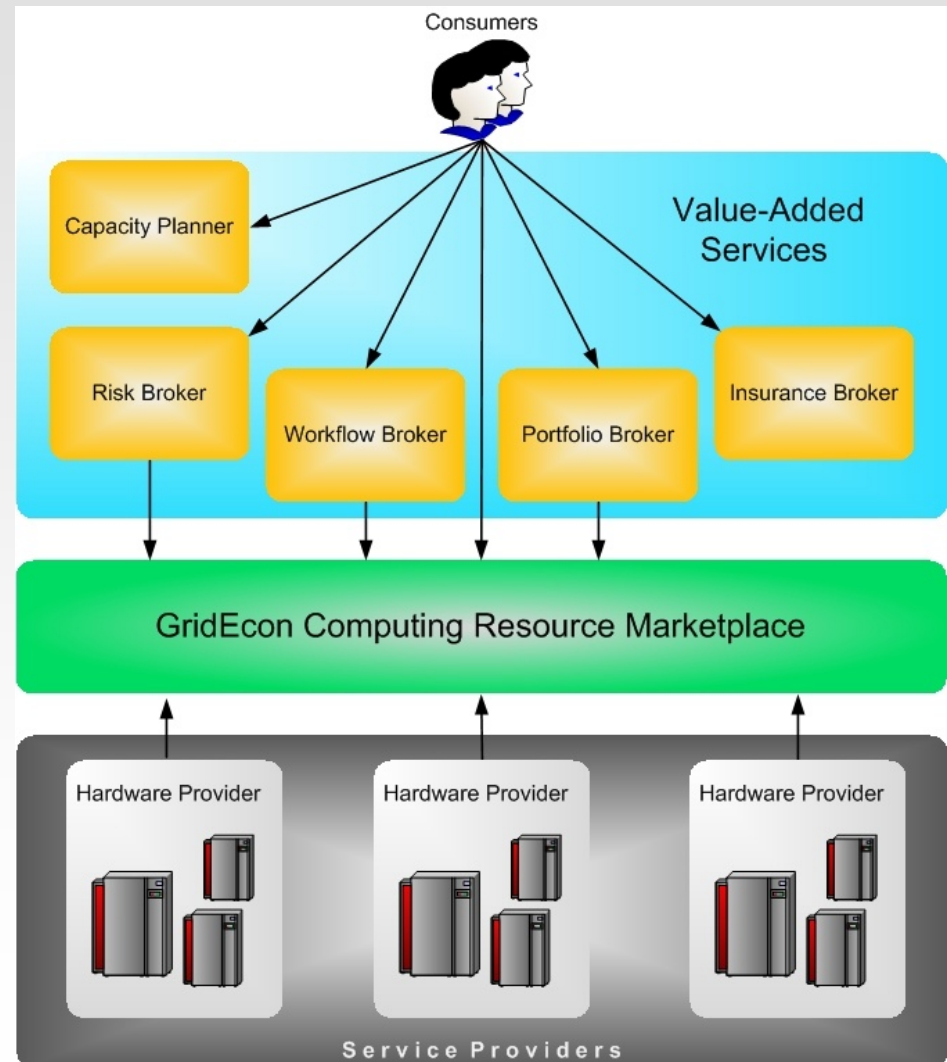
1. Motivation: Analysis

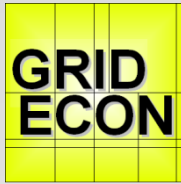
- The results of the analysis also indicated that, in order **to achieve an uptake of Grid technology** in the next generation Internet, a **market for trading computing resources** has to be available

- To make such a market successful, its business model has to be based on a good **understanding of the broader economics issues** of Grid computing, such as
 - The **incentives for users (SMEs)** to access the Cloud
 - The **economic-enhanced services** necessary to offer users more flexibility and different QoS levels
 - The structure of the **computing resource market**

2. Goal of GridEcon

- Assess the viability and the design of a market for computing resource services





3. GridEcon Market Place: Services and Requirements

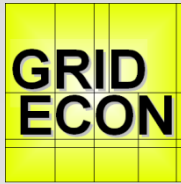
- ❑ **Market Place Services**
 - ❑ **Capability for trading computing resources**
 - ❑ **Resource redundancy**: To achieve service reliability and to improve the probability of a liquid market
 - ❑ **Monitoring of computing resource offers**: To assure quality of the goods offered
 - ❑ **Security**: To separate customers on the same physical machine
 - ❑ **Simple access**: To enable access to computing resources in a transparent and simple way
 - ❑ **Anonymity of sellers and buyers**: To ensure that buyers and sellers do not make the transaction directly
 - ❑ **Standardization of computing resources**: To offer commoditized computing resources
- ❑ **Economic Prerequisites (i.e. demand for computing resources shows viability; uncertainty of demand)**
- ❑ **External Dependencies (i.e. there is supply of computing resources)**

4. Results and Benefit of GridEcon

- ❑ The **economic framework** for trading computing resource services allows analyzing different **economic models** describing markets for computing resources
- ❑ The **GridEcon Platform** allows enterprises to validate their new ideas of business models in the area of service-oriented computing through prototype implementations
 - ❑ It includes the GridEcon Market place, market mechanisms, and support services
- ❑ The **GridEcon market** not only allows access to Cloud computing resources but also to sell spare computing resource services to the Cloud
 - ❑ **Users of the market place can adapt their usage strategies** (e.g. buy more and own less computing power; compute during the night only) based on their demand and the supply of the market.
 - ❑ The GridEcon market place provides **an alternative to the existing oligopoly in the market for cloud computing** (e.g. Amazon, HP, IBM, Google, Sun)

5. Future Work

- ❑ EU projects
 - ❑ I have experience with 5 EC-funded projects during the last 15 years
 - ❑ The evaluation process and research orientation of ICT projects gets better with each new work program
- ❑ In a globalized economy, an **open innovation approach** is the only solution for successfully competing world-wide
- ❑ Therefore, an **active cooperation on knowledge creation** and prototype solutions between developed countries is mandatory
- ❑ **Return on investment** of any country in EC-Projects is very high
 - ❑ E.g. Participation in a STREP project costs about 200 000 Euro to 500 000 Euro, however, compared to an overall project funding of about 4 000 000 Euro, the return on the investment is at least 8 times as high.
- ❑ My plans are to submit proposals continuing **research on market places for computer networks, computing resources, information** (basically follow on project to GridEcon) – This time Seoul National University as one of the partners.



Thank you