BEINGRID

BUSINESS EXPERIMENT FACT SHEET

BUSINESS EXPERIMENTS IN GRID

Visualisation and Virtual Reality

Nowadays, invitations to tender for architectural contracts request more reactivity and quality from the respondent than ever. Firms of architects have to produce graphical pilot studies covering periods ranging from few to several months. The computationally intensive computer rendering required to create these pilots causes a serious bottleneck. Grid resources represent a great opportunity to solve this kind of problem by adapting rendering applications to the Grid environment. Existing hardware (personal computers) available in architect firms, as well as external resources from service providers will be used to build such a Grid to avoid huge investment in costly infrastructure.

Objectives

Architects require a drastic increase in the throughput of 3D rendering tasks. Grid resources represent a great opportunity to solve this kind of problem by adapting rendering applications to the Grid environment. The objective of the experiment is to adapt an existing rendering application so that it can be used to process distributed rendering jobs on a Grid.
Computing needs vary greatly according to the tenders handled by Architects and this may cause either overcapacity spending or slowdown due to the lack of resources. The goal of the experiment is to provide a solution – without expensive additional hardware investment – by distributing rendering services using Grid technologies on existing hardware (personal computers) available in architect firms or by contracting external resources from service providers.

Activities

The Business Experiment has begun with a requirement and design process. The requirement task aims to precisely identify and analyze user and system requirements and to produce the system architecture that serves as the foundation for the implementation phase. The design task will translate the constraints coming from the previously defined user and system requirements specifications into technical characteristics of the system architecture. It also includes an analysis of the rendering solution and chosen Grid middleware.
Following the design, the implementation phase will adapt the rendering application to a Grid platform. As the rendering engine is already able to distribute image computation tasks over several computers, the focus is on interfacing it with the Grid middleware while taking into account Grid systems constraints. This adaptation will bring scalability to the rendering engine (the software will deploy and use resources according to need). Thanks to the ability of the Grid middleware to monitor and discover available resources, the software is also adaptive: rendering is automatically distributed to the resources with the least load.
The implementation also includes a web interface that allows architects to submit their rendering scenes easily.
Application tests will be performed with architects using real projects. The experiment will also explore the effects that Grid architectures have on business models.

Industrial sectors

- ***Architecture***: This sector widely uses rendering applications to produce 3D output of projects, to give clients a realistic idea of what the project will look like.
- ***Computer graphics***: This sector includes advertising companies producing 3D effects that require rendering.
- ***Virtual reality*** - 3D simulations
- ***Media***

Added-value for industry

The market that will be directly impacted by the result of the experiment includes firms using rendering applications such as architects, 3D video editors (animation movies) and advertisers. Added value is twofold:

- New markets for rendering software
- Increased productivity and cost reduction

Since similar ray tracing technologies are used to model other physical phenomena (e.g. acoustics) the market can be expanded to include several sectors such as the automotive, aeronautic, construction and electronic sectors. From a technological and economic point of view, the success of this experiment with the architects will become a major argument to convince their partners to envisage applying grid technologies to other simulation domains that expose similar mechanisms such as acoustics, thermics, lightening, fire.

Partners

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