

Real-Time Online Interactive Applications on the Grid (ROIA 2008)

Through the recent advancements in network technology, graphics cards and displays, a new type of application — real-time online interactive applications (ROIAs) — has become more and more popular. Everyday life has been affected and transformed not only by the use of Web technology, but also by collaborative multimedia applications, networked computer games, cooperative scientific visualizations, networked virtual environments and real-time graphical displays. Users and organizations dislocated all over the globe are enabled to work with a variety of tools and graphical user interfaces to communicate and jointly solve problems using sophisticated graphical interfaces. The grid and its technologies are known to provide a sophisticated basis for ROIAs and collaborative work.

This workshop at Euro-Par 2009 in Las Palmas de Gran Canaria comprised the best selected papers concerning the application and usage of real-time online grid applications, as well as the technologies supporting them in scientific and industrial contexts. The Workshop on Real-Time Online Interactive Applications on the Grid has offered possibilities to discuss the benefits of these applications for human users with a focus on up-to-date characteristics of hard-, soft and middleware aspects, to show the latest results, products or research prototypes to potential users, and to establish connections between developers and users of associated technologies. The attendants were asked to present and discuss the following topics:

- Interactive grid tools and environments
- Development of associated parallel and distributed computing solutions
- Integration of networking and grid computing technology
- Gaming approaches on the grid
- E-learning applications using grid technology
- Evaluation of existing ROIAs and practical experiences

Each of the submitted papers was reviewed by at least three international experts in this domain. The highest ranking contributions are presented here. We would like thank all colleagues and experts who helped in the reviewing process.

The problem of data collection and real-time processing of high-energy physics experiments is addressed by Bubak et al. in their contribution “Real-Time Performance Support for Complex Grid Applications”. The authors present different monitoring systems from this area and the issues which arise by coupling these systems.

Liška et al. present a framework designed for building real-time user-empowered collaborative environments to work primarily on high-speed networks with true high-bandwidth applications such as uncompressed high-definition video in their

contribution “CoUniverse: Framework for Building Self-Organizing Collaborative Environments Using Extreme-Bandwidth Media Applications”. They discuss the overall design of the system and describe in detail the prototype implementation.

The paper by Anthes et al. “Developing VR Applications for the Grid”, investigates the combination of virtual reality (VR) technology in combination with a grid infrastructure. A fast-paced VR entertainment application based on the inVRs framework is ported on the edutain@grid middleware, by exchanging its network component.

Another contribution from the edutain@grid project, “An Information System for Real-Time Online Interactive Applications”, by Nae et al. introduces a novel information system that provides support for ROIA deployment and monitoring. A variety of experiments are conducted which investigate the performance and scalability of the system.

In “Securing Real-Time Online Interactive Applications in edutain@grid”, Ferris et al. present analysis, design and implementation of security facilities within the edutain@grid infrastructure. They describe their solutions to security issues on the different layers on the infrastructure.

The contribution by Landersthamer et al., “The edutain@grid Portals — Providing User Interfaces for Different Kinds of Actors”, investigates the use of user interfaces in order to interact with edutain@grid. Instead of relying on Web portals only, they present approaches to connect with a C++ API to an edutain@grid ROIA.

In the paper “Using RTF for Developing Multi-Player, Online” by Ploss et al., the creation of ROIAs by using a real-time framework in order to allow for scalability by keeping up interactivity is demonstrated. Code examples illustrate their approach and describe the development of such ROIAs in a detailed way.

Christoph Anthes
Thomas Fahringer
Dieter Kranzlmüller