

## Dependable Distributed Systems

**Workshop 9e: 09:00 Friday 21 October 2005**

### Abstract

One key element for achieving scalable and maintainable distributed software systems is dependability, because otherwise the complexity of distribution would leave the system uncontrollable. For a class of systems, availability is more important than integrity. The FP6 IST project DeDiSys investigates the trade-off between integrity and availability. Future exploitation of DeDiSys will include safety critical applications for air traffic control and public safety, health care applications, security systems, control systems in experimental physics, fleet management systems, and pervasive computing environments. In the course of the workshop, two other FP6 projects (GORDA and MADAM) will present their approach to dependability in future systems as well.

The workshop is organised by Dr. Karl M. Göschka and Johannes Osrael from the Vienna University of Technology (Austria). The discussion within the workshop shall be based upon presentations of research results and design studies of the projects first year and shall focus on deployment scenarios and application demands. From a research perspective we are interested in dependability in the context of strongly-coupled, data-centric middleware systems (e.g. CORBA, EJB) and in research covering coordination and dependability-enabling context of loosely coupled service-centric approaches (e.g. GRID, P2P, Web services).

### Objectives

The main objective of the workshop is to bring industry and academia together with the DeDiSys, GORDA, and MADAM consortia in order to share knowledge and to obtain feedback on the ongoing work in the projects. Stimulating the take-up of the research results by industry other than the project partners is also a primary goal of the workshop. We aim at an approach for active and public information exchange in order to also possibly influence the projects' future direction with respect to industry's demands. This shall also be achieved by establishing interest groups, which consist of stakeholders interested in or involved with the presented topics.

### Target Audience

Target audience includes researchers in the field of dependable and distributed systems including appropriate software engineering methods. As take-up of RTD results by industry is a primary objective of the workshop, application developers and integrators, service providers, service developers, middleware developers, and decision makers in these areas shall be attracted.

### Programme

*Chair: Karl M. Goeschka, Vienna University of Technology, Austria*

#### **Scenarios for Increasing Availability by Relaxing Data Integrity**

*Johannes Osrael, Vienna University of Technology, Austria*

A novel approach to enhance dependability in distributed systems – namely relaxing data integrity for increased availability – is presented. As proof of concept, we introduce a real-world scenario. Finally, to stimulate take-up of RTD results, we give an overview about other potential deployment scenarios ranging from control systems to pervasive computing environments.

#### **Fault Tolerance Scenarios in Control Engineering**

*Klemen Zagar, Cosylab, Slovenia*

This talk presents a requirement analysis regarding fault tolerance in control engineering focused on non-functional requirements (in particular availability in the presence of faults). The nature of faults, their consequences and mitigation mechanisms are discussed using several example scenarios.

Mitigation mechanisms where availability improvements can be gained at the expense of reduced system consistency are given special attention.

### **On Availability Improvements in Unstructured Peer-to-Peer Systems**

*Piotr Karwaczynski, Wroclaw University of Technology, Poland*

Unstructured peer-to-peer systems proved to be one of the most popular means of utilisation of computer systems in society. Consequently, service availability of P2P systems is not only influenced by resource availability but also by resource discovery. We are therefore identifying and classifying those properties of peer-to-peer systems that can significantly improve the resource discovery probability which in turn improves service availability.

### **GORDA – Open Replication of Databases**

*Rui Oliveira, Universidade do Minho, Portugal*

High availability and prompt disaster recovery from underlying DBMSs are essential. This makes database replication a key technology for the long-term competitiveness of today's businesses. The goal of the GORDA project is to foster database replication as a means to address the challenges of trust, integration, performance, and cost in current database systems underlying the information society. This is to be achieved with the promotion of the interoperability of DBMSs and replication protocols.

### **MADAM - Mobility and Adaptation enAbling Middleware**

*Svein Hallsteinsen, Sintef, Norway*

The mobile setting is characterised by constant change and this poses a significant challenge to developers. To retain usability, usefulness, and dependability under such circumstances, applications need to adapt to the changing operating environment and the context in which they are used. The overall objective of MADAM is to provide software engineers with modelling language extensions, tools and middleware that collectively foster the design, implementation and operation of innovative applications and services for the mobile user.