The Real-Time QoS Enabled Cloud

3rd EU ICT IRMOS Public Seminar

September 16th, 2010

Location: University of Oslo, Gaustadalléen 23, Blindern

Time: 14:00

Room: Informatikkbygningen, room 3B

http://www.irmosproject.eu

Overview

Cloud computing is one of the hottest buzzwords in IT today and is expected to provide the foundation infrastructure for the Future Internet. The commoditisation of IT resources and the ability to dynamically align user demand to resource provisioning has made Clouds the success we see today through offers by vendors such as Amazon, Microsoft Azure and Salesforce. However, significant research challenges exist that are barriers to adoption by the enterprise in the areas of security and quality of service guarantees

This seminar will present results from the EU ICT IRMOS project which is addressing these barriers by investigating novel approaches to support real-time QoS guarantees for interactive real-time multimedia applications on service oriented infrastructures. It is an EC FP7 project with academic and industrial partners from across Europe:

The seminar will cover our research on how to describe and model complex interactive applications, how to execute and monitor distributed applications that are executed on IaaS locations and future plans on how to achieve fault tolerance in the form of migration to different resources in case of failure and renegotiation in case of performance estimation errors. Challenges in QoS enabled data storage subsystems will also be presented.

Agenda

14:00 – 14:10 Introduction and Overview of IRMOS

Lecturer: Dimosthenis Kyriazis (NTUA)

Abstract: During this session, an introduction will be given, along with an overview of the IRMOS project. Following presentations will be outlined and introduced.

14:10– 14:40 Modeling Interactive Real-time Applications on Service Oriented Infrastructures (30' + 10' Q&A)

Lecturers: Luis Costa (SINTEF) and Juri Papay (IT-Inn)

Abstract: In this session, specifications for describing applications in order to be included in a Cloud environment will be analyzed along with techniques and tools developed within IRMOS for modelling and and describing distributed applications through the Papyrus tool and the IRMOS profile. These mainly cover interactive media applications hosted on third-party virtualised resources (storage, processing and networking). These models have value in many stages of the application lifecycle, for example when configuring applications, determining their characteristics, estimating resource needs in advance of execution, when negotiating QoS with service providers. The ASLA creation from elementary service component descriptions will be demonstrated. It is the major step in order to adapt an application that is going to be offered as a service to the platform and infrastructures to which this is going to be executed.

14:40- 15:00 Challenges for data storage subsystems in cloud environments (15' + 5' Q&A)

Lecturer: Ganesan Umanesan (XYRATEX)

Abstract: The service oriented infrastructures for real time applications ("real time clouds*") pose certain unique challenges for the Data Storage Subsystem, which indeed is the "last mile" for all data accesses. Data Storage subsystems typically used in regular Enterprise environments have many limitations which impedes its direct applicability for such clouds, particularly in its ability to provide Quality of Service for applications. This session focuses on the current challenges for data storage subsystems in cloud environments, how we arrived at our storage architecture, and the specifics of the incorporation of quality of service capabilities, including the interfacing aspects with the rest of the real time cloud enabled IRMOS modules. We also present some interesting results and current outcomes.

15:00 – 15:10 Break

15:10 – 15:40 Workflow Management and Monitoring in Distributed, Virtualized Computing (20’ + 10’ Q&A)

Lecturer: Spyridon Gogouvitis (NTUA)

Abstract: In the current Cloud business model, the roles of SaaS, PaaS and IaaS pose new requirements in the execution of distributed applications. The mediation of providers, the use of virtualization, the transfer of information through heterogeneous environments needs mechanisms that are able to follow the applications and flow of data in this multi layer approach. The design and implementation of the IRMOS Workflow Enactor and Monitoring Services will be described in this presentation.

15:40– 16:15 Fault Tolerance and live migration in real-time Clouds (25’+10’ Q&A)

Lecturer: Soren Berger (USTUTT)

Abstract: This session will focus on the issues of fault tolerance in real-time enabled multi layer cloud environments. Visualization adds new features like live migration and gives the IaaS provider more opportunities to provide more reliable, efficient and flexible service execution. SLAs and QoS constraints used in a real-time environment forces the IaaS provider to have a predictable behavior even if a service stops working or is migrated during the execution.