INF5360
Dependable and Adaptable Distributed Systems

Seminar overview

Lecturers: Frank Eliassen (frank)
Roman Vitenberg (romanvi)

Outline

- Seminar overview (Frank)
- Introduction to dependable distributed systems (Roman)
- Introduction to adaptive distributed software systems (Frank)
- Dependability and adaptivity (Roman)

Motivation

- The scale and dynamism of distributed systems are exploding
  - mobile and P2P systems
  - commercial server clusters
- Need greater emphasis on the ability of distributed systems to tolerate failures and adapt to ever changing conditions.
- Companies are suffering significant losses daily because of system downtime while administrators are performing manual repairs and reconfigurations.
- Recent standards on SOA and Web Services devote much attention to these non-functional system properties
  - WS-Reliability
  - WS-ReliableMessaging
  - etc

Learning goals

- The seminar provides students with a basic understanding of state-of-the-art in the area of dependability and adaptivity of distributed software systems
- The seminars covers
  - Architectural and infrastructural principles for adaptive and dependable distributed systems.
  - Adaptivity and dependability in service-oriented architectures, grid computing, P2P systems, data dissemination schemes, mobile and wireless environments.
  - Approaches to improve the scalability of dependable and adaptive systems.
  - Evaluation and experience reports on dependable and adaptive distributed systems and services.

Seminar elements

- 1-2 lectures
  - overview and challenges
- Paper pool
  - About 15+ papers of various lengths
  - Constitute (most of) the examinable material
- One paper presentation per student
  - Other students act as opponents
- Otherwise self-organizing reading group
- Student presentations
  - Paper presentation
  - Criticism of paper
  - Discussion
- Guidelines for the above

Exam and grading

- Oral exam
  - paper pool and other results of seminar activity
- Grading based on
  - presentations (~ 30-40%)
  - participation (~ 10-20%)
  - oral examination at end of seminar (~ 50-60%)

Plan for student presentations

- A detailed plan will be provided during this week
- First student presentations: 9th February
  - Decide today (or during this week) who will do the presentations
  - Otherwise: read background and overview papers
- Lecture 2nd February
  - On reading, reviewing and presenting research papers (Roman)
  - Seminar topics (Roman/Frank)
  - Demo

Student presentation 9th February (1)

- A.1 Architecture-based approach to adaptivity
  - An Architecture Based Approach to Self-Adaptive Software, P. Oreizy et al, IEEE Intelligent Systems, 1999 (9p)
  - This paper provides an overview of requirements and introduces principles, concepts and terms of self-adaptive software that are generally valid across most approaches to architecture-based adaptivity
  - Optional: Other supporting literature from today's overview lecture

Student presentation 9th February (2)

- D.1 Practical reports on dependability
  - "Causes of Failure in Web Applications" by Soila Pertet and Priya Narasimhan
  - Other relevant reports on http://www.cs.cmu.edu/~priya/downtime.html
  - Check if there are any on distributed systems. If there is none on distributed systems, then a short presentation on
  - "How do Mobile Phones Fail? A Failure Data Analysis of Symbian OS Smart Phones", Marcello Cinque, Domenico Cotroneo, Università di Napoli, Napoli, Italy, Zbigniew Kalbarczyck and Ravishankar Iyer, University of Illinois at Urbana-Champaign, IL, USA
  - This paper is not about distributed systems but apart from being an entertaining practical report, it describes interesting techniques for evaluating dependability.

Quality assurance at the Department of informatics

- As a student you have the right and duty to contribute to the quality assurance of your study program. This is done primarily by participating in midt term evaluation. The course lecturer will initiate the mid term evaluation for each course
- The mid term evaluation provides you with the opportunity to give feed back and suggestions regarding the teaching during the semester, to ensure that improvments can be done during the course
- You may find more information on the main page of Institutt for informatikk under ”Annet” – ”Kvalitetssikring”, or by following the link: http://www.ifi.uio.no/studinf/kvalitetssikring/studenter