Advanced Distributed Systems

Overview

Teachers

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Examination

Advanced Distributed Systems

First given fall of 2014
Applied distributed systems
Practical project-oriented course focus

Previous Courses

Grid Computing
- specialized, focused on research / Grid infrastructure
  - Globus Toolkit
Service-Oriented Architectures
- large-scale distributed systems design patterns
  - web services
  - Apache Axis2 / Restlets

Experiences and Evaluations

Overall very positive feedback
Good
- assignments
- freely chosen project topic
- very applicable and in-demand knowledge
Bad
- high workload
  - BOINC assignment

Distributed Systems Track

(Operating Systems)
- foundations
Distributed Systems
- theoretical
  - algorithms
Advanced Distributed Systems
- practical
  - systems
Cloud Computing
- cloud-specific
  - infrastructures and software
Course Information – Overview

The course is given as a 50% pace 7.5 credit course. The examination is based on three parts:
- Individual assignments (40-60 points)
- Group project (30-45 points)
- Individual written examination (10-15 points)

Examination composition chosen by student, students can select individual examination paths. The majority of the grade is based on practical work.

Teachers

- P-O Östberg
- Ahmed Ali Eldin
- Ewnetu Bayuh Lakew
- Luis Tomas
- Jakub Krzywda

Course Information – Modules

The course consists of four modules:
- Building Blocks
- Security
- Distributed Computing
- Industry Guest Lectures

Building Blocks

- Introduction
- Service models
- Service-Oriented Computing
- Service-Oriented Architectures

Security

- Introduction
- Tools (cryptography)
- Applications
- Evaluation and attacks

Distributed Computing

- High-Performance Computing
- Grid Computing
- High-Throughput Computing
- Peer-to-peer computing
- Cloud Computing
Guest Lectures

- Tieto
  - telecommunications perspective
  - test-driven agile development
- Vitec
  - business systems perspective
  - development-operations (devops)
- CodeMill
  - consultant perspective
  - digital media management projects

Tutorials

- One tutorial per assignment
  - web services
  - cryptography
  - Chord
  - Cassandra
- Introduction to the assignment development environments
- A chance to get started with a teacher in the room

Assignments

1. (Web) Services
   - SOAP - Axis2
   - REST - Restlet
2. Security
   - Google Protocol Buffers
   - AES
   - RSA
3. Peer-to-Peer Computing
   - Chord
4. Distributed Databases
   - Cassandra

Course Project

- Large programming project
  - roughly the size of (at least) two assignments
- Groups of 2 students
- Topic chosen by students
- Public presentation of results

Grade, Grading, and Bonus Credits

- 4 Assignments
  - individual
    - minimum score 10, maximum 15
- 1 Project
  - group (2 students)
    - minimum score 30, maximum 45
- 1 Written examination
  - individual
    - brief (multiple choice, max 30 minutes)
    - minimum score 10, maximum 15
- Grade based on accumulated score, free composition
  - U: 0-49
  - 3: 50-64
  - 4: 65-79
  - 5: 80+
- Bonus credits do not carry over to resubmissions
Examination

- Register (as students taking the course)
- Follow instructions in the assignment specification
- Hard deadlines
  - one second chance, within five (working) days
  - resubmissions not eligible for bonus credits
- Assignment and project reports
  - design decisions, issues, discussion
  - evaluate (task, solution, and results)
  - demonstrate knowledge and understanding