INF 5090: Advanced Topics in Distributed Systems
– a distributed, international graduate course –
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Outline

• Background
• Basic idea and approach
• Content of the course
• Time schedule
• Lab assignments
• Collaboration
• Tools
• Credits, marks, and grading
• Benefits
Overall goal

• Learn about important developments in the future Internet
  – Classical lecture
  – Hands on in team work

• Do something more exciting ….  
  … Go international!

Basic Idea and Goals

• Provide a framework for intensive European collaboration in graduate-level courses/seminars
• Provide high quality lectures from internationally recognized lecturers
• Let students from different European Universities work together in one team to solve concrete assignments
• Enable personal contacts between lecturers, students, and teaching assistants (TAs)
• All institutions should benefit in teaching and research from this course/seminar
• Keep administrative overhead acceptable
• Keep traveling costs (monetary and time) low
History of Support

- **E-NEXT (Emerging Networking Experiments and Technologies)**
  - Networked audiovisual systems and home platforms
  - 1/01/2004 - 31/12/2005
  - EU, IST, FP6-506869
  - 41 partners

- **CONTENT (CONTENT NETWORKS AND SERVICES FOR HOME USERS)**
  - Networked Audiovisual Systems
  - 1/07/2006 - 30/06/2009
  - EU, IST-2006-38423
  - 11 partners

- **EINS (NETWORK OF EXCELLENCE IN INTERNET SCIENCE)**
  - Future Internet
  - 1/12/2011 – 1/5/2015
  - EU, FP7, ICT, 288021
  - 33 partners

History of Involvement

- **Involved organizations (since the beginning):**
  - [List of universities and organizations]
Who is Teaching this Year?

– University of Mannheim (Germany):
  Wolfgang Effelsberg, Stephan Kopf, Phillip Mildner

– University of Oslo (Norway):
  Thomas Plagemann, Knut Omang, Stein Kristiansen

– Possibly additional guest lectures

What are we teaching?

Future Internet

Evolutionary:
- Multicast and CacheCast
- Streaming through firewalls and NATS
- Mobile Ad-Hoc Networks
- Network virtualization

Revolutionary:
- Basic principles
- Delay tolerant networking
- Autonomic Networking in ANA
- Sensor networks, DSMS and events
- Data Center Networks
Preliminary Lecture Plan

http://www.uio.no/studier/emner/matnat/ifi/INF5090/h15/timeplan/index.html#FOR

Lab Assignments

• A team of 4 students works on one assignment
  – Normally 2 local students together with 2 remote students
• Time frame for lab assignments: 21. 9. – 2. 11.
• The deliverables:
  – Paper with design, implementation, and results
    (max 10 pages IEEE format)
  – Code, traces, etc. documented!
  – Presentation of results (mandatory for PhD students @ UiO)

• Important: you have to learn and practise collaboration!
  → tools
Lab Assignments

• Each institution defines assignments that are of their strong interest
• In Oslo you can follow many of our lab assignments up with a Master thesis
• From each institution a supervisor will be responsible for the groups that work on their assignments
• Preliminaries before the real group work starts:
  – Light-weight introduction into project management and team work
  – Introduction into the available collaboration tools
  – Introduction into software that should be used for the particular tasks

Lab Assignments (cont.)

• Examples of previous lab assignments:
  – Studing multihoming on handheld devices
  – Investigation of adaptive bitrate streaming over HTTP
  – Investigating Energy Consumption and Quality of Context Detection for Mobile Phone
  – Proxy to duplicate RTP/UDP traffic
  – Implement the CacheCast protocol in the ns-3 network simulator
  – Image retargeting for handheld mobile devices
  – WebGL on Mobile Devices
  – Analysing the Impact of Internet Worm Attacks Using a Simulation Environment
Lab Assignments (cont.)

- Algorithm for assigning assignments:
  - List of all assignments will be published early February
  - There will be a list in which all students insert their preferences
  - We try to match as good as possible the indicated preferences
  - The group assignments will be published February 26th

- Workshop to boot strap joint work on September 21st
  - Students and supervisors from University of Mannheim come to Ifi
  - All Ifi students must join the meeting (start 10:15)
  - Goal:
    - Get to know each other
    - Brainstorm together with the supervisor
    - Make together a plan for further collaboration

Collaboration

- Tools:
  - Lecturnity: [www.lecturnity.de](http://www.lecturnity.de)
  - Collaboration tool from Univ. Of Mannheim
- Take up immediately contact with your team
- Which communication channels you want to use
  - White board
  - Chat room
  - E-mail
  - Netmeeting
  - Instant messanger
  - ..... 
- When do you want to communicate
  - Regular schedules help, e.g., meet in a chat room every Tuesday and Thursday at 14:00
Collaboration (cont.)

• Preparation:
  – Reading background information
  – Analyze the problem
  – Get familiar with the programming environment and tools
• Design:
  – Brainstorm and develop different ideas for solving the problem
  – Describe their design
  – Discuss and compare their pros & cons
  – Select one (or more)
• Implementation:
  – Split up the implementation task
  – Identify core data structures and interfaces
  – Take care of versioning
• Evaluation:
  – Discuss what should be evaluated, why, and how
  – Analyze the results
  – How to best present the results

Collaboration (cont.)

• Who is doing what when?
  – Team: Make a rough time plan (e.g., start with the tasks on the previous page)
  – Each member: Identify the times you can (and cannot) spend time for the assignment
  – Each member: Select those tasks you would like to do and which match your personal schedule
  – Team: Take care that there is for all tasks at least one responsible (OBS: preparation cannot be entirely partitioned)
  – Team: Compare each week current achievements vs. time plan, estimate the impact of delays, adjust effort and task distribution, update the time plan
• In the last section of the paper each team must identify who has contributed to what!
Great Solutions

• Examples of publications based on lab assignments:
  – If you consider this for your results involve your supervisor!

Marks and Grading

• The following marks are used:
  – Oslo: A,B,C,D, .. E, F
    • A – E is passed
    • F is failed
  – Mannheim: 1,2,3,4, .. 5
    • 1-4 is passed
    • 5 is failed
Marks and Grading (cont.)

- How to perform grading in Oslo (Ifi/UiO):
  - Final mark is based on two parts:
    - 50% weight for oral examination of the theoretical part, i.e., the lectures
      - We provide for each lecture literature in addition to the transparencies
      - Not all lectures are part of the syllabus that will be subject to examination
    - 50% weight for lab assignment and report
    - For PhD students a mandatory presentation
- How to agree on a mark for international groups:
  - for each lab assignment there is one supervisor
  - supervisor identifies how much % has been solved (and agrees with external examiner on this for Oslo students)
  - the % is mapped to the local marking system
- Important: marks and grading are compliant to the local rules!

Summary

- Why a distributed course?
- What do we teach?
- Which lab assignments?
- How do we collaborate?
- How is the course graded?