

Distributed Systems

Course Overview

Werner Nutt

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Aims

- Introduce the principles and concepts involved in the design of distributed systems
- Familiarise students with protocols and interfaces used in the construction of distributed systems
- Enable students to realise themselves simple distributed systems

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Outline (tentative)

- Introduction to Distributed Systems
 - Definition, Examples, Challenges
- Networking Foundations
 - Network characteristics relevant for DS
 - Network principles, Internet protocols (IP, UDP, TCP)
- System Models
 - Architectures, Interaction, Failures, Security
- Concurrent Programming
 - Threads in Java
- Interprocess Communication
 - APIs for Internet protocols, data marshalling
 - Communication models

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Outline (tentative, order may change)

- Distributed Objects
 - Remote Method Invocation (RMI), RMI in Java
- Naming
 - Names, Addresses, Name Resolution
 - Internet DNS
- Time and Clocks
 - Clock synchronisation, logical clocks
- Coordination
 - Mutual exclusion, elections, multicasts
- Fault Tolerance
 - Two Phase Commit

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Textbooks

- Kurose, Ross.
Computer Networking – A TopDown Approach
Pearson Education
- Tanenbaum, van Steen.
Distributed Systems. Principles and Paradigms.
Prentice Hall
- Tanenbaum.
Computer Networks.
Prentice Hall
Both books by Tanenbaum are written in a lively style and make
for good reading
- Coulouris, Dollimore, Kindberg.
Distributed Systems. Concepts and Design. 3rd and 4th ed.
Addison Wesley
Used for chapters on interprocess communication and distributed objects.

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Exam

- Written exam in January/February
 - conceptual questions
 - programming questions
- Final mark
 - either: 100% exam mark
 - or: 70% exam mark + 30% exercise markwhichever is higher

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Labs

- Lab tutors: Paul Knoll, Werner Nutt
- Labs:
 - Introduction to technologies
 - Networking, routing with Cisco routers (29/11, 13/12, 20/12)
 - Interprocess communication
 - Remote Method Invocation
 - Threading and synchronization
 - Name services
 - etc.
 - Programming support for exercises
- Coursework:
 - Elaboration of networking and routing exercises
 - Little Programming projects (in groups of 2)

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Coursework: Rules

- For the coursework you submit you will receive marks
- It is expected that the submissions represent your own work
 - This is not the case if parts of text or code are taken from sources on the web or from other students
 - Copying, e.g. from the web or from other students, will be considered as plagiarism
- Plagiarism will not be tolerated:
 - A single attempt will result in a mark of 0 awarded to all coursework, that is, the entire work for the coursework will be invalidated by one incident of plagiarism
 - In more severe cases, students can be excluded from the exam in January/February

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Schedule

	Mon	Tue	Wed	Thu	Fri
10:30 12:30	Lecture <i>Nutt</i>				
14:00 16:00		Office hour <i>Nutt</i>			
17:00 18:00	Lab Group A <i>Nutt</i>	Die Labs von Paul Knoll finden 16-18 Uhr und 18-20 Uhr statt			
18:00 19:00	Lab Group B <i>Nutt</i>				

Contact

- Office hours
Di, 14:00 – 16:00
- Email
nutt@inf.unibz.it
- Course web pages
<http://www.inf.unibz.it/~nutt/DSs1011.html>
- Labs: Knoll/Nutt