Master Kurs
Rechnernetze
Computer Networks
IN2097

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Course organization

- Lecture
  - Thursday, 10.15-11.45, HS 2
  - Friday, 10.15-11.45, HS 2

- Exercises
  - Typically Bi-weekly, Friday 10.15-11.45, HS 2 (may vary)

- Students are requested to subscribe to lecture and exercises at http://www.net.in.tum.de/de/lehre/ws0809/vorlesungen/master-networks

- Email list
  - for subscribers to lecture and exercises

- Questions and Answers / Office hours
  - Prof. Dr. Georg Carle, carle@net.in.tum.de
    - After the course
    - Office hours: upon reservation, possibly Thursday, 12.30 to 13.30
  - Dr. Thomas Fuhrmann, fuhrmann@net.in.tum.de
Course Material

- Course Material
  - All slides will be made available online. Slides may be updated during the course.
  - The first part of the course focuses on Internet Protocols Material by Thomas Fuhrmann
  - The second part of the course is heavily based on the course CS653 "Advanced Computer Networks" by Prof. Jim Kurose, University of Massachusetts, Amherst. http://www-net.cs.umass.edu/cs653/schedule.htm
  - The permission by Jim Kurose to use his material is gratefully acknowledged!

- Prerequisites
  - A first course on Computer Networks
    - e.g. Introduction to computer networking and distributed systems, IN0010, c.f. http://www.net.in.tum.de/teaching/SS08/rn1/uebungen/
Fundamental Books

  - Innovation: Presentation of Protocols Top-Down
  - Statements of key persons in networking research

Andrew S. Tanenbaum:

- *Computer Networks*
  Prentice-Hall, 4th edition 2003
  ISBN-10: 0130661023, 80 €

- (German translation of this edition unfortunately of low quality, Pearson Studium; 50 €, 4. Auflage 2003
  ISBN-10: 3827370469 )
Additional relevant books

- S. Keshav: *An Engineering Approach to Computer Networking*. Addison-Wesley, 1999
  - Very good quantitative treatment of computer networks
  - Motivation of many design decisions

  - Many details of the implementation of TCP/IP in BSD Unix
Course Outline

- Part 1: Internet protocols
  - Link Layer protocols
  - Network Layer protocols
  - Transport Layer protocols
  - Application Layer protocols
- Part 2: Advanced Computer Networks Principles
  - review: packet-, circuit-switching
  - common themes: signaling, indirection, virtualization, multiplexing, randomization, scalability
  - implementation principles: techniques
  - network architecture: the big picture, synthesis
  - network algorithmics: self stabilization (routing examples), broadcast/controlled flooding (link state broadcast, ad hoc routing), routing and congestion control: an optimization viewpoint
  - network simulation: discrete event simulation, simulator ns-2
  - performance analysis (time permitting)