IK2215 Advanced Internetworking 7.5 credits

Avancerad internetteknik

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for IK2215 valid from Autumn 2013

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Electrical Engineering, Computer Science and Engineering

Specific prerequisites

Required: Knowledge in computer communications. For instance a course in Internetworking (e.g., IK1550 or IK1551).

Recommended: Experience of working in Unix environments.

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

Students will get a deep understanding of protocols and hands-on experience in setting up and operating TCP/IP networks. This means that, after the course, students will be able to:

- describe the functionality of devices and design principles of protocols at the network and transport layers (e.g., routers, routing protocols, multicast, address structures)
- based on general principles and study of different protocol standards be able to understand advantages and disadvantages of different protocol designs.
- critically evaluate current as well as new protocols designs in general and network layer protocols in particular, using technical considerations such as scalability, robustness, and manageability as a basis of comparison.
- to design, set up and operate a TCP/IP network, and to provide TCP/IP services to end-users, using primarily PC hardware and Unix. You will also be able to describe how interior routing protocols, dynamic address assignment, and the domain name system work, and set up intradomain routing, DNS and DHCP services, and TCP/IP application servers such as mail and web.

Course contents

This course focuses on communication protocols for the Internet, and the emphasis is on the generic mechanisms at the layers of the TCP/IP stack. To get a deeper understanding of these mechanisms we evaluate and compare the design of different protocols. To further illustrate these principles and get hands-on experience the course contains a set of lab assignments and a project.

Disposition

The course consists of three parts: a series of lectures, laborations, and a project assignment.

The lectures cover the theoretical background behind the various topoics we cover in the course. The labs will give you experience of applying the theoritecal concepts in practice. The purpose of the project assignment is to give you hands-on experience on how to set up a more complex ISP (Internet Service Provider) network. You will work together in groups in a project to learn about and to demonstrate how to design and configure an ISP network, including different services.

Course literature

Computer Networking, A Top-Down Approach: International Edition, Sixth Edition by James F. Kurose, Keith W. Ross

ISBN-13: 978-0-273-76896-8

ISBN-10: 0-273-76896-4

Examination

- PRO1 - Project work, 1.5 credits, grading scale: P, F
- TEN1 - Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Work, 3.0 credits, grading scale: P, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Other requirements for final grade

The final degree is based on the result of the written exam. To receive grade "pass", the student should be able to describe and explain design principles for communication protocols dealt with during the course, as well as be able to apply these protocols in real TCP/IP networks. To receive a higher grade, the student should also be able to critically evaluate and assess different communication procols as well as be able to compare and explain advantages and disadvantages with various protocol designs.

The course is divided into three parts, and to receive a final grade "pass" all three parts must be approved:

- Written exam (A-F)
- Laborations (Pass/Fail)
- Project assignment (Pass/Fail)

The final grade is based on the written exam.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.