IK2205 Inter Domain Routing 7.5 credits

Inter Domain Routing

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

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

Establishment

Course syllabus for IK2205 valid from Autumn 2010

Grading scale

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

Education cycle

Second cycle

Main field of study

Information Technology,Information and Communication Technology

Specific prerequisites

Good knowledge in networking with TCP/IP.
For instance, courses like Internetworking (e.g., IK1550 or IK1551) or Advanced Internetworking (e.g., IK2204/IK2215).

Language of instruction

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

Intended learning outcomes

This course deals with general concepts and design alternatives for

inter-domain routing, i.e., routing between autonomous systems in

the Internet. Students will get a deep understanding of the design,

condfiguration, and operation of inter-domain routing in general.

In particular, students will get hands-on experience in using the

Border Gateway Protocol (BGP).

This means that, after the course, students will be able to:

* describe the functionality, concepts, and design principles of inter-domain routing solutions. This includes e.g., internal vs external routing, autonomous systems, and the Border Gateway Protocol (BGP).

* differ between routing inside and between autonomous systems, and explain how to control routing inside autonomous systems as well as how to control large-scale autonomous systems.

* critically evaluate various BGP routing designs using technical considerations like scalability, robustness, and manageability as a basis for comparison.

* based on principles of inter-domain routing and studies of BGP compare and explain advantages and disadvantages of different routing architectures and suggest improvements.

* design, configure, and operate BGP routing in networks with multiple autonomous systems, including a mix of both provider and customer networks. This includes the configuration and maintenance of various routing policies, e.g., to control inbound and outbound traffic.

Course contents

The course deals with the inter-domain routing problem, giving a deeper understanding of the routing between autonomous systems in the Internet.

To illustrate important principles and to get hands-on experience the course contains a set of lab assignments in addition to theoretical parts, like lectures.

The focus of the course is design, implementation and operations of inter-domain routing, with much weight on the ability to convert abstract designs into practical network implementations. The course will use the external gateway protocol BGP to solve different routing problems.

Course literature

Internet Routing Architectures, Sam Halabi

Edition: 2nd edition Publisher: Cisco Press Year: 2001

ISBN: 1-57870-233-X

Examination

- LAB1 - Laboratory Work, 3.0 credits, grading scale: P, F
- TEN1 - Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- UPP1 - Assignment, 1.5 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.

Other requirements for final grade

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)
* Home assignment (Pass/Fail)
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 and various concepts for inter-domain routing that have been dealt with during the course, as well as be able to apply these principles and concepts in real TCP/IP networks.
To receive a higher grade, the student should also be able to critically evaluate and assess various routing architectures, compare routing solutions and explain advantages/disadvantages as well as suggest improvements.

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.