IK2220 Software Defined Networking (SDN) and Network Functions Virtualization (NFV) 7.5 credits

Mjukvarubaserad nätverksteknik (SDN) och virtualisering av nätverksfunktioner (NFV)

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

Establishment

Course syllabus for IK2220 valid from Spring 2024

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

Students who attend this course are required to have passed IK2215 (Advanced Internetworking) or have equivalent knowledge in Internetworking and Computer Communications.

Good programming knowledge (C++, Java, or Python but preferably all).

Language of instruction

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

Intended learning outcomes

After passing the course, the student should be able to

- describe the key benefits of Software Defined Networking (SDN), in particular those benefits brought about by the separation of data and control planes
- describe the SDN data plane
- explain in detail the operation of the SDN control plane
- configure an SDN-friendly network emulator
- program a sample SDN for a given task
- explain network virtualization
- describe techniques used for verification and debugging of SDNs
- describe Network Functions Virtualization components and how they work together
- describe the role and functionality of middleboxes in networks and how they are managed
- configure an example service using SDN and NFV
- describe techniques to enable applications to control the underlying network using SDN
- give examples of and describe current research problems within SDN and NFV
- describe the role control and dataplane can have for machine learning training and inference

in order to gain a deep understanding of Software Defined Networking (SDN) and Network Functions Virtualization (NFV).

Course contents

Software Defined Networking (SDN). SDN control plane. Programming large SDNs. Examples of SDN Deployments. Debugging and verifying SDNs. Role of middleboxes in the dataplane. Network Functions Virtualization (NFV). Efficient use of all available hardware for NFV dataplane processing. Load balancing for NFV. Programmable control and dataplane for machine learning applications.

Examination

- SEM1 - Paper Summaries, 2.5 credits, grading scale: A, B, C, D, E, FX, F

- PRO1 - Project Assignments, 2.5 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Written Exam, 2.5 credits, grading scale: A, B, C, D, E, FX, 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.

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.