IK2554 Practical Voice Over IP (VoIP) 7.5 credits

Röst över IP (VoIP) i praktiken

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

Establishment

Course syllabus for IK2554 valid from Spring 2019

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

Data and Computer Communications or equivalent knowledge (such as 2G1700)

Language of instruction

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

Intended learning outcomes

Practical Voice Over IP (VoIP): SIP, and related protocols

This course will give both practical and general knowledge concerning Voice over IP. The emphasis will be on the underlying protocols.

Following this course a student should be able to:

- Understand the relevant protocols (particularily SIP, SDP, RTP, and SRTP): what they are, how they can be used, and how they can be extended.

- Enable you to utilize SIP in Presence and event-based communications

- Understand how SIP can provide application-level mobility along with other forms of mobility

- Understand how SIP can be used to facilitate communications access for users with disabilities (for example using real-time text, text-to-speech, and speech-to-text) and to know what the basic requirements are to provide such services

- Understand SIP can be used as part of Internet-based emergency services and to know what the basic requirements are to provide such services

- Contrast "peer-to-peer" voice over IP systems (i.e., how they differ, how they might scale, what are the peers, ...)

- Know the relevant standards and specifications - both of the protocols and of the requirements (for example, concerning legal intecept)

- Understand the key issues regarding quality-of-service and security

- Evaluate existing voice over IP and other related services (including presence, mobile presence, location-aware, context-aware, and other service)

- Design and evaluate new SIP based services

- Read the current literature at the level of conference papers in this area. • While you may not be able to understand all of the papers in journals, magazines, and conferences in this area - you **should** be able to read 90% or more of them and have good comprehension. In this area it is especially important that develop a habit of reading the journals, trade papers, etc. **In addition, you should also be aware of both standardization activities, new products/services, and public policy in the area.**

- Demonstrate knowledge of this area both orally and in writing. • By **writing** a paper suitable for submission to conferences and journals in the area.

Course contents

Practical Voice Over IP (VoIP): SIP, and related protocols

This course will focus on the **protocols** associate with Voice over IP. The course should give both practical and more general knowledge concerning the these protocols. One of the major aims of the course is that student should be able to build upon these protocols to enable **new** services.

The course consists of 10 hours of lectures and an assigned paper requiring roughly 50h of work by each student.

Topics

- Session Initiation Protocol (SIP)
- Real-time Transport Protocol (RTP)
- Real-time Streaming Protocol (RTSP)
- Common Open Policy Server (COPS)
- SIP User Agents
- Location Server, Redirect Server, SIP Proxy Server, Registrar Server, ... , Provisioning Server, Feature Server
- Call Processing Language (CPL)

Course literature

Henry Sinnreich and Alan B. Johnston, **Internet Communications Using SIP: Delivering VoIP and Multimedia Services with Session Initiation Protocol**, 2nd Edition, Wiley, August 2006, ISBN: 0-471-77657-2

Examination

- PRO1 - Project, 7.5 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.

Other requirements for final grade

Practical Voice Over IP (VoIP): SIP, and related protocolsA written report:
o The length of the final report should be ~7-8 pages (roughly 3,000 words) for each student
o The report should clearly describe: 1) what you have done; 2) if you have done some implementation and measurements you should describe the methods and tools used, along with the test or implementation results, and your analysis.
o The topic for the paper should be selected in consultation with the instructor.
Language: the report can be written in Swedish or English - (better feedback may be available if the report is written in English)

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.