T-106.5250 Distributed systems

Examination 2014-02-19

Only writing tools are allowed in this exam. In each separate answer paper, write the name of the course, the date of the exam, the number of the answer paper and the total number of answer papers (in the form 'paper 1/2'), and your own name, study program, and student number.

Tell also, which edition of the course textbook you have studied (fifth, fourth, or third).

Try to answer clearly. When preparing the answer for an essay, think first what you know about the subject and make some notes. Remember that the subject may have been described in several chapters of the book. Design an outline for your answer and only after that start writing. You can use subsection headers to make your answer clearer.

1. (12p) Give a short answer to following questions (max. 100 words per question):

   (a) Give a definition of distributed system.

   (b) What is peer-to-peer architecture and why is it useful?

   (c) Why do we need middleware?

   (d) What are logical clocks and logical time, and why are they needed?

   (e) What problems does the use of locking cause in transaction processing?

   (f) What are the ACID properties of transactions?

2. (6p) Essay: Failures in distributed systems.

3. (6p) Essay: Remote invocation. Describe different forms of remote invocation and their implementation.

4. (6p) Essay: Processes and threads. Describe processes and threads and compare the advantages and disadvantages of using them.