

Computer Networks and Distributed Systems

Exercise Sheet 1

Publication: October 17, **Discussion:** October 24—October 28, **submission not mandatory**

General Information: Successful completion of the practical class requires:

- Presentation of 2 of exercises (except quiz questions)
- 25% points in the programming exercise

The quiz questions are an additional opportunity to review the contents of the course.

The solved exercises may (but do not have to) be solved and sent to your for correction.

Quiz questions

1. The infrastructure service installs on all university network computers a unified distribution of office software. Does this count as a distributed system?
2. Is the physical mail a connection-oriented or a connectionless service?
3. Suppose that mail privacy is guaranteed. Which error classes can occur (and which can not) while communicating via physical mail?
4. Think of issues with computing a global state inside a distributed system.

Exercise 1.1 Sketch the following processes in a time diagram (see slides: Chapter 1, p. 10, 17). Please highlight and name important places.

- (a) A. Nonymous would like to buy unicorns in a dark corner of the Internet. To do so, he transfers an amount of 1000 Bitcoins to a neutral third party M and waits for his order. M informs the unicorn trader, who then ships the ordered unicorns via air mail. When the package is received by A. Nonymous, he informs M , who transfers the money to the unicorn trader.
- (b) Alice makes a phone call to Bob. Describe the process with the agents Alice, Bob, and the telephone exchange.

Exercise 1.2

- (a) Describe the differences between the terms *simplex*, *half-duplex*, and *(full) duplex*. How can duplex communication be made possible?
- (b) Differentiate the terms *broadcast*, *unicast*, *multicast*.