

1. Problem Sheet

Out 19.04.17

Due 25.04.17

Discussion 28.04.17 - 02.05.17

Contacts

Prof. Dr. Mesut Güneş

MSc. Marian Buschsieweke marian.buschsieweke@ovgu.de

MSc. Kai Kientopf kai.kientopf@ovgu.de

Please solve the problems in groups with two people and submit your solutions before the lecture. The discussion of the problem sheet is in the exercise course after the submission.

The first exercise courses are related to the discussion of the first problem sheet on 28.04.17, 01.05.17, and 02.05.17.

Problem 1: OSI model

3 points

Name the layers of the OSI model starting from the top and their general (most important) functions.

Problem 2: Bridges and Switches

3 points

What layer of the OSI reference model do bridges and switches operate?

Problem 3: Link Layer

3 points

What is controlled at the link layer?

Problem 4: Overhead

3 points

Explain which service type has more overhead - connection-oriented or connection-less communication?

Problem 5: Communication Principles

3 points

Explain the differences of unicast, multicast, anycast, and broadcast transmissions. Give an example application for each transmissions type. Do you know what a concast and geocast is? What is the difference between a broadcast and flooding?

Problem 6: Cost efficient network upgrade

2+3 = 5 points

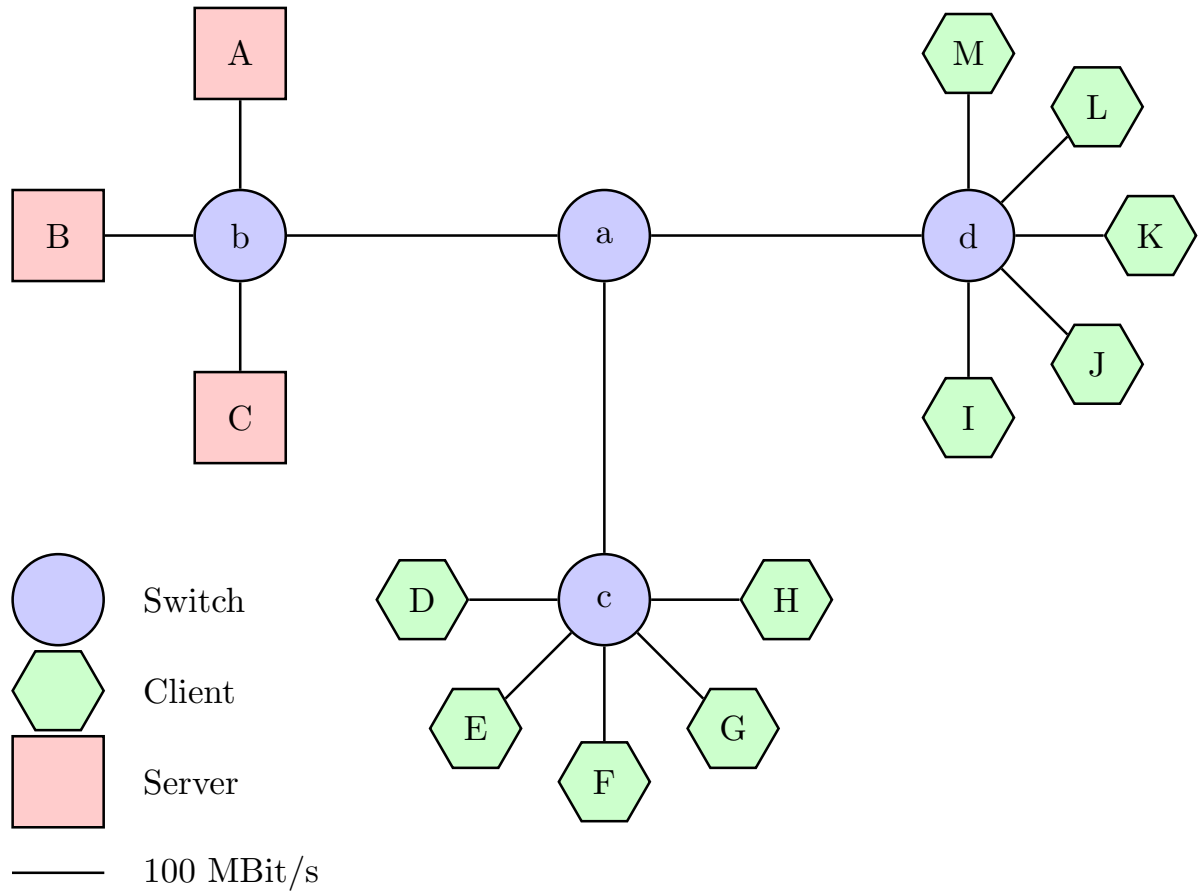


Figure 1: Network architecture to upgrade

1. Given the network architecture shown in Figure 1, what is the maximum network throughput when all clients access random servers in parallel?
2. You could upgrade the 100 MBit/s connections to 1 GBit/s. However, you wonder if you could achieve a significant speed up with only upgrading a few connections. Is this possible? How big is the speed up?

a total of 20 points