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Exercises in PMMC

Exercise 6

Hand out date: Wednesday Nov 2, 2016
Submission until and discussion: Nov 9, 2016 9:45

1) IP Switching

1.1) What are drawbacks, when IP routing is performed in the backbone of the Internet?

1.2) What is an overlay network and what is its purpose?

1.3) Argue if overlay networks can be defined on top of other overlay networks.

1.4) Outline the key idea, advantages, and drawbacks of IP switching.

2) MPLS

2.1) What is a label distribution protocol and which information processes a LSR (Label Switch Router)

2.2) Describe all steps that are necessary to enable the transportation of an IP packet in a MPLS network.

3) ADSL

3.1) Assume that the maximal size of PPPoA packets is 1500 Byte and the underlying ATM layer uses AAL5, i.e., 8 Byte AAL5 overhead are being added to each PPPoA packet before being encapsulated into ATM cells. Further, assume that a stream of data has to be transmitted via PPPoA, i.e., no padding bits need to be added by the PPPoA layer when encapsulating the data received from the layer above. Which maximal size for PPPoA packets would you configure in your router in order to minimize the overhead added by the ATM and PPPoA layer?

3.2) Name factors that significantly influence data rates in ADSL infrastructures. Where is ADSL located in the protocol stack of the ISO/OSI basic reference model?

4) Type-of-Service (ToS)

4.1) How is the term *Type-of-Service* related to the terms *quality-of-service* and *service class*? What is the opposite of a deterministic guarantuee and what lies in between these two extreme cases?

4.2) Specify the following stochastic ToS guarantees formally:

a) A jitter of at most 25ms shall be guaranteed with a probability of 90 percent.
b) A throughput of at least 2 Mbit/s shall be guaranteed with a probability of 95 percent.