

Exercise No. 10
Peer-To-Peer Networks
 Winter 2016

Exercise 1 *Basic routing*

There are four hosts A, B, C and D, with two network interfaces, each connected to a single central switch. The switch is not configured, i.e. all ports are connected. The hosts are set to forward packets and choose the Gateway with the smallest metric as their default gateway.

Additionally, you have a DSL modem (*MOD*) connected to your switch. Assume that *MOD* is correctly working and has a default route (0.0.0.0/0) to your internet provider.

	IP	Gateway	Subnet	Metric
A	192.168.1.2	192.168.1.1	/24	1
	10.1.1.1	10.1.1.1	/23	100
B	172.16.1.3	172.16.1.1	/24	1
	10.1.1.2	10.1.1.1	/23	100
C	172.16.1.4	172.16.1.1	/24	100
	10.1.0.3	10.1.1.1	/23	1
D	172.16.1.1	172.16.1.1	/24	100
	10.1.1.3	10.1.1.1	/24	1
MOD	192.168.1.1	192.168.1.1	/24	100

1. Explain, what happens, if
 - (a) B sends a packet towards 172.16.1.3
 - (b) B sends a packet towards 172.16.1.4
 - (c) B sends a packet towards 10.1.0.3
 - (d) D sends a packet towards 172.16.1.2
 - (e) C sends a packet towards 192.168.1.2
 - (f) B sends a packet towards 8.8.8.8
 - (g) D sends a packet towards 10.1.0.3

Also describe the return path, if possible.

We unplug the network cable on host D for the first interface (172.16.1.1). Explain, whether D can reach A or C. Why?

Exercise 2 *TCP*

Alice wants to send Bob a long message (e.g. a large file) using TCP. She knows both the IP and the port of Bob's host.

1. Which packets does her system send to Bob?
2. Explain what Nagle's algorithm does here. Is it important? Why?

Exercise 3 *UDP*

1. Explain, why SIP / VoIP usually prefer UDP.
2. You have two phones connected by a single switch. There are no other devices connected to the switch. Assume that your switch has an approximately endless throughput but loses about 20 % of all packets. Would you still use UDP? Explain.