Department of Electrical and Information Technology ETSF10 – Internet Protocols Answers to selected textbook questions Exercise Session 3

## **Chapter 20**

Exercise 11:If no fragmentation, time to live and header checksum.In case of fragmentation, total length and flags and fragmentation offset in addition.(options ignored here for the sake of simplicity.)



Exercise 13: Advantages of a large MTU: (i) better throughput, increased efficiency due to lower overhead; (ii) less probability of fragmentation, faster delivery, no need for reassembly; (iii) good for non-real-time data transfer.

Advantages of a small MTU: (i) better for multiplexing; (ii) data losses less catastrophic; (iii) good for real-time multimedia apps.



- Exercise 14: The first byte is **offset x 8**. So the byte number is 120\*8 = 960. The last byte is **offset x 8 + total length – (hlen x 4) – 1**.
- Exercise 15: The IP header is between 20 and 60 bytes in size. It can't have less than 20 bytes. Since *hlen* = header length / 4, it's minimum possible value is 5.
- **Exercise 18:** There are 16 bytes of data in the packet. **total length = header length + data length**. 36 = (5\*4) + 16.
- Exercise 19: The total length of the packet is 1044 bytes. total length = header length + data length. 1044 = 20 + 1024.
- Exercise 23:CORRECTION OF QUESTION the header information should read as follows.**0x45 00 00 54 00 03 00 00 20 06 58 50 7C 4E 03 02 B4 0E 0F 02**If you put this into the header you find out the answers more easily.

4	5	00	00 54			
00 03			0	0 00		
2	20 06			58 50		
7C 4E 03 02						
B4 0E 0F 02						

a. Checksum calculation shows the packet is not corrupted.

b. Header length is 20 bytes. There are no options.

c. Flags are not set, offset is 0. No fragmentation.

d. 84 bytes.

e. 32.

f. 3.

g. Normal.

## **Chapter 29**

Exercise 11: With the information given in Figure 29.17 as well as Figure 29.16, the following can be concluded about the amount of data arriving at the receiver, being played, and still in the buffer (in seconds).

Time	Arrived	Played	Buffered
17"	12	9	3
20″	15	12	3
25″	20	17	3
30"	23	22	1



- Exercise 12: TCP, due to its retransmission mechanism and lack of timestamping, is not suitable for real-time traffic. RTP can handle this type of traffic much better since it uses timestamps and does not retransmit lost segments.
- Exercise 13: RTP on top of UDP is still not the same as TCP. See the above answer.
- Exercise 14: RTCP is a control protocol to carry information on flow control and quality feedback. TCP defines these types of messages as an integral part of the protocol, so it does not need anything extra.