

Computer Networking and IT Security (INHN0012)

Tutorial 7

Problem 1 Wireshark

Given is the hexdump in Figure 1.1 in network byte order of an Ethernet frame without checksum, which is to be analyzed in the following

```
0x0000  00 16 3e ff ff ff 00 16      3e 6d cd 0d 08 00 45 00
0x0010  00 58 9f 47 40 00 40 06      47 33 ac 10 fe 02 ac 10
0x0020  fe 01 00 16 da e2 02 5d      78 9a f2 3d 99 17 80 18
0x0030  00 e3 54 70 00 00 01 01      08 0a b3 13 65 ca 11 82
0x0040  53 20 53 53 48 2d 32 2e      30 2d 74 69 6e 79 73 73
0x0050  68 5f 6e 6f 76 65 72 73      69 6f 6e 20 5a 34 43 53
0x0060  69 31 5a 52 0d 0a
```

Figure 1.1: Hexdump of an Ethernet frame, without checksum, in network byte order

Note: To solve this task, information from the cheatsheet is necessary.

- In figure 1.1 mark the start and the end of the Ethernet header.
- Reason, by highlighting and describing relevant header fields, which protocol is used at layer 3.
- Describe how the length of the header on layer 3 is determined. Mark and name relevant sections in figure 1.1.
- Mark all layer 3 addresses and name them.
- Mark all extensions headers contained in layer 3.
- Name and describe the 3 smallest header fields of layer 3. Indicate the size of those fields.
- If there is an L3 SDU, state its type and justify the statement. Otherwise, state your thought process and discuss how this situation could occur.
- The bytes `0x0042` and following are payload of layer 4. Specify the ASCII representation of the first 7 B of the payload.
- What application layer protocol is this probably and what is this protocol used for?

Problem 2 Subnetting

TUMexam AG is assigned the address ranges 131.159.32.0/22 and 131.159.36.0/24. The subdivision of those address ranges is left up to TUMexam AG. After a careful analysis the following requirements for the subnets and the minimal number of **usable** IP addresses are determined:

Subnet	NET 1	NET 2	NET 3	NET 4	NET 5
IPs	300	300	15	40	4

The IP address needed in for the router interface is included in those numbers.

- Write down each first and last IP address of both given address ranges.
- How many IP addresses does TUMexam AG have available? Can all of them be used to address hosts?
- * Is it possible to aggregate both blocks of address ranges into one single subnet?
- Divide both address ranges according to the analysis in order to get subnets with fitting sizes. Use as little IP addresses as possible. A large continuous address range should remain available for future use. For every subnet you should indicate:

- the size of th subnet
- the amount of usable addresses
- the subnet in prefix notation
- the subnetmask in dotted-decimal-notation
- the network and broadcast addresses

Subnet	NET 1	NET 2	NET 3
Requirement			
Size			
Usable			
Prefix notation			
Subnetmask			
Network address			
Broadcast			

Subnet	NET 4	NET 5
Requirement		
Size		
Usable		
Prefix notation		
Subnetmask		
Network address		
Broadcast		

