

City University of Hong Kong
Department of Electrical Engineering

EE3009 Data Communications and Networking

Solution to Tutorial 2

1. Given:

IP packet = 600 data bytes

MTU = 200 bytes

IP header = 20 header bytes

Maximum possible data length per fragment = MTU – IP header = 200 – 20 = 180 bytes.

The data length of each fragment must be a multiple of eight bytes; therefore the maximum number of data bytes that can be carried per fragment is $22 \times 8 = 176$.

The data packet must be divided into 4 frames, as shown by the following calculations:

$$176 + 176 + 176 + 72 = 600$$

$$\frac{20 + 20 + 20 + 20}{196 \quad 196 \quad 196 \quad 92}$$

The sequence of frames and packet headers is shown below:

Total length	Id	Mf	Fragment Offset
Original Packet 620	x	0	0
Fragment 1 196	x	1	0
Fragment 2 196	x	1	22
Fragment 3 196	x	1	44
Fragment 4 92	x	0	66

2.

<i>i</i>	Subnet mask	no. of subnets	no. of hosts
2	255.255.255.192	4	62
3	255.255.255.224	8	30
4	255.255.255.240	16	14
5	255.255.255.248	32	6
6	255.255.255.252	64	2

3. To support 20 subnets and 5 hosts per subnet, 5 bits are borrowed from the last byte. So, subnet mask is 255.255.255.248, and the three smallest subnet addresses are: 201.222.5.0, 201.222.5.8 and 201.222.5.16
For subnet 201.222.5.0, the host addresses are from 201.222.5.1 to 201.222.5.6

4. 128.56.24.0/24 = 10000000.00111000.00011000.00000000
128.56.25.0/24 = 10000000.00111000.00011001.00000000
128.56.26.0/24 = 10000000.00111000.00011010.00000000
128.56.27.0/24 = 10000000.00111000.00011011.00000000
Mask = 11111111.11111111.11111100.00000000
The resulting prefix is 128.56.24.0/22

5.

- a. ::F53:6382:AB00:67DB:BB27:7332
- b. ::4D:ABCD
- c. ::AF36:7328:0:87AA:398
- d. 2819:AF::35:CB2:B271