

Quiz

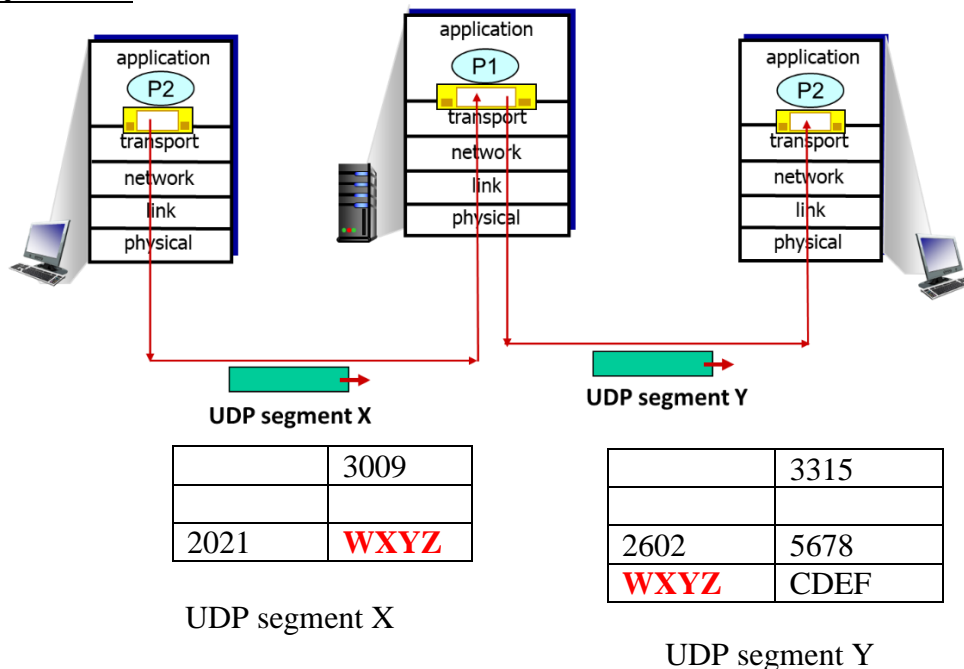
Question 1

Host A sends a packet of **WXYZ** bytes to host B via 2 routers. **WXYZ** are the first 4 digits of your student ID number (in decimal). The distance between host A and the first router is 30 m. The distance between host B and the second router is 35 m. The distance between the two routers is 400 m. The propagation speed is 2×10^8 m/sec. The recommended transmission rates are: 3 Mbps between host A and the first router, 200 Gbps between the 2 routers, and 5 Mbps between the second router and host B. Each router spends 1 msec to perform error detection.

- (a) At what time the last bit of the packet leaves host A?
- (b) At what time the last bit of the packet reaches the second router?
- (c) If there is no congestion in the network, calculate the total end-to-end transmission delay for host A to send the packet to host B.

[5 marks]

Question 2



WXYZ are the last 4 digits of your student ID number (in hexadecimal).

- (a) Determine all the unknown fields of UDP segment X. All numbers are in hexadecimal.
- (b) Similarly, determine all the unknown fields of UDP segment Y.

[5 marks]

Question 3

Host A sends a file of 51,300 bytes to Host B over a TCP connection. Assume the maximum segment size (MSS) is 144 bytes. The segment has no options field. The transport layer, network layer, and data-link layer add headers of a total size of 66 bytes to each segment before the resulting packet is sent out over a 100 Mbps link.

- (a) What is the size of the first packet?
- (b) What is the size of the last packet?
- (c) What is the sequence number (in 8 hexadecimal digits) of the last segment?
- (d) Assume no congestion, calculate the time (in msec, round to 3 decimal places) required to transmit the file.

[5 marks]

Quiz Solution

Question 1

For reference only. Assume WXYZ is 1234.

(a) $1234 \times 8 / 3 \times 10^6 = 3.29 \text{ msec}$

(1 mark)

(b) $3.29 \text{ msec} + (30 / 2 \times 10^8) + 1 \text{ msec} + (1234 \times 8 / 200 \times 10^9) + (400 / 2 \times 10^8) = 4.29 \text{ msec}$

(2 marks)

(c) $4.29 \text{ msec} + 1 \text{ msec} + (1234 \times 8 / 5 \times 10^6) + (35 / 2 \times 10^8) = 7.27 \text{ msec}$

(2 marks)

Question 2

For reference only. Assume WXYZ is 1234.

(a)

3315	3009
000C	6A80
2021	1234

(2 marks)

(b)

3009	3315
0010	4033
2602	5678
1234	CDEF

(3 marks)

Question 3

(a) 210 bytes

(1 mark)

(b) 102 bytes

(1 mark)

(c) 0000 C840

(2 marks)

(d) 5.989 msec

(1 mark)