NETWORK PROTOCOLS

ASSAIGNMENT-III

Q1. Explain the common rules in generating Acknowledgements in TCP. List and Explain how Lost segment, Lost Acknowledgements and Idea of Fast retransmissions implemented in TCP.

Q2. We have the following information shown below. Show the contents of the IP datagram header sent from the remote host to the home agent.

Mobile host home address: 130.45.6.7/16
Mobile host care-of address: 14.56.8.9/8
Remote host address: 200.4.7.14/24
Home agent address: 130.45.10.20/16
Foreign agent address: 14.67.34.6/8
What type of inefficiency do we have in this? Explain your answer.

Q3. A client uses UDP to send data to a server. The data is 16 bytes.

(i) Calculate the efficiency of this transmission at the UDP level(Ratio of useful bytes to total bytes).

(ii) Calculate the efficiency of transmission at the IP level. Assume no options for the IP header.

(iii) Calculate the efficiency of transmission at Data Link Layer. Assume no options for the IP header and use Ethernet at the Data Link Layer.

Q4. (a) TCP opens a connection using an initial sequence number(ISN) of 14,534. The other party opens the connections with an ISN of 21,732. Show the three TCP segments during the connection establishment.

(b) Using (a) above, show the contents of segments during the data transmission if an initiator sends a segment containing the message “Hello Dear customer” and the other party answers with a segment containing “Hi there seller.”

(c) Using (a) and (b), Show the contents of segments during the connection termination.

Q5. A host sends five packets and receives three acknowledgments. The time is shown as hour:minute:seconds.

a. Segment 1 was sent at 0:0:00.
b. Segment 2 was sent at 0:0:05.
c. ACK for segments 1 and 2 received at 0:0:07.
d. Segment 3 was sent at 0:0:20.
e. Segment 4 was sent at 0:0:22.
f. Segment 5 was sent at 0:0:27.
g. ACK for segments 1 and 2 received at 0:0:45.
h. ACK for segment 3 received at 0:0:65.

Calculate the values of RTT_M , RTT_S , RTT_D , and RTO if the original RTO is 6 seconds. Did the sender miss the retransmission of any segment? Show which segments should have been retransmitted and when. Rewrite the events including the retransmission time.