EE450: Sample Problems on Fragmentation.

No solutions will be posted but will be happy to check your work during office hours (for on-campus students) or via e-mail for DEN students.

1)

A message consisting of 220 bytes is sent to TCP layer and down to the Internet layer. Each layer appends a header of 20 bytes. The packets are then Transmitted over a network which has an MTU of 92 Bytes.
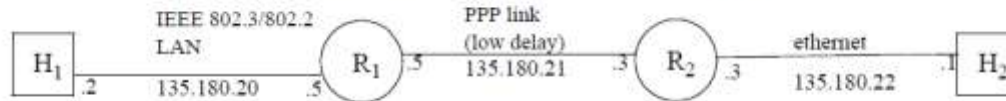
  a. Determine the number of bytes including header delivered to the network layer protocol at the destination
  b. With the aid of diagram show the fragmentation details including the fragmentation offset (FO), more flag (MF) and total length (TL)

  2) Suppose an IP packet arrives at a gateway and is to be forwarded to a packet switched network having a maximum transfer unit (MTU) of 576 bytes. The IP packet has an IP header of 20 bytes and a data part of 1484 bytes.
      a. Determine the number of fragment sent
      b. Show the values of the IP header in each fragment including the total length (TL), more flag (MF) and fragment offset (FO)

Question 3: Assume Host H_1 sends a UDP datagram to host H_2 whose payload is 2000 bytes long. List

	IEEE 802.3/802.2 LAN			PPP link (low delay)		ethernet	

H₁ .2   135.180.20   .5   R₁ .5   135.180.21   .3   R₂ .3   135.180.22   .1   H₂

the total length, identification, more bit of the flags, fragment offset, source and destination IP addresses and TTL fields in the IP header, the length of the UDP header and the length of the IP payload for each of

The packets carried over each of the links in the above figure. Assume that the header5 of the IP packet is 20 Bytes and the header of the UDP datagram is 8 Bytes. Assume that the TTL of host H1 packet is set to 16. Assume

MTU for the IEEE 802.3/802.2 link is 1492 bytes, MTU for the PPP link (low delay) is 296 bytes and MTU for ethernet is 1500 bytes.

4) Host A is connected to router R1 and host B is connected to router R2. Router R1 is connected to router R2. A TCP message contains 940 bytes of data and 20 bytes of TCP header are passed to the IP code at the host A for delivery to host B. IP layer will append 20 bytes. Assume that router R1 supports a maximum transfer Unit (MTU) of 1024 bytes including 16 bytes frame header and router R2 has MTU if 512 bytes including 8 frame header.

   a. With the aid of diagram show the size of IP fragments received by router R1 and R2

   b. Determine the number of bytes received by host B at IP layer.