

Instructions

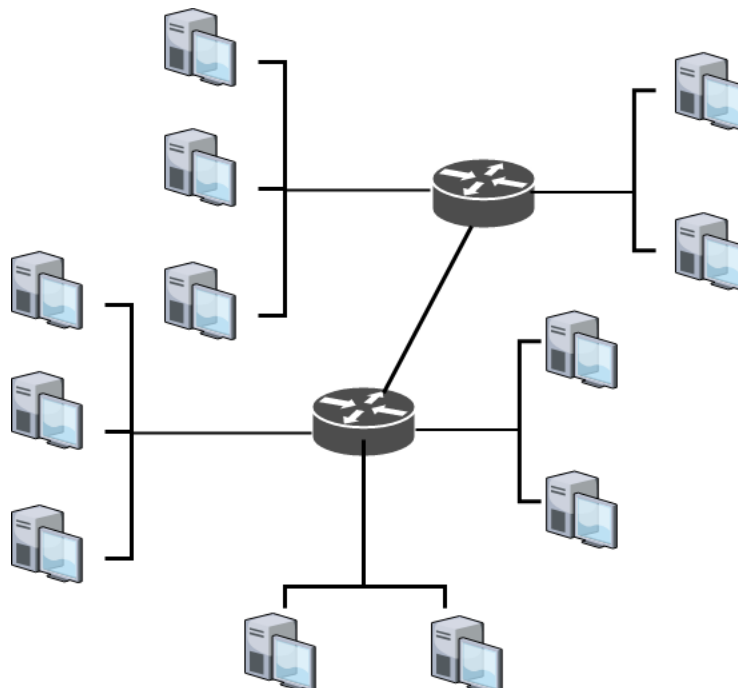
This assignment is due on **Thursday 16th April, 2020 by 1:00pm EST**

Please typewrite your answers and submit a pdf file to Canvas. You should complete this assignment individually.

There are some **extra** credits for **EECS 325 and 325N** students. Credit points are shown in front of each question. Credits are marked as **red** for **EECS 325/325N**, and **blue** for **EECS 425**, if they are different.

Questions

1. (8pts) Assume a datagram of size 5000 bytes (excluding header) crosses multiple network segments from sender to receiver. One of the network segments has MTU of size 820 bytes.(Assuming the other network segments have unlimited MTU)
 - a. (1pts) The original datagram will be fragmented into how many datagrams?
 - b. (1pts) At which point does the fragmentation occur?
 - c. (4pts) Show the length, fragflag and offset fields of each IP datagram after fragmentation.
 - d. (2pts) At which location are the IP fragments reassembled?
2. (5pts) In the figure below, assign an IP address for each of the host and router interfaces and specify the number of subnets.



3. (7 pts) Consider a host A behind NAT, sending a packet to another external host B. The packets (sent by A and response packet from B) are shown below:

Packet sent by A (before modified by NAT):

dst IP: 4.3.2.1
src IP: 192.168.2.7
dst port: 80
src port: 1067

Response packet sent by B (before modified by NAT):

dst IP: 2.2.2.2
src IP: 4.3.2.1
dst port: 2500
src port: 80

- i (4 pts) For the response packet leaving NAT towards A, fill the blank:

dst IP:
src IP:
dst port:
src port:

- ii (3 pts) Fill the following:

external IP address of the NAT:
IP address of host A:
IP address of host B:

4. (10 pts) Suppose a router has four interfaces, numbered from 0 - 3. The forwarding policies for the following address ranges are below:

Address 11000000 00000000 00000000 00000000
through 11000001 11111111 11111111 11111111 → interface 0

Address 11100001 00000000 00000000 00000000
through 11100001 00000000 11111111 11111111 → interface 1

Address 11100001 00000001 00000000 00000000
through 11100001 11111111 11111111 11111111 → interface 2

All other addresses → interface 3

- a Provide a forwarding table that has four entries, using longest prefix matching, and forwards packets to the correct link interfaces.
- b Consider three datagrams with the following addresses. Which interfaces would they be sent to?
 - i) 11001000 10010001 01010001 01010101
 - ii) 11100001 00000000 11000011 00111100
 - iii) 11100001 10000000 00010001 01110111
- c Rewrite the forwarding table entries with a.b.c.d/x notation instead of binary string notation.