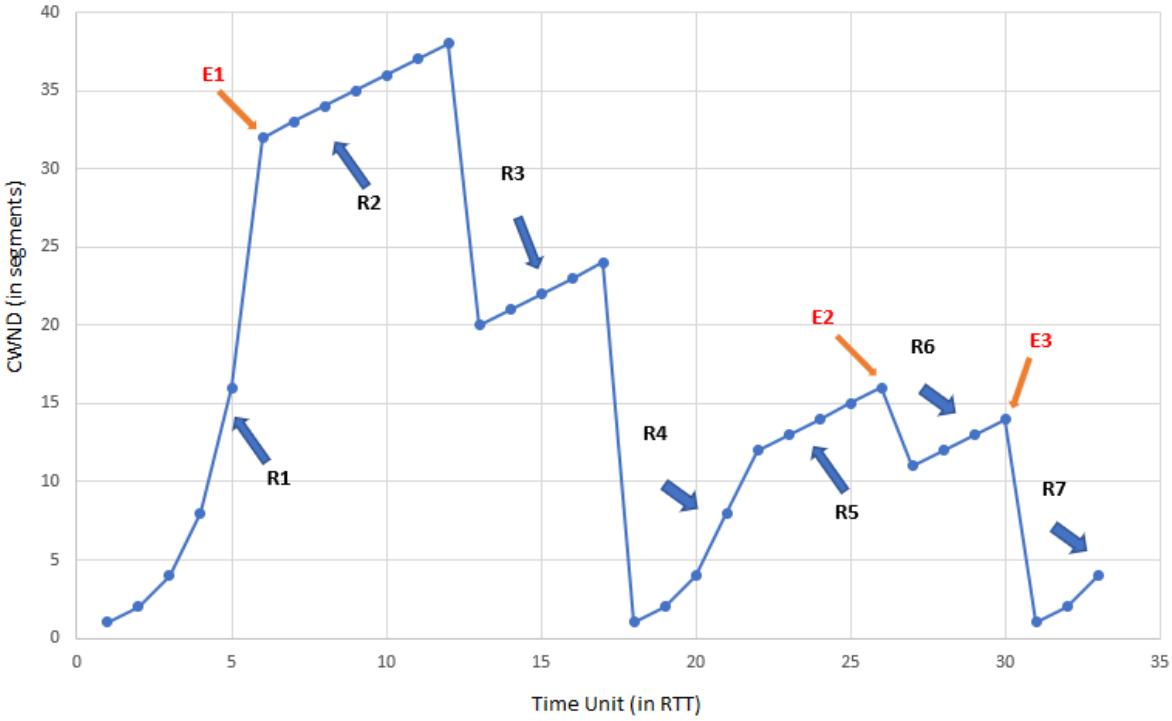
CSCI 379- Homework 4 Solution

Due Nov 22nd 11:59 PM

Based on Week 8,9 and 10 material

Answer any 2 questions (each worth 5 points) for the purpose of the submission.

Question 1: TCP Congestion



Part 1: Which congestion state are the seven regions (R1 - R7) in?

SS= *SlowStart*, CA= *Congestion Avoidance, FR = Fast Recovery*

R1-SS, R2-CA, R3-FR, CA, R4-SS, R5-CA, R6-FR,CA, R7-SS

Part 2: What is the event at E1, E2, E3?

E1 = cwnd reached the SSthresh, 2- Three DUP ACK, 3- Time Out

Part 3: What is the value of the initial ssthresh and final ssthresh (i.e, after event E3)?

Initial ssthresh = 32
Final ssthresh = 7

Question 2: Datagram Fragmentation

The maximum transmission unit on an Ethernet link is 1500 bytes. This means that the IP packets sent over Ethernet cannot be larger than 1500 bytes including the IP header. Suppose original datagram, is 10000-byte. Obviously, the IP layer will have to fragment the data.

Provide the length of new datagrams (after fragmentation). Provide the Flag and offset of each of the new datagrams

Original Datagram = 10,000 bytes.

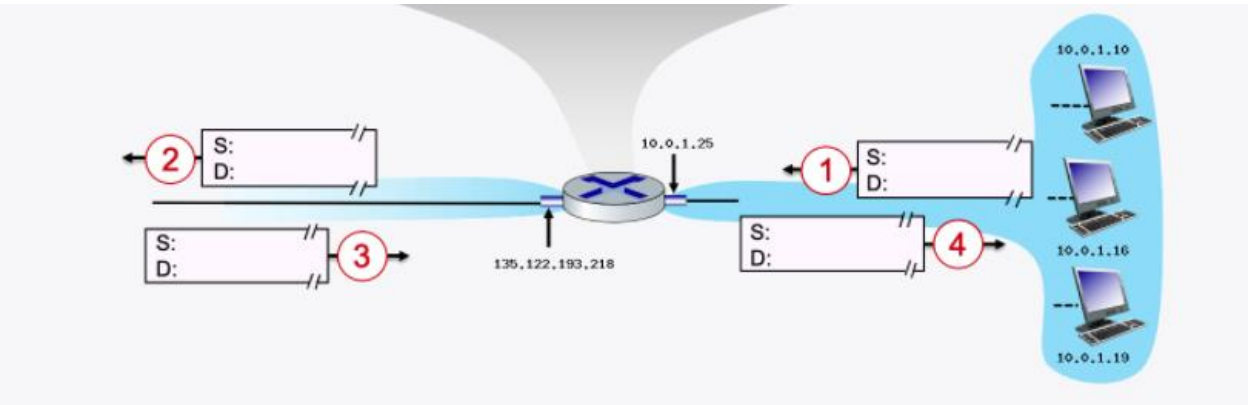
Original Payload = 9,980 (10,000-20)

Length	More Fragment Flag	Offset	Payload
1500	1	0	1480
1500	1	1480	1480
1500	1	2960	1480
1500	1	4440	1480
1500	1	5920	1480
1500	1	7400	1480
1120 (1100+20)	0	8880	1100 (=9980-8880)

Question 3: NAT Router

Consider the scenario below in which three hosts, with private IP addresses 10.0.1.10, 10.0.1.16, 10.0.1.19 are in a local network behind a NAT'd router that sits between these three hosts and the larger Internet. IP datagrams being sent from, or destined to, these three hosts must pass through this NAT router. The router's interface on the LAN side has IP address 10.0.1.25, while the router's address on the Internet side has IP address 135.122.193.218

NAT translation table	
WAN side addr	LAN side addr



Suppose that the host with IP address 10.0.1.19 sends an IP datagram destined to host 128.119.176.188. The source port is 3367, and the destination port is 80.

Part 1: What is the IP Address and Port number at Step 1, Step 2, Step 3 and Step 4 in the above diagram?

Part 2: Show the entries made in the NAT translation table

Step 1
S: 10.0.1.19, 3367
D: 128.119.176.188, 80

Step2:
S: 135.122.193.218, 1111 (random port # generated by NAT router)
D: 128.119.176.188, 80

Step 3:
S: 128.119.176.188, 80
D: 135.122.193.218, 1111

Step 4
S: 128.119.176.188, 80
D: 10.0.1.19, 3367

NAT Translation Table	
WAN	LAN
135.122.193.218, 1111	10.0.1.19, 3367