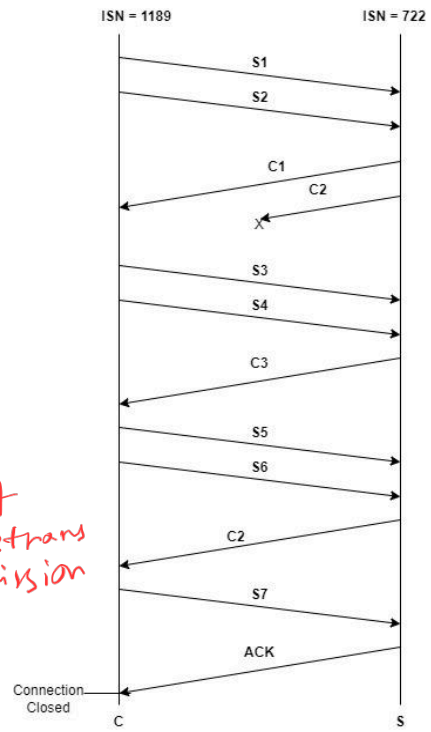
CSE421 Assignment 2

1. In a **Go-Back-N** TCP connection, a HTTP request (**241 bytes** each) is sent for each of the data segments (**926 bytes** each). Like this, a total of **15** data segments are sent from the server, including the base HTML file. Furthermore, the client has an ISN of **5193** and a RWND of **11021** bytes and the server has an ISN of **4992** and a RWND of **21800** bytes. The 9th data segment got lost on its way to the client.
    a. **Calculate** the sequence and acknowledgment number of the 4th data segment.
    b. **Calculate** the sequence and acknowledgment number of the 11th HTTP request that's sent to the server.
    c. **Calculate** the RWND of the client when it received the 13th segment? Assume the first 5 segments were processed by the client.

2. In a selective repeat TCP connection, **S1,S2,S3,S4,S5,S6,S7** are carrying **327, 222, 319, 242, 432, 394, 177** bytes of data respectively. **C1, C2 and C3** are carrying **304, 424 and 250** bytes of data respectively. The client(C) has a rwnd of **12100** and the server(S) has a rwnd of **8930**.
    a. **Calculate** the sequence and acknowledgement number of S3 segment.
    b. **Calculate** the sequence and acknowledgement number of the second C2 segment.
    c. **Calculate** the rwnd of the client after receiving the C2 segment. Consider C1 is already processed.
    d. **State** the reason C2 is sent after S6. → Fast retransmission
    e. **State** the type of connection termination used here. Full close



S_1 → seq → 1190, ack = 723

S_2 → seq → 1190+327, ack = 723

C_1 → seq → 723, ack = 1190+327+222

C_2 → seq → 723+304, ack = 1190+327+222 (a)

b) C_2 → seq → 723+304

ack → 1190+327+222+319+242+432+394

1. a) DS1 → seq = 4993

acu = 5194 + 241

DS4 ⇒ seq = 4993 + 3 × 926

acu = 5194 + 4 × 241

b) seq → 5194 + 10 × 241

acu → 4993 + 8 × 241

c) bund = 11021 − 8 × 926 + 5 × 926

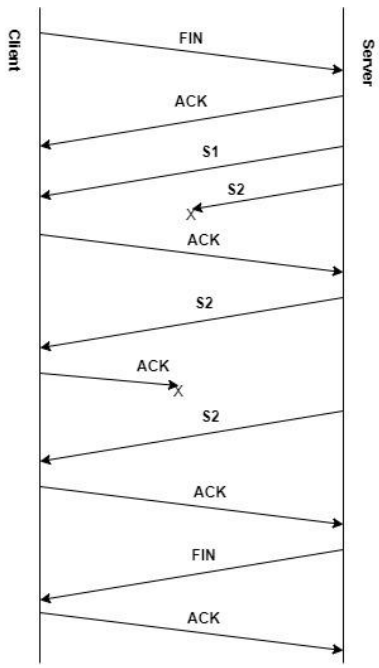
3. After requesting certain data segments, the Client sends the FIN segment, with the sequence and acknowledgement number of **891** and **7568** respectively and the FIN flag on.
    a. **Determine** the sequence and acknowledgement number of the first ACK segment that the server sends as shown in the figure.

The server sends 2 data segments carrying 225 and 167 bytes respectively. The 2nd segment gets lost in transmission.

    b. **Determine** the sequence number of the first ACK segment sent by the client as shown in the figure.

The lost segment is retransmitted using the **Go-Back N** ARQ method.

    c. **Determine** the acknowledgement number of the FIN segment sent by the server.



a) seq → 7568

ack → 892

b) seq → 892

ack → 7568+225

c) 892