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CWID: 10477484 Assignment-6

(1) Suppose Client A initiates a Telnet session with server S. At about the same time, client B also initiates a Telnet session with server S. Provide possible source & destination port number for

a) The segments sent from A to S.
b) The segments sent from B to S
c) The segments sent from S to A.
d) The segment sent from S to B.
e) If A & B are different hosts (it is possible that the source port no in the segments from A to S is the same as that from B to S?
f) How about they are the same host?

⇒

	Source port nos	destination Port nos.
a) A → S	467	23
b) B → S	513	23
c) S → A	23	467
d) S → B	23	513

e) Yes

f) No

(2) Consider fig. 3.5 what are the source & destination port values in the segments following from the server back to client processes? what are the IP addresses in the network layer datagram carrying the transport layer segment.

⇒ Assume the IP addresses of the host A, B, C are a, b, c. respectively:

To host A source port = 80, source IP address = b, destination port = 2645, destination IP address = a

To host C, left process: source port = 80, source IP address = b
dest port = 7532, destination IP address = C
To host C, right process: source port = 80, source IP address = b
dest port = 26145, destination IP address = C.

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(3)

Given 8 bit bytes are as follows:

01010011
01100110
01110100

Calculate the sum of the given 3 bytes.

Add first two 8-bit bytes

```
  0 1 0 1 0 0 1 1
+ 0 1 1 0 0 1 1 0
-----------------
  1 0 1 1 1 0 0 1
```

now add the result with 3rd byte

```
  1 0 1 1 1 0 0 1
  0 1 1 1 0 1 0 0
-----------------
1 0 0 1 0 1 1 0 1
```

wrap around the extra bit.

```
  0 0 1 0 1 1 0 1
                1
-----------------
  0 0 1 0 1 1 1 0
```

The sum of 3 8 bit bytes is 00101110. Invert all the bits to get checksum.

Checksum is 11010001. ✓

now calculate one's compliment of the sum. convert all 0's to 1's & vise versa to find the 1's compliment.

The 1's compliment of (sum) 00101110 is 11010001.

It is clear that the 1's compliment & the checksum are same.

UDP uses the 1's compliment as it is same as the checksum of the segment.

The checksum is used by the receiver (host) to identify the errors in the segment.

The process of detecting errors by the recievers:

The reciever performs the following steps at the reciever end to identify the errors in the segment.

- Add all the bytes including checksum.
- observe the sum.
  - If it contains all 1's then the segment has no errors.
  - If it contains 1 or more 0's then the segment contains error.

All one bit errors will be detected, but 2 bit errors can be undetected.

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(7) The protocol rdt3.0 is used to transfer data from sender to reciever.

- if a sender transfers the packet to the reciever, then reciever
- if sender recieved Ack then go to next level.
- In this process, needs sequences no to the sender for finding duplicate packets data or Ack data.
- if the sender finds any duplicate ACK, then ignore it.
- In this proces. Ack packets doesnot require sequence no.

So, Ack packets doesnot require sequence nos.

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(8) Draw the FSM for the reciever side of protocol rdt3.0

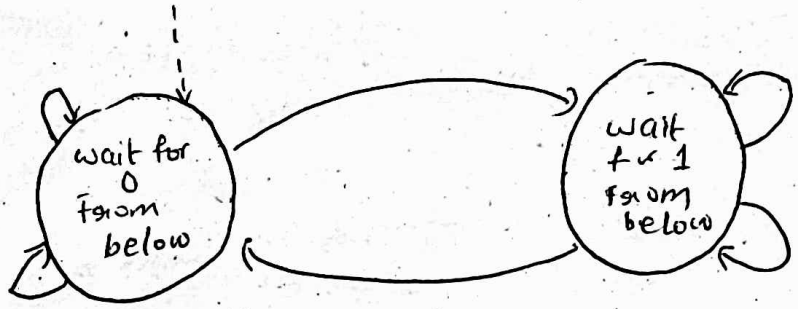
⇒ To transfer the data over a channel, rdt 3.0 protocol is useful. This a reliable protocol.

The sender transmits the packet & the reciever acknowledge it by sending an Ack & confirms the packet if recieved.

The rdt 3.0 protocol allows duplicate packets into the sender to reciever data stream by adding timeout. This is not possible in rdt 2.0.

The rdt 3.0 & rdt 2.0 works in the same way at receivers end. Both handles duplicate packets.

FSM diagram for the reciever side of the protocol rdt 3.0 is follows:



The FSM will be same as the FSM of rdt2.1 given in the figure 3.12 of textbook.

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(14)

If the sender sends the data infrequently, then the NAK only protocol is not preferred. It is good to use the protocol that uses ACKs.

- The main disadvantage of NAK only protocol is that it can detect that the packet has been lost only when the next packets is recieved by the reciever.
- The NAK only protocol realize the loss of packet after a longtime when it recieves the data packet with wrong seq. no as the sender sends the data packets occasionally
- when the reciever realize the packet loss, it sends NAK to the sender & the sender has to retransmit both the lost and next packet.
- if the sender sends the data frequently, then the NAK-only protocol is preferred. The protocol that uses ACKs & not preferred. as it requires to send more no of Acknowledgments. when the sender sends data frequently & the data loss rate is very moreless, then a NAK only protocol is preferable to a protocol that uses ACKs.
- The reciever sends the NAK as it realizes the packets loss quickly as the data transmitted frequently.
- since the data loss is less, the no of NAK in NAK-only protocol is less when compared with protocol that uses ACK's.