ASSIGNMENT 2

Network Lab

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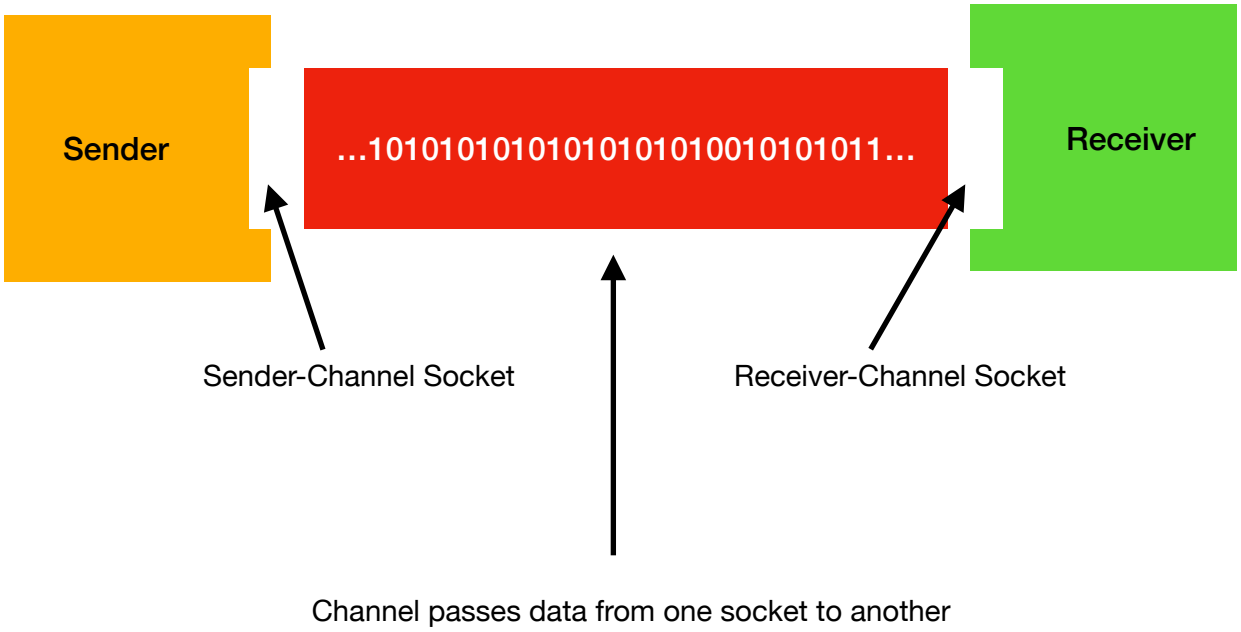
BCSE-III (19-23) A3

Problem Statement

Implement three data link layer protocols, Stop and Wait, Go Back N Sliding Window and Selective Repeat Sliding Window for flow control.

Sender, Receiver and Channel all are **independent processes**. There may be **multiple Transmitter** and **Receiver** processes, but only **one Channel** process. The channel process introduces random delay and/or bit error while transferring frames. Define **your own frame format** or you may use **IEEE 802.3 Ethernet** frame format.

Design



- All frames are even-parity VRC encoded
- Data is inputted by the user
- Data is resend on timeout (and NAK reception in case of Selective Repeat Sliding Window Protocol)

Performance Analysis

- The Round Trip Time(RTT) has been calculated for each frame, which is used as the performance metric

Stop and Wait

```
Enter data: 1010100101010
Sending to channel : 10101001010100
Received from channel : Corrupt Data
Round trip time:  2.0065619945526123

TIMEOUT!
Again Sending to channel : 10101001010100
Again Received from channel : ACK
Round trip time: 2.005190134048462 seconds

TIMEOUT!
Again Sending to channel : 10101001010100
Again Received from channel : ACK
Round trip time: 2.0088961124420166 seconds

TIMEOUT!
Again Sending to channel : 10101001010100
Again Received from channel : ACK
Round trip time: 0.003947734832763672 seconds
```

GoBackN

```
Ritobrotos-MacBook-Air:gobackn rgdgr8$ python3 send*
Initiating Sender # 1

Enter data: 101111111111111
sending to channel : 1011111111111110/0 ui=  -1
Received from channel: 0
RTT= 0.0007748603820800781

Enter data: 1110110101001001021
sending to channel : 11101101010010010210/1 ui=  -1
Received from channel: 1
RTT= 0.0006048679351806641
```

Selective Repeat Sliding Window

```
Received from Sender 1 : 10101010101010101111111111111110/0/
Sending to Receiver 1
10101010101010101111111111111110 0 TIMEOUT
Round trip time:  2.5073070526123047
Current frame no: 1

Received from Sender 1 : 11000000000000111111111110101010010101010/1/
Sending to Receiver 1
11001000000000011111111111010101001010101010 1 NAK
Round trip time:  0.5015490055084229
Current frame no: 2
```

From the above outputs I may conclude that my GoBackN protocol is working the most efficiently in my particular machine environment.