

RDT3.0

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Packets are being sent without Delay.

```
client.py x server.py
client.py > rdt_send
1 import socket
2
3 def calculate_checksum(packet):
4     # Simple checksum calculation
5     return sum([ord(c) for c in packet]) % 256
6
7 def rdt_send(sock, data, packet_size=1024, timeout=1, seq_no=0):
8     MAX_RESEDS = 3 # maximum number of times a packet can be resent
9     #server_address = ('localhost', 10000)
10    # Break data into packets
11    packets = data.split(" ")
12    print(packets)
13    for packet in packets:
14        # Add sequence number and checksum to packet
15        packet_with_seqno = str(seq_no) + ':' + packet
16        checksum = calculate_checksum(packet_with_seqno)
17        packet = packet_with_seqno + ":" + str(checksum).zfill(3)
18        print('\n\n'+packet)
19        # Send packet to server

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
PS C:\Users\DELL\Documents\CN_ASS_3> python -u .\server.py
Starting up on localhost port 10000
Waiting for a connection
Sent ACK: 0
Received data: Hel123lo
Sent ACK: 1
Received data: server
Sent ACK: 0
Received data: This
Sent ACK: 1
Received data: is
Sent ACK: 0
Received data: RDT
Sent ACK: 1
Received data: 30
Sent ACK: 0
Received data: Hello
Sent ACK: 1
Received data: server
PS C:\Users\DELL\Documents\CN_ASS_3>

PS C:\Users\DELL\Documents\CN_ASS_3> python -u .\client.py
Connecting to localhost port 10000
['Hel123lo', 'server', 'This', 'is', 'RDT', '30', 'Hello', 'server']
seq num data checksum
0:Hel123lo:244
Sent packet: 0
Received ACK: 0
1:server:002
Sent packet: 1
Received ACK: 1
0:This:002
Sent packet: 0
```

Adding delay when sending ACK.

client.pyserver.py X

server.py > rdt_rcv

```
19 packet_seq_no = int(packet_seq_no)
20 # Check if received packet has the expected sequence number
21 if packet_seq_no == seq_no:
22     # Check checksum
23     if packet_checksum != calculate_checksum(str(packet_seq_no) + ":" + packet_data):
24         print("Received packet with invalid checksum. Discarding packet.")
25         continue
26     # Send ACK
27     ack = "ACK:" + str(seq_no) + ":" + str(calculate_checksum("ACK:" + str(seq_no)))
28     time.sleep(5) # added delay, when sending ack
29     connection.send(ack.encode())
30     print("Sent ACK:", seq_no)
31     # Update sequence number
32     seq_no = 1 - seq_no
33     # Update last_seq_no
34     last_seq_no = packet_seq_no
35     # Return data
36     return packet_data
37 elif packet_seq_no <= last_seq_no:
38     # Discard old packet
39     print(packet)
40     print("Received old packet. Discarding packet.")
41 else:
```

PROBLEMSOUTPUTDEBUG CONSOLETERMINAL

PS C:\Users\DELL\Documents\CN_ASS_3> python -u .\server.py

Starting up on localhost port 10000

Waiting for a connection

Sent ACK: 0

Received data: Hel123lo

Traceback (most recent call last):

File "C:\Users\DELL\Documents\CN_ASS_3\server.py", line 81, in <module>

main()

File "C:\Users\DELL\Documents\CN_ASS_3\server.py", line 70, in main

data = rdt_rcv(connection,seq_no)

File "C:\Users\DELL\Documents\CN_ASS_3\server.py", line 13, in rdt_rcv

packet = connection.recv(packet_size)

ConnectionAbortedError: [WinError 10053] An established connection was abo

rted by the software in your host machine

PS C:\Users\DELL\Documents\CN_ASS_3>

PS C:\Users\DELL\Documents\CN_ASS_3> python -u .\client.py

Connecting to localhost port 10000

['Hel123lo', 'server', 'This', 'is', 'RDT', '30', 'Hello', 'se

0:Hel123lo:244

Sent packet: 0

Timeout: Resending packet (1/3): 0

Sent packet: 0

Timeout: Resending packet (2/3): 0

Sent packet: 0

Timeout: Resending packet (3/3): 0

Sent packet: 0

Max resends (3) reached. Aborting transmission.

PS C:\Users\DELL\Documents\CN_ASS_3>

Activate

Go to Sett