CS 4480
PA2-A Report
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Design

My program was written in Java, for the PA2 part A, I designed the protocol as rdt 3.0 referred from the textbook. I have implemented all required methods in the StudentNetworkSimulator class. In order to show the statistics at the end of the program, I tried to add IO print out in the NetworkSimulator class but the better way I found is to override the runSimulator() method in the StudentNetworkSimulator class and I can enter the statistic print out.

For the design tradeoffs, I actually did not make ant tradeoff. I reviewed the reliable data transfer part in the textbook from rdt 1.0 to rdt 3.0. I developed from rdt 1.0 and add features to reach the rdt 3.0.

In my program, I found that sometimes when I send 10 packets with the lost rate is 0.05 and corrupt rate is 0.05, only 9 ACKS will be sent back to sender.

Test

I tested with different message numbers which are 10, 100, 1000. The corrupt rate and loss rate are both 0.05, the trace level is 2 and the delay is 1000 and the default random seed.

Result

Result of 10 message:

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Network Simulator v1.0
Enter number of messages to simulate (> 0): [10] Enter the packet loss probability
(0.0 for no loss): [0.05] Enter the packet corruption probability (0.0 for no
corruption): [0.05] Enter the average time between messages from sender's layer 5
(> 0.0): [1000] Enter trace level (>= 0): [0] Enter random seed: [random]
EVENT time: 933.171277602306  type: 1  entity: 0
Sender: Reveived message from process layer: aaaaaaaaaaaaaaaaaaa

EVENT time: 940.9422679014277  type: 2  entity: 1
Receiver: Packet sent from sender has been received with payload
aaaaaaaaaaaaaaaaaaa
Receiver: The received packet is not incorrupt, the payload has bees sent to layer
5

EVENT time: 949.046113029039  type: 2  entity: 0
Sender: The packet with the sequence number 0 is sended and incoming packet has
sequence 0 and ACK 0

EVENT time: 1097.1679111899014  type: 1  entity: 0
Sender: Reveived message from process layer: bbbbbbbbbbbbbbbbbbb

EVENT time: 1103.3749615452584  type: 2  entity: 1
Receiver: Packet sent from sender has been received with payload
bbbbbbbbbbbbbbbbbbb
Receiver: The received packet is not incorrupt, the payload has bees sent to layer
5

EVENT time: 1107.6928669648448  type: 2  entity: 0
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Sender: The packet with the sequence number 1 is sended and incoming packet has sequence 0 and ACK 1

EVENT time: 2980.26845466344 type: 1 entity: 0
Sender: Reveived message from process layer: ccccccccccccccccccc

EVENT time: 2982.6232687544893 type: 2 entity: 1
Receiver: Packet sent from sender has been received with payload ccccccccccccccccccc
Receiver: The received packet is not incorrupt, the payload has bees sent to layer 5

EVENT time: 2989.185690033627 type: 2 entity: 0
Sender: The packet with the sequence number 0 is sended and incoming packet has sequence 0 and ACK 0

EVENT time: 4514.896820010239 type: 1 entity: 0
Sender: Reveived message from process layer: ddddddddddddddddddd

EVENT time: 4516.766404900281 type: 2 entity: 1
Receiver: Packet sent from sender has been received with payload ddddddddddddddddddd
Receiver: The received packet is not incorrupt, the payload has bees sent to layer 5

EVENT time: 4523.331610450485 type: 2 entity: 0
Sender: The packet with the sequence number 1 is sended and incoming packet has sequence 0 and ACK 1

EVENT time: 5103.365067905658 type: 1 entity: 0
Sender: Reveived message from process layer: eeeeeeeeeeeeeeeeeee

EVENT time: 5109.488871205914 type: 2 entity: 1
Receiver: Packet sent from sender has been received with payload eeeeeeeeeeeeeeeeeee
Receiver: The received packet is not incorrupt, the payload has bees sent to layer 5

EVENT time: 5114.332149642366 type: 2 entity: 0
Sender: The packet with the sequence number 0 is sended and incoming packet has sequence 0 and ACK 0

EVENT time: 6739.455221673127 type: 1 entity: 0
Sender: Reveived message from process layer: ffffffffffffffffff

EVENT time: 6748.073767407854 type: 2 entity: 1
Receiver: Packet sent from sender has been received with payload ffffffffffffffffff
Receiver: The received packet is not incorrupt, the payload has bees sent to layer 5

EVENT time: 6753.047277650592 type: 2 entity: 0
Sender: The packet with the sequence number 1 is sended and incoming packet has sequence 0 and ACK 1

EVENT time: 7293.08061236064 type: 1 entity: 0
Sender: Reveived message from process layer: gggggggggggggggggggg

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EVENT time: 7299.353377440108  type: 2  entity: 1
Receiver: Packet sent from sender has been received with payload
ggggggggggggggggggg
Receiver: The received packet is not incorrupt, the payload has bees sent to layer
5

EVENT time: 7308.471166577522  type: 2  entity: 0
Sender: The packet with the sequence number 0 is sended and incoming packet has
sequence 0 and ACK 0

EVENT time: 7801.763343850637  type: 1  entity: 0
Sender: Reveived message from process layer: hhhhhhhhhhhhhhhhhhhh

EVENT time: 7807.374004611581  type: 2  entity: 1
Receiver: Packet sent from sender has been received with payload
hhhhhhhhhhhhhhhhhhhh
Receiver: The received packet is not incorrupt, the payload has bees sent to layer
5

EVENT time: 7809.610227938928  type: 2  entity: 0
Sender: The packet with the sequence number 1 is sended and incoming packet has
sequence 0 and ACK 1

EVENT time: 8097.322620470134  type: 1  entity: 0
Sender: Reveived message from process layer: iiiiiiiiiiiiiiiiiii

EVENT time: 8098.912916888255  type: 2  entity: 1
Receiver: Packet sent from sender has been received with payload
iiiiiiiiiiiiiiiiiii
Receiver: The received packet is not incorrupt, the payload has bees sent to layer
5

EVENT time: 8100.887618861206  type: 2  entity: 0
Sender: The packet with the sequence number 0 is sended and incoming packet has
sequence 0 and ACK 0

EVENT time: 8321.830194418566  type: 1  entity: 0
Sender: Reveived message from process layer: jjjjjjjjjjjjjjjjjjj

EVENT time: 8328.082395839167  type: 2  entity: 1


Number of original data packets transmitted:    10
Number of ACK packets:                          9
Number of corrupt packets                       0
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Result of 100 message:

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Number of original data packets transmitted:    97
Number of ACK packets:                          113
Number of corrupt packets                       15
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Result of 1000 message:

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Number of original data packets transmitted:    982
Number of ACK packets:                          1113
Number of corrupt packets                       95
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The final statistic has 1000 message input with the loss probability is 0.05 and corruption probability is 0.05 as well. As the result, there are 1113 ack packets received and 95 corrupt packets. Thus I used 95 / 1113 = 0.08535 which is approximately reached the corruption probability entered by myself.