Submitted to: Dr. Ayman Bahaa

Submitted by: Bassil Usama Mohamed – 16P6025

Mohamed Riad El-Sayied – 16P6028

Final Project submission

## INTRODUCTION:

**Project is divided into 2 parts, Alternating-Bit-Protocol version and the second part for the Go-Back-N version.**

## DESCRIPTION OF FUNCTIONS:

**A\_output(message), where message is a structure of type msg, containing data to be sent to the B-side. This routine will be called whenever the upper layer at the sending side (A) has a message to send. It is the job of your protocol to ensure that the data in such a message is delivered in-order, and correctly, to the receiving side upper layer.**

**A\_input(packet), where packet is a structure of type pkt. This routine will be called whenever a packet sent from the B-side (i.e., as a result of a tolayer3() being done by a B-side procedure) arrives at the Aside. packet is the (possibly corrupted) packet sent from the B-side.**

**A\_timerinterrupt() This routine will be called when A's timer expires (thus generating a timer interrupt). You'll probably want to use this routine to control the retransmission of packets. See starttimer() and stoptimer() below for how the timer is started and stopped.**

**A\_init() This routine will be called once, before any of your other A-side routines are called. It can be used to do any required initialization.**

**B\_input(packet),where packet is a structure of type pkt. This routine will be called whenever a packet sent from the A-side (i.e., as a result of a tolayer3() being done by a A-side procedure) arrives at the Bside. packet is the (possibly corrupted) packet sent from the A-side.**

**B\_init() This routine will be called once, before any of your other B-side routines are called. It can be used to do any required initialization.**

**Output:**

**ALTERNATING BIT PROTOCOL:**

**A. No loss scenario ----- Stop and Wait Network Simulator Version 1.1 --------**

**Enter the number of messages to simulate: 10**

**Enter packet loss probability [enter 0.0 for no loss]:0.0**

**Enter packet corruption probability [0.0 for no corruption]:0.0**

**Enter average time between messages from sender's layer5 [ > 0.0]:5.0**

**Enter TRACE:0**

**Sent: seq = 0, ack = 0, checksum = 3232, aaaaaaaaaaaaaaaaaaaa**

**Accpeted: seq = 0, ack = 0, checksum = 3232, aaaaaaaaaaaaaaaaaaaa**

**Sent: seq = 1, ack = 0, checksum = 1e1d, cccccccccccccccccccc**

**Accpeted: seq = 1, ack = 0, checksum = 1e1d, cccccccccccccccccccc**

**Sent: seq = 0, ack = 0, checksum = 0, ffffffffffffffffffff**

**Accpeted: seq = 0, ack = 0, checksum = 0, ffffffffffffffffffff Sent: seq = 1, ack = 0, checksum = e1e0, iiiiiiiiiiiiiiiiiiii**

**Accpeted: seq = 1, ack = 0, checksum = e1e0, iiiiiiiiiiiiiiiiiiii**

**Simulator terminated at time 47.591816 after sending 10 msgs from layer5**

**B. 30 percent loss and no error scenario ----- Stop and Wait Network Simulator Version 1.1 -------**

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**Enter the number of messages to simulate: 50**

**Enter packet loss probability [enter 0.0 for no loss]:0.3**

**Enter packet corruption probability [0.0 for no corruption]:0.0**

**Enter average time between messages from sender's layer5 [ > 0.0]:10.0 Enter TRACE:0**

**Sent: seq = 0, ack = 0, checksum = 3232, aaaaaaaaaaaaaaaaaaaa**

**Accpeted: seq = 0, ack = 0, checksum = 3232, aaaaaaaaaaaaaaaaaaaa**

**Sent: seq = 1, ack = 0, checksum = 2827, bbbbbbbbbbbbbbbbbbbb**

**Accpeted: seq = 1, ack = 0, checksum = 2827, bbbbbbbbbbbbbbbbbbbb**

**Sent: seq = 0, ack = 0, checksum = 1e1e, cccccccccccccccccccc**

**Accpeted: seq = 0, ack = 0, checksum = 1e1e, cccccccccccccccccccc**

**Sent: seq = 1, ack = 0, checksum = 1413, dddddddddddddddddddd**

**Accpeted: seq = 1, ack = 0, checksum = 1413, dddddddddddddddddddd**

**Sent: seq = 0, ack = 0, checksum = a0a, eeeeeeeeeeeeeeeeeeee**

**Accpeted: seq = 0, ack = 0, checksum = a0a, eeeeeeeeeeeeeeeeeeee**

**Sent: seq = 1, ack = 0, checksum = e1e0, iiiiiiiiiiiiiiiiiiii**

**Accpeted: seq = 1, ack = 0, checksum = e1e0, iiiiiiiiiiiiiiiiiiii**

**Sent: seq = 0, ack = 0, checksum = afaf, nnnnnnnnnnnnnnnnnnnn**

**Accpeted: seq = 0, ack = 0, checksum = afaf, nnnnnnnnnnnnnnnnnnnn**

**Sent: seq = 1, ack = 0, checksum = 9b9a, pppppppppppppppppppp**

**Accpeted: seq = 1, ack = 0, checksum = 9b9a, pppppppppppppppppppp**

**Sent: seq = 0, ack = 0, checksum = 7d7d, ssssssssssssssssssss**

**Accpeted: seq = 0, ack = 0, checksum = 7d7d, ssssssssssssssssssss**

**Sent: seq = 1, ack = 0, checksum = 4b4a, xxxxxxxxxxxxxxxxxxxx**

**Accpeted: seq = 1, ack = 0, checksum = 4b4a, xxxxxxxxxxxxxxxxxxxx**

**Sent: seq = 0, ack = 0, checksum = d7d7, jjjjjjjjjjjjjjjjjjjj**

**Accpeted: seq = 0, ack = 0, checksum = d7d7, jjjjjjjjjjjjjjjjjjjj**

**Sent: seq = 1, ack = 0, checksum = c3c2, llllllllllllllllllll**

**Accpeted: seq = 1, ack = 0, checksum = c3c2, llllllllllllllllllll**

**Sent: seq = 0, ack = 0, checksum = 8787, rrrrrrrrrrrrrrrrrrrr**

**Accpeted: seq = 0, ack = 0, checksum = 8787, rrrrrrrrrrrrrrrrrrrr**

**Sent: seq = 1, ack = 0, checksum = 5554, wwwwwwwwwwwwwwwwwwww**

**Accpeted: seq = 1, ack = 0, checksum = 5554, wwwwwwwwwwwwwwwwwwww**

**Simulator terminated at time 490.078461 after sending 50 msgs from layer5**

**C. No loss and 30 percent corruption scenario ----- Stop and Wait Network Simulator Version 1.1**

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**Enter the number of messages to simulate: 10**

**Enter packet loss probability [enter 0.0 for no loss]:0.0**

**Enter packet corruption probability [0.0 for no corruption]:0.3**

**Enter average time between messages from sender's layer5 [ > 0.0]:10.0**

**Enter TRACE:0**

**Sent: seq = 0, ack = 0, checksum = 3232, aaaaaaaaaaaaaaaaaaaa**

**Accpeted: seq = 0, ack = 0, checksum = 3232, aaaaaaaaaaaaaaaaaaaa**

**Sent: seq = 1, ack = 0, checksum = 2827, bbbbbbbbbbbbbbbbbbbb**

**Accpeted: seq = 1, ack = 0, checksum = 2827, bbbbbbbbbbbbbbbbbbbb**

**Sent: seq = 0, ack = 0, checksum = 1e1e, cccccccccccccccccccc**

**Accpeted: seq = 0, ack = 0, checksum = 1e1e, cccccccccccccccccccc**

**Sent: seq = 1, ack = 0, checksum = 1413, dddddddddddddddddddd**

**Accpeted: seq = 1, ack = 0, checksum = 1413, dddddddddddddddddddd**

**Sent: seq = 0, ack = 0, checksum = 0, ffffffffffffffffffff**

**Accpeted: seq = 0, ack = 0, checksum = 0, ffffffffffffffffffff**

**Sent: seq = 1, ack = 0, checksum = e1e0, iiiiiiiiiiiiiiiiiiii**

**Simulator terminated at time 118.404739**

**after sending 10 msgs from layer5**

### GBN:

**A. No loss scenario ----- Stop and Wait Network Simulator Version 1.1 --------**

**Enter the number of messages to simulate: 10**

**Enter packet loss probability [enter 0.0 for no loss]:0.0**

**Enter packet corruption probability [0.0 for no corruption]:0.0**

**Enter average time between messages from sender's layer5 [ > 0.0]:5.0 Enter TRACE:0**

**[1] Send: seq = 0 ack = 7 checksum = 322b aaaaaaaaaaaaaaaaaaaa**

**[0] Accepted: seq = 0 ack = 7 checksum = 322b aaaaaaaaaaaaaaaaaaaa**

1. **Send: seq = 0 ack = 0 checksum = 2828 bbbbbbbbbbbbbbbbbbbb**
2. **Accepted: seq = 0 ack = 0 checksum = 2828 bbbbbbbbbbbbbbbbbbbb**

**[0] Send: seq = 1 ack = 0 checksum = 1e1d cccccccccccccccccccc**

1. **Send: seq = 2 ack = 0 checksum = 1412 dddddddddddddddddddd**
2. **Accepted: seq = 1 ack = 0 checksum = 1e1d cccccccccccccccccccc**
3. **Send: seq = 3 ack = 0 checksum = a07 eeeeeeeeeeeeeeeeeeee**
4. **Accepted: seq = 2 ack = 0 checksum = 1412 dddddddddddddddddddd**

**[1] Accepted: seq = 3 ack = 0 checksum = a07 eeeeeeeeeeeeeeeeeeee**

**[1] Send: seq = 1 ack = 3 checksum = fffb ffffffffffffffffffff**

**[0] Accepted: seq = 1 ack = 3 checksum = fffb ffffffffffffffffffff**

1. **Send: seq = 4 ack = 1 checksum = f5f0 gggggggggggggggggggg**
2. **Send: seq = 2 ack = 3 checksum = ebe6 hhhhhhhhhhhhhhhhhhhh**

**[0] Accepted: seq = 2 ack = 3 checksum = ebe6 hhhhhhhhhhhhhhhhhhhh**

1. **Send: seq = 5 ack = 2 checksum = e1da iiiiiiiiiiiiiiiiiiii**
2. **Accepted: seq = 4 ack = 1 checksum = f5f0 gggggggggggggggggggg**
3. **Send: seq = 6 ack = 2 checksum = d7cf jjjjjjjjjjjjjjjjjjjj**

**Simulator terminated at time 48.679771 after sending 10 msgs from layer5**

**B. 30 percent loss and no error scenario ----- Stop and Wait Network Simulator Version 1.1 -------**

**-**

**Enter the number of messages to simulate: 50**

**Enter packet loss probability [enter 0.0 for no loss]:0.3**

**Enter packet corruption probability [0.0 for no corruption]:0.0**

**Enter average time between messages from sender's layer5 [ > 0.0]:10.0**

**Enter TRACE:0**

1. **Send: seq = 0 ack = 7 checksum = 322b aaaaaaaaaaaaaaaaaaaa**

**[0] Accepted: seq = 0 ack = 7 checksum = 322b aaaaaaaaaaaaaaaaaaaa**

1. **Send: seq = 0 ack = 0 checksum = 2828 bbbbbbbbbbbbbbbbbbbb**
2. **Accepted: seq = 0 ack = 0 checksum = 2828 bbbbbbbbbbbbbbbbbbbb**
3. **Send: seq = 1 ack = 0 checksum = 1e1d cccccccccccccccccccc**
4. **Accepted: seq = 1 ack = 0 checksum = 1e1d cccccccccccccccccccc**
5. **Send: seq = 2 ack = 0 checksum = 1412 dddddddddddddddddddd**
6. **Accepted: seq = 2 ack = 0 checksum = 1412 dddddddddddddddddddd**

**[1] Send: seq = 1 ack = 2 checksum = a07 eeeeeeeeeeeeeeeeeeee**

1. **Send: seq = 3 ack = 0 checksum = fffc ffffffffffffffffffff**
2. **Send: seq = 2 ack = 2 checksum = f5f1 gggggggggggggggggggg**

**[0] Accepted: seq = 1 ack = 2 checksum = a07 eeeeeeeeeeeeeeeeeeee**

1. **Send: seq = 4 ack = 1 checksum = ebe6 hhhhhhhhhhhhhhhhhhhh**
2. **Send: seq = 3 ack = 2 checksum = e1dc iiiiiiiiiiiiiiiiiiii**
3. **Accepted: seq = 2 ack = 2 checksum = f5f1 gggggggggggggggggggg**
4. **Send: seq = 4 ack = 2 checksum = d7d1 jjjjjjjjjjjjjjjjjjjj**

**[0] Send: seq = 5 ack = 2 checksum = cdc6 kkkkkkkkkkkkkkkkkkkk**

1. **Accepted: seq = 3 ack = 2 checksum = e1dc iiiiiiiiiiiiiiiiiiii**
2. **Accepted: seq = 3 ack = 0 checksum = fffc ffffffffffffffffffff**

**[0] Accepted: seq = 4 ack = 2 checksum = d7d1 jjjjjjjjjjjjjjjjjjjj**

1. **Send: seq = 6 ack = 4 checksum = c3b9 llllllllllllllllllll**
2. **Send: seq = 5 ack = 3 checksum = b9b1 mmmmmmmmmmmmmmmmmmmm**

**[1] Accepted: seq = 4 ack = 1 checksum = ebe6 hhhhhhhhhhhhhhhhhhhh**

**[1] Send: seq = 6 ack = 4 checksum = afa5 nnnnnnnnnnnnnnnnnnnn**

**[1] Send: seq = 7 ack = 4 checksum = a59a oooooooooooooooooooo [0] Send: seq = 7 ack = 4 checksum = 9b90 pppppppppppppppppppp**

**[1] Accepted: seq = 5 ack = 2 checksum = cdc6 kkkkkkkkkkkkkkkkkkkk**

**[1] Send: seq = 0 ack = 5 checksum = 918c qqqqqqqqqqqqqqqqqqqq**

**[1] Accepted: seq = 6 ack = 4 checksum = c3b9 llllllllllllllllllll**

**[0] Send: seq = 0 ack = 4 checksum = 8783 rrrrrrrrrrrrrrrrrrrr**

**[0] Accepted: seq = 5 ack = 3 checksum = b9b1 mmmmmmmmmmmmmmmmmmmm**

**[0] Send: seq = 1 ack = 5 checksum = 7d77 ssssssssssssssssssss**

1. **Accepted: seq = 6 ack = 4 checksum = afa5 nnnnnnnnnnnnnnnnnnnn**
2. **Send: seq = 1 ack = 6 checksum = 736c tttttttttttttttttttt**

**[0] Accepted: seq = 7 ack = 4 checksum = a59a oooooooooooooooooooo**

**[0] Send: seq = 2 ack = 7 checksum = 6960 uuuuuuuuuuuuuuuuuuuu**

1. **Accepted: seq = 0 ack = 5 checksum = 918c qqqqqqqqqqqqqqqqqqqq**
2. **Send: seq = 2 ack = 6 checksum = 5f57 vvvvvvvvvvvvvvvvvvvv**

**[1] Send: seq = 3 ack = 6 checksum = 554c wwwwwwwwwwwwwwwwwwww**

**[0] Send: seq = 3 ack = 0 checksum = 4b48 xxxxxxxxxxxxxxxxxxxx**

1. **Send: seq = 4 ack = 0 checksum = 413d yyyyyyyyyyyyyyyyyyyy**
2. **Send: seq = 4 ack = 6 checksum = 372d zzzzzzzzzzzzzzzzzzzz**
3. **Send: seq = 5 ack = 0 checksum = 2823 bbbbbbbbbbbbbbbbbbbb**
4. **Accepted: seq = 7 ack = 4 checksum = 9b90 pppppppppppppppppppp**

**[1] Accepted: seq = 0 ack = 4 checksum = 8783 rrrrrrrrrrrrrrrrrrrr**

**[1] Accepted: seq = 1 ack = 5 checksum = 7d77 ssssssssssssssssssss**

1. **Accepted: seq = 1 ack = 6 checksum = 736c tttttttttttttttttttt**
2. **Accepted: seq = 2 ack = 7 checksum = 6960 uuuuuuuuuuuuuuuuuuuu**

**[0] Accepted: seq = 2 ack = 6 checksum = 5f57 vvvvvvvvvvvvvvvvvvvv**

**[0] Accepted: seq = 3 ack = 6 checksum = 554c wwwwwwwwwwwwwwwwwwww**

1. **Accepted: seq = 4 ack = 6 checksum = 372d zzzzzzzzzzzzzzzzzzzz**
2. **Accepted: seq = 3 ack = 0 checksum = 4b48 xxxxxxxxxxxxxxxxxxxx**

**Simulator terminated at time 405.668488 after sending 50 msgs from layer5**

**C. No loss and 30 percent corruption scenario ----- Stop and Wait Network Simulator Version 1.1**

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**Enter the number of messages to simulate: 10**

**Enter packet loss probability [enter 0.0 for no loss]:0.0**

**Enter packet corruption probability [0.0 for no corruption]:0.3**

**Enter average time between messages from sender's layer5 [ > 0.0]:10.0**

**Enter TRACE:0**

**Enter TRACE:0**

**[1] Send: seq = 0 ack = 7 checksum = 322b aaaaaaaaaaaaaaaaaaaa**

1. **Send: seq = 0 ack = 7 checksum = 2821 bbbbbbbbbbbbbbbbbbbb**
2. **Accepted: seq = 0 ack = 7 checksum = 2821 bbbbbbbbbbbbbbbbbbbb**

**[1] Send: seq = 1 ack = 0 checksum = 1e1d cccccccccccccccccccc**

**[0] Accepted: seq = 0 ack = 7 checksum = 322b aaaaaaaaaaaaaaaaaaaa**

1. **Send: seq = 1 ack = 0 checksum = 1413 dddddddddddddddddddd**
2. **Send: seq = 2 ack = 0 checksum = a08 eeeeeeeeeeeeeeeeeeee**

**[0] Accepted: seq = 1 ack = 0 checksum = 1e1d cccccccccccccccccccc**

1. **Send: seq = 2 ack = 1 checksum = fffc ffffffffffffffffffff**
2. **Accepted: seq = 1 ack = 0 checksum = 1413 dddddddddddddddddddd**

**[1] Accepted: seq = 2 ack = 1 checksum = fffc ffffffffffffffffffff**

**[0] Send: seq = 3 ack = 1 checksum = f5f1 gggggggggggggggggggg**

1. **Send: seq = 4 ack = 1 checksum = ebe6 hhhhhhhhhhhhhhhhhhhh**
2. **Accepted: seq = 3 ack = 1 checksum = f5f1 gggggggggggggggggggg**
3. **Send: seq = 5 ack = 1 checksum = e1db iiiiiiiiiiiiiiiiiiii**
4. **Send: seq = 3 ack = 3 checksum = d7d1 jjjjjjjjjjjjjjjjjjjj**

**Simulator terminated at time 101.658104 after sending 10 msgs from layer5**