Ain Shams University
Faculty of Engineering
Computer Networks - CSE 335

Submitted To: Dr. Ayman Bahaa

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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 A-side. 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 B-side. 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, aaaaaaaaaaaaaaaaaaa
Accpeted: seq = 0, ack = 0, checksum = 3232, aaaaaaaaaaaaaaaaaaa
Sent: seq = 1, ack = 0, checksum = 1e1d, ccccccccccccccccccc
Accpeted: seq = 1, ack = 0, checksum = 1e1d, ccccccccccccccccccc
Sent: seq = 0, ack = 0, checksum = 0, ffffffffffffffffffff
Accpeted: seq = 0, ack = 0, checksum = 0, ffffffffffffffffffff
Sent: seq = 1, ack = 0, checksum = e1e0, iiiiiiiiiiiiiiiiii
Accpeted: seq = 1, ack = 0, checksum = e1e0, iiiiiiiiiiiiiiiiii
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, aaaaaaaaaaaaaaaaaaa
Accpeted: seq = 0, ack = 0, checksum = 3232, aaaaaaaaaaaaaaaaaaa
Sent: seq = 1, ack = 0, checksum = 2827, bbbbbbbbbbbbbbbbbbb
Accpeted: seq = 1, ack = 0, checksum = 2827, bbbbbbbbbbbbbbbbbbb
Sent: seq = 0, ack = 0, checksum = 1e1e, ccccccccccccccccccc
Accpeted: seq = 0, ack = 0, checksum = 1e1e, ccccccccccccccccccc
Sent: seq = 1, ack = 0, checksum = 1413, ddddddddddddddddddddd
Accpeted: seq = 1, ack = 0, checksum = 1413, ddddddddddddddddddddd

Sent: seq = 0, ack = 0, checksum = a0a, eeeeeeeeeeeeeeeeeee
Accpeted: seq = 0, ack = 0, checksum = a0a, eeeeeeeeeeeeeeeeeee
Sent: seq = 1, ack = 0, checksum = e1e0, iiiiiiiiiiiiiiiiii
Accpeted: seq = 1, ack = 0, checksum = e1e0, iiiiiiiiiiiiiiiiii
Sent: seq = 0, ack = 0, checksum = afaf, nnnnnnnnnnnnnnnnnnn
Accpeted: seq = 0, ack = 0, checksum = afaf, nnnnnnnnnnnnnnnnnnn
Sent: seq = 1, ack = 0, checksum = 9b9a, pppppppppppppppppppp
Accpeted: seq = 1, ack = 0, checksum = 9b9a, pppppppppppppppppppp
Sent: seq = 0, ack = 0, checksum = 7d7d, sssssssssssssssssss
Accpeted: seq = 0, ack = 0, checksum = 7d7d, sssssssssssssssssss
Sent: seq = 1, ack = 0, checksum = 4b4a, xxxxxxxxxxxxxxxxxxxx
Accpeted: seq = 1, ack = 0, checksum = 4b4a, xxxxxxxxxxxxxxxxxxxx
Sent: seq = 0, ack = 0, checksum = d7d7, jjjjjjjjjjjjjjjjj
Accpeted: seq = 0, ack = 0, checksum = d7d7, jjjjjjjjjjjjjjjjj
Sent: seq = 1, ack = 0, checksum = c3c2, lllllllllllllllllll
Accpeted: seq = 1, ack = 0, checksum = c3c2, lllllllllllllllllll
Sent: seq = 0, ack = 0, checksum = 8787, rrrrrrrrrrrrrrrrrr
Accpeted: seq = 0, ack = 0, checksum = 8787, rrrrrrrrrrrrrrrrrr
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

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, aaaaaaaaaaaaaaaaaaa
Accpeted: seq = 0, ack = 0, checksum = 3232, aaaaaaaaaaaaaaaaaaa
Sent: seq = 1, ack = 0, checksum = 2827, bbbbbbbbbbbbbbbbbbb
Accpeted: seq = 1, ack = 0, checksum = 2827, bbbbbbbbbbbbbbbbbbb

Sent: seq = 0, ack = 0, checksum = 1e1e, ccccccccccccccccccc
Accpeted: seq = 0, ack = 0, checksum = 1e1e, ccccccccccccccccccc
Sent: seq = 1, ack = 0, checksum = 1413, ddddddddddddddddddddd
Accpeted: seq = 1, ack = 0, checksum = 1413, ddddddddddddddddddddd
Sent: seq = 0, ack = 0, checksum = 0, ffffffffffffffffffff
Accpeted: seq = 0, ack = 0, checksum = 0, ffffffffffffffffffff
Sent: seq = 1, ack = 0, checksum = e1e0, iiiiiiiiiiiiiiiiii
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 aaaaaaaaaaaaaaaaaaa
[0] Accepted: seq = 0 ack = 7 checksum = 322b aaaaaaaaaaaaaaaaaaa
[0] Send: seq = 0 ack = 0 checksum = 2828 bbbbbbbbbbbbbbbbbbbb
[1] Accepted: seq = 0 ack = 0 checksum = 2828 bbbbbbbbbbbbbbbbbbbb
[0] Send: seq = 1 ack = 0 checksum = 1e1d ccccccccccccccccccc
[0] Send: seq = 2 ack = 0 checksum = 1412 ddddddddddddddddddddd
[1] Accepted: seq = 1 ack = 0 checksum = 1e1d ccccccccccccccccccc
[0] Send: seq = 3 ack = 0 checksum = a07 eeeeeeeeeeeeeeeeeee
[1] Accepted: seq = 2 ack = 0 checksum = 1412 ddddddddddddddddddddd
[1] Accepted: seq = 3 ack = 0 checksum = a07 eeeeeeeeeeeeeeeeeee
[1] Send: seq = 1 ack = 3 checksum = fffb ffffffffffffffffffff
[0] Accepted: seq = 1 ack = 3 checksum = fffb ffffffffffffffffffff
[0] Send: seq = 4 ack = 1 checksum = f5f0 gggggggggggggggggggg
[1] Send: seq = 2 ack = 3 checksum = ebe6 hhhhhhhhhhhhhhhhhhhh
[0] Accepted: seq = 2 ack = 3 checksum = ebe6 hhhhhhhhhhhhhhhhhhhh
[0] Send: seq = 5 ack = 2 checksum = e1da iiiiiiiiiiiiiiiii
[1] Accepted: seq = 4 ack = 1 checksum = f5f0 gggggggggggggggggggg
[0] Send: seq = 6 ack = 2 checksum = d7cf jjjjjjjjjjjjjjjjj
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 -------
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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
[1] Send: seq = 0 ack = 7 checksum = 322b aaaaaaaaaaaaaaaaaaaa
[0] Accepted: seq = 0 ack = 7 checksum = 322b aaaaaaaaaaaaaaaaaaaa
[0] Send: seq = 0 ack = 0 checksum = 2828 bbbbbbbbbbbbbbbbbbbb
[1] Accepted: seq = 0 ack = 0 checksum = 2828 bbbbbbbbbbbbbbbbbbbb
[0] Send: seq = 1 ack = 0 checksum = 1e1d ccccccccccccccccccc
[1] Accepted: seq = 1 ack = 0 checksum = 1e1d ccccccccccccccccccc
[0] Send: seq = 2 ack = 0 checksum = 1412 ddddddddddddddddddddd
[1] Accepted: seq = 2 ack = 0 checksum = 1412 ddddddddddddddddddddd
[1] Send: seq = 1 ack = 2 checksum = a07 eeeeeeeeeeeeeeeeeee
[0] Send: seq = 3 ack = 0 checksum = fffc ffffffffffffffffffff
[1] Send: seq = 2 ack = 2 checksum = f5f1 gggggggggggggggggggg
[0] Accepted: seq = 1 ack = 2 checksum = a07 eeeeeeeeeeeeeeeeeee
[0] Send: seq = 4 ack = 1 checksum = ebe6 hhhhhhhhhhhhhhhhhhhh
[1] Send: seq = 3 ack = 2 checksum = e1dc iiiiiiiiiiiiiiiiii
[0] Accepted: seq = 2 ack = 2 checksum = f5f1 gggggggggggggggggggg
[1] Send: seq = 4 ack = 2 checksum = d7d1 jjjjjjjjjjjjjjjj
[0] Send: seq = 5 ack = 2 checksum = cdc6 kkkkkkkkkkkkkkkkkkkk
[0] Accepted: seq = 3 ack = 2 checksum = e1dc iiiiiiiiiiiiiiiiii
[1] Accepted: seq = 3 ack = 0 checksum = fffc ffffffffffffffffffff
[0] Accepted: seq = 4 ack = 2 checksum = d7d1 jjjjjjjjjjjjjjjj
[0] Send: seq = 6 ack = 4 checksum = c3b9 llllllllllllllllllll
[1] 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 rrrrrrrrrrrrrrrrrrr
[0] Accepted: seq = 5 ack = 3 checksum = b9b1 mmmmmmmmmmmmmmmmmmmm
[0] Send: seq = 1 ack = 5 checksum = 7d77 sssssssssssssssssss

[0] Accepted: seq = 6 ack = 4 checksum = afa5 nnnnnnnnnnnnnnnnnnn
[1] Send: seq = 1 ack = 6 checksum = 736c ttttttttttttttttttt
[0] Accepted: seq = 7 ack = 4 checksum = a59a ooooooooooooooooooo
[0] Send: seq = 2 ack = 7 checksum = 6960 uuuuuuuuuuuuuuuuuuu
[0] Accepted: seq = 0 ack = 5 checksum = 918c qqqqqqqqqqqqqqqqqqq
[1] Send: seq = 2 ack = 6 checksum = 5f57 vvvvvvvvvvvvvvvvvvv
[1] Send: seq = 3 ack = 6 checksum = 554c wwwwwwwwwwwwwwwwwwww
[0] Send: seq = 3 ack = 0 checksum = 4b48 xxxxxxxxxxxxxxxxxxxx
[0] Send: seq = 4 ack = 0 checksum = 413d yyyyyyyyyyyyyyyyyyyy
[1] Send: seq = 4 ack = 6 checksum = 372d zzzzzzzzzzzzzzzzzzz
[0] Send: seq = 5 ack = 0 checksum = 2823 bbbbbbbbbbbbbbbbbbb
[1] Accepted: seq = 7 ack = 4 checksum = 9b90 pppppppppppppppppppp
[1] Accepted: seq = 0 ack = 4 checksum = 8783 rrrrrrrrrrrrrrrrrr
[1] Accepted: seq = 1 ack = 5 checksum = 7d77 sssssssssssssssssss
[0] Accepted: seq = 1 ack = 6 checksum = 736c ttttttttttttttttttt
[1] Accepted: seq = 2 ack = 7 checksum = 6960 uuuuuuuuuuuuuuuuuuu
[0] Accepted: seq = 2 ack = 6 checksum = 5f57 vvvvvvvvvvvvvvvvvvv
[0] Accepted: seq = 3 ack = 6 checksum = 554c wwwwwwwwwwwwwwwwwwww
[0] Accepted: seq = 4 ack = 6 checksum = 372d zzzzzzzzzzzzzzzzzzz
[1] 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

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 aaaaaaaaaaaaaaaaaaa
[0] Send: seq = 0 ack = 7 checksum = 2821 bbbbbbbbbbbbbbbbbbb
[1] Accepted: seq = 0 ack = 7 checksum = 2821 bbbbbbbbbbbbbbbbbbb
[1] Send: seq = 1 ack = 0 checksum = 1e1d ccccccccccccccccccc

[0] Accepted: seq = 0 ack = 7 checksum = 322b aaaaaaaaaaaaaaaaaaa
[0] Send: seq = 1 ack = 0 checksum = 1413 ddddddddddddddddddddd
[1] Send: seq = 2 ack = 0 checksum = a08 eeeeeeeeeeeeeeeeeeee
[0] Accepted: seq = 1 ack = 0 checksum = 1e1d ccccccccccccccccccc
[0] Send: seq = 2 ack = 1 checksum = fffc ffffffffffffffffffff
[1] Accepted: seq = 1 ack = 0 checksum = 1413 ddddddddddddddddddddd
[1] Accepted: seq = 2 ack = 1 checksum = fffc ffffffffffffffffffff
[0] Send: seq = 3 ack = 1 checksum = f5f1 gggggggggggggggggggg
[0] Send: seq = 4 ack = 1 checksum = ebe6 hhhhhhhhhhhhhhhhhhhh
[1] Accepted: seq = 3 ack = 1 checksum = f5f1 gggggggggggggggggggg
[0] Send: seq = 5 ack = 1 checksum = e1db iiiiiiiiiiiiiiiiii
[1] Send: seq = 3 ack = 3 checksum = d7d1 jjjjjjjjjjjjjjjjjj
Simulator terminated at time 101.658104
after sending 10 msgs from layer5