

# Lab 2: Reliable Transport Protocol

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CS536

February 26, 2017

## The Go-Back-N version

### Input

```
----- Stop and Wait Network Simulator Version 1.1 -----  
  
Enter the number of messages to simulate: 70  
Enter packet loss probability [enter 0.0 for no loss]:.2  
Enter packet corruption probability [0.0 for no corruption]:.2  
Enter average time between messages from sender's layer5 [ > 0.0]:10.0  
Enter TRACE:2
```

```
EVENT time: 18.705740, type: 1, fromlayer5 entity: 0  
A: sending packet# 0, checksum 107, payload aaaaaaaaaaaaaaaaaa  
EVENT time: 24.170835, type: 2, fromlayer3 entity: 1
```

### Handle corruption

```
=====B-Input=====  
B: received packet# 0, checksum 107, payload aaaaaaaaaaaaaaaaaa  
B: send ACK#0.  
      TOLAYER3: packet being corrupted  
=====
```

```
EVENT time: 29.402451, type: 2, fromlayer3 entity: 0  
=====A-Input=====  
A: received an corrupted ACK  
A: discard ACK  
=====
```

```
EVENT time: 35.124840, type: 1, fromlayer5 entity: 0  
A: sending packet# 1, checksum 86, payload bbbbbbbbbbbbbbbbbbb  
      TOLAYER3: packet being lost
```

```
EVENT time: 37.680447, type: 1, fromlayer5 entity: 0  
A: sending packet# 2, checksum 65, payload cccccccccccccccccc
```

TOLAYER3: packet being corrupted

EVENT time: 38.705742, type: 0, timerinterrupt entity: 0

Handle loss/timeout

```
=====A-Timeout=====
A: time out.
A: is waiting for ACK# 0, last packet sent: #2
A: resends from packet# 0
      TOLAYER3: packet being lost
A: to packet# 2
=====
```

EVENT time: 42.147713, type: 2, fromlayer3 entity: 1

```
=====B-Input=====
B: received a corrupted packet.
B: discard that packet.
B: resend ACK#0.
      TOLAYER3: packet being corrupted
=====
```

EVENT time: 46.394402, type: 1, fromlayer5 entity: 0

A: sending packet# 3, checksum 44, payload ddddddddddddddddddd

TOLAYER3: packet being lost

EVENT time: 51.166378, type: 2, fromlayer3 entity: 0

```
=====A-Input=====
A: received an corrupted ACK
A: discard ACK
=====
```

EVENT time: 51.576138, type: 2, fromlayer3 entity: 1

```
=====B-Input=====
B: received packet# 1, checksum 86, payload bbbbbbbbbbbbbbbbbbb
B: send ACK#1.
      TOLAYER3: packet being corrupted
=====
```

EVENT time: 53.202408, type: 1, fromlayer5 entity: 0

A: sending packet# 4, checksum 23, payload eeeeeeeeeeeeeeeeeee

EVENT time: 57.152939, type: 2, fromlayer3 entity: 0

```
=====A-Input=====
A: received an corrupted ACK
A: discard ACK
=====
```

```

EVENT time: 58.705742,  type: 0, timerinterrupt  entity: 0
=====A-Timeout=====
A: time out.
A: is waiting for ACK# 0, last packet sent: #4
A: resends from packet# 0
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
A: to packet# 4
=====

```

```

EVENT time: 59.039051,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received packet# 2, checksum 65, payload cccccccccccccccccccc
B: send ACK#2.
    TOLAYER3: packet being corrupted
=====

```

```

_____ Handle out-of-order/duplicate _____
EVENT time: 63.197636,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #3 received #4
B: discard out-of-order packet.
B: resend ACK#2.
    TOLAYER3: packet being corrupted
=====

```

```

EVENT time: 64.617668,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received an corrupted ACK
A: discard ACK
=====

```

```

EVENT time: 69.035599,  type: 2, fromlayer3  entity: 1
_____ Handle corruption _____
=====B-Input=====
B: received a corrupted packet.
B: discard that packet.
B: resend ACK#2.
=====

```

```

EVENT time: 70.867607,  type: 2, fromlayer3  entity: 0
=====A-Input=====

```

```

A: received an corrupted ACK
A: discard ACK
=====

EVENT time: 70.910789,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received duplicate packet.
B: expect #3 received #2
B: discard that duplicate packet.
B: resend ACK#2.
=====

EVENT time: 72.217178,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #3 received #4
B: discard out-of-order packet.
B: resend ACK#2.
=====

EVENT time: 72.839478,  type: 1, fromlayer5  entity: 0
A: sending packet# 5, checksum 2, payload ffffffffffffffffffff

EVENT time: 73.456062,  type: 1, fromlayer5  entity: 0
A: sending packet# 6, checksum 237, payload gggggggggggggggggggg
    TOLAYER3: packet being lost

EVENT time: 75.686890,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received cumulative ACK for packet# 2, correctly sent: 0
=====

EVENT time: 76.283989,  type: 1, fromlayer5  entity: 0
A: sending packet# 7, checksum 216, payload hhhhhhhhhhhhhhhhhhhh
    TOLAYER3: packet being lost

EVENT time: 78.458145,  type: 1, fromlayer5  entity: 0
A: sending packet# 8, checksum 195, payload iiiiiiiiiiiiiiiiii
    TOLAYER3: packet being lost

EVENT time: 82.230896,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #3 received #5
B: discard out-of-order packet.

```

```

B: resend ACK#2.
    TOLAYER3: packet being lost
=====

EVENT time: 82.674294,  type: 1, fromlayer5  entity: 0
A: sending packet# 9, checksum 174, payload jjjjjjjjjjjjjjjjjjjj
    TOLAYER3: packet being lost

EVENT time: 85.082970,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 3, received #2
Ignore duplicate ACK
=====

EVENT time: 94.315735,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 3, received #2
Ignore duplicate ACK
=====

EVENT time: 95.686890,  type: 0, timerinterrupt  entity: 0
=====A-Timeout=====
A: time out.
A: is waiting for ACK# 3, last packet sent: #9
A: resends from packet# 3
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
A: to packet# 9
=====

EVENT time: 97.658607,  type: 1, fromlayer5  entity: 0
A: sending packet# 10, checksum 153, payload kkkkkkkkkkkkkkkkkkkk

EVENT time: 98.703934,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received packet# 3, checksum 44, payload ddddddddddddddddddd
B: send ACK#3.
=====

EVENT time: 103.457993,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received packet# 4, checksum 23, payload eeeeeeeeeeeeeeeeeee
B: send ACK#4.
=====

```

```

EVENT time: 108.551910,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received cumulative ACK for packet# 3, correctly sent: 3
=====

EVENT time: 109.442093,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #5 received #6
B: discard out-of-order packet.
B: resend ACK#4.
=====

EVENT time: 111.297150,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received cumulative ACK for packet# 4, correctly sent: 4
=====

EVENT time: 113.437668,  type: 1, fromlayer5  entity: 0
A: sending packet# 11, checksum 132, payload 11111111111111111111
    TOLAYER3: packet being lost

EVENT time: 117.304031,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received a corrupted packet.
B: discard that packet.
B: resend ACK#4.
=====

EVENT time: 119.658302,  type: 1, fromlayer5  entity: 0
A: sending packet# 12, checksum 111, payload mmmmmmmmmmmmmmmmmmmmm
    TOLAYER3: packet being lost

EVENT time: 120.785332,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 5, received #4
Ignore duplicate ACK
=====

EVENT time: 125.261894,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #5 received #9
B: discard out-of-order packet.

```



```

B: discard that packet.
B: resend ACK#4.
=====

EVENT time: 141.196960,  type: 1, fromlayer5  entity: 0
A: sending packet# 14, checksum 69, payload oooooooooooooooooooooo

EVENT time: 147.934570,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 5, received #4
Ignore duplicate ACK
=====

EVENT time: 148.811874,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received a corrupted packet.
B: discard that packet.
B: resend ACK#4.
=====

EVENT time: 150.395737,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received a corrupted packet.
B: discard that packet.
B: resend ACK#4.
=====

EVENT time: 151.297150,  type: 0, timerinterrupt  entity: 0
=====A-Timeout=====
A: time out.
A: is waiting for ACK# 5, last packet sent: #14
A: resends from packet# 5
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being corrupted
A: to packet# 14
=====

EVENT time: 154.493332,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 5, received #4
Ignore duplicate ACK
=====

EVENT time: 155.642868,  type: 2, fromlayer3  entity: 1

```



```

=====B-Input=====
B: received out-of-order packet.
B: expect #5 received #8
B: discard out-of-order packet.
B: resend ACK#4.
=====

EVENT time: 155.868103, type: 1, fromlayer5 entity: 0
A: sending packet# 15, checksum 48, payload ppppppppppppppppppppp

EVENT time: 159.432541, type: 2, fromlayer3 entity: 0
=====A-Input=====
A: wait for ACK# 5, received #4
Ignore duplicate ACK
=====

EVENT time: 161.850906, type: 2, fromlayer3 entity: 0
=====A-Input=====
A: wait for ACK# 5, received #4
Ignore duplicate ACK
=====

EVENT time: 164.586609, type: 2, fromlayer3 entity: 1
=====B-Input=====
B: received a corrupted packet.
B: discard that packet.
B: resend ACK#4.
    TOLAYER3: packet being corrupted
=====

EVENT time: 168.051651, type: 1, fromlayer5 entity: 0
A: sending packet# 16, checksum 27, payload qqqqqqqqqqqqqqqqqqqq
    TOLAYER3: packet being lost

EVENT time: 171.297150, type: 0, timerinterrupt entity: 0
=====A-Timeout=====
A: time out.
A: is waiting for ACK# 5, last packet sent: #16
A: resends from packet# 5
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost

```

```

        TOLAYER3: packet being corrupted
        TOLAYER3: packet being lost
A: to packet# 16
        TOLAYER3: packet being corrupted
=====

EVENT time: 171.772552,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received an corrupted ACK
A: discard ACK
=====

EVENT time: 173.909058,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received a corrupted packet.
B: discard that packet.
B: resend ACK#4.
        TOLAYER3: packet being lost
=====

EVENT time: 174.432419,  type: 1, fromlayer5  entity: 0
A: sending packet# 17, checksum 6, payload rrrrrrrrrrrrrrrrrrrr

EVENT time: 176.905441,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #5 received #11
B: discard out-of-order packet.
B: resend ACK#4.
        TOLAYER3: packet being lost
=====

EVENT time: 185.905853,  type: 1, fromlayer5  entity: 0
A: sending packet# 18, checksum 241, payload ssssssssssssssssssss
        TOLAYER3: packet being lost

EVENT time: 186.028137,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #5 received #13
B: discard out-of-order packet.
B: resend ACK#4.
        TOLAYER3: packet being corrupted
=====

```

```

EVENT time: 191.297150,  type: 0, timerinterrupt  entity: 0
=====A-Timeout=====
A: time out.
A: is waiting for ACK# 5, last packet sent: #18
A: resends from packet# 5
    TOLAYER3: packet being lost
A: to packet# 18
=====

EVENT time: 192.299820,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #5 received #14
B: discard out-of-order packet.
B: resend ACK#4.
    TOLAYER3: packet being lost
=====

EVENT time: 193.202393,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received an corrupted ACK
A: discard ACK
=====

EVENT time: 196.484802,  type: 1, fromlayer5  entity: 0
A: sending packet# 19, checksum 220, payload tttttttttttttttttttt

EVENT time: 199.068268,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received a corrupted packet.
B: discard that packet.
B: resend ACK#4.
=====

EVENT time: 202.683258,  type: 1, fromlayer5  entity: 0
A: sending packet# 20, checksum 199, payload uuuuuuuuuuuuuuuuuuuu
    TOLAYER3: packet being lost

EVENT time: 202.786484,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #5 received #7
B: discard out-of-order packet.
B: resend ACK#4.
=====

```

```

EVENT time: 203.700790, type: 1, fromlayer5 entity: 0
A: sending packet# 21, checksum 178, payload vvvvvvvvvvvvvvvvvvvv
=====
EVENT time: 204.418198, type: 2, fromlayer3 entity: 0
=====A-Input=====
A: wait for ACK# 5, received #4
Ignore duplicate ACK
=====

EVENT time: 207.658157, type: 2, fromlayer3 entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #5 received #8
B: discard out-of-order packet.
B: resend ACK#4.
=====

EVENT time: 209.190842, type: 2, fromlayer3 entity: 0
=====A-Input=====
A: wait for ACK# 5, received #4
Ignore duplicate ACK
=====

EVENT time: 210.237701, type: 2, fromlayer3 entity: 0
=====A-Input=====
A: wait for ACK# 5, received #4
Ignore duplicate ACK
=====

EVENT time: 211.297150, type: 0, timerinterrupt entity: 0
=====A-Timeout=====
A: time out.
A: is waiting for ACK# 5, last packet sent: #21
A: resends from packet# 5
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
A: to packet# 21
    TOLAYER3: packet being corrupted
=====

EVENT time: 214.197388, type: 2, fromlayer3 entity: 1

```

```

=====B-Input=====
B: received out-of-order packet.
B: expect #5 received #9
B: discard out-of-order packet.
B: resend ACK#4.
=====

EVENT time: 216.203873,  type: 1, fromlayer5  entity: 0
A: sending packet# 22, checksum 157, payload wwwwwwwwwwwwwwwwww

EVENT time: 218.305130,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #5 received #10
B: discard out-of-order packet.
B: resend ACK#4.
=====

EVENT time: 221.324677,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 5, received #4
Ignore duplicate ACK
=====

EVENT time: 225.586578,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received a corrupted packet.
B: discard that packet.
B: resend ACK#4.
=====

EVENT time: 226.468292,  type: 1, fromlayer5  entity: 0
A: sending packet# 23, checksum 136, payload xxxxxxxxxxxxxxxxxxxx

EVENT time: 226.795517,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 5, received #4
Ignore duplicate ACK
=====

EVENT time: 229.870331,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 5, received #4
Ignore duplicate ACK
=====

```

```

EVENT time: 231.297150,  type: 0, timerinterrupt  entity: 0
=====A-Timeout=====
A: time out.
A: is waiting for ACK# 5, last packet sent: #23
A: resends from packet# 5
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
A: to packet# 23
=====

EVENT time: 232.091965,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #5 received #12
B: discard out-of-order packet.
B: resend ACK#4.
=====

EVENT time: 233.497589,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #5 received #13
B: discard out-of-order packet.
B: resend ACK#4.
=====

EVENT time: 234.641922,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #5 received #14
B: discard out-of-order packet.
B: resend ACK#4.
=====

EVENT time: 236.514069,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 5, received #4

```

Ignore duplicate ACK

EVENT time: 242.109650, type: 1, fromlayer5 entity: 0

A: sending packet# 24, checksum 115, payload yyyyyyyyyyyyyyyyyyyyyy

EVENT time: 243.239105, type: 2, fromlayer3 entity: 0

=====A-Input=====

A: wait for ACK# 5, received #4

Ignore duplicate ACK

EVENT time: 243.398117, type: 2, fromlayer3 entity: 1

=====B-Input=====

B: received out-of-order packet.

B: expect #5 received #15

B: discard out-of-order packet.

B: resend ACK#4.

EVENT time: 251.297150, type: 0, timerinterrupt entity: 0

=====A-Timeout=====

A: time out.

A: is waiting for ACK# 5, last packet sent: #24

A: resends from packet# 5

TOLAYER3: packet being corrupted

TOLAYER3: packet being lost

TOLAYER3: packet being lost

TOLAYER3: packet being corrupted

TOLAYER3: packet being corrupted

TOLAYER3: packet being lost

TOLAYER3: packet being corrupted

TOLAYER3: packet being lost

TOLAYER3: packet being corrupted

TOLAYER3: packet being lost

TOLAYER3: packet being corrupted

TOLAYER3: packet being lost

A: to packet# 24

TOLAYER3: packet being lost

EVENT time: 251.484589, type: 2, fromlayer3 entity: 0

=====A-Input=====

A: wait for ACK# 5, received #4

Ignore duplicate ACK

```

=====
EVENT time: 251.979538,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received packet# 5, checksum 2, payload ffffffffffffffffffff
B: send ACK#5.
      TOLAYER3: packet being corrupted
=====

EVENT time: 255.393723,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received packet# 6, checksum 237, payload gggggggggggggggggggg
B: send ACK#6.
      TOLAYER3: packet being lost
=====

EVENT time: 258.114532,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 5, received #4
Ignore duplicate ACK
=====

EVENT time: 260.250000,  type: 1, fromlayer5  entity: 0
A: sending packet# 25, checksum 94, payload zzzzzzzzzzzzzzzzzzzz

EVENT time: 260.586517,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received a corrupted packet.
B: discard that packet.
B: resend ACK#6.
=====

EVENT time: 265.017517,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received a corrupted packet.
B: discard that packet.
B: resend ACK#6.
      TOLAYER3: packet being lost
=====

EVENT time: 266.555023,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #7 received #12
B: discard out-of-order packet.

```



```

B: resend ACK#6.
    TOLAYER3: packet being lost
=====

EVENT time: 267.631897,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received an corrupted ACK
A: discard ACK
=====

EVENT time: 270.963409,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received cumulative ACK for packet# 6, correctly sent: 5
=====

EVENT time: 272.236328,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received a corrupted packet.
B: discard that packet.
B: resend ACK#6.
=====

EVENT time: 273.601929,  type: 1, fromlayer5  entity: 0
A: sending packet# 26, checksum 81, payload aaaaaaaaaaaaaaaaaa

EVENT time: 274.083527,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received a corrupted packet.
B: discard that packet.
B: resend ACK#6.
=====

EVENT time: 276.805389,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 7, received #6
Ignore duplicate ACK
=====

EVENT time: 279.918610,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #7 received #17
B: discard out-of-order packet.
B: resend ACK#6.
    TOLAYER3: packet being corrupted

```

```

=====
EVENT time: 280.093292,  type: 1, fromlayer5  entity: 0
A: sending packet# 27, checksum 60, payload bbbbbbbbbbbbbbbbbbbb

EVENT time: 282.499420,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 7, received #6
Ignore duplicate ACK
=====

EVENT time: 284.676575,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received an corrupted ACK
A: discard ACK
=====

EVENT time: 285.714142,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received duplicate packet.
B: expect #7 received #5
B: discard that duplicate packet.
B: resend ACK#6.
=====

EVENT time: 288.496277,  type: 1, fromlayer5  entity: 0
A: sending packet# 28, checksum 39, payload ccccccccccccccccccc
    TOLAYER3: packet being lost

EVENT time: 290.963409,  type: 0, timerinterrupt  entity: 0
=====A-Timeout=====
A: time out.
A: is waiting for ACK# 7, last packet sent: #28
A: resends from packet# 7
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being corrupted
A: to packet# 28
=====

EVENT time: 291.128784,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 7, received #6

```

Ignore duplicate ACK

EVENT time: 292.333038, type: 2, fromlayer3 entity: 1

=====B-Input=====

B: received duplicate packet.

B: expect #7 received #6

B: discard that duplicate packet.

B: resend ACK#6.

EVENT time: 296.842743, type: 2, fromlayer3 entity: 0

=====A-Input=====

A: wait for ACK# 7, received #6

Ignore duplicate ACK

EVENT time: 299.232178, type: 1, fromlayer5 entity: 0

A: sending packet# 29, checksum 18, payload ddddddddddddddddddd

TOLAYER3: packet being lost

EVENT time: 299.489441, type: 2, fromlayer3 entity: 1

=====B-Input=====

B: received packet# 7, checksum 216, payload hhhhhhhhhhhhhhhhhhhh

B: send ACK#7.

EVENT time: 303.665955, type: 2, fromlayer3 entity: 1

=====B-Input=====

B: received packet# 8, checksum 195, payload iiiiiiiiiiiiiiiiiiiii

B: send ACK#8.

EVENT time: 307.175995, type: 2, fromlayer3 entity: 1

=====B-Input=====

B: received packet# 9, checksum 174, payload jjjjjjjjjjjjjjjjjjjj

B: send ACK#9.

EVENT time: 308.152374, type: 1, fromlayer5 entity: 0

A: sending packet# 30, checksum 253, payload eeeeeeeeeeeeeeeeeee

EVENT time: 309.068390, type: 2, fromlayer3 entity: 0

=====A-Input=====

A: received cumulative ACK for packet# 7, correctly sent: 7

```

=====
EVENT time: 311.533234,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received packet# 10, checksum 153, payload kkkkkkkkkkkkkkkkkkkkk
B: send ACK#10.
=====

EVENT time: 312.557526,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received cumulative ACK for packet# 8, correctly sent: 8
=====

EVENT time: 317.600586,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received packet# 11, checksum 132, payload llllllllllllllllllll
B: send ACK#11.
=====

EVENT time: 319.503021,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received packet# 12, checksum 111, payload mmmmmmmmmmmmmmmmmmmmm
B: send ACK#12.
      TOLAYER3: packet being corrupted
=====

EVENT time: 322.387817,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received cumulative ACK for packet# 9, correctly sent: 9
=====

EVENT time: 325.000824,  type: 1, fromlayer5  entity: 0
A: sending packet# 31, checksum 232, payload ffffffffffffffffffff
      TOLAYER3: packet being lost

EVENT time: 326.165985,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received packet# 13, checksum 90, payload nnnnnnnnnnnnnnnnnnnn
B: send ACK#13.
      TOLAYER3: packet being lost
=====

EVENT time: 328.207947,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.

```

```

B: expect #14 received #15
B: discard out-of-order packet.
B: resend ACK#13.
=====

EVENT time: 329.123627,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received cumulative ACK for packet# 10, correctly sent: 10
=====

EVENT time: 333.618134,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received cumulative ACK for packet# 11, correctly sent: 11
=====

EVENT time: 335.045441,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #14 received #16
B: discard out-of-order packet.
B: resend ACK#13.
      TOLAYER3: packet being corrupted
=====

EVENT time: 338.501831,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #14 received #17
B: discard out-of-order packet.
B: resend ACK#13.
=====

EVENT time: 342.772797,  type: 1, fromlayer5  entity: 0
A: sending packet# 32, checksum 211, payload gggggggggggggggggggg

EVENT time: 342.941315,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received an corrupted ACK
A: discard ACK
=====

EVENT time: 347.931641,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received cumulative ACK for packet# 13, correctly sent: 12
=====

```

```

EVENT time: 348.114624,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #14 received #18
B: discard out-of-order packet.
B: resend ACK#13.
    TOLAYER3: packet being corrupted
=====

EVENT time: 353.424194,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received an corrupted ACK
A: discard ACK
=====

EVENT time: 357.851532,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #14 received #19
B: discard out-of-order packet.
B: resend ACK#13.
    TOLAYER3: packet being corrupted
=====

EVENT time: 361.929260,  type: 1, fromlayer5  entity: 0
A: sending packet# 33, checksum 190, payload hhhhhhhhhhhhhhhhhhhhh
    TOLAYER3: packet being corrupted

EVENT time: 363.337433,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 14, received #13
Ignore duplicate ACK
=====

EVENT time: 365.345184,  type: 1, fromlayer5  entity: 0
A: sending packet# 34, checksum 169, payload iiiiiiiiiiiiiiiiii

EVENT time: 366.991577,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #14 received #21
B: discard out-of-order packet.
B: resend ACK#13.
=====

```

```

EVENT time: 367.931641,  type: 0, timerinterrupt  entity: 0
=====A-Timeout=====
A: time out.
A: is waiting for ACK# 14, last packet sent: #34
A: resends from packet# 14
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being corrupted
A: to packet# 34
    TOLAYER3: packet being corrupted
=====

EVENT time: 368.246094,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received an corrupted ACK
A: discard ACK
=====

EVENT time: 374.963867,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received duplicate packet.
B: expect #14 received #5
B: discard that duplicate packet.
B: resend ACK#13.
    TOLAYER3: packet being lost
=====

EVENT time: 376.288757,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received an corrupted ACK
A: discard ACK
=====

EVENT time: 377.423889,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received duplicate packet.
B: expect #14 received #7
B: discard that duplicate packet.
B: resend ACK#13.
=====

```

```

EVENT time: 379.847015,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 14, received #13
Ignore duplicate ACK
=====

EVENT time: 382.058838,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 14, received #13
Ignore duplicate ACK
=====

EVENT time: 382.991028,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received duplicate packet.
B: expect #14 received #8
B: discard that duplicate packet.
B: resend ACK#13.
    TOLAYER3: packet being corrupted
=====

EVENT time: 383.138428,  type: 1, fromlayer5  entity: 0
A: sending packet# 35, checksum 148, payload jjjjjjjjjjjjjjjjjjjj

EVENT time: 387.931641,  type: 0, timerinterrupt  entity: 0
=====A-Timeout=====
A: time out.
A: is waiting for ACK# 14, last packet sent: #35
A: resends from packet# 14
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
A: to packet# 35
=====

EVENT time: 388.694672,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received an corrupted ACK
A: discard ACK
=====

EVENT time: 389.942780,  type: 2, fromlayer3  entity: 1

```



```

=====B-Input=====
B: received duplicate packet.
B: expect #14 received #9
B: discard that duplicate packet.
B: resend ACK#13.
=====

EVENT time: 392.159607, type: 2, fromlayer3 entity: 1
=====B-Input=====
B: received duplicate packet.
B: expect #14 received #11
B: discard that duplicate packet.
B: resend ACK#13.
=====

EVENT time: 394.293243, type: 2, fromlayer3 entity: 1
=====B-Input=====
B: received packet# 14, checksum 69, payload oooooooooooooooooooooo
B: send ACK#14.
=====

EVENT time: 399.854614, type: 2, fromlayer3 entity: 0
=====A-Input=====
A: wait for ACK# 14, received #13
Ignore duplicate ACK
=====

EVENT time: 399.980591, type: 2, fromlayer3 entity: 1
=====B-Input=====
B: received packet# 15, checksum 48, payload pppppppppppppppppppppp
B: send ACK#15.
=====

EVENT time: 401.539642, type: 1, fromlayer5 entity: 0
A: sending packet# 36, checksum 127, payload kkkkkkkkkkkkkkkkkkkkk

EVENT time: 405.390411, type: 2, fromlayer3 entity: 0
=====A-Input=====
A: wait for ACK# 14, received #13
Ignore duplicate ACK
=====

EVENT time: 405.493683, type: 2, fromlayer3 entity: 1
=====B-Input=====
B: received out-of-order packet.

```

```

B: expect #16 received #17
B: discard out-of-order packet.
B: resend ACK#15.
=====

EVENT time: 407.133362,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #16 received #18
B: discard out-of-order packet.
B: resend ACK#15.
=====

EVENT time: 407.931641,  type: 0, timerinterrupt  entity: 0
=====A-Timeout=====
A: time out.
A: is waiting for ACK# 14, last packet sent: #36
A: resends from packet# 14
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
A: to packet# 36
    TOLAYER3: packet being lost
=====

EVENT time: 413.084808,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #16 received #19
B: discard out-of-order packet.
B: resend ACK#15.
=====

EVENT time: 415.218323,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received cumulative ACK for packet# 14, correctly sent: 14
=====

EVENT time: 418.072540,  type: 1, fromlayer5  entity: 0
A: sending packet# 37, checksum 106, payload 11111111111111111111

EVENT time: 420.496277,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.

```

[illegible]

```

B: expect #16 received #23
B: discard out-of-order packet.
B: resend ACK#15.
=====

EVENT time: 435.600586,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received duplicate packet.
B: expect #16 received #5
B: discard that duplicate packet.
B: resend ACK#15.
    TOLAYER3: packet being corrupted
=====

EVENT time: 440.183685,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 16, received #15
Ignore duplicate ACK
=====

EVENT time: 441.898468,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 16, received #15
Ignore duplicate ACK
=====

EVENT time: 442.660370,  type: 0, timerinterrupt  entity: 0
=====A-Timeout=====
A: time out.
A: is waiting for ACK# 16, last packet sent: #40
A: resends from packet# 16
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being corrupted
A: to packet# 40
=====

EVENT time: 444.743408,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received duplicate packet.
B: expect #16 received #7

```

```

B: discard that duplicate packet.
B: resend ACK#15.
=====

EVENT time: 447.138092,  type: 1, fromlayer5  entity: 0
A: sending packet# 41, checksum 22, payload ppppppppppppppppppppp

EVENT time: 449.257019,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received an corrupted ACK
A: discard ACK
=====

EVENT time: 451.297699,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received duplicate packet.
B: expect #16 received #8
B: discard that duplicate packet.
B: resend ACK#15.
=====

EVENT time: 453.323090,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received an corrupted ACK
A: discard ACK
=====

EVENT time: 457.381409,  type: 1, fromlayer5  entity: 0
A: sending packet# 42, checksum 1, payload qqqqqqqqqqqqqqqqqqqq

EVENT time: 459.267914,  type: 1, fromlayer5  entity: 0
A: sending packet# 43, checksum 236, payload rrrrrrrrrrrrrrrrrrrr
    TOLAYER3: packet being corrupted

EVENT time: 459.830566,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received duplicate packet.
B: expect #16 received #9
B: discard that duplicate packet.
B: resend ACK#15.
=====

EVENT time: 461.354706,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 16, received #15

```

Ignore duplicate ACK

EVENT time: 462.660370, type: 0, timerinterrupt entity: 0

=====A-Timeout=====

A: time out.

A: is waiting for ACK# 16, last packet sent: #43

A: resends from packet# 16

TOLAYER3: packet being corrupted

TOLAYER3: packet being corrupted

TOLAYER3: packet being lost

TOLAYER3: packet being lost

TOLAYER3: packet being corrupted

TOLAYER3: packet being lost

TOLAYER3: packet being lost

TOLAYER3: packet being lost

TOLAYER3: packet being corrupted

TOLAYER3: packet being corrupted

A: to packet# 43

TOLAYER3: packet being lost

EVENT time: 464.789368, type: 2, fromlayer3 entity: 1

=====B-Input=====

B: received a corrupted packet.

B: discard that packet.

B: resend ACK#15.

EVENT time: 466.314819, type: 1, fromlayer5 entity: 0

A: sending packet# 44, checksum 215, payload sssssssssssssssssssss

EVENT time: 468.092285, type: 2, fromlayer3 entity: 1

=====B-Input=====

B: received duplicate packet.

B: expect #16 received #12

B: discard that duplicate packet.

B: resend ACK#15.

TOLAYER3: packet being corrupted

EVENT time: 468.703613, type: 2, fromlayer3 entity: 0

=====A-Input=====

A: wait for ACK# 16, received #15

Ignore duplicate ACK

```

=====
EVENT time: 470.016205,  type: 1, fromlayer5  entity: 0
A: sending packet# 45, checksum 194, payload tttttttttttttttttttt

EVENT time: 473.658142,  type: 1, fromlayer5  entity: 0
A: sending packet# 46, checksum 173, payload uuuuuuuuuuuuuuuuuuuu

EVENT time: 474.623260,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received duplicate packet.
B: expect #16 received #14
B: discard that duplicate packet.
B: resend ACK#15.
=====

EVENT time: 477.997650,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received an corrupted ACK
A: discard ACK
=====

EVENT time: 482.660370,  type: 0, timerinterrupt  entity: 0
=====A-Timeout=====
A: time out.
A: is waiting for ACK# 16, last packet sent: #46
A: resends from packet# 16
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
A: to packet# 46
=====

EVENT time: 483.632812,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received duplicate packet.

```

```

B: expect #16 received #15
B: discard that duplicate packet.
B: resend ACK#15.
      TOLAYER3: packet being corrupted
=====

EVENT time: 485.034821,  type: 1, fromlayer5  entity: 0
A: sending packet# 47, checksum 152, payload vvvvvvvvvvvvvvvvvvvvvv
      TOLAYER3: packet being corrupted

EVENT time: 487.902069,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 16, received #15
Ignore duplicate ACK
=====

EVENT time: 489.948303,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received packet# 16, checksum 27, payload qqqqqqqqqqqqqqqqqqqqq
B: send ACK#16.
=====

EVENT time: 490.526611,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 16, received #15
Ignore duplicate ACK
=====

EVENT time: 494.656555,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 16, received #15
Ignore duplicate ACK
=====

EVENT time: 497.444031,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received a corrupted packet.
B: discard that packet.
B: resend ACK#16.
=====

EVENT time: 497.789764,  type: 1, fromlayer5  entity: 0
A: sending packet# 48, checksum 131, payload wwwwwwwwwwwwwwwwwwwww
      TOLAYER3: packet being lost

```



```

EVENT time: 499.284241,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 16, received #15
Ignore duplicate ACK
=====

EVENT time: 500.545532,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received an corrupted ACK
A: discard ACK
=====

EVENT time: 502.660370,  type: 0, timerinterrupt  entity: 0
=====A-Timeout=====
A: time out.
A: is waiting for ACK# 16, last packet sent: #48
A: resends from packet# 16
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
A: to packet# 48
=====

EVENT time: 504.564178,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 16, received #15
Ignore duplicate ACK
=====

EVENT time: 506.270996,  type: 1, fromlayer5  entity: 0
A: sending packet# 49, checksum 110, payload xxxxxxxxxxxxxxxxxxxxx
    TOLAYER3: packet being corrupted

EVENT time: 506.859955,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #17 received #20

```

```

B: discard out-of-order packet.
B: resend ACK#16.
=====

EVENT time: 509.008698,  type: 1, fromlayer5  entity: 0
A: sending packet# 50, checksum 89, payload yyyyyyyyyyyyyyyyyyyy
    TOLAYER3: packet being corrupted

EVENT time: 511.770874,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received an corrupted ACK
A: discard ACK
=====

EVENT time: 516.323242,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #17 received #23
B: discard out-of-order packet.
B: resend ACK#16.
=====

EVENT time: 516.325928,  type: 1, fromlayer5  entity: 0
A: sending packet# 51, checksum 68, payload zzzzzzzzzzzzzzzzzzzz

EVENT time: 517.336548,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received cumulative ACK for packet# 16, correctly sent: 16
=====

EVENT time: 520.923645,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #17 received #24
B: discard out-of-order packet.
B: resend ACK#16.
    TOLAYER3: packet being lost
=====

EVENT time: 521.726196,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 17, received #16
Ignore duplicate ACK
=====

```

```

EVENT time: 525.049744,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received a corrupted packet.
B: discard that packet.
B: resend ACK#16.
=====

EVENT time: 527.536499,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 17, received #16
Ignore duplicate ACK
=====

EVENT time: 532.030823,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 17, received #16
Ignore duplicate ACK
=====

EVENT time: 532.655945,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received a corrupted packet.
B: discard that packet.
B: resend ACK#16.
=====

EVENT time: 534.186157,  type: 1, fromlayer5  entity: 0
A: sending packet# 52, checksum 55, payload aaaaaaaaaaaaaaaaaa
    TOLAYER3: packet being lost

EVENT time: 535.813538,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 17, received #16
Ignore duplicate ACK
=====

EVENT time: 536.192688,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received a corrupted packet.
B: discard that packet.
B: resend ACK#16.
    TOLAYER3: packet being lost
=====

EVENT time: 537.336548,  type: 0, timerinterrupt  entity: 0

```

```

=====A-Timeout=====
A: time out.
A: is waiting for ACK# 17, last packet sent: #52
A: resends from packet# 17
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
A: to packet# 52
    TOLAYER3: packet being corrupted
=====

EVENT time: 539.421326,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received duplicate packet.
B: expect #17 received #10
B: discard that duplicate packet.
B: resend ACK#16.
=====

EVENT time: 544.205933,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 17, received #16
Ignore duplicate ACK
=====

EVENT time: 545.311340,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 17, received #16
Ignore duplicate ACK
=====

EVENT time: 548.269775,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received duplicate packet.
B: expect #17 received #12
B: discard that duplicate packet.

```

```

B: resend ACK#16.
    TOLAYER3: packet being lost
=====

EVENT time: 553.864380,  type: 1, fromlayer5  entity: 0
A: sending packet# 53, checksum 34, payload bbbbbbbbbbbbbbbbbbbb

EVENT time: 555.363708,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received a corrupted packet.
B: discard that packet.
B: resend ACK#16.
=====

EVENT time: 557.336548,  type: 0, timerinterrupt  entity: 0
=====A-Timeout=====
A: time out.
A: is waiting for ACK# 17, last packet sent: #53
A: resends from packet# 17
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
A: to packet# 53
    TOLAYER3: packet being lost
=====

EVENT time: 561.760010,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 17, received #16
Ignore duplicate ACK
=====

EVENT time: 562.452820,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received a corrupted packet.

```

B: discard that packet.  
B: resend ACK#16.

=====

EVENT time: 567.762939, type: 2, fromlayer3 entity: 1

=====B-Input=====

B: received a corrupted packet.  
B: discard that packet.  
B: resend ACK#16.

=====

EVENT time: 569.217712, type: 1, fromlayer5 entity: 0  
A: sending packet# 54, checksum 13, payload ccccccccccccccccccc

EVENT time: 571.362122, type: 2, fromlayer3 entity: 0

=====A-Input=====

A: wait for ACK# 17, received #16  
Ignore duplicate ACK

=====

EVENT time: 571.830566, type: 2, fromlayer3 entity: 1

=====B-Input=====

B: received out-of-order packet.  
B: expect #17 received #18  
B: discard out-of-order packet.  
B: resend ACK#16.

TOLAYER3: packet being corrupted

=====

EVENT time: 573.862854, type: 1, fromlayer5 entity: 0  
A: sending packet# 55, checksum 248, payload ddddddddddddddddddd

EVENT time: 576.820496, type: 2, fromlayer3 entity: 1

=====B-Input=====

B: received out-of-order packet.  
B: expect #17 received #19  
B: discard out-of-order packet.  
B: resend ACK#16.

=====

EVENT time: 577.336548, type: 0, timerinterrupt entity: 0

=====A-Timeout=====

A: time out.  
A: is waiting for ACK# 17, last packet sent: #55  
A: resends from packet# 17

```

TOLAYER3: packet being corrupted
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TOLAYER3: packet being lost
A: to packet# 55
=====

EVENT time: 577.620178,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 17, received #16
Ignore duplicate ACK
=====

EVENT time: 581.291077,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received an corrupted ACK
A: discard ACK
=====

EVENT time: 582.553101,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 17, received #16
Ignore duplicate ACK
=====

EVENT time: 584.347168,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #17 received #20
B: discard out-of-order packet.
B: resend ACK#16.
=====

EVENT time: 588.333252,  type: 1, fromlayer5  entity: 0
A: sending packet# 56, checksum 227, payload eeeeeeeeeeeeeeeeeee
TOLAYER3: packet being lost

EVENT time: 589.171509,  type: 2, fromlayer3  entity: 0
=====A-Input=====

```

A: wait for ACK# 17, received #16  
Ignore duplicate ACK

=====

EVENT time: 590.830322, type: 2, fromlayer3 entity: 1

=====B-Input=====

B: received out-of-order packet.  
B: expect #17 received #22  
B: discard out-of-order packet.  
B: resend ACK#16.

TOLAYER3: packet being lost

=====

EVENT time: 594.434509, type: 2, fromlayer3 entity: 1

=====B-Input=====

B: received out-of-order packet.  
B: expect #17 received #23  
B: discard out-of-order packet.  
B: resend ACK#16.

=====

EVENT time: 596.699951, type: 1, fromlayer5 entity: 0

A: sending packet# 57, checksum 206, payload ffffffffffffffffffff

EVENT time: 597.336548, type: 0, timerinterrupt entity: 0

=====A-Timeout=====

A: time out.

A: is waiting for ACK# 17, last packet sent: #57

A: resends from packet# 17

TOLAYER3: packet being corrupted

TOLAYER3: packet being lost

TOLAYER3: packet being corrupted

TOLAYER3: packet being lost

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TOLAYER3: packet being corrupted

TOLAYER3: packet being corrupted

TOLAYER3: packet being lost

TOLAYER3: packet being corrupted

A: to packet# 57



```

EVENT time: 598.039001,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 17, received #16
Ignore duplicate ACK
=====

EVENT time: 598.256104,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #17 received #25
B: discard out-of-order packet.
B: resend ACK#16.
      TOLAYER3: packet being corrupted
=====

EVENT time: 600.695618,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #17 received #26
B: discard out-of-order packet.
B: resend ACK#16.
      TOLAYER3: packet being lost
=====

EVENT time: 601.326294,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received an corrupted ACK
A: discard ACK
=====

EVENT time: 604.655945,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #17 received #27
B: discard out-of-order packet.
B: resend ACK#16.
      TOLAYER3: packet being lost
=====

EVENT time: 611.533997,  type: 1, fromlayer5  entity: 0
A: sending packet# 58, checksum 185, payload ggggggggggggggggggggg

EVENT time: 613.308716,  type: 2, fromlayer3  entity: 1
=====B-Input=====

```

```

B: received duplicate packet.
B: expect #17 received #7
B: discard that duplicate packet.
B: resend ACK#16.
    TOLAYER3: packet being lost
=====

EVENT time: 615.292969,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received duplicate packet.
B: expect #17 received #8
B: discard that duplicate packet.
B: resend ACK#16.
=====

EVENT time: 616.822510,  type: 1, fromlayer5  entity: 0
A: sending packet# 59, checksum 164, payload hhhhhhhhhhhhhhhhhhhhh

EVENT time: 617.336548,  type: 0, timerinterrupt  entity: 0
=====A-Timeout=====
A: time out.
A: is waiting for ACK# 17, last packet sent: #59
A: resends from packet# 17
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
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    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being corrupted
A: to packet# 59
    TOLAYER3: packet being lost
=====

```

```

EVENT time: 618.116089,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received a corrupted packet.
B: discard that packet.
B: resend ACK#16.
=====

EVENT time: 622.246399,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 17, received #16
Ignore duplicate ACK
=====

EVENT time: 626.461426,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received duplicate packet.
B: expect #17 received #11
B: discard that duplicate packet.
B: resend ACK#16.
=====

EVENT time: 630.507080,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 17, received #16
Ignore duplicate ACK
=====

EVENT time: 631.207397,  type: 1, fromlayer5  entity: 0
A: sending packet# 60, checksum 143, payload iiiiiiiiiiiiiiiiii

        TOLAYER3: packet being corrupted

EVENT time: 633.188477,  type: 1, fromlayer5  entity: 0
A: sending packet# 61, checksum 122, payload jjjjjjjjjjjjjjjjjjjj

EVENT time: 634.021545,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received duplicate packet.
B: expect #17 received #13
B: discard that duplicate packet.
B: resend ACK#16.
        TOLAYER3: packet being corrupted
=====

```

```

EVENT time: 637.336548,  type: 0, timerinterrupt  entity: 0
=====A-Timeout=====
A: time out.
A: is waiting for ACK# 17, last packet sent: #61
A: resends from packet# 17
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
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    TOLAYER3: packet being corrupted
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
A: to packet# 61
=====

EVENT time: 638.273682,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 17, received #16
Ignore duplicate ACK
=====

EVENT time: 640.538452,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received an corrupted ACK
A: discard ACK
=====

EVENT time: 642.758850,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received a corrupted packet.
B: discard that packet.
B: resend ACK#16.
=====

EVENT time: 643.015320,  type: 1, fromlayer5  entity: 0
A: sending packet# 62, checksum 101, payload kkkkkkkkkkkkkkkkkkkkk

EVENT time: 648.821045,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received duplicate packet.

```

```

B: expect #17 received #15
B: discard that duplicate packet.
B: resend ACK#16.
=====

EVENT time: 651.684631,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 17, received #16
Ignore duplicate ACK
=====

EVENT time: 655.873108,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 17, received #16
Ignore duplicate ACK
=====

EVENT time: 657.336548,  type: 0, timerinterrupt  entity: 0
=====A-Timeout=====
A: time out.
A: is waiting for ACK# 17, last packet sent: #62
A: resends from packet# 17
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
    TOLAYER3: packet being lost
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    TOLAYER3: packet being lost
    TOLAYER3: packet being lost
    TOLAYER3: packet being corrupted
A: to packet# 62
=====

EVENT time: 658.086487,  type: 1, fromlayer5  entity: 0
A: sending packet# 63, checksum 80, payload llllllllllllllllllll

EVENT time: 658.522278,  type: 2, fromlayer3  entity: 1
=====B-Input=====

```

```

B: received duplicate packet.
B: expect #17 received #16
B: discard that duplicate packet.
B: resend ACK#16.
=====

EVENT time: 661.384583,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: wait for ACK# 17, received #16
Ignore duplicate ACK
=====

EVENT time: 664.054688,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received packet# 17, checksum 6, payload rrrrrrrrrrrrrrrrrrrrrr
B: send ACK#17.
=====

EVENT time: 666.063782,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received cumulative ACK for packet# 17, correctly sent: 17
=====

EVENT time: 668.239868,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received packet# 18, checksum 241, payload ssssssssssssssssssssss
B: send ACK#18.
=====

EVENT time: 670.626099,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received cumulative ACK for packet# 18, correctly sent: 18
=====

EVENT time: 673.409302,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received packet# 19, checksum 220, payload ttttttttttttttttttttt
B: send ACK#19.
      TOLAYER3: packet being lost
=====

EVENT time: 675.700195,  type: 1, fromlayer5  entity: 0
A: sending packet# 64, checksum 59, payload mmmmmmmmmmmmmmmmmmmmm
      TOLAYER3: packet being corrupted

```

[illegible]

```

A: to packet# 65
=====

EVENT time: 694.068359,  type: 1, fromlayer5  entity: 0
A: sending packet# 66, checksum 17, payload oooooooooooooooooooooo

EVENT time: 697.106140,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received packet# 22, checksum 157, payload wwwwwwwwwwwwwwwwwwww
B: send ACK#22.
=====

EVENT time: 700.690247,  type: 1, fromlayer5  entity: 0
A: sending packet# 67, checksum 252, payload ppppppppppppppppppppp

EVENT time: 703.951477,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received packet# 23, checksum 136, payload xxxxxxxxxxxxxxxxxxxxxx
B: send ACK#23.
      TOLAYER3: packet being corrupted
=====

EVENT time: 706.440613,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received cumulative ACK for packet# 22, correctly sent: 19
=====

EVENT time: 709.534119,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received packet# 24, checksum 115, payload yyyyyyyyyyyyyyyyyyyy
B: send ACK#24.
=====

EVENT time: 714.027344,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received an corrupted ACK
A: discard ACK
=====

EVENT time: 717.635376,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received a corrupted packet.
B: discard that packet.
B: resend ACK#24.
=====

```



```

EVENT time: 719.255127,  type: 1, fromlayer5  entity: 0
A: sending packet# 68, checksum 231, payload qqqqqqqqqqqqqqqqqqqqq

EVENT time: 719.258118,  type: 2, fromlayer3  entity: 1
=====B-Input=====
B: received out-of-order packet.
B: expect #25 received #26
B: discard out-of-order packet.
B: resend ACK#24.
=====

EVENT time: 721.496704,  type: 2, fromlayer3  entity: 0
=====A-Input=====
A: received cumulative ACK for packet# 24, correctly sent: 23
=====

EVENT time: 723.788330,  type: 1, fromlayer5  entity: 0
A: sending packet# 69, checksum 210, payload rrrrrrrrrrrrrrrrrrrr

EVENT time: 723.824280,  type: 1, fromlayer5  entity: 0
  Simulator terminated at time 723.824280
  after sending 70 msgs from layer5

```