```
EVENT time: 18.705740, type: 1, fromlayer5 entity: 0

    A side received message from upper layer:

                                              aaaaaaaaaaaaaaa
Sending Message:
                                                               ack# = 0
                                                                           seq# = 0
                                        aaaaaaaaaaaaaaa
- Started timer for packet 0
EVENT time: 24.170835, type: 2, fromlayer3 entity: 1
- B side received packet:
                                                               ack# = 0
                                                                           seq# = 0
                                        aaaaaaaaaaaaaaaa
- In-order packet received (seq# 0)!
Sending all buffered packets in the window.
     - B side sending packet to upper
       layer (seq# 0).

    Updating receiver buffer window.

 Now expecting packet 1
- B side sending ACK for packet 0:
                                                         ack# = 0
                                        ACK
                                                                     seq# = 0
         TOLAYER3: packet being corrupted
EVENT time: 29.402449, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                                         ack# = 0
                                        ACK
                                                                     seq# = 9999999
- A side received corrupt packet :(
EVENT time: 35.124840, type: 1, fromlayer5 entity: 0

    A side received message from upper layer:

                                              Sending Message:
                                                               ack# = 1
                                                                          seq# = 1
         TOLAYER3: packet being lost.

    Started timer for packet 1

EVENT time: 37.680447, type: 1, fromlayer5 entity: 0
 A side received message from upper layer:
                                              ccccccccccccccc
Sending Message:
                                        ccccccccccccccc
                                                               ack# = 2
                                                                           seq# = 2
         TOLAYER3: packet being corrupted
- Started timer for packet 2
EVENT time: 38.705742, type: 0, timerinterrupt entity: 0

    TIMEOUT (packet 0) - timer restarted

packet 0 resent:
                                        aaaaaaaaaaaaaaaa
                                                               ack# = 0
         TOLAYER3: packet being lost.
EVENT time: 42.147713, type: 2, fromlayer3 entity: 1
B side received packet:
                                        Zcccccccccccccc
                                                               ack# = 2
                                                                           seq# = 2
B side received corrupt packet. Ignoring...
```

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

```
    A side received message from upper layer:

                                              dddddddddddddddd
- Sending Message:
                                        dddddddddddddd
                                                               ack# = 3
                                                                           seq# = 3
- Started timer for packet 3
EVENT time: 51.666630, type: 2, fromlayer3 entity: 1
- B side received packet:
                                        dddddddddddddddd
                                                               ack# = 3
                                                                           seq# = 3
Out-of-order packet received (seq# 3).
 Expecting seq# 1. Buffering for later...
B side sending ACK for packet 3:
                                                          ack# = 3
                                                                     seq# = 3
                                        ACK
EVENT time: 54.979748, type: 1, fromlayer5 entity: 0
- A side received message from upper layer:
                                              eeeeeeeeeeeee
- Sending Message:
                                                               ack# = 4
                                                                           seq# = 4
                                        eeeeeeeeeeeeee
         TOLAYER3: packet being lost.
- Started timer for packet 4
EVENT time: 55.124840, type: 0, timerinterrupt
- TIMEOUT (packet 1) - timer restarted
                                        packet 1 resent:
                                                               ack# = 1
                                                                           seq# = 1
         TOLAYER3: packet being corrupted
EVENT time: 55.869270, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                                         ack# = 3
                                        ACK
                                                                     seq# = 3
- A side received valid packet.

    New ACK received (packet 3) - STOPPED TIMER

** 0 MESSAGES HAVE BEEN SENT SUCCESSFULLY **

    Updating sending window...

    Making sure all packets in the sending

 window have been sent.
     - Message in window, already sent:
                                                                     ack# = 0
                                                                                 seq# = 0
                                              aaaaaaaaaaaaaaaaaaaaaa
      - Message in window, already sent:
                                              ack# = 1
                                                                                 seq# = 1
      - Message in window, already sent:
                                              cccccccccccccc
                                                                     ack# = 2
                                                                                 seq# = 2
      - Message in window, already sent:
                                              dddddddddddddddd
                                                                     ack# = 3
                                                                                 seq# = 3
      - Message in window, already sent:
                                                                                 seq# = 4
                                              <del>eeeeeeeeeeeeeee</del>
                                                                     ack# = 4
EVENT time: 57.680447, type: 0, timerinterrupt
                                                entity: 0
- TIMEOUT (packet 2) - timer restarted
                                        ccccccccccccc ack# = 2
 packet 2 resent:
                                                                           seq# = 2
         TOLAYER3: packet being corrupted
EVENT time: 58.705742, type: 0, timerinterrupt
                                                entity: 0
- TIMEOUT (packet 0) - timer restarted
 packet 0 resent:
                                        aaaaaaaaaaaaaaaa
                                                               ack# = 0
                                                                           seq# = 0
```

```
EVENT time: 59.188442, type: 2, fromlayer3 entity: 1
- B side received packet:
                                      - B side received corrupt packet. Ignoring...
EVENT time: 60.972366, type: 2, fromlayer3 entity: 1
- B side received packet:
                                      cccccccccccccc ack# = 999999
                                                                             seq# = 2

    B side received corrupt packet. Ignoring...

EVENT time: 65.130951, type: 2, fromlayer3 entity: 1
- B side received packet:
                                      aaaaaaaaaaaaaaaa ack# = 0
                                                                       seq# = 0
- Previously ACKed packet received. Re-ACKing...
- B side sending ACK for packet 0:
                                                   ack# = 0
                                                                  seq# = 0
         TOLAYER3: packet being lost.
EVENT time: 72.798996, type: 1, fromlayer5 entity: 0
- A side received message from upper layer:
                                            ffffffffffffffffffff
                                      ffffffffffffffffff
Sending Message:
                                                            ack# = 5
                                                                        seq# = 5
- Started timer for packet 5
EVENT time: 74.979752, type: 0, timerinterrupt
                                              entity: 0
- TIMEOUT (packet 4) - timer restarted
 packet 4 resent:
                                      eeeeeeeeeeeeee ack# = 4
                                                                        sea# = 4
EVENT time: 75.124840, type: 0, timerinterrupt
                                              entity: 0
- TIMEOUT (packet 1) - timer restarted
 packet 1 resent:
                                      ack# = 1
                                                                       seq# = 1
         TOLAYER3: packet being lost.
EVENT time: 75.429649, type: 2, fromlayer3 entity: 1
- B side received packet:
                                      ffffffffffffffff ack# = 5
                                                                       seq# = 5
- Out-of-order packet received (seq# 5).
 Expecting seq# 1. Buffering for later...
- B side sending ACK for packet 5:
                                                       ack# = 5
                                                                  seq# = 5
                                      ACK
EVENT time: 76.736038, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                                       ack# = 5
                                                                  seq# = 5
                                      ACK
- A side received valid packet.
- New ACK received (packet 5) - STOPPED TIMER
** 0 MESSAGES HAVE BEEN SENT SUCCESSFULLY **
- Updating sending window...
- Making sure all packets in the sending
```

window have been sent.

```
- Message in window, already sent:
                                                                                seq# = 0
                                              aaaaaaaaaaaaaaaa
                                                                     ack# = 0
      - Message in window, already sent:
                                              ack# = 1
                                                                                seq# = 1
     - Message in window, already sent:
                                              cccccccccccccc
                                                                     ack# = 2
                                                                                seq# = 2
     - Message in window, already sent:
                                                                     ack# = 3
                                                                                seq# = 3
                                              dddddddddddddddd
     - Message in window, already sent:
                                                                     ack# = 4
                                                                                seq# = 4
                                              eeeeeeeeeeeee
     - Message in window, already sent:
                                              fffffffffffffffffffff
                                                                     ack# = 5
                                                                                seq# = 5
EVENT time: 77.304840, type: 2, fromlayer3 entity: 1
- B side received packet:
                                                               ack# = 4
                                                                           seq# = 4
                                        eeeeeeeeeeeeee
- Out-of-order packet received (seq# 4).
  Expecting seq# 1. Buffering for later...
B side sending ACK for packet 4:
                                                         ack# = 4
                                                                     seq# = 4
         TOLAYER3: packet being corrupted
EVENT time: 77.680450, type: 0, timerinterrupt entity: 0
- TIMEOUT (packet 2) - timer restarted
  packet 2 resent:
                                        ccccccccccccc ack# = 2
                                                                           seq# = 2
         TOLAYER3: packet being corrupted
EVENT time: 78.705742, type: 0, timerinterrupt
- TIMEOUT (packet 0) - timer restarted
 packet 0 resent:
                                        aaaaaaaaaaaaaaa
                                                               ack# = 0
                                                                          seq# = 0
EVENT time: 82.443901, type: 1, fromlayer5 entity: 0
- A side received message from upper layer:
                                              gggggggggggggggg
Sending Message:
                                                               ack# = 6
                                                                           seq# = 6
                                        gggggggggggggggg
- Started timer for packet 6
EVENT time: 82.883453, type: 2, fromlayer3 entity: 0

    A side received from lower layer:

                                        ZCK
                                                         ack# = 4
- A side received corrupt packet :(
EVENT time: 83.930389, type: 2, fromlayer3 entity: 1
- B side received packet:
                                        Zccccccccccccc ack# = 2
                                                                           seq# = 2
- B side received corrupt packet. Ignoring...
EVENT time: 88.749672, type: 2, fromlayer3 entity: 1
- B side received packet:
                                        aaaaaaaaaaaaaaaa ack# = 0
                                                                           seq# = 0
- Previously ACKed packet received. Re-ACKing...
- B side sending ACK for packet 0:
                                                        ack# = 0
                                                                     seq# = 0
         TOLAYER3: packet being corrupted
EVENT time: 92.411438, type: 2, fromlayer3 entity: 1
```

```
- B side received packet:
                                                            ack# = 6 seq# = 6
                                      ggggggggggggggg
- Out-of-order packet received (seq# 6).
 Expecting seq# 1. Buffering for later...
- B side sending ACK for packet 6:
                                                      ack# = 6
                                                                  seq# = 6
         TOLAYER3: packet being corrupted
EVENT time: 94.260300, type: 1, fromlayer5 entity: 0
- A side received message from upper layer:
                                            hhhhhhhhhhhhhhhhhh
- Sending Message:
                                      hhhhhhhhhhhhhhhhh
                                                            ack# = 7
                                                                       seq# = 7
         TOLAYER3: packet being lost.
- Started timer for packet 7
EVENT time: 94.979752, type: 0, timerinterrupt entity: 0
- TIMEOUT (packet 4) - timer restarted
 packet 4 resent:
                                      eeeeeeeeeeeeee ack# = 4
                                                                        seq# = 4
         TOLAYER3: packet being corrupted
EVENT time: 95.124840, type: 0, timerinterrupt
                                              entity: 0
- TIMEOUT (packet 1) - timer restarted
 packet 1 resent:
                                      seq# = 1
         TOLAYER3: packet being lost.
EVENT time: 96.434456, type: 1, fromlayer5 entity: 0
- A side received message from upper layer:
                                            111111111111111111111
- Too many packets in-flight. Buffering to send later...
EVENT time: 96.786087, type: 2, fromlayer3 entity: 1
- B side received packet:
                                      Zeeeeeeeeeeeee ack# = 4
                                                                       seq# = 4
- B side received corrupt packet. Ignoring...
EVENT time: 97.660454, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                      ZCK
                                                       ack# = 0
                                                                  seq# = 0
- A side received corrupt packet :(
EVENT time: 97.680450, type: 0, timerinterrupt entity: 0
- TIMEOUT (packet 2) - timer restarted
 packet 2 resent:
                                                                        seq# = 2
                                                            ack# = 2
                                      cccccccccccccc
EVENT time: 98.705742, type: 0, timerinterrupt
- TIMEOUT (packet 0) - timer restarted
 packet 0 resent:
                                      seq# = 0
         TOLAYER3: packet being corrupted
```

```
EVENT time: 102.443901, type: 0, timerinterrupt
                                                  entity: 0
- TIMEOUT (packet 6) - timer restarted
 packet 6 resent:
                                                                ack# = 6
                                                                            seq# = 6
                                         gggggggggggggggg
EVENT time: 103.278122, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                         ZCK
                                                          ack# = 6
                                                                      seq# = 6
- A side received corrupt packet :(
EVENT time: 104.371796, type: 2, fromlayer3 entity: 1
- B side received packet:
                                         ccccccccccccc ack# = 2
                                                                            seq# = 2

    Out-of-order packet received (seq# 2).

 Expecting seq# 1. Buffering for later...
- B side sending ACK for packet 2:
                                                          ack# = 2
                                                                      seq# = 2
                                         ACK
EVENT time: 106.076035, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                                          ack# = 2
                                         ACK
                                                                      seq# = 2
- A side received valid packet.
- New ACK received (packet 2) - STOPPED TIMER
** 0 MESSAGES HAVE BEEN SENT SUCCESSFULLY **

    Updating sending window...

- Making sure all packets in the sending
 window have been sent.
     - Message in window, already sent:
                                                                                  seq# = 0
                                               aaaaaaaaaaaaaaaaa
                                                                      ack# = 0
     - Message in window, already sent:
                                              ack# = 1
                                                                                  seq# = 1
     - Message in window, already sent:
                                               cccccccccccccc
                                                                      ack# = 2
                                                                                  seq# = 2
     - Message in window, already sent:
                                                                      ack# = 3
                                                                                  seq# = 3
                                              dddddddddddddddd
     - Message in window, already sent:
                                                                      ack# = 4
                                                                                  seq# = 4
                                              eeeeeeeeeeeee
     - Message in window, already sent:
                                              ffffffffffffffffffffff
                                                                      ack# = 5
                                                                                  seq# = 5
                                                                                  seq# = 6
     - Message in window, already sent:
                                                                      ack# = 6
                                              gggggggggggggggg
                                                                                  seq# = 7
     - Message in window, already sent:
                                              hhhhhhhhhhhhhhhhhh
                                                                      ack# = 7
EVENT time: 107.572578, type: 1, fromlayer5
                                             entity: 0
- A side received message from upper layer:
                                              - Too many packets in-flight. Buffering to send later...
EVENT time: 108.736366, type: 1, fromlayer5
                                             entity: 0
- A side received message from upper layer:
                                              kkkkkkkkkkkkkkkkk
- Too many packets in-flight. Buffering to send later...
EVENT time: 109.844398, type: 2, fromlayer3 entity: 1
- B side received packet:
                                         Zaaaaaaaaaaaaaaa
                                                                ack# = 0
                                                                            seq# = 0
- B side received corrupt packet. Ignoring...
```

```
EVENT time: 114.260300, type: 0, timerinterrupt
                                                 entity: 0
- TIMEOUT (packet 7) - timer restarted
  packet 7 resent:
                                        hhhhhhhhhhhhhhhhhh
                                                               ack# = 7
                                                                          seq# = 7
EVENT time: 114.979752, type: 0, timerinterrupt
                                                 entity: 0
- TIMEOUT (packet 4) - timer restarted
  packet 4 resent:
                                        eeeeeeeeeeeee
                                                               ack# = 4
                                                                          seq# = 4
EVENT time: 115.124840, type: 0, timerinterrupt
                                                 entity: 0
- TIMEOUT (packet 1) - timer restarted
  packet 1 resent:
                                        ack# = 1
                                                                          seq# = 1
EVENT time: 115.231255, type: 2, fromlayer3 entity: 1
- B side received packet:
                                                               ack# = 6
                                                                          seq# = 6
                                        ggggggggggggggg
- Out-of-order packet received (seq# 6).
 Expecting seq# 1. Buffering for later...
- B side sending ACK for packet 6:
                                        ACK
                                                         ack# = 6
                                                                     seq# = 6
EVENT time: 117.976494, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                                         ack# = 6
                                                                     seq# = 6
- A side received valid packet.
- New ACK received (packet 6) - STOPPED TIMER
** 0 MESSAGES HAVE BEEN SENT SUCCESSFULLY **
- Updating sending window...
- Making sure all packets in the sending
  window have been sent.
     - Message in window, already sent:
                                                                                seq# = 0
                                                                     ack# = 0
                                              aaaaaaaaaaaaaaa
     - Message in window, already sent:
                                             ack# = 1
                                                                                seq# = 1
                                                                                seq# = 2
     - Message in window, already sent:
                                              cccccccccccccc
                                                                     ack# = 2
     - Message in window, already sent:
                                              ddddddddddddddd
                                                                                seq# = 3
                                                                     ack# = 3
     - Message in window, already sent:
                                                                     ack# = 4
                                                                                seq# = 4
                                              eeeeeeeeeeeee
     - Message in window, already sent:
                                              ffffffffffffffffffffff
                                                                     ack# = 5
                                                                                seq# = 5
     - Message in window, already sent:
                                                                                seq# = 6
                                                                     ack# = 6
                                              ggggggggggggggg
     - Message in window, already sent:
                                             hhhhhhhhhhhhhhhhhh
                                                                     ack# = 7
                                                                                seq# = 7
EVENT time: 118.705742, type: 0, timerinterrupt
                                                 entity: 0
- TIMEOUT (packet 0) - timer restarted
  packet 0 resent:
                                                               ack# = 0
                                        aaaaaaaaaaaaaaa
                                                                          seq# = 0
EVENT time: 123.898842, type: 1, fromlayer5 entity: 0
- A side received message from upper layer:
```

- Too many packets in-flight. Buffering to send later...

```
EVENT time: 124.665741, type: 2, fromlayer3 entity: 1
- B side received packet:
                                      seq# = 7
- Out-of-order packet received (seq# 7).
 Expecting seq# 1. Buffering for later...
- B side sending ACK for packet 7:
                                                     ack# = 7
                                                                  seq# = 7
                                      ACK
         TOLAYER3: packet being lost.
EVENT time: 130.119476, type: 1, fromlayer5 entity: 0

    A side received message from upper layer:

                                            - Too many packets in-flight. Buffering to send later...
EVENT time: 133.491638, type: 2, fromlayer3 entity: 1
- B side received packet:
                                                                       seq# = 4
                                      eeeeeeeeeeeeee ack# = 4
- Out-of-order packet received (seq# 4).
 Expecting seq# 1. Buffering for later...
- B side sending ACK for packet 4:
                                                      ack# = 4
                                                                 sea# = 4
                                      ACK
EVENT time: 134.260300, type: 0, timerinterrupt entity: 0
- TIMEOUT (packet 7) - timer restarted
 packet 7 resent:
                                      seq# = 7
         TOLAYER3: packet being lost.
EVENT time: 134.979752, type: 0, timerinterrupt
                                               entity: 0
- TIMEOUT (packet 4) - timer restarted
 packet 4 resent:
                                      eeeeeeeeeeeee
                                                            ack# = 4
                                                                       seq# = 4
         TOLAYER3: packet being lost.
EVENT time: 135.124847, type: 0, timerinterrupt
                                              entity: 0
- TIMEOUT (packet 1) - timer restarted
 packet 1 resent:
                                      ack# = 1
                                                                       seq# = 1
         TOLAYER3: packet being corrupted
EVENT time: 135.246201, type: 1, fromlayer5 entity: 0

    A side received message from upper layer:

                                           nnnnnnnnnnnnnnnn
- Too many packets in-flight. Buffering to send later...
EVENT time: 138.705750, type: 0, timerinterrupt
                                              entity: 0
- TIMEOUT (packet 0) - timer restarted
 packet 0 resent:
                                      aaaaaaaaaaaaaaaa ack# = 0
EVENT time: 139.750916, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                                      ack# = 4
                                                                  seq# = 4
                                      ACK
- A side received valid packet.
```

```
- New ACK received (packet 4) - STOPPED TIMER
** 0 MESSAGES HAVE BEEN SENT SUCCESSFULLY **
- Updating sending window...
- Making sure all packets in the sending
 window have been sent.
     - Message in window, already sent:
                                                                       ack# = 0
                                                                                  seq# = 0
                                               aaaaaaaaaaaaaaaa
     - Message in window, already sent:
                                                                       ack# = 1
                                                                                  seq# = 1
                                               - Message in window, already sent:
                                               cccccccccccccc
                                                                       ack# = 2
                                                                                  seq# = 2
     - Message in window, already sent:
                                               ddddddddddddddd
                                                                       ack# = 3
                                                                                  seq# = 3
     - Message in window, already sent:
                                                                       ack# = 4
                                                                                  seq# = 4
                                               eeeeeeeeeeeeee
     - Message in window, already sent:
                                               fffffffffffffffffffff
                                                                       ack# = 5
                                                                                  seq# = 5
     - Message in window, already sent:
                                                                       ack# = 6
                                                                                  seq# = 6
                                               gggggggggggggggg
      - Message in window, already sent:
                                               hhhhhhhhhhhhhhhhhh
                                                                       ack# = 7
                                                                                   seq# = 7
EVENT time: 143.339615, type: 2, fromlayer3 entity: 1
- B side received packet:
                                         ack# = 1
                                                                             sea# = 1
- In-order packet received (seq# 1)!
 Sending all buffered packets in the window.
       B side sending packet to upper
       layer (seq# 1).

    B side sending packet to upper

       layer (seq# 2).

    B side sending packet to upper

       layer (seq# 3).
       B side sending packet to upper
       layer (seq# 4).
       B side sending packet to upper
       layer (seq# 5).

    B side sending packet to upper

       layer (seq# 6).
      - B side sending packet to upper
       layer (seq# 7).

    Updating receiver buffer window.

 Now expecting packet 8
- B side sending ACK for packet 1:
                                         ACK
                                                           ack# = 1
         TOLAYER3: packet being corrupted
EVENT time: 144.923477, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                         ZCK
                                                           ack# = 1
                                                                       seq# = 1
A side received corrupt packet :(
EVENT time: 147.702179, type: 1, fromlayer5 entity: 0
- A side received message from upper layer:
                                               000000000000000000
```

 Too many packets in-flight. Buffering to send later... EVENT time: 152.827789, type: 2, fromlayer3 entity: 1 - B side received packet: aaaaaaaaaaaaaaa ack# = 0 seq# = 0- Previously ACKed packet received. Re-ACKing... - B side sending ACK for packet 0: ACK ack# = 0seq# = 0EVENT time: 154.260300, type: 0, timerinterrupt entity: 0 - TIMEOUT (packet 7) - timer restarted packet 7 resent: seq# = 7TOLAYER3: packet being corrupted EVENT time: 155.124847, type: 0, timerinterrupt entity: 0 - TIMEOUT (packet 1) - timer restarted packet 1 resent: TOLAYER3: packet being corrupted EVENT time: 158.666260, type: 2, fromlayer3 entity: 0 - A side received from lower layer: ack# = 0seq# = 0- A side received valid packet. - New ACK received (packet 0) - STOPPED TIMER ** 1 MESSAGES HAVE BEEN SENT SUCCESSFULLY ** Updating sending window... - Making sure all packets in the sending window have been sent. Message in window, already sent: ack# = 1seq# = 1- Message in window, already sent: cccccccccccccc ack# = 2seq# = 2Message in window, already sent: dddddddddddddddd ack# = 3seq# = 3Message in window, already sent: eeeeeeeeeeeeee ack# = 4seq# = 4Message in window, already sent: ack# = 5ffffffffffffffffffffff seq# = 5 Message in window, already sent: ack# = 6seq# = 6ggggggggggggggg Message in window, already sent: **հ**իհիհիհիհիհիհիհի ack# = 7seq# = 7 Sending NEW buffered message: 11111111111111111111 ack# = 8seq# = 8- Started timer for packet 8 TOLAYER3: packet being corrupted EVENT time: 158.728745, type: 2, fromlayer3 entity: 1 - B side received packet: - B side received corrupt packet. Ignoring... EVENT time: 160.878128, type: 2, fromlayer3 entity: 1 - B side received packet: aaaaaaaaaaaaaaa ack# = 0seq# = 0- Previously ACKed packet received. Re-ACKing...

ack# = 0 seq# = 0- B side sending ACK for packet 0: ACK TOLAYER3: packet being lost. EVENT time: 163.413452, type: 2, fromlayer3 entity: 1 - B side received packet: Zhhhhhhhhhhhhhhhhh ack# = 7 seq# = 7- B side received corrupt packet. Ignoring... EVENT time: 164.904617, type: 2, fromlayer3 entity: 1 - B side received packet: ack# = 1seq# = 1- B side received corrupt packet. Ignoring... EVENT time: 166.390564, type: 1, fromlayer5 entity: 0 - A side received message from upper layer: - Too many packets in-flight. Buffering to send later... EVENT time: 168.274017, type: 2, fromlayer3 entity: 1 - B side received packet: - B side received corrupt packet. Ignoring... EVENT time: 170.096252, type: 1, fromlayer5 entity: 0 - A side received message from upper layer: qqqqqqqqqqqqqq - Too many packets in-flight. Buffering to send later... EVENT time: 174.260300, type: 0, timerinterrupt entity: 0 - TIMEOUT (packet 7) - timer restarted packet 7 resent: hhhhhhhhhhhhhhhhh ack# = 7seq# = 7EVENT time: 175.124847, type: 0, timerinterrupt entity: 0 - TIMEOUT (packet 1) - timer restarted packet 1 resent: ack# = 1seq# = 1EVENT time: 178.666260, type: 0, timerinterrupt entity: 0 - TIMEOUT (packet 8) - timer restarted packet 8 resent: seq# = 8ack# = 8EVENT time: 181.828812, type: 2, fromlayer3 entity: 1 - B side received packet: hhhhhhhhhhhhhhhhh seq# = 7ack# = 7- Previously ACKed packet received. Re-ACKing... - B side sending ACK for packet 7: ack# = 7seq# = 7EVENT time: 186.002518, type: 2, fromlayer3 entity: 1 - B side received packet: ack# = 1seq# = 1- Previously ACKed packet received. Re-ACKing...

```
- B side sending ACK for packet 1:
                                        ACK
                                                         ack# = 1
                                                                     seq# = 1
EVENT time: 187.928848, type: 1, fromlayer5 entity: 0
                                              rrrrrrrrrrrrrrrrrr
- A side received message from upper layer:
- Too many packets in-flight. Buffering to send later...
EVENT time: 190.959702, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                                                     seq# = 7
                                        ACK
                                                         ack# = 7
- A side received valid packet.
- New ACK received (packet 7) - STOPPED TIMER
** 1 MESSAGES HAVE BEEN SENT SUCCESSFULLY **

    Updating sending window...

- Making sure all packets in the sending
 window have been sent.
      - Message in window, already sent:
                                              ack# = 1
                                                                                seq# = 1
     - Message in window, already sent:
                                                                     ack# = 2
                                                                                seq# = 2
                                              cccccccccccccc
     - Message in window, already sent:
                                              ddddddddddddddd
                                                                     ack# = 3
                                                                                seq# = 3
     - Message in window, already sent:
                                                                     ack# = 4
                                                                                seq# = 4
                                              eeeeeeeeeeeee
     - Message in window, already sent:
                                              ffffffffffffffffffffff
                                                                     ack# = 5
                                                                                seq# = 5
     - Message in window, already sent:
                                                                     ack# = 6
                                                                                 seq# = 6
                                              gggggggggggggggg
      - Message in window, already sent:
                                              hhhhhhhhhhhhhhhhhh
                                                                     ack# = 7
                                                                                seq# = 7
     - Message in window, already sent:
                                                                     ack# = 8
                                                                                 seq# = 8
                                              EVENT time: 193.604523, type: 2, fromlayer3 entity: 1
- B side received packet:
                                        ack# = 8
                                                                           seq# = 8
- In-order packet received (seq# 8)!
  Sending all buffered packets in the window.
      - B side sending packet to upper
       layer (seq# 8).
- Updating receiver buffer window.
 Now expecting packet 9
- B side sending ACK for packet 8:
                                        ACK
                                                         ack# = 8
                                                                     seq# = 8
EVENT time: 195.124847, type: 0, timerinterrupt
                                                 entity: 0
- TIMEOUT (packet 1) - timer restarted
  packet 1 resent:
                                        ack# = 1
                                                                           seq# = 1
EVENT time: 195.337723, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                                         ack# = 1
                                                                     seq# = 1
                                        ACK
- A side received valid packet.
- New ACK received (packet 1) - STOPPED TIMER
** 8 MESSAGES HAVE BEEN SENT SUCCESSFULLY **
- Updating sending window...
```

```
- Making sure all packets in the sending
 window have been sent.
     - Message in window, already sent:
                                           ack# = 8
                                                                             seq# = 8
     - Sending NEW buffered message:
                                                                       ack# = 9
                                                                                  seq# = 9
                                                 - Started timer for packet 9
     - Sending NEW buffered message:
                                                 kkkkkkkkkkkkkkkk
                                                                       ack# = 10
                                                                                  seq# = 10
- Started timer for packet 10
     - Sending NEW buffered message:
                                                 ack# = 11
                                                                                  seq# = 11
- Started timer for packet 11
     - Sending NEW buffered message:
                                                 ack# = 12
                                                                                  seq# = 12
- Started timer for packet 12
     - Sending NEW buffered message:
                                                 nnnnnnnnnnnnnnnn
                                                                       ack# = 13
                                                                                  seq# = 13
- Started timer for packet 13
         TOLAYER3: packet being corrupted
     - Sending NEW buffered message:
                                                                       ack# = 14
                                                 000000000000000000
                                                                                  seq# = 14
- Started timer for packet 14
     - Sending NEW buffered message:
                                                 ack# = 15
                                                                                  seq# = 15
- Started timer for packet 15
EVENT time: 196.682648, type: 1, fromlayer5 entity: 0
- A side received message from upper layer:
                                            SSSSSSSSSSSSSSS
- Too many packets in-flight. Buffering to send later...
EVENT time: 196.721329, type: 2, fromlayer3 entity: 1
- B side received packet:
                                      ack# = 1
                                                                       seq# = 1
- Previously ACKed packet received. Re-ACKing...
- B side sending ACK for packet 1:
                                      ACK
                                                      ack# = 1
                                                                  seq# = 1
         TOLAYER3: packet being lost.
EVENT time: 197.611755, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                      ACK
                                                      ack# = 8
                                                                  seq# = 8
- A side received valid packet.
- New ACK received (packet 8) - STOPPED TIMER
** 9 MESSAGES HAVE BEEN SENT SUCCESSFULLY **
- Updating sending window...
- Making sure all packets in the sending
 window have been sent.
     - Message in window, already sent:
                                                                  ack# = 9
                                                                             seq# = 9
                                            - Message in window, already sent:
                                            kkkkkkkkkkkkkkkk
                                                                  ack# = 10
                                                                             seq# = 10
     - Message in window, already sent:
                                            ack# = 11
                                                                             seq# = 11
     - Message in window, already sent:
                                            ack# = 12
                                                                             seq# = 12
     - Message in window, already sent:
                                                                  ack# = 13
                                                                             seq# = 13
                                            nnnnnnnnnnnnnnnn
     - Message in window, already sent:
                                           000000000000000000
                                                                  ack# = 14
                                                                             seq# = 14
```

```
- Message in window, already sent:
                                                                     ack# = 15
                                                                                seq# = 15
                                             - Sending NEW buffered message:
                                                                          ack# = 16
                                                                                      seq# = 16
                                                   qqqqqqqqqqqqqq
- Started timer for packet 16
         TOLAYER3: packet being corrupted
EVENT time: 200.439545, type: 2, fromlayer3 entity: 1
- B side received packet:
                                        ack# = 9
                                                                          seq# = 9
- In-order packet received (seg# 9)!
 Sending all buffered packets in the window.
     - B side sending packet to upper
       layer (seq# 9).
- Updating receiver buffer window.
 Now expecting packet 10
- B side sending ACK for packet 9:
                                        ACK
                                                         ack# = 9
                                                                     seq# = 9
EVENT time: 203.454391, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                        ACK
                                                         ack# = 9
                                                                     seq# = 9
- A side received valid packet.
- New ACK received (packet 9) - STOPPED TIMER
** 10 MESSAGES HAVE BEEN SENT SUCCESSFULLY **
- Updating sending window...
- Making sure all packets in the sending
 window have been sent.
     - Message in window, already sent:
                                                                     ack# = 10
                                                                                seq# = 10
                                              kkkkkkkkkkkkkkkkk
     - Message in window, already sent:
                                              111111111111111111111
                                                                     ack# = 11
                                                                                seq# = 11
     - Message in window, already sent:
                                                                     ack# = 12
                                                                                seq# = 12
                                              - Message in window, already sent:
                                                                     ack# = 13
                                                                                seq# = 13
                                              nnnnnnnnnnnnnnnn
                                                                                seq# = 14
     - Message in window, already sent:
                                              0000000000000000000
                                                                     ack# = 14
     - Message in window, already sent:
                                                                     ack# = 15
                                                                                seq# = 15
                                             - Message in window, already sent:
                                                                     ack# = 16
                                                                                seq# = 16
                                              qqqqqqqqqqqqq
     - Sending NEW buffered message:
                                                                          ack# = 17 seq# = 17
                                                   rrrrrrrrrrrrrrrrrrrr
- Started timer for packet 17
EVENT time: 205.311218, type: 2, fromlayer3 entity: 1
- B side received packet:
                                        kkkkkkkkkkkkkkkk
                                                               ack# = 10
                                                                          seq# = 10
- In-order packet received (seq# 10)!
 Sending all buffered packets in the window.
     - B side sending packet to upper
       layer (seq# 10).
- Updating receiver buffer window.
 Now expecting packet 11
- B side sending ACK for packet 10:
                                        ACK
                                                         ack# = 10
                                                                     seq# = 10
         TOLAYER3: packet being lost.
```

```
EVENT time: 210.887939, type: 1, fromlayer5 entity: 0
- A side received message from upper layer:
                                              tttttttttttttttt
- Too many packets in-flight. Buffering to send later...
EVENT time: 211.850449, type: 2, fromlayer3 entity: 1
- B side received packet:
                                        1111111111111111111
                                                               ack# = 11
                                                                           seq# = 11
- In-order packet received (seq# 11)!
 Sending all buffered packets in the window.
      - B side sending packet to upper
       layer (seq# 11).
- Updating receiver buffer window.
 Now expecting packet 12
- B side sending ACK for packet 11:
                                        ACK
                                                         ack# = 11
                                                                     seq# = 11
EVENT time: 213.713379, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                        ACK
                                                         ack# = 11
                                                                     seq# = 11
- A side received valid packet.
- New ACK received (packet 11) - STOPPED TIMER
** 10 MESSAGES HAVE BEEN SENT SUCCESSFULLY **
- Updating sending window...
- Making sure all packets in the sending
 window have been sent.
     - Message in window, already sent:
                                                                     ack# = 10
                                                                                 seq# = 10
                                              kkkkkkkkkkkkkkkkk
     - Message in window, already sent:
                                              111111111111111111111
                                                                     ack# = 11
                                                                                 seq# = 11
     - Message in window, already sent:
                                                                     ack# = 12
                                                                                 seq# = 12
                                              - Message in window, already sent:
                                                                     ack# = 13
                                                                                 seq# = 13
                                              nnnnnnnnnnnnnnnn
     - Message in window, already sent:
                                              0000000000000000000
                                                                     ack# = 14
                                                                                 seq# = 14
     - Message in window, already sent:
                                                                                 seq# = 15
                                              ack# = 15
     - Message in window, already sent:
                                                                     ack# = 16
                                                                                 seq# = 16
                                              qqqqqqqqqqqqqq
     - Message in window, already sent:
                                              rrrrrrrrrrrrrrrrr
                                                                     ack# = 17
                                                                                 seq# = 17
EVENT time: 215.337723, type: 0, timerinterrupt
                                                 entity: 0
- TIMEOUT (packet 15) - timer restarted
  packet 15 resent:
                                                               ack# = 15
                                                                           seq# = 15
                                        EVENT time: 215.337723, type: 0, timerinterrupt
                                                 entity: 0
- TIMEOUT (packet 14) - timer restarted
  packet 14 resent:
                                                                           seq# = 14
                                        000000000000000000
                                                               ack# = 14
EVENT time: 215.337723, type: 0, timerinterrupt
                                                 entity: 0
- TIMEOUT (packet 13) - timer restarted
  packet 13 resent:
                                                               ack# = 13
                                        nnnnnnnnnnnnnnnn
                                                                           seq# = 13
```

TOLAYER3: packet being corrupted

EVENT time: 215.337723, type: 0, timerinterrupt entity: 0 - TIMEOUT (packet 12) - timer restarted packet 12 resent: ack# = 12 seq# = 12TOLAYER3: packet being corrupted EVENT time: 215.337723, type: 0, timerinterrupt entity: 0 - TIMEOUT (packet 10) - timer restarted packet 10 resent: kkkkkkkkkkkkkkkk ack# = 10seq# = 10TOLAYER3: packet being lost. EVENT time: 215.958191, type: 2, fromlayer3 entity: 1 - B side received packet: ack# = 12seq# = 12- In-order packet received (seq# 12)! Sending all buffered packets in the window. - B side sending packet to upper layer (seq# 12). - Updating receiver buffer window. Now expecting packet 13 - B side sending ACK for packet 12: ACK ack# = 12 seq# = 12TOLAYER3: packet being lost. EVENT time: 217.611755, type: 0, timerinterrupt entity: 0 - TIMEOUT (packet 16) - timer restarted packet 16 resent: ack# = 16seq# = 16qqqqqqqqqqqqqq EVENT time: 223.239639, type: 2, fromlayer3 entity: 1 - B side received packet: Znnnnnnnnnnnnnnn ack# = 13seq# = 13- B side received corrupt packet. Ignoring... EVENT time: 223.454391, type: 0, timerinterrupt entity: 0 - TIMEOUT (packet 17) - timer restarted packet 17 resent: ack# = 17seq# = 17rrrrrrrrrrrrrrrr TOLAYER3: packet being lost. EVENT time: 229.745026, type: 2, fromlayer3 entity: 1 - B side received packet: ooooooooooooo ack# = 14 seq# = 14- Out-of-order packet received (seq# 14). Expecting seq# 13. Buffering for later... - B side sending ACK for packet 14: ACK ack# = 14 seq# = 14TOLAYER3: packet being corrupted

EVENT time: 230.009552, type: 1, fromlayer5 entity: 0 A side received message from upper layer: uuuuuuuuuuuuuuu - Too many packets in-flight. Buffering to send later... EVENT time: 230.930359, type: 1, fromlayer5 entity: 0 - A side received message from upper layer: VVVVVVVVVVVVVVVVVVVV - Too many packets in-flight. Buffering to send later... EVENT time: 231.150650, type: 2, fromlayer3 entity: 1 - B side received packet: seq# = 15 Out-of-order packet received (seq# 15). Expecting seq# 13. Buffering for later... - B side sending ACK for packet 15: ack# = 15ACK seq# = 15TOLAYER3: packet being lost. EVENT time: 235.337723, type: 0, timerinterrupt entity: 0 - TIMEOUT (packet 10) - timer restarted packet 10 resent: kkkkkkkkkkkkkkkkk ack# = 10seq# = 10TOLAYER3: packet being lost. EVENT time: 235.337723, type: 0, timerinterrupt entity: 0 - TIMEOUT (packet 12) - timer restarted packet 12 resent: ack# = 12seq# = 12TOLAYER3: packet being lost. EVENT time: 235.337723, type: 0, timerinterrupt entity: 0 - TIMEOUT (packet 13) - timer restarted packet 13 resent: ack# = 13nnnnnnnnnnnnnnn seq# = 13TOLAYER3: packet being lost. EVENT time: 235.337723, type: 0, timerinterrupt entity: 0 - TIMEOUT (packet 14) - timer restarted packet 14 resent: 0000000000000000000 ack# = 14 seq# = 14EVENT time: 235.337723, type: 0, timerinterrupt entity: 0 - TIMEOUT (packet 15) - timer restarted packet 15 resent: ack# = 15seq# = 15EVENT time: 235.426331, type: 2, fromlayer3 entity: 0 A side received from lower layer: ACK ack# = 9999999seq# = 14- A side received corrupt packet :(EVENT time: 237.611755, type: 0, timerinterrupt entity: 0

```
- TIMEOUT (packet 16) - timer restarted
 packet 16 resent:
                                                                          seq# = 16
                                                              ack# = 16
                                        qqqqqqqqqqqqqq
         TOLAYER3: packet being lost.
EVENT time: 240.864792, type: 2, fromlayer3 entity: 1
- B side received packet:
                                                              ack# = 16
                                                                          seq# = 16
                                        Zqqqqqqqqqqqqq
- B side received corrupt packet. Ignoring...
EVENT time: 243.454391, type: 0, timerinterrupt
                                               entity: 0
- TIMEOUT (packet 17) - timer restarted
 packet 17 resent:
                                        rrrrrrrrrrrrrrrrrrrr
                                                              ack# = 17
                                                                          seq# = 17
         TOLAYER3: packet being corrupted
EVENT time: 244.843124, type: 1, fromlayer5 entity: 0

    A side received message from upper layer:

                                             WWWWWWWWWWWWWWWW
- Too many packets in-flight. Buffering to send later...
EVENT time: 246.597839, type: 2, fromlayer3 entity: 1
- B side received packet:
                                        rrrrrrrrrrrrrrr ack# = 17
                                                                          seq# = 17
- Out-of-order packet received (seq# 17).
 Expecting seq# 13. Buffering for later...
- B side sending ACK for packet 17:
                                                        ack# = 17
                                                                    seq# = 17
EVENT time: 250.722809, type: 2, fromlayer3 entity: 1
- B side received packet:
                                                              ack# = 15
                                                                          seq# = 15
                                        - Out-of-order packet received (seq# 15).
 Expecting seq# 13. Buffering for later...
- B side sending ACK for packet 15:
                                        ACK
                                                         ack# = 15
                                                                    seq# = 15
EVENT time: 254.720230, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                        ACK
                                                         ack# = 17
                                                                    seq# = 17
- A side received valid packet.

    New ACK received (packet 17) - STOPPED TIMER

** 10 MESSAGES HAVE BEEN SENT SUCCESSFULLY **
- Updating sending window...
- Making sure all packets in the sending
 window have been sent.
     - Message in window, already sent:
                                             kkkkkkkkkkkkkkkkk
                                                                    ack# = 10
                                                                                seq# = 10
     - Message in window, already sent:
                                             111111111111111111111
                                                                    ack# = 11
                                                                                seq# = 11
     - Message in window, already sent:
                                                                    ack# = 12
                                                                                seq# = 12
                                             - Message in window, already sent:
                                                                    ack# = 13
                                                                                seq# = 13
                                             nnnnnnnnnnnnnnnn
     - Message in window, already sent:
                                                                    ack# = 14
                                                                                seq# = 14
                                             - Message in window, already sent:
                                                                    ack# = 15
                                                                                seq# = 15
```

EVENT time: 255.337723, type: 0, timerinterrupt entity: 0

- TIMEOUT (packet 15) - timer restarted

EVENT time: 255.337723, type: 0, timerinterrupt entity: 0

- TIMEOUT (packet 14) - timer restarted

packet 14 resent: ooooooooooooooooo ack# = 14 seq# = 14

EVENT time: 255.337723, type: 0, timerinterrupt entity: 0

- TIMEOUT (packet 13) - timer restarted

packet 13 resent: nnnnnnnnnnnnnnnnnn ack# = 13 seq# = 13

EVENT time: 255.337723, type: 0, timerinterrupt entity: 0

- TIMEOUT (packet 12) - timer restarted

EVENT time: 255.337723, type: 0, timerinterrupt entity: 0

- TIMEOUT (packet 10) - timer restarted

packet 10 resent: kkkkkkkkkkkkkkkkkkkkkk ack# = 10 seq# = 10

EVENT time: 256.727448, type: 1, fromlayer5 entity: 0

- A side received message from upper layer: xxxxxxxxxxxxxxxxxxxxxxx
- Too many packets in-flight. Buffering to send later...

EVENT time: 257.611755, type: 0, timerinterrupt entity: 0

- TIMEOUT (packet 16) - timer restarted

EVENT time: 258.732880, type: 1, fromlayer5 entity: 0

- A side received message from upper layer: yyyyyyyyyyyyyyyyy
- Too many packets in-flight. Buffering to send later...

EVENT time: 260.648254, type: 2, fromlayer3 entity: 1

- B side received packet: ooooooooooooooo ack# = 14 seq# = 14
- Out-of-order packet received (seq# 14).
 Expecting seq# 13. Buffering for later...
- B side sending ACK for packet 14: ACK ack# = 14 seq# = 14 TOLAYER3: packet being lost.

EVENT time: 263.061981, type: 2, fromlayer3 entity: 1

```
- B side received packet:
                                        Znnnnnnnnnnnnnnnn
                                                              ack# = 13
                                                                          seq# = 13
- B side received corrupt packet. Ignoring...
EVENT time: 264.090729, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                                         ack# = 15
                                                                    seq# = 15
- A side received valid packet.
- New ACK received (packet 15) - STOPPED TIMER
** 10 MESSAGES HAVE BEEN SENT SUCCESSFULLY **

    Updating sending window...

- Making sure all packets in the sending
 window have been sent.
     - Message in window, already sent:
                                              kkkkkkkkkkkkkkkkk
                                                                     ack# = 10
                                                                                seq# = 10
     - Message in window, already sent:
                                              111111111111111111111
                                                                     ack# = 11
                                                                                seq# = 11
     - Message in window, already sent:
                                              ack# = 12
                                                                                seq# = 12
     - Message in window, already sent:
                                                                     ack# = 13
                                                                                seq# = 13
                                              nnnnnnnnnnnnnnnn
     - Message in window, already sent:
                                                                     ack# = 14
                                                                                seq# = 14
                                              0000000000000000000
                                                                                seq# = 15
     - Message in window, already sent:
                                                                     ack# = 15
                                             - Message in window, already sent:
                                                                     ack# = 16
                                                                                seq# = 16
                                              qqqqqqqqqqqqqq
     - Message in window, already sent:
                                                                     ack# = 17
                                                                                seq# = 17
                                              rrrrrrrrrrrrrrrrrr
EVENT time: 267.492981, type: 2, fromlayer3 entity: 1
- B side received packet:
                                        ack# = 12
                                                                          seq# = 12
- B side received corrupt packet. Ignoring...
EVENT time: 269.030487, type: 2, fromlayer3 entity: 1
- B side received packet:
                                                               ack# = 16
                                                                          seq# = 16
                                        qqqqqqqqqqqqqq
- Out-of-order packet received (seq# 16).
 Expecting seq# 13. Buffering for later...
- B side sending ACK for packet 16:
                                                         ack# = 16
                                                                    seq# = 16
EVENT time: 271.072449, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                        ACK
                                                         ack# = 16
                                                                     seq# = 16
- A side received valid packet.
- New ACK received (packet 16) - STOPPED TIMER
** 10 MESSAGES HAVE BEEN SENT SUCCESSFULLY **

    Updating sending window...

- Making sure all packets in the sending
  window have been sent.
     - Message in window, already sent:
                                                                     ack# = 10
                                                                                seq# = 10
                                              kkkkkkkkkkkkkkkkk
     - Message in window, already sent:
                                                                     ack# = 11
                                                                                seq# = 11
                                              11111111111111111111
     - Message in window, already sent:
                                                                     ack# = 12
                                                                                seq# = 12
                                              - Message in window, already sent:
                                                                     ack# = 13
                                                                                seq# = 13
                                              nnnnnnnnnnnnnnnn
     - Message in window, already sent:
                                                                     ack# = 14
                                                                                seq# = 14
```

```
- Message in window, already sent:
                                                                    ack# = 15
                                                                               seq# = 15
                                             - Message in window, already sent:
                                                                    ack# = 16
                                                                               seq# = 16
                                             qqqqqqqqqqqqqq
     - Message in window, already sent:
                                                                    ack# = 17
                                                                               seq# = 17
                                             rrrrrrrrrrrrrrrrrrrr
EVENT time: 275.337708, type: 0, timerinterrupt
                                                entity: 0
- TIMEOUT (packet 10) - timer restarted
  packet 10 resent:
                                       kkkkkkkkkkkkkkkkk
                                                              ack# = 10
                                                                         seq# = 10
EVENT time: 275.337708, type: 0, timerinterrupt
                                                entity: 0
- TIMEOUT (packet 12) - timer restarted
  packet 12 resent:
                                       ack# = 12
                                                                         seq# = 12
EVENT time: 275.337708, type: 0, timerinterrupt
                                                entity: 0
- TIMEOUT (packet 13) - timer restarted
 packet 13 resent:
                                                              ack# = 13
                                                                         seq# = 13
                                       nnnnnnnnnnnnnnn
EVENT time: 275.337708, type: 0, timerinterrupt
                                                entity: 0
- TIMEOUT (packet 14) - timer restarted
  packet 14 resent:
                                       00000000000000000
                                                              ack# = 14
                                                                         seq# = 14
         TOLAYER3: packet being lost.
EVENT time: 277.743988, type: 2, fromlayer3 entity: 1
- B side received packet:
                                       00000000000000000
                                                              ack# = 14
                                                                         seq# = 14
- Out-of-order packet received (seq# 14).
 Expecting seq# 13. Buffering for later...
- B side sending ACK for packet 14:
                                                       ack# = 14
                                                                    seq# = 14
EVENT time: 278.016022, type: 1, fromlayer5 entity: 0
- A side received message from upper layer:
                                             ZZZZZZZZZZZZZZZZZZ
- Too many packets in-flight. Buffering to send later...
EVENT time: 279.871674, type: 2, fromlayer3 entity: 1
- B side received packet:
                                       seq# = 15
- Out-of-order packet received (seq# 15).
 Expecting seq# 13. Buffering for later...
- B side sending ACK for packet 15:
                                                        ack# = 15
                                                                    seq# = 15
EVENT time: 282.917542, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                       ACK
                                                        ack# = 14
                                                                    seq# = 14
- A side received valid packet.
- New ACK received (packet 14) - STOPPED TIMER
** 10 MESSAGES HAVE BEEN SENT SUCCESSFULLY **
```

- Updating sending window...

- Making sure all packets in the sending window have been sent. - Message in window, already sent: kkkkkkkkkkkkkkkkk ack# = 10seq# = 10- Message in window, already sent: seq# = 11ack# = 11- Message in window, already sent: ack# = 12seq# = 12- Message in window, already sent: nnnnnnnnnnnnnnnn ack# = 13seq# = 13- Message in window, already sent: seq# = 14000000000000000000 ack# = 14- Message in window, already sent: ack# = 15seq# = 15- Message in window, already sent: ack# = 16seq# = 16qqqqqqqqqqqqqq - Message in window, already sent: ack# = 17seq# = 17rrrrrrrrrrrrrrrrrr EVENT time: 287.045929, type: 2, fromlayer3 entity: 1 - B side received packet: Zrrrrrrrrrrrrrrrrrr ack# = 17 seq# = 17 - B side received corrupt packet. Ignoring... EVENT time: 288.267487, type: 2, fromlayer3 entity: 0 - A side received from lower layer: ACK ack# = 15seq# = 15- A side received valid packet. - Received duplicate ACK for packet. Ignoring...14 EVENT time: 289.792328, type: 1, fromlayer5 entity: 0 - A side received message from upper layer: aaaaaaaaaaaaaaaa - Too many packets in-flight. Buffering to send later... EVENT time: 290.082886, type: 2, fromlayer3 entity: 1 - B side received packet: seq# = 15- Out-of-order packet received (seq# 15). Expecting seq# 13. Buffering for later... - B side sending ACK for packet 15: ACK ack# = 15 seq# = 15TOLAYER3: packet being lost. EVENT time: 290.809875, type: 1, fromlayer5 entity: 0 A side received message from upper layer: - Too many packets in-flight. Buffering to send later... EVENT time: 295.337708, type: 0, timerinterrupt entity: 0 - TIMEOUT (packet 13) - timer restarted packet 13 resent: nnnnnnnnnnnnnnnn ack# = 13seq# = 13EVENT time: 295.337708, type: 0, timerinterrupt entity: 0 - TIMEOUT (packet 12) - timer restarted packet 12 resent: ack# = 12seq# = 12

```
EVENT time: 295.337708, type: 0, timerinterrupt
                                                  entity: 0
- TIMEOUT (packet 10) - timer restarted
  packet 10 resent:
                                         kkkkkkkkkkkkkkkk
                                                                ack# = 10
                                                                            seq# = 10
EVENT time: 297.801147, type: 2, fromlayer3 entity: 1
- B side received packet:
                                                                ack# = 14
                                                                            seq# = 14
                                         00000000000000000
- Out-of-order packet received (seq# 14).
 Expecting seq# 13. Buffering for later...
- B side sending ACK for packet 14:
                                                          ack# = 14
                                                                      seq# = 14
                                         ACK
EVENT time: 301.307526, type: 1, fromlayer5 entity: 0
- A side received message from upper layer:
                                               ccccccccccccc
- Too many packets in-flight. Buffering to send later...
EVENT time: 301.438660, type: 1, fromlayer5 entity: 0
- A side received message from upper layer:
                                               ddddddddddddddd
- Too many packets in-flight. Buffering to send later...
EVENT time: 305.773438, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                                          ack# = 14
                                                                      seq# = 14
- A side received valid packet.
- Received duplicate ACK for packet. Ignoring...13
EVENT time: 305.933777, type: 2, fromlayer3 entity: 1
- B side received packet:
                                         nnnnnnnnnnnnnnn
                                                                ack# = 13
                                                                            seq# = 13
- In-order packet received (seq# 13)!
  Sending all buffered packets in the window.
      - B side sending packet to upper
       layer (seq# 13).
      - B side sending packet to upper
       layer (seq# 14).
      - B side sending packet to upper
       layer (seq# 15).
      - B side sending packet to upper
       layer (seq# 16).
      - B side sending packet to upper
       layer (seq# 17).
- Updating receiver buffer window.
 Now expecting packet 18
- B side sending ACK for packet 13:
                                         ACK
                                                          ack# = 13
                                                                      seq# = 13
          TOLAYER3: packet being lost.
```

EVENT time: 308.150024, type: 1, fromlayer5 entity: 0

- A side received message from upper layer: eeeeeeeeeeeeeee
- Too many packets in-flight. Buffering to send later...

EVENT time: 313.739777, type: 1, fromlayer5 entity: 0

- Too many packets in-flight. Buffering to send later...

EVENT time: 314.085480, type: 2, fromlayer3 entity: 1

- Previously ACKed packet received. Re-ACKing...
- B side sending ACK for packet 12: ACK ack# = 12 seq# = 12

EVENT time: 315.337708, type: 0, timerinterrupt entity: 0

- TIMEOUT (packet 10) - timer restarted

packet 10 resent: kkkkkkkkkkkkkkkkkkkkkkkk ack# = 10 seq# = 10

TOLAYER3: packet being corrupted

EVENT time: 315.337708, type: 0, timerinterrupt entity: 0

- TIMEOUT (packet 12) - timer restarted

TOLAYER3: packet being lost.

EVENT time: 315.337708, type: 0, timerinterrupt entity: 0

- TIMEOUT (packet 13) - timer restarted

packet 13 resent: nnnnnnnnnnnnnnnnn ack# = 13 seq# = 13

TOLAYER3: packet being corrupted

EVENT time: 317.213654, type: 2, fromlayer3 entity: 0

- A side received from lower layer: ACK ack# = 12 seq# = 12
- A side received valid packet.
- New ACK received (packet 12) STOPPED TIMER
- ** 10 MESSAGES HAVE BEEN SENT SUCCESSFULLY **
- Updating sending window...
- Making sure all packets in the sending window have been sent.

-	Message i	n window,	already	sent:	kkkkkkkkkkkkkkk	ack# = 10	seq# = 10
-	Message i	n window,	already	sent:	1111111111111111111	ack# = 11	seq# = 11
-	Message i	n window,	already	sent:	mmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm	ack# = 12	seq# = 12
-	Message i	n window,	already	sent:	nnnnnnnnnnnnnnn	ack# = 13	seq# = 13
-	Message i	n window,	already	sent:	00000000000000000	ack# = 14	seq# = 14
-	Message i	n window,	already	sent:	рррррррррррррррр	ack# = 15	seq# = 15
-	Message i	n window,	already	sent:	qqqqqqqqqqqqq	ack# = 16	seq# = 16
-	Message i	n window,	already	sent:	rrrrrrrrrrrrrrr	ack# = 17	seq# = 17

```
EVENT time: 318.400238, type: 2, fromlayer3 entity: 1
- B side received packet:
                                        kkkkkkkkkkkkkkkkkk ack# = 10
                                                                          seq# = 10
- Previously ACKed packet received. Re-ACKing...
- B side sending ACK for packet 10:
                                                        ack# = 10
                                                                    seq# = 10
         TOLAYER3: packet being lost.
EVENT time: 323.986572, type: 2, fromlayer3 entity: 1
- B side received packet:
                                                                          seq# = 16
                                        qqqqqqqqqqqqqq ack# = 16
- Previously ACKed packet received. Re-ACKing...
- B side sending ACK for packet 16:
                                        ACK
                                                        ack# = 16
                                                                    seq# = 16
EVENT time: 330.269623, type: 1, fromlayer5 entity: 0
- A side received message from upper layer:
                                             gggggggggggggggg
- Too many packets in-flight. Buffering to send later...
EVENT time: 330.824066, type: 2, fromlayer3 entity: 1
- B side received packet:
                                        kkkkkkkkkkkkkkkkk
                                                              ack# = 10
                                                                          seq# = 10
- Previously ACKed packet received. Re-ACKing...
- B side sending ACK for packet 10:
                                                       ack# = 10
                                                                    seq# = 10
         TOLAYER3: packet being lost.
EVENT time: 331.590546, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                        ACK
                                                        ack# = 16
                                                                    seq# = 16
- A side received valid packet.
- Received duplicate ACK for packet. Ignoring...15
EVENT time: 334.280457, type: 2, fromlayer3 entity: 1
- B side received packet:
                                        seq# = 12
- Previously ACKed packet received. Re-ACKing...
- B side sending ACK for packet 12:
                                        ACK
                                                        ack# = 12   seq# = 12
EVENT time: 335.211243, type: 1, fromlayer5 entity: 0
- A side received message from upper layer:
                                             hhhhhhhhhhhhhhhhhh
- Too many packets in-flight. Buffering to send later...
EVENT time: 335.337708, type: 0, timerinterrupt
                                                entity: 0
- TIMEOUT (packet 13) - timer restarted
  packet 13 resent:
                                        nnnnnnnnnnnnnnnn ack# = 13 seq# = 13
         TOLAYER3: packet being lost.
EVENT time: 335.337708, type: 0, timerinterrupt
                                                entity: 0
- TIMEOUT (packet 10) - timer restarted
```

packet 10 resent: kkkkkkkkkkkkkkkkkkk ack# = 10 seq# = 10EVENT time: 339.793549, type: 2, fromlayer3 entity: 0 - A side received from lower layer: ACK ack# = 12seq# = 12- A side received valid packet. - Received duplicate ACK for packet. Ignoring...11 EVENT time: 343.820709, type: 1, fromlayer5 entity: 0 A side received message from upper layer: - Too many packets in-flight. Buffering to send later... EVENT time: 343.893250, type: 2, fromlayer3 entity: 1 - B side received packet: seq# = 13nnnnnnnnnnnnnnn ack# = 13 Previously ACKed packet received. Re-ACKing... - B side sending ACK for packet 13: ack# = 13seq# = 13EVENT time: 348.446960, type: 2, fromlayer3 entity: 1 - B side received packet: nnnnnnnnnnnnnnnn ack# = 13seq# = 13- Previously ACKed packet received. Re-ACKing... - B side sending ACK for packet 13: ack# = 13seq# = 13TOLAYER3: packet being corrupted EVENT time: 351.304718, type: 2, fromlayer3 entity: 0 - A side received from lower layer: ACK ack# = 13seq# = 13- A side received valid packet. - New ACK received (packet 13) - STOPPED TIMER ** 10 MESSAGES HAVE BEEN SENT SUCCESSFULLY ** - Updating sending window... - Making sure all packets in the sending window have been sent. - Message in window, already sent: kkkkkkkkkkkkkkkk ack# = 10seq# = 10- Message in window, already sent: 111111111111111111111 ack# = 11seq# = 11- Message in window, already sent: ack# = 12seq# = 12- Message in window, already sent: ack# = 13seq# = 13nnnnnnnnnnnnnnnn - Message in window, already sent: ack# = 14seq# = 14- Message in window, already sent: ack# = 15seq# = 15- Message in window, already sent: ack# = 16seq# = 16qqqqqqqqqqqqqq - Message in window, already sent: ack# = 17seq# = 17rrrrrrrrrrrrrrrrrr

EVENT time: 354.283325, type: 2, fromlayer3 entity: 0

- A side received from lower layer: ACK ack# = 9999999 seq# = 13

- A side received corrupt packet :(

```
EVENT time: 355.337708, type: 0, timerinterrupt
- TIMEOUT (packet 10) - timer restarted
 packet 10 resent:
                                        kkkkkkkkkkkkkkkkkk ack# = 10 seg# = 10
EVENT time: 356.190094, type: 1, fromlayer5 entity: 0
- A side received message from upper layer:

    Too many packets in-flight. Buffering to send later...

EVENT time: 357.587006, type: 2, fromlayer3 entity: 1
- B side received packet:
                                        seq# = 12
- Previously ACKed packet received. Re-ACKing...
- B side sending ACK for packet 12:
                                                        ack# = 12
                                                                    seq# = 12
EVENT time: 358.633850, type: 2, fromlayer3 entity: 1
- B side received packet:
                                        kkkkkkkkkkkkkkkkkkk ack# = 10
                                                                          seq# = 10
- Previously ACKed packet received. Re-ACKing...
- B side sending ACK for packet 10:
                                        ACK
                                                        ack# = 10
                                                                    seq# = 10
EVENT time: 360.226501, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                                        ack# = 12
                                                                    seq# = 12
- A side received valid packet.
- Received duplicate ACK for packet. Ignoring...11
EVENT time: 364.551331, type: 2, fromlayer3 entity: 1
- B side received packet:
                                        Zkkkkkkkkkkkkkkkkkk ack# = 10
                                                                          seq# = 10
- B side received corrupt packet. Ignoring...
EVENT time: 365.697327, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                                         ack# = 10
                                                                    seq# = 10
- A side received valid packet.
- New ACK received (packet 10) - STOPPED TIMER
** 18 MESSAGES HAVE BEEN SENT SUCCESSFULLY **

    Updating sending window...

- Making sure all packets in the sending
 window have been sent.
     - Sending NEW buffered message:
                                                   SSSSSSSSSSSSSSS
                                                                          ack# = 18
                                                                                      seq# = 18
- Started timer for packet 18
     - Sending NEW buffered message:
                                                   ttttttttttttttttt
                                                                          ack# = 19
                                                                                      seq# = 19
- Started timer for packet 19
     - Sending NEW buffered message:
                                                   uuuuuuuuuuuuuuu
                                                                          ack# = 20
                                                                                      seq# = 20
- Started timer for packet 20
         TOLAYER3: packet being corrupted
     - Sending NEW buffered message:
                                                                          ack# = 21
                                                   VVVVVVVVVVVVVVVVVVV
                                                                                      seq# = 21
```

 Started timer for packet 21 TOLAYER3: packet being lost. - Sending NEW buffered message: ack# = 22WWWWWWWWWWWWWWWW - Started timer for packet 22 - Sending NEW buffered message: ack# = 23XXXXXXXXXXXXXXXXXX - Started timer for packet 23 - Sending NEW buffered message: ack# = 24ууууууууууууууууу - Started timer for packet 24 - Sending NEW buffered message: ack# = 25ZZZZZZZZZZZZZZZZZZ - Started timer for packet 25 TOLAYER3: packet being lost. EVENT time: 366.454498, type: 1, fromlayer5 entity: 0 - A side received message from upper layer: kkkkkkkkkkkkkkkkk - Too many packets in-flight. Buffering to send later... EVENT time: 366.589905, type: 2, fromlayer3 entity: 1 - B side received packet: Znnnnnnnnnnnnnnn ack# = 13seq# = 13- B side received corrupt packet. Ignoring... EVENT time: 369.436462, type: 2, fromlayer3 entity: 1 - B side received packet: kkkkkkkkkkkkkkkkkkk ack# = 10 seq# = 10- Previously ACKed packet received. Re-ACKing... - B side sending ACK for packet 10: ACK ack# = 10 seq# = 10EVENT time: 371.099884, type: 2, fromlayer3 entity: 0 - A side received from lower layer: ACK ack# = 10 seq# = 10- A side received valid packet. - Received duplicate ACK for packet. Ignoring...9 EVENT time: 376.563751, type: 2, fromlayer3 entity: 1 - B side received packet: kkkkkkkkkkkkkkkk seq# = 10ack# = 10 Previously ACKed packet received. Re-ACKing... - B side sending ACK for packet 10: ack# = 10 seq# = 10ACK EVENT time: 379.638580, type: 2, fromlayer3 entity: 1 - B side received packet: sssssssssssssss ack# = 18 seq# = 18- In-order packet received (seq# 18)! Sending all buffered packets in the window. - B side sending packet to upper layer (seq# 18). - Updating receiver buffer window.

Now expecting packet 19

seq# = 22

seq# = 23

seq# = 24

seq# = 25

- B side sending ACK for packet 18: ACK ack# = 18 seq# = 18TOLAYER3: packet being lost. EVENT time: 379.866669, type: 2, fromlayer3 entity: 0 - A side received from lower layer: ack# = 10seq# = 10- A side received valid packet. Received duplicate ACK for packet. Ignoring...9 EVENT time: 380.817200, type: 1, fromlayer5 entity: 0 - A side received message from upper layer: - Too many packets in-flight. Buffering to send later... EVENT time: 382.819519, type: 2, fromlayer3 entity: 1 - B side received packet: ttttttttttttttttttttt ack# = 19 seq# = 19- In-order packet received (seq# 19)! Sending all buffered packets in the window. - B side sending packet to upper layer (seq# 19). - Updating receiver buffer window. Now expecting packet 20 - B side sending ACK for packet 19: ACK ack# = 19seq# = 19EVENT time: 385.697327, type: 0, timerinterrupt entity: 0 - TIMEOUT (packet 25) - timer restarted packet 25 resent: ack# = 25seq# = 25ZZZZZZZZZZZZZZZZZZ EVENT time: 385.697327, type: 0, timerinterrupt - TIMEOUT (packet 24) - timer restarted ack# = 24packet 24 resent: seq# = 24ууууууууууууууууу EVENT time: 385.697327, type: 0, timerinterrupt entity: 0 - TIMEOUT (packet 23) - timer restarted packet 23 resent: XXXXXXXXXXXXXXXXXX ack# = 23seq# = 23EVENT time: 385.697327, type: 0, timerinterrupt entity: 0 - TIMEOUT (packet 22) - timer restarted packet 22 resent: ack# = 22seq# = 22WWWWWWWWWWWWWWWW TOLAYER3: packet being lost. EVENT time: 385.697327, type: 0, timerinterrupt entity: 0 - TIMEOUT (packet 21) - timer restarted packet 21 resent: ack# = 21seq# = 21VVVVVVVVVVVVVVVVVVV

TOLAYER3: packet being lost.

```
EVENT time: 385.697327, type: 0, timerinterrupt
                                                 entity: 0
- TIMEOUT (packet 20) - timer restarted
  packet 20 resent:
                                        uuuuuuuuuuuuuuuu
                                                               ack# = 20
                                                                           seq# = 20
EVENT time: 385.697327, type: 0, timerinterrupt
                                                 entity: 0
- TIMEOUT (packet 19) - timer restarted
  packet 19 resent:
                                        tttttttttttttttt
                                                               ack# = 19
                                                                           seq# = 19
         TOLAYER3: packet being lost.
EVENT time: 385.697327, type: 0, timerinterrupt
                                                 entity: 0
- TIMEOUT (packet 18) - timer restarted
  packet 18 resent:
                                                               ack# = 18
                                                                           seq# = 18
                                        SSSSSSSSSSSSSSS
         TOLAYER3: packet being lost.
EVENT time: 388.286163, type: 2, fromlayer3 entity: 1
- B side received packet:
                                        Zuuuuuuuuuuuuuu
                                                               ack# = 20
                                                                           seq# = 20
- B side received corrupt packet. Ignoring...
EVENT time: 390.154846, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                        ACK
                                                         ack# = 19
                                                                     seq# = 19
- A side received valid packet.
- New ACK received (packet 19) - STOPPED TIMER
** 18 MESSAGES HAVE BEEN SENT SUCCESSFULLY **
- Updating sending window...
- Making sure all packets in the sending
 window have been sent.
     - Message in window, already sent:
                                                                     ack# = 18
                                                                                 seq# = 18
                                              SSSSSSSSSSSSSSSS
                                                                                 seq# = 19
     - Message in window, already sent:
                                              ttttttttttttttttt
                                                                     ack# = 19
                                                                                 seq# = 20
     - Message in window, already sent:
                                                                     ack# = 20
                                              uuuuuuuuuuuuuuuu
     - Message in window, already sent:
                                              ack# = 21
                                                                                 seq# = 21
     - Message in window, already sent:
                                                                     ack# = 22
                                                                                 seq# = 22
                                              WWWWWWWWWWWWWWW
     - Message in window, already sent:
                                                                     ack# = 23
                                                                                 seq# = 23
                                              XXXXXXXXXXXXXXXXX
     - Message in window, already sent:
                                                                     ack# = 24
                                                                                 seq# = 24
                                              уууууууууууууууу
     - Message in window, already sent:
                                                                     ack# = 25
                                                                                 seq# = 25
                                              ZZZZZZZZZZZZZZZZZZ
EVENT time: 395.869995, type: 1, fromlayer5 entity: 0
- A side received message from upper layer:
                                              - Too many packets in-flight. Buffering to send later...
EVENT time: 397.428986, type: 2, fromlayer3 entity: 1
- B side received packet:
                                        WWWWWWWWWWWWWWWW
                                                               ack# = 22
                                                                           seq# = 22
```

- Out-of-order packet received (seq# 22).

Expecting seq# 20. Buffering for later... - B side sending ACK for packet 22: ack# = 22ACK seq# = 22EVENT time: 401.440765, type: 2, fromlayer3 entity: 0 - A side received from lower layer: ack# = 22seq# = 22- A side received valid packet. - New ACK received (packet 22) - STOPPED TIMER ** 18 MESSAGES HAVE BEEN SENT SUCCESSFULLY ** Updating sending window... - Making sure all packets in the sending window have been sent. - Message in window, already sent: ack# = 18seq# = 18SSSSSSSSSSSSSSS - Message in window, already sent: ack# = 19seq# = 19tttttttttttttttt - Message in window, already sent: ack# = 20seq# = 20uuuuuuuuuuuuuuuu - Message in window, already sent: ack# = 21seq# = 21VVVVVVVVVVVVVVVVVVVV - Message in window, already sent: ack# = 22seq# = 22WWWWWWWWWWWWWWW - Message in window, already sent: ack# = 23seq# = 23XXXXXXXXXXXXXXXXXX - Message in window, already sent: ack# = 24seq# = 24уууууууууууууууу - Message in window, already sent: ack# = 25seq# = 25ZZZZZZZZZZZZZZZZZ EVENT time: 403.983276, type: 2, fromlayer3 entity: 1 XXXXXXXXXXXXXXXXXX - B side received packet: ack# = 23seq# = 23- Out-of-order packet received (seq# 23). Expecting seq# 20. Buffering for later... - B side sending ACK for packet 23: ACK ack# = 23seq# = 23EVENT time: 405.529999, type: 1, fromlayer5 entity: 0 - A side received message from upper layer: nnnnnnnnnnnnnnn - Too many packets in-flight. Buffering to send later... EVENT time: 405.697327, type: 0, timerinterrupt entity: 0 - TIMEOUT (packet 18) - timer restarted packet 18 resent: SSSSSSSSSSSSSSS ack# = 18seq# = 18EVENT time: 405.697327, type: 0, timerinterrupt entity: 0 - TIMEOUT (packet 20) - timer restarted packet 20 resent: ack# = 20seq# = 20uuuuuuuuuuuuuuu EVENT time: 405.697327, type: 0, timerinterrupt entity: 0 - TIMEOUT (packet 21) - timer restarted packet 21 resent: ack# = 21seq# = 21VVVVVVVVVVVVVVVVVVV

entity: 0

EVENT time: 405.697327, type: 0, timerinterrupt

```
- TIMEOUT (packet 23) - timer restarted
 packet 23 resent:
                                                               ack# = 23
                                                                          seq# = 23
                                        XXXXXXXXXXXXXXXXXX
EVENT time: 405.697327, type: 0, timerinterrupt
                                                 entity: 0
- TIMEOUT (packet 24) - timer restarted
 packet 24 resent:
                                                               ack# = 24
                                                                          seq# = 24
                                        уууууууууууууууу
EVENT time: 405.697327, type: 0, timerinterrupt
                                                 entity: 0
- TIMEOUT (packet 25) - timer restarted
 packet 25 resent:
                                                              ack# = 25
                                        ZZZZZZZZZZZZZZZZZ
                                                                          seq# = 25
         TOLAYER3: packet being lost.
EVENT time: 408.658447, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                        ACK
                                                         ack# = 23
                                                                    seq# = 23
- A side received valid packet.
- New ACK received (packet 23) - STOPPED TIMER
** 18 MESSAGES HAVE BEEN SENT SUCCESSFULLY **
- Updating sending window...
- Making sure all packets in the sending
 window have been sent.
     - Message in window, already sent:
                                                                     ack# = 18
                                                                                seq# = 18
                                              SSSSSSSSSSSSSSS
     - Message in window, already sent:
                                                                     ack# = 19
                                                                                seq# = 19
                                             ttttttttttttttttt
     - Message in window, already sent:
                                                                     ack# = 20
                                                                                seq# = 20
                                              uuuuuuuuuuuuuuuu
     - Message in window, already sent:
                                             ack# = 21
                                                                                seq# = 21
     - Message in window, already sent:
                                                                     ack# = 22
                                                                                seq# = 22
                                             WWWWWWWWWWWWWWW
     - Message in window, already sent:
                                                                     ack# = 23
                                                                                seq# = 23
                                             XXXXXXXXXXXXXXXXXX
     - Message in window, already sent:
                                                                     ack# = 24
                                                                                seq# = 24
                                             ууууууууууууууууу
     - Message in window, already sent:
                                             ZZZZZZZZZZZZZZZZZZZ
                                                                     ack# = 25
                                                                                seq# = 25
EVENT time: 412.516144, type: 2, fromlayer3 entity: 1
- B side received packet:
                                        yyyyyyyyyyyyyyy ack# = 24
                                                                          seq# = 24
- Out-of-order packet received (seq# 24).
 Expecting seq# 20. Buffering for later...
- B side sending ACK for packet 24:
                                        ACK
                                                        ack# = 24
                                                                    seq# = 24
         TOLAYER3: packet being lost.
EVENT time: 417.890076, type: 2, fromlayer3 entity: 1
- B side received packet:
                                        seq# = 25
- Out-of-order packet received (seq# 25).
 Expecting seq# 20. Buffering for later...
- B side sending ACK for packet 25:
                                        ACK
                                                         ack# = 25
                                                                    seq# = 25
         TOLAYER3: packet being corrupted
```

```
EVENT time: 418.252289, type: 1, fromlayer5 entity: 0

    A side received message from upper layer:

                                              000000000000000000
- Too many packets in-flight. Buffering to send later...
EVENT time: 425.496277, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                         ZCK
                                                          ack# = 25
                                                                      seq# = 25
- A side received corrupt packet :(
EVENT time: 425.697327, type: 0, timerinterrupt
                                                 entity: 0
- TIMEOUT (packet 25) - timer restarted
  packet 25 resent:
                                         ZZZZZZZZZZZZZZZZZZ
                                                                ack# = 25
                                                                            seq# = 25
EVENT time: 425.697327, type: 0, timerinterrupt
                                                 entity: 0
- TIMEOUT (packet 24) - timer restarted
 packet 24 resent:
                                                                ack# = 24
                                                                           seq# = 24
                                        уууууууууууууууу
EVENT time: 425.697327, type: 0, timerinterrupt entity: 0
- TIMEOUT (packet 21) - timer restarted
  packet 21 resent:
                                        VVVVVVVVVVVVVVVVVV
                                                                ack# = 21
                                                                           seq# = 21
         TOLAYER3: packet being lost.
EVENT time: 425.697327, type: 0, timerinterrupt
                                                entity: 0
- TIMEOUT (packet 20) - timer restarted
  packet 20 resent:
                                                                ack# = 20
                                                                           seq# = 20
                                        uuuuuuuuuuuuuuu
EVENT time: 425.697327, type: 0, timerinterrupt
                                                  entity: 0
- TIMEOUT (packet 18) - timer restarted
 packet 18 resent:
                                                                ack# = 18
                                         SSSSSSSSSSSSSSS
                                                                            seq# = 18
         TOLAYER3: packet being corrupted
EVENT time: 425.815735, type: 2, fromlayer3 entity: 1
- B side received packet:
                                                                            seq# = 24
                                                                ack# = 24
                                        уууууууууууууууу
- Out-of-order packet received (seq# 24).
 Expecting seq# 20. Buffering for later...
- B side sending ACK for packet 24:
                                                         ack# = 24
                                        ACK
                                                                      seq# = 24
         TOLAYER3: packet being lost.
EVENT time: 427.932770, type: 2, fromlayer3 entity: 1
- B side received packet:
                                        XXXXXXXXXXXXXXXXX
                                                                ack# = 23
                                                                            seq# = 23
- Out-of-order packet received (seq# 23).
 Expecting seq# 20. Buffering for later...
- B side sending ACK for packet 23:
                                                          ack# = 23
                                                                      seq# = 23
         TOLAYER3: packet being corrupted
```

```
EVENT time: 435.021881, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                        ZCK
                                                         ack# = 23
                                                                    seq# = 23
- A side received corrupt packet :(
EVENT time: 436.558899, type: 1, fromlayer5 entity: 0
- A side received message from upper layer:
                                             - Too many packets in-flight. Buffering to send later...
EVENT time: 437.348694, type: 2, fromlayer3 entity: 1
- B side received packet:
                                        uuuuuuuuuuuuuuuu
                                                              ack# = 20
                                                                          seq# = 20
- In-order packet received (seq# 20)!
 Sending all buffered packets in the window.
     - B side sending packet to upper
       layer (seq# 20).
- Updating receiver buffer window.
 Now expecting packet 21
                                        ACK
- B side sending ACK for packet 20:
                                                       ack# = 20
                                                                    seq# = 20
         TOLAYER3: packet being corrupted
EVENT time: 437.841797, type: 1, fromlayer5 entity: 0
- A side received message from upper layer:
                                             - Too many packets in-flight. Buffering to send later...
EVENT time: 440.980865, type: 2, fromlayer3 entity: 1
- B side received packet:
                                        sssssssssssssss ack# = 18
                                                                          seq# = 18
- Previously ACKed packet received. Re-ACKing...
- B side sending ACK for packet 18:
                                        ACK
                                                        ack# = 18
                                                                    seq# = 18
EVENT time: 442.658813, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                        ACK
                                                        ack# = 20
                                                                    seq# = 9999999
- A side received corrupt packet :(
EVENT time: 445.697327, type: 0, timerinterrupt entity: 0
- TIMEOUT (packet 18) - timer restarted
  packet 18 resent:
                                        SSSSSSSSSSSSSSS
                                                              ack# = 18
EVENT time: 445.697327, type: 0, timerinterrupt
                                                entity: 0
- TIMEOUT (packet 20) - timer restarted
  packet 20 resent:
                                        uuuuuuuuuuuuuuu
                                                              ack# = 20
                                                                          seq# = 20
         TOLAYER3: packet being corrupted
EVENT time: 445.697327, type: 0, timerinterrupt
                                               entity: 0
```

```
- TIMEOUT (packet 21) - timer restarted
  packet 21 resent:
                                                               ack# = 21
                                                                           seq# = 21
                                        VVVVVVVVVVVVVVVVVVVVV
EVENT time: 445.697327, type: 0, timerinterrupt
                                                 entity: 0
- TIMEOUT (packet 24) - timer restarted
  packet 24 resent:
                                                               ack# = 24
                                                                           seq# = 24
                                        ууууууууууууууууу
         TOLAYER3: packet being corrupted
EVENT time: 445.697327, type: 0, timerinterrupt
                                                 entity: 0
- TIMEOUT (packet 25) - timer restarted
  packet 25 resent:
                                        ZZZZZZZZZZZZZZZZZZ
                                                               ack# = 25
                                                                           seq# = 25
         TOLAYER3: packet being corrupted
EVENT time: 450.144012, type: 2, fromlayer3 entity: 1
- B side received packet:
                                        uuuuuuuuuuuuuuuu
                                                               ack# = 20
                                                                           seq# = 20
- Previously ACKed packet received. Re-ACKing...
- B side sending ACK for packet 20:
                                        ACK
                                                         ack# = 20
                                                                     seq# = 20
EVENT time: 450.423462, type: 2, fromlayer3 entity: 0
- A side received from lower layer:
                                                         ack# = 18
                                                                     seq# = 18
- A side received valid packet.
- New ACK received (packet 18) - STOPPED TIMER
** 20 MESSAGES HAVE BEEN SENT SUCCESSFULLY **
- Updating sending window...
- Making sure all packets in the sending
  window have been sent.
     - Message in window, already sent:
                                                                                 seq# = 20
                                                                     ack# = 20
                                              uuuuuuuuuuuuuuuu
     - Message in window, already sent:
                                              ack# = 21
                                                                                 seq# = 21
                                                                                 seq# = 22
     - Message in window, already sent:
                                                                     ack# = 22
                                              WWWWWWWWWWWWWWWW
     - Message in window, already sent:
                                                                     ack# = 23
                                                                                 seq# = 23
                                              XXXXXXXXXXXXXXXXXX
     - Message in window, already sent:
                                                                     ack# = 24
                                                                                 seq# = 24
                                              ууууууууууууууууу
     - Message in window, already sent:
                                                                     ack# = 25
                                                                                 seq# = 25
                                              ZZZZZZZZZZZZZZZZZ
     - Sending NEW buffered message:
                                                    aaaaaaaaaaaaaaa
                                                                           ack# = 26
                                                                                       seq# = 26
- Started timer for packet 26
      - Sending NEW buffered message:
                                                    ack# = 27
                                                                                       seq# = 27
- Started timer for packet 27
         TOLAYER3: packet being corrupted
EVENT time: 450.966705, type: 1, fromlayer5 entity: 0
```

rrrrrrrrrrrrrrrrrr

EVENT time: 458.316711, type: 2, fromlayer3 entity: 1

- Too many packets in-flight. Buffering to send later...

A side received message from upper layer:

- B side received packet: vvvvvvvvvvvvvvvvvvvv ack# = 21 seq# = 21

- In-order packet received (seq# 21)!
 Sending all buffered packets in the window.
 - B side sending packet to upper layer (seq# 21).
 - B side sending packet to upper layer (seq# 22).
 - B side sending packet to upper layer (seq# 23).
 - B side sending packet to upper layer (seq# 24).
 - B side sending packet to upper layer (seq# 25).
- Updating receiver buffer window.
 Now expecting packet 26
- B side sending ACK for packet 21: ACK ack# = 21 seq# = 21

EVENT time: 458.786407, type: 2, fromlayer3 entity: 0

- A side received from lower layer: ACK ack# = 20 seq# = 20
- A side received valid packet.
- New ACK received (packet 20) STOPPED TIMER
- ** 21 MESSAGES HAVE BEEN SENT SUCCESSFULLY **
- Updating sending window...
- Making sure all packets in the sending window have been sent.

-	Message in window,	already sent:	VVVVVVVVVVVVVVVVVV	ack#	= 21	seq# = 21	
-	Message in window,	already sent:	WWWWWWWWWWWWWWW	ack#	= 22	seq# = 22	
-	Message in window,	already sent:	xxxxxxxxxxxxxxx	ack#	= 23	seq# = 23	
-	Message in window,	already sent:	уууууууууууууууууу	ack#	= 24	seq# = 24	
-	Message in window,	already sent:	ZZZZZZZZZZZZZZZZZZZ	ack#	= 25	seq# = 25	
-	Message in window,	already sent:	aaaaaaaaaaaaaaaa	ack#	= 26	seq# = 26	
-	Message in window,	already sent:	bbbbbbbbbbbbbbbbb	ack#	= 27	seq# = 27	
-	Sending NEW buffer	ed message:	cccccccccccc	СС	ack#	= 28 seq# = 28	,

- Started timer for packet 28

TOLAYER3: packet being lost.

EVENT time: 458.897980, type: 1, fromlayer5 entity: 0

- A side received message from upper layer: ssssssssssssssssss
- Too many packets in-flight. Buffering to send later...

EVENT time: 462.707520, type: 2, fromlayer3 entity: 0