

# Hw2 report

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## Result - Screenshots

./SR 10 0 0 10 2

```
----- Stop and Wait Network Simulator Version 1.1 -----
the number of messages to simulate: 10
packet loss probability: 0.000000
packet corruption probability: 0.000000
average time between messages from sender's layer5: 10.000000
TRACE: 2

EVENT time: 18.705740, type: 1, fromlayer5 entity: 0
[A] seqnum=1, acknum=-1, checksum=1843, data=aaaaaaaaaaaaaaaa
[A] base=1, seqnum=2

EVENT time: 24.170835, type: 2, fromlayer3 entity: 1
[B] ack 1 sent
[B] message aaaaaaaaaaaaaaaaaa delivered

EVENT time: 29.402449, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=1, base=1

EVENT time: 35.124840, type: 1, fromlayer5 entity: 0
[A] seqnum=2, acknum=-1, checksum=1863, data=bbbbbbbbbbbbbbbbbb
[A] base=2, seqnum=3

EVENT time: 37.145336, type: 2, fromlayer3 entity: 1
[B] ack 2 sent
[B] message bbbbbbbbbbbbbbbbbb delivered

EVENT time: 41.612602, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=2, base=2

EVENT time: 52.094032, type: 1, fromlayer5 entity: 0
[A] seqnum=3, acknum=-1, checksum=1883, data=cccccccccccccccccc
[A] base=3, seqnum=4
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EVENT time: 56.957436, type: 2, fromlayer3 entity: 1
[B] ack 3 sent
[B] message cccccccccccccccc delivered

EVENT time: 60.917324, type: 1, fromlayer5 entity: 0
[A] seqnum=4, acknum=-1, checksum=1903, data=dddddddddddddddddd
[A] base=3, seqnum=5

EVENT time: 63.255848, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=3, base=3

EVENT time: 68.034302, type: 1, fromlayer5 entity: 0
[A] seqnum=5, acknum=-1, checksum=1923, data=eeeeeeeeeeeeeeeeee
[A] base=4, seqnum=6

EVENT time: 69.935989, type: 2, fromlayer3 entity: 1
[B] ack 4 sent
[B] message dddddddddddddddd delivered

EVENT time: 71.719910, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=4, base=4

EVENT time: 72.302330, type: 2, fromlayer3 entity: 1
[B] ack 5 sent
[B] message eeeeeeeeeeeeeeee delivered

EVENT time: 78.551346, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=5, base=5

EVENT time: 82.822174, type: 1, fromlayer5 entity: 0
[A] seqnum=6, acknum=-1, checksum=1943, data=fffffffffffffffffff
[A] base=6, seqnum=7

EVENT time: 88.162384, type: 2, fromlayer3 entity: 1
[B] ack 6 sent
[B] message ffffffffffffffff delivered

EVENT time: 94.523087, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=6, base=6

EVENT time: 96.604027, type: 1, fromlayer5 entity: 0
[A] seqnum=7, acknum=-1, checksum=1963, data=gggggggggggggggggggg
[A] base=7, seqnum=8

EVENT time: 97.662491, type: 2, fromlayer3 entity: 1
[B] ack 7 sent
[B] message gggggggggggggggggg delivered

EVENT time: 98.548904, type: 1, fromlayer5 entity: 0
[A] seqnum=8, acknum=-1, checksum=1983, data=hhhhhhhhhhhhhhhhhhh
[A] base=7, seqnum=9

EVENT time: 101.285919, type: 2, fromlayer3 entity: 1
[B] ack 8 sent
[B] message hhhhhhhhhhhhhhhhhh delivered

EVENT time: 102.584366, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=7, base=7

EVENT time: 104.340042, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=8, base=8

EVENT time: 108.723610, type: 1, fromlayer5 entity: 0
[A] seqnum=9, acknum=-1, checksum=2003, data=iiiiiiiiiiiiiiiiiii
[A] base=9, seqnum=10

EVENT time: 111.601448, type: 2, fromlayer3 entity: 1
[B] ack 9 sent
[B] message iiiiiiiiiiiiiiiiii delivered

EVENT time: 115.178009, type: 1, fromlayer5 entity: 0
[A] seqnum=10, acknum=-1, checksum=2023, data=jjjjjjjjjjjjjjjjjjj
[A] base=9, seqnum=11

EVENT time: 115.263214, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=9, base=9

EVENT time: 124.088791, type: 2, fromlayer3 entity: 1
[B] ack 10 sent
[B] message jjjjjjjjjjjjjjjjjj delivered

EVENT time: 133.480209, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=10, base=10
Simulator terminated at time 133.480209
after sending 10 msgs from layer5
```

./SR 20 0.1 0 10 2

```
----- Stop and Wait Network Simulator Version 1.1 -----
the number of messages to simulate: 20
packet loss probability: 0.100000
packet corruption probability: 0.000000
average time between messages from sender's layer5: 10.000000
TRACE: 2

EVENT time: 18.705740, type: 1, fromlayer5 entity: 0
[A] seqnum=1, acknum=-1, checksum=1843, data=aaaaaaaaaaaaaaaaaaaa
[A] base=1, seqnum=2

EVENT time: 24.170835, type: 2, fromlayer3 entity: 1
[B] ack 1 sent
[B] message aaaaaaaaaaaaaaaaaa delivered

EVENT time: 29.402449, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=1, base=1

EVENT time: 35.124840, type: 1, fromlayer5 entity: 0
[A] seqnum=2, acknum=-1, checksum=1863, data=bbbbbbbbbbbbbbbbbbbb
[A] base=2, seqnum=3

EVENT time: 37.145336, type: 2, fromlayer3 entity: 1
[B] ack 2 sent
[B] message bbbbbbbbbbbbbbbbbb delivered

EVENT time: 41.612602, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=2, base=2

EVENT time: 52.094032, type: 1, fromlayer5 entity: 0
TOLAYER3: packet being lost
[A] seqnum=3, acknum=-1, checksum=1883, data=cccccccccccccccccccc
[A] base=3, seqnum=4

EVENT time: 60.917324, type: 1, fromlayer5 entity: 0
[A] seqnum=4, acknum=-1, checksum=1903, data=dddddddddddddddddd
[A] base=3, seqnum=5

EVENT time: 66.189552, type: 2, fromlayer3 entity: 1
[B] ack 4 sent
[B] packet 4 buffered

EVENT time: 69.502670, type: 1, fromlayer5 entity: 0
[A] seqnum=5, acknum=-1, checksum=1923, data=eeeeeeeeeeeeeeeeeeee
[A] base=3, seqnum=6

EVENT time: 70.392197, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=4, base=3

EVENT time: 77.157211, type: 2, fromlayer3 entity: 1
[B] ack 5 sent
[B] packet 5 buffered

EVENT time: 80.570114, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=5, base=3

EVENT time: 82.094032, type: 0, timerinterrupt entity: 0
[A] timeout(3)
TOLAYER3: packet being lost

EVENT time: 87.321922, type: 1, fromlayer5 entity: 0
[A] seqnum=6, acknum=-1, checksum=1943, data=ffffffffffffffffffff
[A] base=3, seqnum=7

EVENT time: 89.103027, type: 1, fromlayer5 entity: 0
TOLAYER3: packet being lost
[A] seqnum=7, acknum=-1, checksum=1963, data=gggggggggggggggggggg
[A] base=3, seqnum=8

EVENT time: 93.570938, type: 2, fromlayer3 entity: 1
[B] ack 6 sent
[B] packet 6 buffered

EVENT time: 99.408905, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=6, base=3

EVENT time: 102.884880, type: 1, fromlayer5 entity: 0
[A] seqnum=8, acknum=-1, checksum=1983, data=hhhhhhhhhhhhhhhhhhhh
[A] base=3, seqnum=9

EVENT time: 104.760071, type: 2, fromlayer3 entity: 1
TOLAYER3: packet being lost
[B] ack 8 sent
[B] packet 8 buffered

EVENT time: 112.094032, type: 0, timerinterrupt entity: 0
[A] timeout(3)

EVENT time: 113.400421, type: 2, fromlayer3 entity: 1
[B] ack 3 sent
[B] message cccccccccccccccccc delivered
[B] message dddddddddddddddddd delivered
[B] message eeeeeeeeeeeeeeeeee delivered
[B] message ffffffffffffffffffff delivered

EVENT time: 114.797554, type: 1, fromlayer5 entity: 0
[A] seqnum=9, acknum=-1, checksum=2003, data=iiiiiiiiiiiiiiiiiiii
[A] base=3, seqnum=10
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EVENT time: 118.657585, type: 1, fromlayer5 entity: 0
[A] seqnum=10, acknum=-1, checksum=2023, data=jjjjjjjjjjjjjjjjjjjj
[A] base=3, seqnum=11

EVENT time: 118.979034, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=3, base=3

EVENT time: 119.103027, type: 0, timerinterrupt entity: 0
[A] timeout(7)

EVENT time: 119.794250, type: 1, fromlayer5 entity: 0
[A] seqnum=11, acknum=-1, checksum=2043, data=kkkkkkkkkkkkkkkkkkkk
[A] base=7, seqnum=12

EVENT time: 121.047485, type: 2, fromlayer3 entity: 1
[B] ack 9 sent
[B] packet 9 buffered

EVENT time: 125.866768, type: 2, fromlayer3 entity: 1
[B] ack 10 sent
[B] packet 10 buffered

EVENT time: 130.438904, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=9, base=7

EVENT time: 132.460968, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=10, base=7

EVENT time: 132.884888, type: 0, timerinterrupt entity: 0
[A] timeout(8)

EVENT time: 133.391754, type: 1, fromlayer5 entity: 0
[A] seqnum=12, acknum=-1, checksum=2063, data=lllllllllllllllllllll
[A] base=7, seqnum=13

EVENT time: 135.262848, type: 2, fromlayer3 entity: 1
[B] ack 7 sent
[B] message gggggggggggggggggggg delivered
[B] message hhhhhhhhhhhhhhhhhhhh delivered
[B] message iiiiiiiiiiiiiiiiii delivered
[B] message jjjjjjjjjjjjjjjjjjjj delivered

EVENT time: 135.814606, type: 1, fromlayer5 entity: 0
[A] seqnum=13, acknum=-1, checksum=2083, data=mmmmmmmmmmmmmmmmmmmm
[A] base=7, seqnum=14

EVENT time: 141.954193, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=7, base=7

EVENT time: 144.156952, type: 1, fromlayer5 entity: 0
[A] seqnum=14, acknum=-1, checksum=2103, data=nnnnnnnnnnnnnnnnnnnnn
[A] base=8, seqnum=15

EVENT time: 144.173630, type: 2, fromlayer3 entity: 1
TOLAYER3: packet being lost
[B] ack 11 sent
[B] message kkkkkkkkkkkkkkkkkkk delivered

EVENT time: 147.070892, type: 2, fromlayer3 entity: 1
[B] ack 8 sent
[B] packet 8 buffered

EVENT time: 148.594604, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=8, base=8

EVENT time: 149.183624, type: 2, fromlayer3 entity: 1
[B] ack 12 sent
[B] message llllllllllllllllllll delivered

EVENT time: 149.794250, type: 0, timerinterrupt entity: 0
[A] timeout(11)

EVENT time: 151.666000, type: 2, fromlayer3 entity: 1
[B] ack 13 sent
[B] message oooooooooooooooooo delivered

EVENT time: 155.232727, type: 1, fromlayer5 entity: 0
[A] seqnum=15, acknum=-1, checksum=2123, data=oooooooooooooooooooo
[A] base=11, seqnum=16

EVENT time: 158.618118, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=12, base=11

EVENT time: 160.995010, type: 2, fromlayer3 entity: 1
[B] ack 14 sent
[B] message nnnnnnnnnnnnnnnnnnn delivered

EVENT time: 165.814606, type: 0, timerinterrupt entity: 0
[A] timeout(13)

EVENT time: 167.892380, type: 1, fromlayer5 entity: 0
[A] seqnum=16, acknum=-1, checksum=2143, data=ppppppppppppppppppppp
[A] base=11, seqnum=17

EVENT time: 168.466095, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=13, base=11

EVENT time: 169.820908, type: 2, fromlayer3 entity: 1
[B] ack 11 sent
[B] packet 11 buffered
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EVENT time: 174.156952, type: 0, timerinterrupt entity: 0
[A] timeout(14)
    TOLAYER3: packet being lost

EVENT time: 175.081772, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=14, base=11

EVENT time: 175.323868, type: 2, fromlayer3 entity: 1
[B] ack 15 sent
[B] message oooooooooooooooooo delivered

EVENT time: 178.630890, type: 2, fromlayer3 entity: 1
[B] ack 13 sent
[B] packet 13 buffered

EVENT time: 179.579651, type: 1, fromlayer5 entity: 0
    TOLAYER3: packet being lost
[A] seqnum=17, acknum=-1, checksum=2163, data=qqqqqqqqqqqqqqqqqq
[A] base=11, seqnum=18

EVENT time: 179.794250, type: 0, timerinterrupt entity: 0
[A] timeout(11)

EVENT time: 180.144989, type: 2, fromlayer3 entity: 1
[B] ack 16 sent
[B] message ppppppppppppppppp delivered

EVENT time: 180.982727, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=11, base=11

EVENT time: 182.977158, type: 1, fromlayer5 entity: 0
[A] seqnum=18, acknum=-1, checksum=2183, data=rrrrrrrrrrrrrrrrrr
[A] base=15, seqnum=19

EVENT time: 185.206009, type: 1, fromlayer5 entity: 0
[A] seqnum=19, acknum=-1, checksum=2203, data=ssssssssssssssssss
[A] base=15, seqnum=20

EVENT time: 185.232727, type: 0, timerinterrupt entity: 0
[A] timeout(15)

EVENT time: 185.344620, type: 1, fromlayer5 entity: 0
[A] seqnum=20, acknum=-1, checksum=2223, data=tttttttttttttttttt
[A] base=15, seqnum=21

EVENT time: 185.392120, type: 2, fromlayer3 entity: 1
[B] ack 11 sent
[B] packet 11 buffered

EVENT time: 189.805847, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=15, base=15

EVENT time: 194.714569, type: 2, fromlayer3 entity: 1
[B] ack 18 sent
[B] packet 18 buffered

EVENT time: 196.586823, type: 2, fromlayer3 entity: 0

EVENT time: 197.710953, type: 2, fromlayer3 entity: 1
[B] ack 19 sent
[B] packet 19 buffered

EVENT time: 197.892380, type: 0, timerinterrupt entity: 0
[A] timeout(16)

EVENT time: 205.530563, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=16, base=16

EVENT time: 205.966614, type: 2, fromlayer3 entity: 1
[B] ack 15 sent
[B] packet 15 buffered

EVENT time: 209.579651, type: 0, timerinterrupt entity: 0
[A] timeout(17)

EVENT time: 212.977158, type: 0, timerinterrupt entity: 0
[A] timeout(18)

EVENT time: 214.653259, type: 2, fromlayer3 entity: 0

EVENT time: 214.991287, type: 2, fromlayer3 entity: 1
[B] ack 20 sent
[B] packet 20 buffered

EVENT time: 215.206009, type: 0, timerinterrupt entity: 0
[A] timeout(19)

EVENT time: 215.344620, type: 0, timerinterrupt entity: 0
[A] timeout(20)

EVENT time: 219.891525, type: 2, fromlayer3 entity: 1
[B] ack 16 sent
[B] packet 16 buffered

EVENT time: 222.165558, type: 2, fromlayer3 entity: 1
[B] ack 17 sent
[B] message qqqqqqqqqqqqqqqqq delivered
[B] message rrrrrrrrrrrrrrrrr delivered
[B] message sssssssssssssssss delivered
[B] message ttttttttttttttttt delivered

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EVENT time: 222.599075, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=18, base=17

EVENT time: 223.762039, type: 2, fromlayer3 entity: 1
[B] ack 18 sent
[B] packet 18 buffered

EVENT time: 227.325867, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=19, base=17

EVENT time: 228.633713, type: 2, fromlayer3 entity: 1
[B] ack 19 sent
[B] packet 19 buffered

EVENT time: 235.172943, type: 2, fromlayer3 entity: 1
[B] ack 20 sent
[B] packet 20 buffered

EVENT time: 237.064575, type: 2, fromlayer3 entity: 0

EVENT time: 239.579651, type: 0, timerinterrupt entity: 0
[A] timeout(17)

EVENT time: 240.782791, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=20, base=17

EVENT time: 244.890533, type: 2, fromlayer3 entity: 0

EVENT time: 249.293793, type: 2, fromlayer3 entity: 1
[B] ack 17 sent
[B] packet 17 buffered

EVENT time: 252.171982, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=17, base=17

EVENT time: 257.055450, type: 2, fromlayer3 entity: 0

EVENT time: 261.069824, type: 2, fromlayer3 entity: 0

EVENT time: 268.462189, type: 2, fromlayer3 entity: 0

EVENT time: 274.944794, type: 2, fromlayer3 entity: 0
Simulator terminated at time 274.944794
after sending 20 msgs from layer5

```

./SR 20 0 0.1 10 2

```
----- Stop and Wait Network Simulator Version 1.1 -----
the number of messages to simulate: 20
packet loss probability: 0.000000
packet corruption probability: 0.100000
average time between messages from sender's layer5: 10.000000
TRACE: 2

EVENT time: 18.705740, type: 1, fromlayer5 entity: 0
[A] seqnum=1, acknum=-1, checksum=1843, data=aaaaaaaaaaaaaaaa
[A] base=1, seqnum=2

EVENT time: 24.170835, type: 2, fromlayer3 entity: 1
[B] ack 1 sent
[B] message aaaaaaaaaaaaaaaaaa delivered

EVENT time: 29.402449, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=1, base=1

EVENT time: 35.124840, type: 1, fromlayer5 entity: 0
[A] seqnum=2, acknum=-1, checksum=1863, data=bbbbbbbbbbbbbbbbbb
[A] base=2, seqnum=3

EVENT time: 37.145336, type: 2, fromlayer3 entity: 1
TOLAYER3: packet being corrupted
[B] ack 2 sent
[B] message bbbbbbbbbbbbbbbb delivered

EVENT time: 41.612602, type: 2, fromlayer3 entity: 0

EVENT time: 52.094032, type: 1, fromlayer5 entity: 0
[A] seqnum=3, acknum=-1, checksum=1883, data=cccccccccccccccccc
[A] base=2, seqnum=4

EVENT time: 53.157188, type: 1, fromlayer5 entity: 0
[A] seqnum=4, acknum=-1, checksum=1903, data=dddddddddddddddddd
[A] base=2, seqnum=5

EVENT time: 61.522457, type: 2, fromlayer3 entity: 1
[B] ack 3 sent
[B] message cccccccccccccccc delivered

EVENT time: 64.252701, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=3, base=2

EVENT time: 64.931442, type: 1, fromlayer5 entity: 0
[A] seqnum=5, acknum=-1, checksum=1923, data=eeeeeeeeeeeeeeeeee
[A] base=2, seqnum=6

EVENT time: 65.124840, type: 0, timerinterrupt entity: 0
[A] timeout(2)

EVENT time: 65.725098, type: 2, fromlayer3 entity: 1
[B] ack 4 sent
[B] message dddddddddddddddd delivered

EVENT time: 69.138000, type: 2, fromlayer3 entity: 1
[B] ack 5 sent
[B] message eeeeeeeeeeeeeeee delivered

EVENT time: 69.883682, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=4, base=2

EVENT time: 70.939499, type: 2, fromlayer3 entity: 1
[B] ack 2 sent
[B] packet 2 buffered

EVENT time: 71.739449, type: 1, fromlayer5 entity: 0
[A] seqnum=6, acknum=-1, checksum=1943, data=fffffffffffffffffff
[A] base=2, seqnum=7

EVENT time: 72.797913, type: 2, fromlayer3 entity: 1
[B] ack 6 sent
[B] message ffffffffffffffff delivered

EVENT time: 73.684326, type: 1, fromlayer5 entity: 0
[A] seqnum=7, acknum=-1, checksum=1963, data=gggggggggggggggggg
[A] base=2, seqnum=8

EVENT time: 75.223892, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=5, base=2

EVENT time: 76.421341, type: 2, fromlayer3 entity: 1
TOLAYER3: packet being corrupted
[B] ack 7 sent
[B] message gggggggggggggggg delivered

EVENT time: 81.584595, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=2, base=2

EVENT time: 83.859032, type: 1, fromlayer5 entity: 0
[A] seqnum=8, acknum=-1, checksum=1983, data=hhhhhhhhhhhhhhhhhh
[A] base=6, seqnum=9

EVENT time: 86.506470, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=6, base=6

EVENT time: 88.262146, type: 2, fromlayer3 entity: 0

EVENT time: 90.176414, type: 2, fromlayer3 entity: 1
[B] ack 8 sent
[B] message hhhhhhhhhhhhhhhh delivered
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EVENT time: 92.346321, type: 1, fromlayer5 entity: 0
[A] seqnum=9, acknum=-1, checksum=2003, data=iiiiiiiiiiiiiiiiii
[A] base=7, seqnum=10

EVENT time: 97.295296, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=8, base=7

EVENT time: 98.780922, type: 2, fromlayer3 entity: 1
[B] ack 9 sent
[B] message iiiiiiiiiiiiiiiiii delivered

EVENT time: 101.053490, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=9, base=7

EVENT time: 103.684326, type: 0, timerinterrupt entity: 0
[A] timeout(7)

EVENT time: 105.716141, type: 2, fromlayer3 entity: 1
[B] ack 7 sent
[B] packet 7 buffered

EVENT time: 107.806427, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=7, base=7

EVENT time: 109.925835, type: 1, fromlayer5 entity: 0
[A] seqnum=10, acknum=-1, checksum=2023, data=jjjjjjjjjjjjjjjjjj
[A] base=10, seqnum=11

EVENT time: 112.398560, type: 1, fromlayer5 entity: 0
[A] seqnum=11, acknum=-1, checksum=2043, data=kkkkkkkkkkkkkkkkkk
[A] base=10, seqnum=12

EVENT time: 112.942871, type: 2, fromlayer3 entity: 1
[B] ack 10 sent
[B] message jjjjjjjjjjjjjjjj delivered

EVENT time: 118.415474, type: 2, fromlayer3 entity: 1
TOLAYER3: packet being corrupted
[B] ack 11 sent
[B] message kkkkkkkkkkkkkkkk delivered

EVENT time: 118.926971, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=10, base=10

EVENT time: 124.026207, type: 1, fromlayer5 entity: 0
[A] seqnum=12, acknum=-1, checksum=2063, data=lllllllllllllllllll
[A] base=11, seqnum=13

EVENT time: 125.189995, type: 1, fromlayer5 entity: 0
[A] seqnum=13, acknum=-1, checksum=2083, data=mmmmmmmmmmmmmmmmmm
[A] base=11, seqnum=14

EVENT time: 126.788910, type: 2, fromlayer3 entity: 0

EVENT time: 131.984070, type: 2, fromlayer3 entity: 1
[B] ack 12 sent
[B] message llllllllllllllll delivered

EVENT time: 140.809967, type: 2, fromlayer3 entity: 1
[B] ack 13 sent
[B] message nnnnnnnnnnnnnnnnn delivered

EVENT time: 140.969055, type: 1, fromlayer5 entity: 0
[A] seqnum=14, acknum=-1, checksum=2103, data=nnnnnnnnnnnnnnnnnn
[A] base=11, seqnum=15

EVENT time: 141.832047, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=12, base=11

EVENT time: 142.398560, type: 0, timerinterrupt entity: 0
[A] timeout(11)

EVENT time: 144.577286, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=13, base=11

EVENT time: 147.584732, type: 2, fromlayer3 entity: 1
TOLAYER3: packet being corrupted
[B] ack 14 sent
[B] message nnnnnnnnnnnnnnnn delivered

EVENT time: 150.891754, type: 2, fromlayer3 entity: 1
TOLAYER3: packet being corrupted
[B] ack 11 sent
[B] packet 11 buffered

EVENT time: 155.364365, type: 2, fromlayer3 entity: 0

EVENT time: 156.051575, type: 1, fromlayer5 entity: 0
[A] seqnum=15, acknum=-1, checksum=2123, data=oooooooooooooooooooo
[A] base=11, seqnum=16

EVENT time: 158.200958, type: 2, fromlayer3 entity: 1
[B] ack 15 sent
[B] message oooooooooooooooooo delivered

EVENT time: 161.265320, type: 2, fromlayer3 entity: 0

EVENT time: 162.849182, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=15, base=11
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EVENT time: 168.892975, type: 1, fromlayer5 entity: 0
[A] seqnum=17, acknum=-1, checksum=2163, data=qqqqqqqqqqqqqqqqqq
[A] base=11, seqnum=18

EVENT time: 170.969055, type: 0, timerinterrupt entity: 0
[A] timeout(14)
    TOLAYER3: packet being corrupted

EVENT time: 172.398560, type: 0, timerinterrupt entity: 0
[A] timeout(11)

EVENT time: 173.754684, type: 2, fromlayer3 entity: 1
    TOLAYER3: packet being corrupted
[B] ack 16 sent
[B] message pppppppppppppppppp delivered

EVENT time: 176.290009, type: 2, fromlayer3 entity: 1
[B] ack 17 sent
[B] message qqqqqqqqqqqqqqqqq delivered

EVENT time: 182.010345, type: 2, fromlayer3 entity: 0

EVENT time: 185.612457, type: 2, fromlayer3 entity: 1

EVENT time: 185.923111, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=17, base=11

EVENT time: 187.243530, type: 1, fromlayer5 entity: 0
[A] seqnum=18, acknum=-1, checksum=2183, data=rrrrrrrrrrrrrrrrrrrr
[A] base=11, seqnum=19

EVENT time: 188.608841, type: 2, fromlayer3 entity: 1
[B] ack 11 sent
[B] packet 11 buffered

EVENT time: 192.782547, type: 2, fromlayer3 entity: 1
[B] ack 18 sent
[B] message rrrrrrrrrrrrrrrrrrr delivered

EVENT time: 196.210846, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=11, base=11

EVENT time: 198.507553, type: 0, timerinterrupt entity: 0
[A] timeout(16)

EVENT time: 200.969055, type: 0, timerinterrupt entity: 0
[A] timeout(14)

EVENT time: 202.885574, type: 2, fromlayer3 entity: 1
    TOLAYER3: packet being corrupted
[B] ack 16 sent
[B] packet 16 buffered

EVENT time: 205.293961, type: 1, fromlayer5 entity: 0
[A] seqnum=19, acknum=-1, checksum=2203, data=ssssssssssssssssssss
[A] base=14, seqnum=20

EVENT time: 205.341736, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=18, base=14

EVENT time: 206.207336, type: 2, fromlayer3 entity: 1
[B] ack 14 sent
[B] packet 14 buffered

EVENT time: 212.110199, type: 2, fromlayer3 entity: 0

EVENT time: 214.637085, type: 2, fromlayer3 entity: 1
[B] ack 19 sent
[B] message sssssssssssssssssss delivered

EVENT time: 218.251373, type: 1, fromlayer5 entity: 0
[A] seqnum=20, acknum=-1, checksum=2223, data=tttttttttttttttttttt
[A] base=14, seqnum=21

EVENT time: 218.795609, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=14, base=14

EVENT time: 223.084137, type: 2, fromlayer3 entity: 1
[B] ack 20 sent
[B] message tttttttttttttttttt delivered

EVENT time: 224.505676, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=19, base=16

EVENT time: 227.284256, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=20, base=16

EVENT time: 228.507553, type: 0, timerinterrupt entity: 0
[A] timeout(16)

EVENT time: 235.012939, type: 2, fromlayer3 entity: 1
[B] ack 16 sent
[B] packet 16 buffered

EVENT time: 236.418564, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=16, base=16
Simulator terminated at time 236.418564
after sending 20 msgs from layer5

```

./SR 20 0.1 0.1 10 2

```
----- Stop and Wait Network Simulator Version 1.1 -----
the number of messages to simulate: 20
packet loss probability: 0.100000
packet corruption probability: 0.100000
average time between messages from sender's layer5: 10.000000
TRACE: 2

EVENT time: 18.705740, type: 1, fromlayer5 entity: 0
[A] seqnum=1, acknum=-1, checksum=1843, data=aaaaaaaaaaaaaaaa
[A] base=1, seqnum=2

EVENT time: 24.170835, type: 2, fromlayer3 entity: 1
[B] ack 1 sent
[B] message aaaaaaaaaaaaaaaaaa delivered

EVENT time: 29.402449, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=1, base=1

EVENT time: 35.124840, type: 1, fromlayer5 entity: 0
[A] seqnum=2, acknum=-1, checksum=1863, data=bbbbbbbbbbbbbbbb
[A] base=2, seqnum=3

EVENT time: 37.145336, type: 2, fromlayer3 entity: 1
TOLAYER3: packet being corrupted
[B] ack 2 sent
[B] message bbbbbbbbbbbbbbbb delivered

EVENT time: 41.612602, type: 2, fromlayer3 entity: 0

EVENT time: 52.094032, type: 1, fromlayer5 entity: 0
[A] seqnum=3, acknum=-1, checksum=1883, data=cccccccccccccccc
[A] base=2, seqnum=4

EVENT time: 53.157188, type: 1, fromlayer5 entity: 0
[A] seqnum=4, acknum=-1, checksum=1903, data=dddddddddddddddd
[A] base=2, seqnum=5

EVENT time: 61.522457, type: 2, fromlayer3 entity: 1
[B] ack 3 sent
[B] message cccccccccccccccc delivered

EVENT time: 64.252701, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=3, base=2

EVENT time: 64.931442, type: 1, fromlayer5 entity: 0
[A] seqnum=5, acknum=-1, checksum=1923, data=eeeeeeeeeeeeeeee
[A] base=2, seqnum=6

EVENT time: 65.124840, type: 0, timerinterrupt entity: 0
[A] timeout(2)
TOLAYER3: packet being lost

EVENT time: 65.725098, type: 2, fromlayer3 entity: 1
TOLAYER3: packet being lost
[B] ack 4 sent
[B] message dddddddddddddddd delivered

EVENT time: 69.138000, type: 2, fromlayer3 entity: 1
[B] ack 5 sent
[B] message eeeeeeeeeeeeeeee delivered

EVENT time: 71.739449, type: 1, fromlayer5 entity: 0
TOLAYER3: packet being lost
[A] seqnum=6, acknum=-1, checksum=1943, data=ffffffffffffffff
[A] base=2, seqnum=7

EVENT time: 75.387016, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=5, base=2

EVENT time: 83.157188, type: 0, timerinterrupt entity: 0
[A] timeout(4)

EVENT time: 85.521301, type: 1, fromlayer5 entity: 0
[A] seqnum=7, acknum=-1, checksum=1963, data=gggggggggggggggggg
[A] base=2, seqnum=8

EVENT time: 88.995155, type: 2, fromlayer3 entity: 1
TOLAYER3: packet being lost
[B] ack 4 sent
[B] packet 4 buffered

EVENT time: 90.870346, type: 2, fromlayer3 entity: 1
[B] ack 7 sent
[B] packet 7 buffered

EVENT time: 92.176735, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=7, base=2

EVENT time: 95.124840, type: 0, timerinterrupt entity: 0
[A] timeout(2)
TOLAYER3: packet being corrupted

EVENT time: 97.433975, type: 1, fromlayer5 entity: 0
TOLAYER3: packet being corrupted
[A] seqnum=8, acknum=-1, checksum=1983, data=hhhhhhhhhhhhhhhhh
[A] base=2, seqnum=9

EVENT time: 100.703461, type: 2, fromlayer3 entity: 1
```

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EVENT time: 101.739449, type: 0, timerinterrupt entity: 0
[A] timeout(6)

EVENT time: 102.459137, type: 2, fromlayer3 entity: 1

EVENT time: 105.336975, type: 2, fromlayer3 entity: 1
[B] ack 6 sent
[B] message ffffffffffffffff delivered
[B] message gggggggggggggggggg delivered

EVENT time: 108.998741, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=6, base=2

EVENT time: 113.157188, type: 0, timerinterrupt entity: 0
[A] timeout(4)
TOLAYER3: packet being corrupted

EVENT time: 114.725662, type: 1, fromlayer5 entity: 0
[A] seqnum=9, acknum=-1, checksum=2003, data=iiiiiiiiiiiiiiiiiii
[A] base=2, seqnum=10

EVENT time: 122.067970, type: 2, fromlayer3 entity: 1

EVENT time: 124.340538, type: 2, fromlayer3 entity: 1
[B] ack 9 sent
[B] packet 9 buffered

EVENT time: 125.124840, type: 0, timerinterrupt entity: 0
[A] timeout(2)
TOLAYER3: packet being lost

EVENT time: 126.372353, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=9, base=2

EVENT time: 127.433975, type: 0, timerinterrupt entity: 0
[A] timeout(8)

EVENT time: 133.373245, type: 1, fromlayer5 entity: 0
[A] adding to buf
[A] base=2, seqnum=11

EVENT time: 135.176910, type: 2, fromlayer3 entity: 1
[B] ack 8 sent
[B] message hhhhhhhhhhhhhhhhhh delivered
[B] message iiiiiiiiiiiiiiiiii delivered

EVENT time: 141.868256, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=8, base=2

EVENT time: 143.157196, type: 0, timerinterrupt entity: 0
[A] timeout(4)

EVENT time: 144.511368, type: 1, fromlayer5 entity: 0
[A] adding to buf
[A] base=2, seqnum=12

EVENT time: 148.629807, type: 2, fromlayer3 entity: 1
[B] ack 4 sent
[B] packet 4 buffered

EVENT time: 154.016663, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=4, base=2

EVENT time: 154.532990, type: 1, fromlayer5 entity: 0
[A] adding to buf
[A] base=2, seqnum=13

EVENT time: 155.124847, type: 0, timerinterrupt entity: 0
[A] timeout(2)
TOLAYER3: packet being lost

EVENT time: 169.781754, type: 1, fromlayer5 entity: 0
[A] adding to buf
[A] base=2, seqnum=14

EVENT time: 185.124847, type: 0, timerinterrupt entity: 0
[A] timeout(2)
TOLAYER3: packet being lost

EVENT time: 186.948639, type: 1, fromlayer5 entity: 0
[A] adding to buf
[A] base=2, seqnum=15

EVENT time: 202.111115, type: 1, fromlayer5 entity: 0
[A] adding to buf
[A] base=2, seqnum=16

EVENT time: 215.124847, type: 0, timerinterrupt entity: 0
[A] timeout(2)

EVENT time: 217.573029, type: 1, fromlayer5 entity: 0
[A] adding to buf
[A] base=2, seqnum=17

EVENT time: 223.225418, type: 2, fromlayer3 entity: 1
[B] ack 2 sent
[B] packet 2 buffered
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EVENT time: 228.890442, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=2, base=2
TOLAYER3: packet being corrupted
TOLAYER3: packet being corrupted

EVENT time: 234.963928, type: 1, fromlayer5 entity: 0
TOLAYER3: packet being lost
[A] seqnum=17, acknum=-1, checksum=2163, data=qqqqqqqqqqqqqqqqqq
[A] base=10, seqnum=18

EVENT time: 235.587280, type: 2, fromlayer3 entity: 1
[B] ack 10 sent
[B] message jjjjjjjjjjjjjjjjjj delivered

EVENT time: 236.760727, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=10, base=10

EVENT time: 243.374405, type: 2, fromlayer3 entity: 1
[B] ack 11 sent
[B] message kkkkkkkkkkkkkkkkk delivered

EVENT time: 247.173691, type: 2, fromlayer3 entity: 1
[B] ack 12 sent
[B] message lllllllllllllllll delivered

EVENT time: 247.810562, type: 1, fromlayer5 entity: 0
TOLAYER3: packet being corrupted
[A] seqnum=18, acknum=-1, checksum=2183, data=rrrrrrrrrrrrrrrrrr
[A] base=11, seqnum=19

EVENT time: 249.212875, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=11, base=11

EVENT time: 251.748199, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=12, base=12

EVENT time: 255.469879, type: 1, fromlayer5 entity: 0
[A] seqnum=19, acknum=-1, checksum=2203, data=ssssssssssssssssss
[A] base=13, seqnum=20

EVENT time: 256.205414, type: 2, fromlayer3 entity: 1
TOLAYER3: packet being lost
[B] ack 13 sent
[B] message mmmmmmmmmmmmmmmmm delivered

EVENT time: 257.719513, type: 2, fromlayer3 entity: 1

EVENT time: 258.817535, type: 2, fromlayer3 entity: 1

EVENT time: 258.890442, type: 0, timerinterrupt entity: 0
[A] timeout(16)

EVENT time: 258.890442, type: 0, timerinterrupt entity: 0
[A] timeout(15)

EVENT time: 258.890442, type: 0, timerinterrupt entity: 0
[A] timeout(14)

EVENT time: 258.890442, type: 0, timerinterrupt entity: 0
[A] timeout(13)

EVENT time: 259.906281, type: 1, fromlayer5 entity: 0
[A] seqnum=20, acknum=-1, checksum=2223, data=tttttttttttttttttt
[A] base=13, seqnum=21

EVENT time: 260.966919, type: 2, fromlayer3 entity: 1
[B] ack 16 sent
[B] packet 16 buffered

EVENT time: 262.458099, type: 2, fromlayer3 entity: 1

EVENT time: 264.611572, type: 2, fromlayer3 entity: 1
[B] ack 19 sent
[B] packet 19 buffered

EVENT time: 264.963928, type: 0, timerinterrupt entity: 0
[A] timeout(17)

EVENT time: 270.705627, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=16, base=13

EVENT time: 272.979645, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=19, base=13

EVENT time: 273.636230, type: 2, fromlayer3 entity: 1
[B] ack 16 sent
[B] packet 16 buffered

EVENT time: 277.354431, type: 2, fromlayer3 entity: 0

EVENT time: 277.810547, type: 0, timerinterrupt entity: 0
[A] timeout(18)

EVENT time: 282.758911, type: 2, fromlayer3 entity: 1
[B] ack 15 sent
[B] packet 15 buffered

EVENT time: 288.890442, type: 0, timerinterrupt entity: 0
[A] timeout(13)

EVENT time: 288.890442, type: 0, timerinterrupt entity: 0
[A] timeout(14)

EVENT time: 288.890442, type: 0, timerinterrupt entity: 0
[A] timeout(15)

EVENT time: 289.298157, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=15, base=13

EVENT time: 289.906281, type: 0, timerinterrupt entity: 0
[A] timeout(20)
TOLAYER3: packet being corrupted

EVENT time: 290.704712, type: 2, fromlayer3 entity: 1
[B] ack 14 sent
[B] message nnnnnnnnnnnnnnnnn delivered
[B] message ooooooooooooooooo delivered
[B] message ppppppppppppppppp delivered

EVENT time: 291.849030, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=14, base=13

EVENT time: 294.963928, type: 0, timerinterrupt entity: 0
[A] timeout(17)

EVENT time: 295.431519, type: 2, fromlayer3 entity: 1
[B] ack 13 sent
[B] packet 13 buffered

EVENT time: 298.446350, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=13, base=13

EVENT time: 300.331757, type: 2, fromlayer3 entity: 1
[B] ack 20 sent
[B] packet 20 buffered

EVENT time: 301.928223, type: 2, fromlayer3 entity: 1
[B] ack 17 sent
[B] message qqqqqqqqqqqqqqq delivered

EVENT time: 306.064819, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=20, base=17

EVENT time: 306.799896, type: 2, fromlayer3 entity: 1
TOLAYER3: packet being lost
[B] ack 18 sent
[B] message rrrrrrrrrrrrrrrrr delivered
[B] message sssssssssssssssss delivered
[B] message ttttttttttttttttt delivered

EVENT time: 307.810547, type: 0, timerinterrupt entity: 0
[A] timeout(18)

EVENT time: 310.907654, type: 2, fromlayer3 entity: 1
[B] ack 13 sent
[B] packet 13 buffered

EVENT time: 315.669556, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=17, base=17

EVENT time: 318.189117, type: 2, fromlayer3 entity: 1
[B] ack 14 sent
[B] packet 14 buffered

EVENT time: 319.083740, type: 2, fromlayer3 entity: 0

EVENT time: 323.072571, type: 2, fromlayer3 entity: 1
TOLAYER3: packet being lost
[B] ack 15 sent
[B] packet 15 buffered

EVENT time: 324.276520, type: 2, fromlayer3 entity: 0

EVENT time: 327.086945, type: 2, fromlayer3 entity: 1

EVENT time: 329.505310, type: 2, fromlayer3 entity: 1
TOLAYER3: packet being lost
[B] ack 17 sent
[B] packet 17 buffered

EVENT time: 337.810547, type: 0, timerinterrupt entity: 0
[A] timeout(18)

EVENT time: 338.086731, type: 2, fromlayer3 entity: 1
[B] ack 18 sent
[B] packet 18 buffered

EVENT time: 339.910095, type: 2, fromlayer3 entity: 0
[A] packet.seqnum=0, acknum=18, base=18

EVENT time: 342.517731, type: 2, fromlayer3 entity: 1
[B] ack 18 sent
[B] packet 18 buffered

EVENT time: 344.055237, type: 2, fromlayer3 entity: 0
Simulator terminated at time 344.055237
after sending 20 msgs from layer5

```