

COMP3331 Assignment 1 Report
Ziming Zheng z5052592

Both sender.py and receiver.py are used by Python3

1. List of features provided by Sender

- a. A three-way handshake for the connection establishment(sending SYN, receiving SYN+ACK, sending ACK).
- b. The connection termination(sending FIN, receiving FIN+ACK, sending ACK).
- c. Sender's log file basically follows the format of flags provided on page 7 of specification (section 3.5.3).
- d. Sender maintains a single-timer for timeout operation. This is accomplished by creating a timer class in my code.
- e. Sender follows the TCP features in the textbook(section 3.5.4), which can re-transmit while time-out as well as doing fast retransmission while receiving three duplicative acknowledgement number.
- f. Sender has included sequence number and acknowledge number fields in the STP header for each segment.
- g. Sender always send data with no more than MSS(Maximum segment size)
- h. Sender can also deal with MWS(Maximum Window Size)
- i. Sender can simulate PLD Module.

List of features provided by Receiver

- j. A three-way handshake for the connection establishment(receiving SYN, sending SYN+ACK, receiving ACK).
- k. The connection termination(receiving FIN, receiving FIN+ACK, receiving ACK)
- l. Receiver's log file basically follows the format of flags provided on page 7 of specification(section 3.5.3).
- m. Receiver uses concepts of sequence numbers, cumulative acknowledgements.
- n. Receiver also maintains a buffer array to store out of order packets.
- o. Receiver will create a new text file and all incoming data should be stored in this file without any data loss.

2. STP header and explanation of all fields:

- a. I basically used something similar with bit field in C language. This is accomplished by a Python module named ctypes. The following numbers are all represented by binary digits. If this header is seen as a whole, it is just a 64-bit integer combined with different fields.

```
class Segments(Structure):
    _fields_ = [("flags", c_uint64, 4), ("length", c_uint64, 12), ("seqnum",
c_uint64, 16),("acknum", c_uint64, 16),("rwnd", c_uint64, 16)]

class Header(Union):
    _fields_ = [("segments", Segments),
                ("integer",c_uint64)]
```

For instance, Here is a packet with 64-bit width:

1001011000 0000000000000001 000000000110011 000000110010 0001
DATA

0000001001011000 - 16 bits

- **rwnd:** This represents the number of maximum window size in binary. In this example, I made the maximum window size 600 bytes.

0000000000000001 - 16 bits

- **acknum:** This represents the acknowledge number in binary. As the example above is sender's header, we can see that the acknowledge number is always 1, which is also the sequence number in receiver side while processing the data.

000000000110011 - 16 bits

- **seqnum:** This represents the sequence number in binary. As this example is sender's header, we can see that the sequence number is 51.

000000110010 - 12 bits

- **length:** This represents the data length in binary. For instance, I had set up the maximum segment size(MSS) is 50 bytes. So, if it is not the last segment sent, it would be 50 which is same as the number provided in binary.

0001 - 4 bits

- **flags:** This 4-bit field represents different flags. There are our binary numbers: 1000, 0100, 0010, and 0001 represented by SYN, ACK, FIN and DATA respectively. If you want to have a "FA" flag or "SA" flag, you can do bitwise OR to make it. Hence, FA = (FIN | ACK) and SA = (SYN | ACK).

3.

(1)

In my code, I found 200ms is suitable for the given parameter setting. I first tested out 1000ms, 700ms, and 500ms. From my observation, it seems that these figures gave the same statistics(see [Appendix A](#)) Then, I tried some small numbers such as 2ms, 50ms, 100ms and 200ms. The settings with 2ms, 50ms and 100ms timeout could all get more duplicate acknowledgement or segments. From that, I found that with using 200ms I could get the same duplicate segments and duplicated acknowledgement number. As 200ms may reduce the running time of the program compared with 500ms and 1000ms, I choose 200ms.

Then I used 200ms with pdrop = 0.1 to run my program to observe receiver log file. My output is appended in [Appendix B](#). From my output, we can see that while handshaking at the beginning, it has generated correct sequence number. Similarly, at the end, since we know the size of file is 1593 bytes and sender will send 1594 and 1595 while doing the termination. The output with pdrop = 0.3 is in [Appendix C](#).

The way to check whether a packet dropping occurred is to check whether there is a missing sequence number in which it supposed to be without any packet dropping. For instance, in the example below caught from [Appendix B](#):

0 1 1 51 151 251 301 401 451

We can see that if there is no packet dropping, the sequence number should be

0,1,1,51,101,151,251,301,401,451. Now, as 101 is missing, we can detect that the packet with 101 sequence number had dropped. Also, compared with the setting with pdrop = 0.1, the setting with pdrop = 0.3 will generate more packets dropping.

(2)

	Packets Transmitted (including retransmission)	Duration of overall transfer(sender)	Duration of overall transfer(receiver)
200ms	48	2508	2404
200ms x 4 = 800ms	48	2498	2378.3
200ms/4 = 50ms	174	17114	16780

Results are in [Appendix D](#)

We can see that when the timeout is short, in this example, by using $T_{current}/4$, the number of retransmissions increases a lot. Also, the transferring time of $T_{current}/4$ is also longer than $T_{current}$ because there may have more retransmissions and thus spend more time. The time of $4 \times T_{current}$ and $T_{current}$ are similar in my example though theoretically more time-out would have more duration. There might have some internal computer things affecting this.

APPENDIX:

Appendix A:

Sender_log.txt in 500(ms) timeout
Number of Data Transferred: 1593
Number of Data Segments Sent(excluding retransmissions): 32
Number of Packets Dropped: 4
Number of Retransmitted Segments: 1
Number of Duplicate Acknowledgements: 20

Receiver_log.txt in 500(ms) timeout
Number of received bytes: 1593 bytes
Number of received segments number: 32
Number of duplicated segments: 2

Sender_log.txt in 700(ms) timeout
Number of Data Transferred: 1593
Number of Data Segments Sent(excluding retransmissions): 32
Number of Packets Dropped: 4
Number of Retransmitted Segments: 1
Number of Duplicate Acknowledgements: 20

Receiver_log.txt in 700(ms) timeout
Number of received bytes: 1593 bytes
Number of received segments number: 32
Number of duplicated segments: 2

Sender_log.txt in 1000(ms) timeout
Number of Data Transferred: 1593
Number of Data Segments Sent(excluding retransmissions): 32
Number of Packets Dropped: 4
Number of Retransmitted Segments: 1
Number of Duplicate Acknowledgements: 20

Receiver_log.txt in 1000(ms) timeout
Number of received bytes: 1593 bytes
Number of received segments number: 32
Number of duplicated segments: 2

Sender_log.txt in 2500(ms) timeout
Number of Data Transferred: 1593
Number of Data Segments Sent(excluding retransmissions): 32
Number of Packets Dropped: 4
Number of Retransmitted Segments: 1
Number of Duplicate Acknowledgements: 20

Receiver_log.txt in 2500(ms) timeout
Number of received bytes: 1593 bytes
Number of received segments number: 32
Number of duplicated segments: 2

Sender_log.txt in 2(ms) timeout
Number of Data Transferred: 1593
Number of Data Segments Sent(excluding retransmissions): 32
Number of Packets Dropped: 13
Number of Retransmitted Segments: 79
Number of Duplicate Acknowledgements: 88

Receiver_log.txt in 2(ms) timeout

Sender_log.txt in 2(ms) timeout
Number of Data Transferred: 1593
Number of Data Segments Sent(excluding retransmissions): 32
Number of Packets Dropped: 11
Number of Retransmitted Segments: 74
Number of Duplicate Acknowledgements: 85

Receiver_log.txt in 2(ms) timeout
Number of received bytes: 1593 bytes
Number of received segments number: 32
Number of duplicated segments: 89

Sender_log.txt in 50(ms) timeout
Number of Data Transferred: 1593
Number of Data Segments Sent(excluding retransmissions): 32
Number of Packets Dropped: 6
Number of Retransmitted Segments: 24
Number of Duplicate Acknowledgements: 47

Receiver_log.txt in 50(ms) timeout
Number of received bytes: 1593 bytes
Number of received segments number: 32
Number of duplicated segments: 31

Sender_log.txt in 100(ms) timeout
Number of Data Transferred: 1593
Number of Data Segments Sent(excluding retransmissions): 32
Number of Packets Dropped: 4
Number of Retransmitted Segments: 10
Number of Duplicate Acknowledgements: 28

Receiver_log.txt in 100(ms) timeout
Number of received bytes: 1593 bytes
Number of received segments number: 32
Number of duplicated segments: 12

Sender_log.txt in 200(ms) timeout
Number of Data Transferred: 1593
Number of Data Segments Sent(excluding retransmissions): 32
Number of Packets Dropped: 4
Number of Retransmitted Segments: 9
Number of Duplicate Acknowledgements: 20

Receiver_log.txt in 200(ms) timeout
Number of received bytes: 1593 bytes
Number of received segments number: 32
Number of duplicated segments: 2

Appendix B

0
1
1
51
151
201
251
301
351
401
451
501
551
101
101
601
651
701
751

801
851
901
951
1001
1101
1151
1201
1251
1301
1351
1401
1501
1051
1051
1551
1451
1594
1595

Appendix C

0
1
1
51
151
201
251
301
401
451
101
101
101
101
351
651
701
751
351
851
901
951
501

501
501
551
1001
1051
601
1101
1151
801
1301
1351
1451
1501
1201
1251
1401
1551
1594
1595

Appendix D:

Receiver log with 200ms

```
rcv 15789 S 0 0 0
snd 15789 SA 0 0 1
rcv 15789 A 1 0 1
rcv 15790 D 1 50 1
snd 15790 A 1 0 51
rcv 15790 D 51 50 1
snd 15790 A 1 0 101
rcv 15790 D 151 50 1
snd 15790 A 1 0 101
rcv 15790 D 201 50 1
snd 15790 A 1 0 101
rcv 15790 D 251 50 1
snd 15790 A 1 0 101
rcv 15791 D 301 50 1
snd 15791 A 1 0 101
rcv 15791 D 351 50 1
snd 15791 A 1 0 101
rcv 15791 D 401 50 1
snd 15791 A 1 0 101
rcv 15791 D 451 50 1
snd 15791 A 1 0 101
rcv 15791 D 501 50 1
snd 15791 A 1 0 101
```


rcv 15914 D 551 50 1
snd 15914 A 1 0 101
rcv 16242 D 101 50 1
snd 16242 A 1 0 601
rcv 16368 D 101 50 1
snd 16369 A 1 0 601
rcv 16396 D 601 50 1
snd 16396 A 1 0 651
rcv 16396 D 651 50 1
snd 16396 A 1 0 701
rcv 16396 D 701 50 1
snd 16396 A 1 0 751
rcv 16396 D 751 50 1
snd 16396 A 1 0 801
rcv 16396 D 801 50 1
snd 16396 A 1 0 851
rcv 16396 D 851 50 1
snd 16396 A 1 0 901
rcv 16396 D 901 50 1
snd 16396 A 1 0 951
rcv 16396 D 951 50 1
snd 16396 A 1 0 1001
rcv 16396 D 1001 50 1
snd 16396 A 1 0 1051
rcv 16508 D 1101 50 1
snd 16508 A 1 0 1051
rcv 16616 D 1151 50 1
snd 16617 A 1 0 1051
rcv 16728 D 1201 50 1
snd 16728 A 1 0 1051
rcv 16843 D 1251 50 1
snd 16844 A 1 0 1051
rcv 16949 D 1301 50 1
snd 16949 A 1 0 1051
rcv 17056 D 1351 50 1
snd 17056 A 1 0 1051
rcv 17156 D 1401 50 1
snd 17157 A 1 0 1051
rcv 17370 D 1501 50 1
snd 17370 A 1 0 1051
rcv 17590 D 1051 50 1
snd 17590 A 1 0 1451
rcv 17732 D 1051 50 1
snd 17732 A 1 0 1451
rcv 17750 D 1551 50 1
snd 17750 A 1 0 1451

rcv 17750 D 1601 50 1
snd 17750 A 1 0 1451
rcv 17750 D 1651 50 1
snd 17750 A 1 0 1451
rcv 17750 D 1701 50 1
snd 17750 A 1 0 1451
rcv 17750 D 1751 50 1
snd 17750 A 1 0 1451
rcv 17750 D 1801 50 1
snd 17750 A 1 0 1451
rcv 17750 D 1851 50 1
snd 17750 A 1 0 1451
rcv 17750 D 1901 50 1
snd 17751 A 1 0 1451
rcv 17965 D 1451 50 1
snd 17965 A 1 0 1951
rcv 18076 D 1451 50 1
snd 18076 A 1 0 1951
rcv 18187 D 1451 50 1
snd 18187 A 1 0 1951
rcv 18194 D 1951 4 1
snd 18194 A 1 0 1955
rcv 18519 F 1955 0 1
snd 18519 FA 1 0 1956
rcv 18520 A 1956 0 2

Number of received bytes: 1954 bytes

Number of received segments number: 40

Number of duplicated segments: 4

Sender log with 200ms

snd 0.0646 S 0 0 0
rcv 0.2375 SA 0 0 1
snd 0.2675 A 1 0 1
snd 1.2045 D 1 50 1
rcv 1.3964 A 1 0 51
snd 1.4856 D 51 50 1
drop 1.6377 D 101 50 1
snd 1.7397 D 151 50 1
snd 1.8368 D 201 50 1
snd 1.9305 D 251 50 1
snd 2.0218 D 301 50 1
snd 2.1095 D 351 50 1
snd 2.1999 D 401 50 1
snd 2.2967 D 451 50 1
snd 2.382 D 501 50 1
rcv 125.04 A 1 0 101

snd 125.35 D 551 50 1
rcv 231.11 A 1 0 101
rcv 231.2 A 1 0 101
rcv 236.32 A 1 0 101
drop 347.34 D 101 50 1
rcv 347.42 A 1 0 101
rcv 347.46 A 1 0 101
rcv 347.5 A 1 0 101
snd 463.59 D 101 50 1
rcv 468.71 A 1 0 101
rcv 473.89 A 1 0 101
rcv 473.97 A 1 0 101
snd 590.12 D 101 50 1
rcv 605.52 A 1 0 601
snd 607.04 D 601 50 1
snd 607.14 D 651 50 1
snd 607.21 D 701 50 1
snd 607.28 D 751 50 1
snd 607.35 D 801 50 1
snd 607.42 D 851 50 1
snd 607.48 D 901 50 1
snd 607.55 D 951 50 1
snd 607.62 D 1001 50 1
drop 607.67 D 1051 50 1
rcv 718.27 A 1 0 601
rcv 718.35 A 1 0 651
snd 719.35 D 1101 50 1
rcv 827.44 A 1 0 701
snd 827.86 D 1151 50 1
rcv 938.65 A 1 0 751
snd 939.35 D 1201 50 1
rcv 1054.5 A 1 0 801
snd 1054.8 D 1251 50 1
rcv 1160.5 A 1 0 851
snd 1160.8 D 1301 50 1
rcv 1266.1 A 1 0 901
snd 1267.1 D 1351 50 1
rcv 1367.6 A 1 0 951
snd 1367.8 D 1401 50 1
rcv 1473.4 A 1 0 1001
drop 1473.5 D 1451 50 1
rcv 1579.2 A 1 0 1051
snd 1581.1 D 1501 50 1
rcv 1685 A 1 0 1051
rcv 1695.2 A 1 0 1051
rcv 1695.2 A 1 0 1051

```

snd 1801 D 1051 50 1
rcv 1821.5 A 1 0 1051
rcv 1821.5 A 1 0 1051
rcv 1821.6 A 1 0 1051
snd 1954.2 D 1051 50 1
rcv 1959.4 A 1 0 1051
rcv 1959.4 A 1 0 1051
rcv 1959.5 A 1 0 1451
snd 1961.1 D 1551 50 1
snd 1961.2 D 1601 50 1
snd 1961.3 D 1651 50 1
snd 1961.3 D 1701 50 1
snd 1961.4 D 1751 50 1
snd 1961.5 D 1801 50 1
snd 1961.6 D 1851 50 1
snd 1961.6 D 1901 50 1
rcv 2065.3 A 1 0 1451
rcv 2065.3 A 1 0 1451
rcv 2065.3 A 1 0 1451
snd 2176.1 D 1451 50 1
rcv 2176.2 A 1 0 1451
rcv 2176.2 A 1 0 1451
rcv 2176.3 A 1 0 1451
snd 2292.4 D 1451 50 1
rcv 2292.4 A 1 0 1451
rcv 2292.4 A 1 0 1451
rcv 2292.5 A 1 0 1451
snd 2398.3 D 1451 50 1
rcv 2403.5 A 1 0 1951
snd 2405.4 D 1951 4 1
rcv 2509.3 A 1 0 1951
rcv 2509.3 A 1 0 1951
rcv 2509.3 A 1 0 1955
snd 2730.6 F 1955 0 1
rcv 2730.9 FA 1 0 1956
snd 2731.2 A 1956 0 2

```

Number of Data Transferred: 1954

Number of Data Segments Sent(excluding retransmissions): 40

Number of Packets Dropped: 4

Number of Retransmitted Segments: 8

Number of Duplicate Acknowledgements: 29

Receiver log with 800ms

```

rcv 8256 S 0 0 0
snd 8256.2 SA 0 0 1
rcv 8256.2 A 1 0 1

```

rcv 8257.7 D 1 50 1
snd 8258 D 1 0 51
rcv 8258 D 51 50 1
snd 8258.1 D 1 0 101
rcv 8258.1 D 151 50 1
snd 8258.2 D 1 0 101
rcv 8258.3 D 201 50 1
snd 8258.3 D 1 0 101
rcv 8258.3 D 251 50 1
snd 8258.4 D 1 0 101
rcv 8258.4 D 301 50 1
snd 8258.5 D 1 0 101
rcv 8258.5 D 351 50 1
snd 8258.6 D 1 0 101
rcv 8258.6 D 401 50 1
snd 8258.7 D 1 0 101
rcv 8258.7 D 451 50 1
snd 8258.8 D 1 0 101
rcv 8263.5 D 501 50 1
snd 8263.6 D 1 0 101
rcv 8369.5 D 551 50 1
snd 8369.7 D 1 0 101
rcv 8740.5 D 101 50 1
snd 8740.8 D 1 0 601
rcv 8848.2 D 101 50 1
snd 8848.2 D 1 0 601
rcv 8853.8 D 601 50 1
snd 8853.9 D 1 0 651
rcv 8853.9 D 651 50 1
snd 8854 D 1 0 701
rcv 8854 D 701 50 1
snd 8854.1 D 1 0 751
rcv 8854.1 D 751 50 1
snd 8854.2 D 1 0 801
rcv 8854.2 D 801 50 1
snd 8854.3 D 1 0 851
rcv 8854.3 D 851 50 1
snd 8854.3 D 1 0 901
rcv 8854.4 D 901 50 1
snd 8854.4 D 1 0 951
rcv 8854.5 D 951 50 1
snd 8854.5 D 1 0 1001
rcv 8854.6 D 1001 50 1
snd 8854.6 D 1 0 1051
rcv 8959.8 D 1101 50 1
snd 8960 D 1 0 1051

rcv 9066 D 1151 50 1
snd 9066.1 D 1 0 1051
rcv 9172.2 D 1201 50 1
snd 9172.3 D 1 0 1051
rcv 9283.5 D 1251 50 1
snd 9283.6 D 1 0 1051
rcv 9399.6 D 1301 50 1
snd 9399.7 D 1 0 1051
rcv 9505.7 D 1351 50 1
snd 9505.8 D 1 0 1051
rcv 9611.2 D 1401 50 1
snd 9611.4 D 1 0 1051
rcv 9828.1 D 1501 50 1
snd 9828.2 D 1 0 1051
rcv 10055 D 1051 50 1
snd 10055 D 1 0 1451
rcv 10167 D 1051 50 1
snd 10167 D 1 0 1451
rcv 10168 D 1551 50 1
snd 10168 D 1 0 1451
rcv 10168 D 1601 50 1
snd 10168 D 1 0 1451
rcv 10168 D 1651 50 1
snd 10168 D 1 0 1451
rcv 10168 D 1701 50 1
snd 10168 D 1 0 1451
rcv 10168 D 1751 50 1
snd 10168 D 1 0 1451
rcv 10168 D 1801 50 1
snd 10168 D 1 0 1451
rcv 10168 D 1851 50 1
snd 10168 D 1 0 1451
rcv 10169 D 1901 50 1
snd 10169 D 1 0 1451
rcv 10384 D 1451 50 1
snd 10384 D 1 0 1951
rcv 10510 D 1451 50 1
snd 10510 D 1 0 1951
rcv 10634 D 1451 50 1
snd 10634 D 1 0 1951
rcv 10636 D 1951 4 1
snd 10636 A 1 0 1955
rcv 10988 F 1955 0 1
snd 10988 FA 1 0 1956
rcv 10988 A 1956 0 2

Number of received bytes: 1954 bytes

Number of received segments number: 40

Number of duplicated segments: 4

Sender log with 800ms

```
rcv 8256 S 0 0 0
snd 8256.2 SA 0 0 1
rcv 8256.2 A 1 0 1
rcv 8257.7 D 1 50 1
snd 8258 D 1 0 51
rcv 8258 D 51 50 1
snd 8258.1 D 1 0 101
rcv 8258.1 D 151 50 1
snd 8258.2 D 1 0 101
rcv 8258.3 D 201 50 1
snd 8258.3 D 1 0 101
rcv 8258.3 D 251 50 1
snd 8258.4 D 1 0 101
rcv 8258.4 D 301 50 1
snd 8258.5 D 1 0 101
rcv 8258.5 D 351 50 1
snd 8258.6 D 1 0 101
rcv 8258.6 D 401 50 1
snd 8258.7 D 1 0 101
rcv 8258.7 D 451 50 1
snd 8258.8 D 1 0 101
rcv 8263.5 D 501 50 1
snd 8263.6 D 1 0 101
rcv 8369.5 D 551 50 1
snd 8369.7 D 1 0 101
rcv 8740.5 D 101 50 1
snd 8740.8 D 1 0 601
rcv 8848.2 D 101 50 1
snd 8848.2 D 1 0 601
rcv 8853.8 D 601 50 1
snd 8853.9 D 1 0 651
rcv 8853.9 D 651 50 1
snd 8854 D 1 0 701
rcv 8854 D 701 50 1
snd 8854.1 D 1 0 751
rcv 8854.1 D 751 50 1
snd 8854.2 D 1 0 801
rcv 8854.2 D 801 50 1
snd 8854.3 D 1 0 851
rcv 8854.3 D 851 50 1
snd 8854.3 D 1 0 901
rcv 8854.4 D 901 50 1
```

snd 8854.4 D 1 0 951
rcv 8854.5 D 951 50 1
snd 8854.5 D 1 0 1001
rcv 8854.6 D 1001 50 1
snd 8854.6 D 1 0 1051
rcv 8959.8 D 1101 50 1
snd 8960 D 1 0 1051
rcv 9066 D 1151 50 1
snd 9066.1 D 1 0 1051
rcv 9172.2 D 1201 50 1
snd 9172.3 D 1 0 1051
rcv 9283.5 D 1251 50 1
snd 9283.6 D 1 0 1051
rcv 9399.6 D 1301 50 1
snd 9399.7 D 1 0 1051
rcv 9505.7 D 1351 50 1
snd 9505.8 D 1 0 1051
rcv 9611.2 D 1401 50 1
snd 9611.4 D 1 0 1051
rcv 9828.1 D 1501 50 1
snd 9828.2 D 1 0 1051
rcv 10055 D 1051 50 1
snd 10055 D 1 0 1451
rcv 10167 D 1051 50 1
snd 10167 D 1 0 1451
rcv 10168 D 1551 50 1
snd 10168 D 1 0 1451
rcv 10168 D 1601 50 1
snd 10168 D 1 0 1451
rcv 10168 D 1651 50 1
snd 10168 D 1 0 1451
rcv 10168 D 1701 50 1
snd 10168 D 1 0 1451
rcv 10168 D 1751 50 1
snd 10168 D 1 0 1451
rcv 10168 D 1801 50 1
snd 10168 D 1 0 1451
rcv 10168 D 1851 50 1
snd 10168 D 1 0 1451
rcv 10169 D 1901 50 1
snd 10169 D 1 0 1451
rcv 10384 D 1451 50 1
snd 10384 D 1 0 1951
rcv 10510 D 1451 50 1
snd 10510 D 1 0 1951
rcv 10634 D 1451 50 1

snd 10634 D 1 0 1951
rcv 10636 D 1951 4 1
snd 10636 A 1 0 1955
rcv 10988 F 1955 0 1
snd 10988 FA 1 0 1956
rcv 10988 A 1956 0 2

Number of received bytes: 1954 bytes

Number of received segments number: 40

Number of duplicated segments: 4

Receiver log with 50ms

rcv 2637.5 S 0 0 0
snd 2637.7 SA 0 0 1
rcv 2637.7 A 1 0 1
rcv 2638.7 D 1 50 1
snd 2638.8 A 1 0 51
rcv 2639.9 D 51 50 1
snd 2640 A 1 0 101
rcv 2640.1 D 151 50 1
snd 2640.2 A 1 0 101
rcv 2640.3 D 201 50 1
snd 2640.3 A 1 0 101
rcv 2640.4 D 251 50 1
snd 2640.4 A 1 0 101
rcv 2640.5 D 301 50 1
snd 2640.5 A 1 0 101
rcv 2640.5 D 351 50 1
snd 2640.6 A 1 0 101
rcv 2640.6 D 401 50 1
snd 2640.7 A 1 0 101
rcv 2640.7 D 451 50 1
snd 2640.8 A 1 0 101
rcv 2640.8 D 501 50 1
snd 2640.9 A 1 0 101
rcv 2701.6 D 51 50 1
snd 2701.7 A 1 0 101
rcv 2858.7 D 101 50 1
snd 2859 A 1 0 551
rcv 3102 D 101 50 1
snd 3102.1 A 1 0 551
rcv 3107.5 D 101 50 1
snd 3107.6 A 1 0 551
rcv 3223.8 D 101 50 1
snd 3223.9 A 1 0 551
rcv 3451.1 D 101 50 1
snd 3451.2 A 1 0 551

rcv 3514 D 101 50 1
snd 3514.2 A 1 0 551
rcv 3649 D 101 50 1
snd 3649.1 A 1 0 551
rcv 3765.7 D 101 50 1
snd 3765.8 A 1 0 551
rcv 3897.2 D 101 50 1
snd 3897.3 A 1 0 551
rcv 4119.6 D 101 50 1
snd 4119.7 A 1 0 551
rcv 4121.1 D 551 50 1
snd 4121.2 A 1 0 601
rcv 4322.4 D 551 50 1
snd 4322.5 A 1 0 601
rcv 4423.3 D 551 50 1
snd 4423.5 A 1 0 601
rcv 4524 D 601 50 1
snd 4524.1 A 1 0 651
rcv 4524.2 D 651 50 1
snd 4524.2 A 1 0 701
rcv 4524.2 D 701 50 1
snd 4524.3 A 1 0 751
rcv 4524.3 D 751 50 1
snd 4524.4 A 1 0 801
rcv 4524.4 D 801 50 1
snd 4524.4 A 1 0 851
rcv 4524.5 D 901 50 1
snd 4524.6 A 1 0 851
rcv 4524.6 D 951 50 1
snd 4524.7 A 1 0 851
rcv 4524.7 D 1001 50 1
snd 4524.8 A 1 0 851
rcv 4658 D 551 50 1
snd 4658 A 1 0 851
rcv 4713.9 D 551 50 1
snd 4714 A 1 0 851
rcv 4880.8 D 551 50 1
snd 4880.9 A 1 0 851
rcv 5137.9 D 551 50 1
snd 5138.1 A 1 0 851
rcv 5257.2 D 551 50 1
snd 5257.3 A 1 0 851
rcv 5295.2 D 551 50 1
snd 5295.4 A 1 0 851
rcv 5396.9 D 651 50 1
snd 5397 A 1 0 851

rcv 5497.5 D 701 50 1
snd 5497.7 A 1 0 851
rcv 5598.2 D 1051 50 1
snd 5598.4 A 1 0 851
rcv 5598.4 D 1101 50 1
snd 5598.5 A 1 0 851
rcv 5598.5 D 1151 50 1
snd 5598.8 A 1 0 851
rcv 5598.8 D 1201 50 1
snd 5598.9 A 1 0 851
rcv 5653.3 D 751 50 1
snd 5653.4 A 1 0 851
rcv 5754 D 1251 50 1
snd 5754.2 A 1 0 851
rcv 5809.1 D 1301 50 1
snd 5809.3 A 1 0 851
rcv 5874.4 D 851 50 1
snd 5874.8 A 1 0 1351
rcv 6092.9 D 851 50 1
snd 6093 A 1 0 1351
rcv 6103.5 D 851 50 1
snd 6103.6 A 1 0 1351
rcv 6225.4 D 851 50 1
snd 6225.6 A 1 0 1351
rcv 6484.8 D 851 50 1
snd 6484.9 A 1 0 1351
rcv 6637.9 D 851 50 1
snd 6638 A 1 0 1351
rcv 6766.5 D 851 50 1
snd 6766.9 A 1 0 1351
rcv 7000.8 D 851 50 1
snd 7000.9 A 1 0 1351
rcv 7167.6 D 851 50 1
snd 7167.8 A 1 0 1351
rcv 7275.3 D 851 50 1
snd 7275.4 A 1 0 1351
rcv 7391.6 D 851 50 1
snd 7391.8 A 1 0 1351
rcv 7514.6 D 851 50 1
snd 7514.9 A 1 0 1351
rcv 7742.8 D 851 50 1
snd 7743 A 1 0 1351
rcv 7753.5 D 851 50 1
snd 7753.6 A 1 0 1351
rcv 7876.1 D 851 50 1
snd 7876.3 A 1 0 1351

rcv 7987.3 D 851 50 1
snd 7987.4 A 1 0 1351
rcv 8098.7 D 851 50 1
snd 8098.8 A 1 0 1351
rcv 8221.9 D 851 50 1
snd 8222.1 A 1 0 1351
rcv 8451.3 D 851 50 1
snd 8451.4 A 1 0 1351
rcv 8473.2 D 851 50 1
snd 8473.3 A 1 0 1351
rcv 8605.9 D 851 50 1
snd 8606.1 A 1 0 1351
rcv 8870.7 D 851 50 1
snd 8870.8 A 1 0 1351
rcv 9009.1 D 851 50 1
snd 9009.2 A 1 0 1351
rcv 9156.8 D 851 50 1
snd 9156.9 A 1 0 1351
rcv 9412.8 D 851 50 1
snd 9412.9 A 1 0 1351
rcv 9413.1 D 851 50 1
snd 9413.1 A 1 0 1351
rcv 9514 D 1351 50 1
snd 9514.1 A 1 0 1401
rcv 9816.2 D 1351 50 1
snd 9816.3 A 1 0 1401
rcv 9916.9 D 1351 50 1
snd 9917 A 1 0 1401
rcv 10118 D 1351 50 1
snd 10118 A 1 0 1401
rcv 10118 D 1401 50 1
snd 10118 A 1 0 1451
rcv 10118 D 1451 50 1
snd 10119 A 1 0 1501
rcv 10119 D 1501 50 1
snd 10119 A 1 0 1551
rcv 10119 D 1551 50 1
snd 10119 A 1 0 1601
rcv 10119 D 1601 50 1
snd 10119 A 1 0 1651
rcv 10119 D 1651 50 1
snd 10119 A 1 0 1701
rcv 10119 D 1701 50 1
snd 10119 A 1 0 1751
rcv 10119 D 1751 50 1
snd 10119 A 1 0 1801

rcv 10119 D 1801 50 1
snd 10119 A 1 0 1851
rcv 10230 D 1351 50 1
snd 10230 A 1 0 1851
rcv 10236 D 1351 50 1
snd 10236 A 1 0 1851
rcv 10499 D 1351 50 1
snd 10499 A 1 0 1851
rcv 10525 D 1351 50 1
snd 10525 A 1 0 1851
rcv 10695 D 1351 50 1
snd 10695 A 1 0 1851
rcv 10911 D 1351 50 1
snd 10912 A 1 0 1851
rcv 10912 D 1351 50 1
snd 10912 A 1 0 1851
rcv 11050 D 1351 50 1
snd 11050 A 1 0 1851
rcv 11191 D 1351 50 1
snd 11191 A 1 0 1851
rcv 11454 D 1351 50 1
snd 11454 A 1 0 1851
rcv 11624 D 1351 50 1
snd 11624 A 1 0 1851
rcv 11774 D 1351 50 1
snd 11774 A 1 0 1851
rcv 11923 D 1351 50 1
snd 11923 A 1 0 1851
rcv 12045 D 1351 50 1
snd 12045 A 1 0 1851
rcv 12256 D 1351 50 1
snd 12256 A 1 0 1851
rcv 12256 D 1351 50 1
snd 12257 A 1 0 1851
rcv 12368 D 1351 50 1
snd 12368 A 1 0 1851
rcv 12497 D 1351 50 1
snd 12497 A 1 0 1851
rcv 12649 D 1351 50 1
snd 12649 A 1 0 1851
rcv 12801 D 1351 50 1
snd 12801 A 1 0 1851
rcv 13057 D 1351 50 1
snd 13057 A 1 0 1851
rcv 13106 D 1351 50 1
snd 13106 A 1 0 1851

rcv 13279 D 1351 50 1
snd 13279 A 1 0 1851
rcv 13429 D 1351 50 1
snd 13429 A 1 0 1851
rcv 13562 D 1351 50 1
snd 13562 A 1 0 1851
rcv 13688 D 1351 50 1
snd 13688 A 1 0 1851
rcv 13838 D 1351 50 1
snd 13838 A 1 0 1851
rcv 13973 D 1351 50 1
snd 13973 A 1 0 1851
rcv 14218 D 1351 50 1
snd 14218 A 1 0 1851
rcv 14229 D 1351 50 1
snd 14229 A 1 0 1851
rcv 14351 D 1351 50 1
snd 14351 A 1 0 1851
rcv 14484 D 1351 50 1
snd 14484 A 1 0 1851
rcv 14606 D 1351 50 1
snd 14606 A 1 0 1851
rcv 14728 D 1351 50 1
snd 14728 A 1 0 1851
rcv 14854 D 1351 50 1
snd 14855 A 1 0 1851
rcv 15203 D 1351 50 1
snd 15203 A 1 0 1851
rcv 15229 D 1351 50 1
snd 15229 A 1 0 1851
rcv 15330 D 1401 50 1
snd 15330 A 1 0 1851
rcv 15532 D 1401 50 1
snd 15532 A 1 0 1851
rcv 15632 D 1401 50 1
snd 15632 A 1 0 1851
rcv 15733 D 1401 50 1
snd 15733 A 1 0 1851
rcv 15834 D 1401 50 1
snd 15834 A 1 0 1851
rcv 15934 D 1401 50 1
snd 15934 A 1 0 1851
rcv 16035 D 1851 50 1
snd 16035 A 1 0 1901
rcv 16046 D 1401 50 1
snd 16046 A 1 0 1901

rcv 16278 D 1401 50 1
snd 16278 A 1 0 1901
rcv 16279 D 1451 50 1
snd 16279 A 1 0 1901
rcv 16380 D 1501 50 1
snd 16380 A 1 0 1901
rcv 16480 D 1901 50 1
snd 16481 A 1 0 1951
rcv 16481 D 1951 4 1
snd 16481 A 1 0 1955
rcv 16542 D 1551 50 1
snd 16542 A 1 0 1955
rcv 16757 D 1651 50 1
snd 16758 A 1 0 1955
rcv 17164 D 1851 50 1
snd 17164 A 1 0 1955
rcv 17365 D 1851 50 1
snd 17366 A 1 0 1955
rcv 17567 D 1851 50 1
snd 17567 A 1 0 1955
rcv 17689 D 1851 50 1
snd 17689 A 1 0 1955
rcv 17795 D 1851 50 1
snd 17795 A 1 0 1955
rcv 17797 D 1851 50 1
snd 17797 A 1 0 1955
rcv 18109 D 1851 50 1
snd 18109 A 1 0 1955
rcv 18220 D 1851 50 1
snd 18220 A 1 0 1955
rcv 18342 D 1851 50 1
snd 18342 A 1 0 1955
rcv 18342 D 1851 50 1
snd 18342 A 1 0 1955
rcv 18546 D 1851 50 1
snd 18546 A 1 0 1955
rcv 18663 D 1851 50 1
snd 18663 A 1 0 1955
rcv 18775 D 1851 50 1
snd 18775 A 1 0 1955
rcv 18886 D 1851 50 1
snd 18886 A 1 0 1955
rcv 18887 D 1851 50 1
snd 18887 A 1 0 1955
rcv 19200 D 1851 50 1
snd 19200 A 1 0 1955

rcv 19417 D 1901 50 1
snd 19417 A 1 0 1955
rcv 19419 D 1901 50 1
snd 19419 A 1 0 1955
rcv 19753 F 1955 0 1
snd 19753 FA 1 0 1956
rcv 19753 A 1956 0 2

Number of received bytes: 1954 bytes

Number of received segments number: 40

Number of duplicated segments: 116

Sender log with 50ms

snd 0.0598 S 0 0 0
rcv 0.3173 SA 0 0 1
snd 0.3395 A 1 0 1
snd 1.7369 D 1 50 1
rcv 2.3363 A 1 0 51
snd 2.573 D 51 50 1
drop 2.6696 D 101 50 1
snd 2.7688 D 151 50 1
snd 2.8718 D 201 50 1
snd 2.9619 D 251 50 1
snd 3.051 D 301 50 1
snd 3.135 D 351 50 1
snd 3.2227 D 401 50 1
snd 3.309 D 451 50 1
snd 3.3906 D 501 50 1
snd 64.162 D 51 50 1
rcv 119.28 A 1 0 101
drop 164.86 D 551 50 1
snd 220.1 D 101 50 1
rcv 227.13 A 1 0 101
rcv 227.2 A 1 0 101
rcv 227.24 A 1 0 101
snd 469.65 D 101 50 1
rcv 469.78 A 1 0 101
rcv 469.88 A 1 0 101
rcv 469.96 A 1 0 101
snd 470.07 D 101 50 1
snd 586.36 D 101 50 1
snd 829.86 D 101 50 1
rcv 855.99 A 1 0 101
rcv 888.48 A 1 0 101
snd 895.32 D 101 50 1
rcv 912.42 A 1 0 101
snd 1011.6 D 101 50 1

snd 1128.3 D 101 50 1
snd 1259.8 D 101 50 1
snd 1482.2 D 101 50 1
rcv 1482.2 A 1 0 551
snd 1483.8 D 551 50 1
rcv 1582.6 A 1 0 551
rcv 1582.7 A 1 0 551
rcv 1582.7 A 1 0 551
drop 1584.4 D 551 50 1
snd 1685 D 551 50 1
snd 1785.9 D 551 50 1
snd 1886.6 D 601 50 1
snd 1886.8 D 651 50 1
snd 1886.8 D 701 50 1
snd 1886.9 D 751 50 1
snd 1887 D 801 50 1
drop 1887.1 D 851 50 1
snd 1887.2 D 901 50 1
snd 1887.3 D 951 50 1
snd 1887.3 D 1001 50 1
snd 2039.3 D 551 50 1
rcv 2083.3 A 1 0 551
snd 2103.8 D 551 50 1
rcv 2103.9 A 1 0 551
rcv 2104 A 1 0 551
snd 2260.6 D 551 50 1
snd 2512.5 D 551 50 1
rcv 2512.6 A 1 0 551
rcv 2512.6 A 1 0 551
rcv 2512.7 A 1 0 551
snd 2619.8 D 551 50 1
rcv 2657.6 A 1 0 601
snd 2657.8 D 551 50 1
rcv 2758.3 A 1 0 601
rcv 2758.4 A 1 0 601
rcv 2758.4 A 1 0 651
snd 2759.5 D 651 50 1
rcv 2859 A 1 0 701
snd 2860.1 D 701 50 1
rcv 2959.5 A 1 0 751
snd 2960.8 D 1051 50 1
snd 2960.9 D 1101 50 1
snd 2961 D 1151 50 1
snd 2961.1 D 1201 50 1
snd 3015.9 D 751 50 1
rcv 3065.4 A 1 0 801

snd 3116.6 D 1251 50 1
rcv 3171.4 A 1 0 851
snd 3171.7 D 1301 50 1
snd 3237 D 851 50 1
rcv 3277.8 A 1 0 851
rcv 3288.4 A 1 0 851
rcv 3293.8 A 1 0 851
snd 3465.8 D 851 50 1
rcv 3465.9 A 1 0 851
rcv 3465.9 A 1 0 851
rcv 3465.9 A 1 0 851
snd 3466.1 D 851 50 1
snd 3588 D 851 50 1
drop 3824 D 851 50 1
rcv 3835 A 1 0 851
rcv 3835.1 A 1 0 851
rcv 3835.2 A 1 0 851
snd 3862.7 D 851 50 1
snd 4017.5 D 851 50 1
snd 4129.1 D 851 50 1
snd 4381.3 D 851 50 1
rcv 4391.8 A 1 0 851
rcv 4392 A 1 0 851
rcv 4392.1 A 1 0 851
drop 4403.5 D 851 50 1
snd 4530.2 D 851 50 1
snd 4643 D 851 50 1
snd 4754.2 D 851 50 1
snd 4877.1 D 851 50 1
snd 5115.7 D 851 50 1
rcv 5115.8 A 1 0 851
rcv 5115.9 A 1 0 851
rcv 5116 A 1 0 851
snd 5116.1 D 851 50 1
snd 5238.7 D 851 50 1
snd 5349.9 D 851 50 1
snd 5461.1 D 851 50 1
snd 5602.4 D 851 50 1
snd 5813.9 D 851 50 1
rcv 5814.1 A 1 0 851
rcv 5820.3 A 1 0 851
rcv 5820.4 A 1 0 851
snd 5835.8 D 851 50 1
snd 5987.3 D 851 50 1
drop 6116.1 D 851 50 1
snd 6232.4 D 851 50 1

snd 6388.6 D 851 50 1
snd 6536.4 D 851 50 1
snd 6775.4 D 851 50 1
rcv 6775.5 A 1 0 1351
snd 6775.7 D 851 50 1
rcv 6876.2 A 1 0 1351
rcv 6876.4 A 1 0 1351
rcv 6876.4 A 1 0 1351
snd 6876.6 D 1351 50 1
drop 6977.5 D 1351 50 1
drop 7078.1 D 1351 50 1
snd 7178.8 D 1351 50 1
snd 7279.5 D 1351 50 1
drop 7380.1 D 1351 50 1
snd 7480.8 D 1351 50 1
snd 7480.9 D 1401 50 1
snd 7481 D 1451 50 1
snd 7481.1 D 1501 50 1
snd 7481.2 D 1551 50 1
snd 7481.5 D 1601 50 1
snd 7481.6 D 1651 50 1
snd 7481.7 D 1701 50 1
snd 7481.8 D 1751 50 1
snd 7481.8 D 1801 50 1
snd 7592.8 D 1351 50 1
rcv 7593 A 1 0 1351
rcv 7593.1 A 1 0 1351
rcv 7603.5 A 1 0 1351
snd 7627.3 D 1351 50 1
snd 7861.7 D 1351 50 1
rcv 7861.8 A 1 0 1351
rcv 7868.4 A 1 0 1351
rcv 7899.3 A 1 0 1351
snd 7932.4 D 1351 50 1
snd 8055.4 D 1351 50 1
snd 8274 D 1351 50 1
rcv 8274.1 A 1 0 1351
rcv 8274.2 A 1 0 1351
rcv 8274.3 A 1 0 1351
snd 8274.4 D 1351 50 1
snd 8431.3 D 1351 50 1
snd 8553 D 1351 50 1
drop 8799.3 D 1351 50 1
rcv 8823.5 A 1 0 1351
snd 8859.4 D 1351 50 1
rcv 8859.5 A 1 0 1351

rcv 8859.6 A 1 0 1351
snd 8991.9 D 1351 50 1
snd 9163.9 D 1351 50 1
snd 9295.7 D 1351 50 1
snd 9407.1 D 1351 50 1
snd 9618.8 D 1351 50 1
rcv 9619 A 1 0 1351
snd 9619.1 D 1351 50 1
rcv 9619.3 A 1 0 1351
rcv 9619.6 A 1 0 1351
snd 9730.3 D 1351 50 1
snd 9876.4 D 1351 50 1
snd 10029 D 1351 50 1
snd 10180 D 1351 50 1
snd 10436 D 1351 50 1
rcv 10487 A 1 0 1351
snd 10508 D 1351 50 1
rcv 10524 A 1 0 1351
rcv 10524 A 1 0 1351
snd 10657 D 1351 50 1
snd 10808 D 1351 50 1
snd 10940 D 1351 50 1
snd 11068 D 1351 50 1
snd 11219 D 1351 50 1
snd 11336 D 1351 50 1
snd 11581 D 1351 50 1
rcv 11592 A 1 0 1351
rcv 11592 A 1 0 1351
rcv 11592 A 1 0 1351
snd 11592 D 1351 50 1
snd 11724 D 1351 50 1
snd 11852 D 1351 50 1
snd 11968 D 1351 50 1
snd 12106 D 1351 50 1
snd 12217 D 1351 50 1
drop 12344 D 1351 50 1
snd 12581 D 1351 50 1
rcv 12591 A 1 0 1351
rcv 12592 A 1 0 1401
snd 12592 D 1351 50 1
rcv 12692 A 1 0 1401
rcv 12692 A 1 0 1401
rcv 12693 A 1 0 1401
snd 12693 D 1401 50 1
drop 12794 D 1401 50 1
snd 12894 D 1401 50 1

snd 12995 D 1401 50 1
snd 13096 D 1401 50 1
snd 13196 D 1401 50 1
snd 13297 D 1401 50 1
snd 13398 D 1851 50 1
snd 13408 D 1401 50 1
snd 13640 D 1401 50 1
rcv 13641 A 1 0 1451
snd 13642 D 1451 50 1
rcv 13741 A 1 0 1501
snd 13742 D 1501 50 1
rcv 13842 A 1 0 1551
snd 13843 D 1901 50 1
snd 13843 D 1951 4 1
snd 13905 D 1551 50 1
rcv 13942 A 1 0 1601
rcv 14058 A 1 0 1651
snd 14120 D 1651 50 1
rcv 14159 A 1 0 1701
rcv 14265 A 1 0 1751
drop 14332 D 1751 50 1
rcv 14365 A 1 0 1801
rcv 14471 A 1 0 1851
snd 14527 D 1851 50 1
rcv 14571 A 1 0 1851
rcv 14571 A 1 0 1851
rcv 14572 A 1 0 1851
snd 14728 D 1851 50 1
rcv 14728 A 1 0 1851
rcv 14728 A 1 0 1851
rcv 14728 A 1 0 1851
drop 14728 D 1851 50 1
snd 14930 D 1851 50 1
rcv 14935 A 1 0 1851
rcv 14945 A 1 0 1851
rcv 14951 A 1 0 1851
snd 15051 D 1851 50 1
rcv 15056 A 1 0 1851
rcv 15057 A 1 0 1851
rcv 15057 A 1 0 1851
snd 15157 D 1851 50 1
rcv 15158 A 1 0 1851
rcv 15158 A 1 0 1851
rcv 15158 A 1 0 1851
snd 15159 D 1851 50 1
drop 15361 D 1851 50 1

rcv 15361 A 1 0 1851
rcv 15366 A 1 0 1851
rcv 15371 A 1 0 1851
snd 15472 D 1851 50 1
rcv 15477 A 1 0 1851
rcv 15482 A 1 0 1851
rcv 15482 A 1 0 1851
snd 15583 D 1851 50 1
rcv 15598 A 1 0 1851
rcv 15604 A 1 0 1851
rcv 15604 A 1 0 1851
snd 15704 D 1851 50 1
rcv 15704 A 1 0 1851
rcv 15704 A 1 0 1851
rcv 15704 A 1 0 1851
snd 15705 D 1851 50 1
snd 15908 D 1851 50 1
rcv 15914 A 1 0 1851
rcv 15919 A 1 0 1851
rcv 15924 A 1 0 1851
snd 16026 D 1851 50 1
rcv 16036 A 1 0 1851
rcv 16036 A 1 0 1851
rcv 16036 A 1 0 1851
snd 16138 D 1851 50 1
rcv 16143 A 1 0 1851
rcv 16148 A 1 0 1851
rcv 16148 A 1 0 1851
snd 16249 D 1851 50 1
rcv 16249 A 1 0 1851
rcv 16249 A 1 0 1851
rcv 16249 A 1 0 1851
snd 16250 D 1851 50 1
drop 16451 D 1851 50 1
rcv 16451 A 1 0 1851
rcv 16456 A 1 0 1851
rcv 16461 A 1 0 1851
drop 16562 D 1851 50 1
rcv 16562 A 1 0 1851
rcv 16562 A 1 0 1901
snd 16563 D 1851 50 1
rcv 16668 A 1 0 1901
rcv 16679 A 1 0 1901
rcv 16679 A 1 0 1901
snd 16779 D 1901 50 1
rcv 16779 A 1 0 1901

rcv 16779 A 1 0 1951

snd 16780 D 1901 50 1

rcv 16897 A 1 0 1955

snd 17116 F 1955 0 1

rcv 17116 A 1 0 1955

snd 17116 A 1956 0 2

Number of Data Transferred: 1954

Number of Data Segments Sent(excluding retransmissions): 40

Number of Packets Dropped: 18

Number of Retransmitted Segments: 134

Number of Duplicate Acknowledgements: 113