

Language: Python3

I already finished all requirements.

The receiver.py can print all receiving segments and dropping information(including dropping ACK). And the sender.py can generate the Send_log.txt which is recording all sending and receiving segments log. At the end of log.txt, it also calculates and records amount of (original) Data Received (in bytes), Number of (original) Data Segments Received, Number of Data segments dropped and Number of ACK segments dropped.

The screenshot shows the Wireshark network protocol analyzer interface. At the top, there's a menu bar with options like File, Edit, View, Capture, Packets, Statistics, Tools, Window, and Help. Below the menu is a toolbar with icons for opening files, saving, zooming, and other functions. The main area is divided into three panes:

- Packets Pane (Left):** Displays a list of captured packets. Each entry includes a packet number, time offset, source IP, destination IP, protocol, length, and offset. For example, packet 1 at 0.0 seconds is from 192.168.1.100 to 192.168.1.1.
- Packet Details Pane (Middle):** Shows the hierarchical structure of the selected packet (packet 1). It lists layers such as Ethernet II, Internet Protocol Version 4, Transmission Control Protocol, and Hypertext Transfer Protocol. Each layer has expandable fields showing specific details like MAC addresses, IP addresses, ports, and headers.
- Packet Bytes Pane (Right):** Displays the raw bytes of the selected packet in hexadecimal and ASCII format.

In this case, the selected packet is an SMTP session initiation. The details pane shows the 'Hypertext Transfer Protocol' section expanded, displaying the 'From:' field as 'root@192.168.1.100'.

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CSE-VLAB - TigerVNC
Applications  聊天记录传输助手(聊天窗)  Sender_log.txt (-Desktop...)  Thunar  x-terminal-emulator

Sender_log.txt
--Desktop933333333
Save  [Icons]  [Menu]  [Window]  [Help]

1547 snd 9158.79 DATA 12261 1000
1548 rcv 9158.84 ACK 13261 0
1549 snd 9165.26 DATA 23261 1000
1550 rcv 9170.44 ACK 24261 0
1551 snd 9170.6 DATA 13261 1000
1552 snd 9170.79 DATA 24261 1000
1553 rcv 9170.89 ACK 25261 0
1554 snd 9176.09 DATA 25261 1000
1555 rcv 9220.92 ACK 10261 0
1556 snd 9220.98 DATA 10261 1000
1557 snd 9221.11 DATA 20261 1000
1558 rcv 9650.71 ACK 22261 0
1559 snd 9650.85 DATA 21261 1000
1560 snd 9650.95 DATA 22261 1000
1561 snd 9651.12 DATA 27261 1000
1562 rcv 9651.4 ACK 23261 0
1563 snd 9656.42 DATA 20261 1000
1564 rcv 9656.79 ACK 29261 0
1565 snd 9663.29 DATA 29261 1000
1566 rcv 9663.52 ACK 30261 0
1567 snd 9668.71 DATA 30261 1000
1568 rcv 9668.86 ACK 31261 0
1569 snd 9669.0 DATA 31261 1000
1570 rcv 9669.16 ACK 32261 0
1571 snd 9669.27 DATA 32261 1000
1572 rcv 9669.4 ACK 33261 0
1573 snd 9669.51 DATA 33261 1000
1574 snd 9670.61 DATA 13261 1000
1575 snd 9676.1 DATA 25261 1000
1576 snd 9721.16 DATA 20261 1000
1577 snd 10151.44 DATA 27261 1000
1578 rcv 10151.67 ACK 26261 0
1579 snd 10163.16 DATA 34261 1000
1580 rcv 10168.41 ACK 35261 0
1581 snd 10169.6 DATA 31261 1000
1582 snd 10169.76 DATA 35261 1000
1583 rcv 10169.84 ACK 34261 0
1584 snd 10169.99 DATA 36261 1000
1585 rcv 10170.24 ACK 30261 0
1586 snd 10170.38 DATA 37261 1000
1587 snd 10170.69 DATA 13261 1000
1588 rcv 10175.79 ACK 14261 0
1589 snd 10175.95 DATA 38261 1000
1590 snd 10176.19 DATA 25261 1000
1591 rcv 10176.25 ACK 39261 0
1592 snd 10176.43 DATA 30261 1000
1593 snd 10221.26 DATA 26261 1000
1594 rcv 10221.32 ACK 27261 0
1595 snd 10237.26 DATA 40261 1000
1596 snd 10670.24 DATA 36261 1000
1597 rcv 10670.42 ACK 37261 0
1598 snd 10670.63 DATA 37261 1000
1599 snd 10670.92 DATA 41261 179
1600 rcv 10671.06 ACK 41448 0
1601 snd 10676.2 DATA 150333 1000
1602 rcv 10676.45 ACK 26261 0
1603 snd 10676.54 DATA 170333 1000
1604 snd 10737.31 DATA 171333 1000
1605 rcv 10737.51 ACK 41261 0
1606 snd 11171.04 DATA 168333 1000
1607 rcv 11176.7 ACK 40261 0
1608 snd 11176.91 DATA 170333 1000
1609 rcv 11671.46 ACK 30261 0
1610 snd 11671.67 DATA 168333 1000
1611 snd 11672.07 FIN 41441 0
1612 rcv 11680.06 ACK 41442 0
1613 Amount of (original) Data Transferred (in Bytes) (excluding retransmissions): 125179 bytes
1614 Number of Data Segments Sent (excluding retransmissions): 126
1615 Number of Retransmitted Data Segments: 108
1616 Number of Duplicate Acknowledgements received: 132

Plain Text  Tab Width: 8  Ln 1580, Col 37  INS
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And the sender can receive all the data packets completely and integrate the txt file.

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CSE-VLAB - TigerVNC
Applications  聊天记录传输助手(聊天窗)  FileToReceive.txt (-Desktop...)  Thunar  x-terminal-emulator

FileToReceive.txt
--Desktop933333333
Save  [Icons]  [Menu]  [Window]  [Help]

4051 JAUQUES DE BOYS He hath.
4052
4053 JAUQUES To him will I : out of these convertites
4054 There is much matter to be heard and learn'd.
4055
4056 [To DUKE SENIOR]
4057
4058 You to your former honour I bequeath:
4059 Your patience and your virtue well deserves it:
4060
4061 [To ORLANDO]
4062
4063 You to a love that your true faith doth merit:
4064
4065 [To OLIVER]
4066
4067 You to your land and love and great allies:
4068
4069 [To SILVIUS]
4070
4071 You to a long and well-deserved bed:
4072
4073 [To TOUCHSTONE]
4074
4075 And you to wrangling; for thy loving voyage
4076 Is but for two months victual'd. So, to your pleasures:
4077 I am for other than for dancing measures.
4078
4079 DUKE SENIOR Stay, Jaques, stay.
4080
4081 JAUQUES To see no pastime I what you would have
4082 I'll stay to know at your abandon'd cave.
4083
4084 [Exit]
4085
4086 DUKE SENIOR Proceed, proceed: we will begin these rites,
4087 As we do trust they'll end, in true delights.
4088
4089 [A dance]
4090
4091
4092
4093
4094 AS YOU LIKE IT
4095
4096 EPILOGUE
4097
4098
4099 ROSALIND It is not the fashion to see the lady the epilogue:
4100 but it is no more unhandsome than to see the lord
4101 the prologue. If it be true that good wine needs no
4102 bush, 'tis true that a good play needs no
4103 epilogue: yet to good wine they do use good bushes,
4104 and good plays prove the better by the help of good
4105 epilogues. What a case am I in then, that am
4106 neither a good epilogue nor cannot insinuate with
4107 you in the behalf of a good play! I am not
4108 furnished like a beggar, therefore to beg will not
4109 become me: by my way is to conjure you; and I'll begin
4110 with the women. I charge you, O women, for the love
4111 you bear to men, to like as much of this play as
4112 please you: and I charge you, O men, for the love
4113 you bear to women—as I perceive by your snoring,
4114 none of you hates then—that between you and the
4115 women the play may please. If I were a woman I
4116 would kiss as many of you as had beards that pleased
4117 me, complexions that liked me and breaths that I
4118 desired not: and, I am sure, as many as have good
4119 beards or good faces or sweet breaths will, for my
4120 kind offer, when I make curtsy, bid me farewell.
4121
4122 [Exeunt]
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