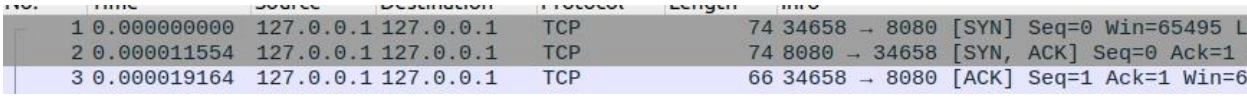
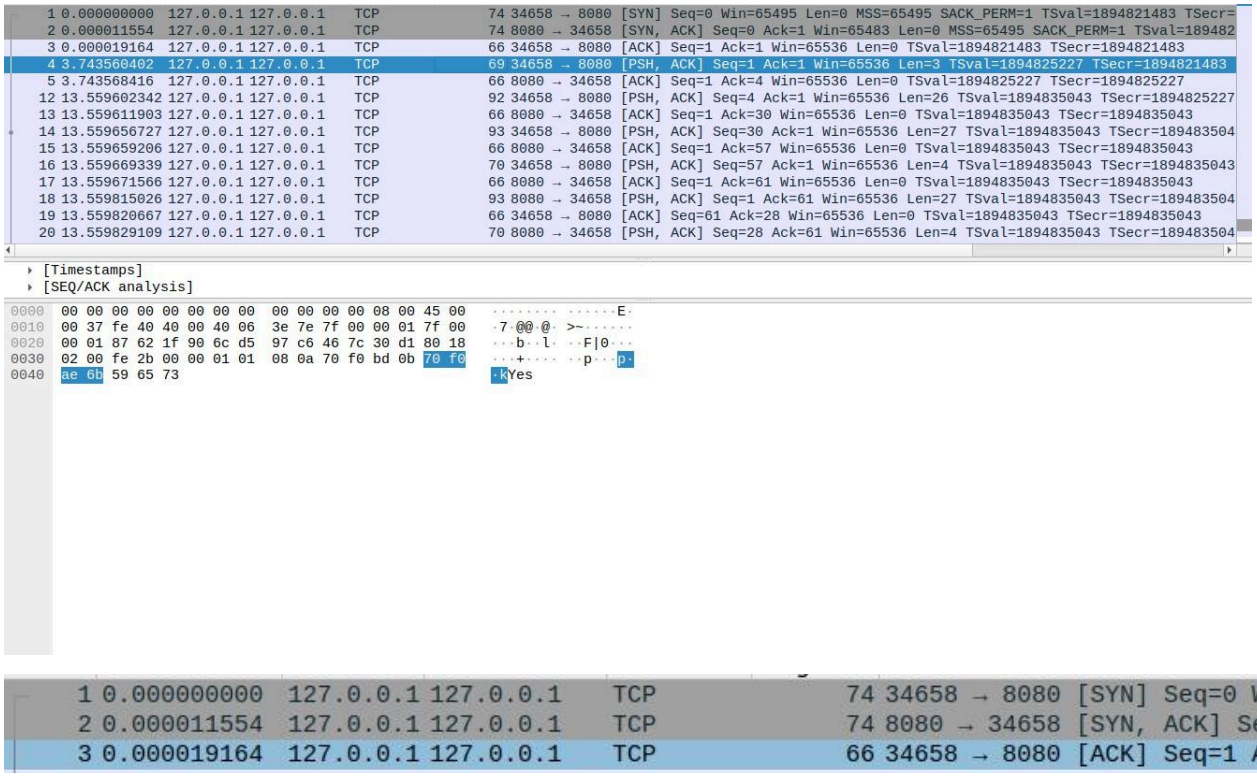
# TCP FILE TRANSFER WIRESHARK ANALYSIS

## 1. CONNECTION DETAILS:

Server address : 127.0.0.1
Server port : 8080
Client address : 127.0.0.1
Client port : 34658(Dynamic)




## 2. THREE-WAY HANDSHAKING PROCEDURE:







### Steps of the Three-Way Handshake

#### Step 1: Client Sends SYN

- The client initiates the connection by sending a **SYN (synchronize)** packet to the server.

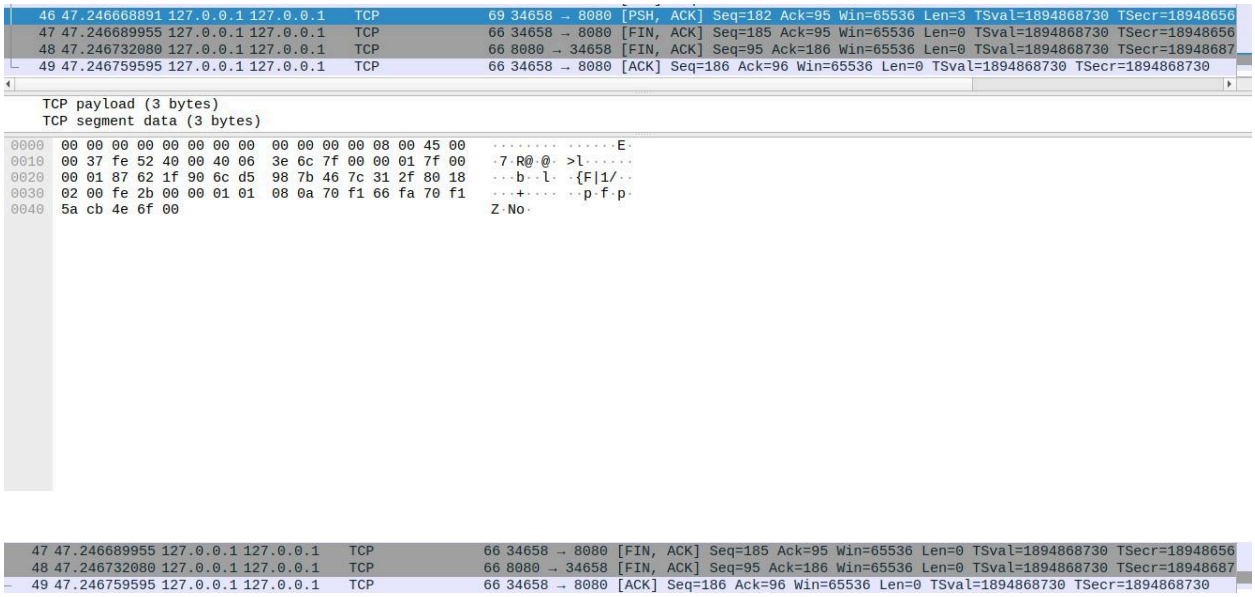
**Step 2: Server Sends SYN-ACK**

- The server responds with a **SYN-ACK (synchronize-acknowledge)** packet.

**Step 3: Client Sends ACK**

- The client sends an **ACK (acknowledge)** packet back to the server.

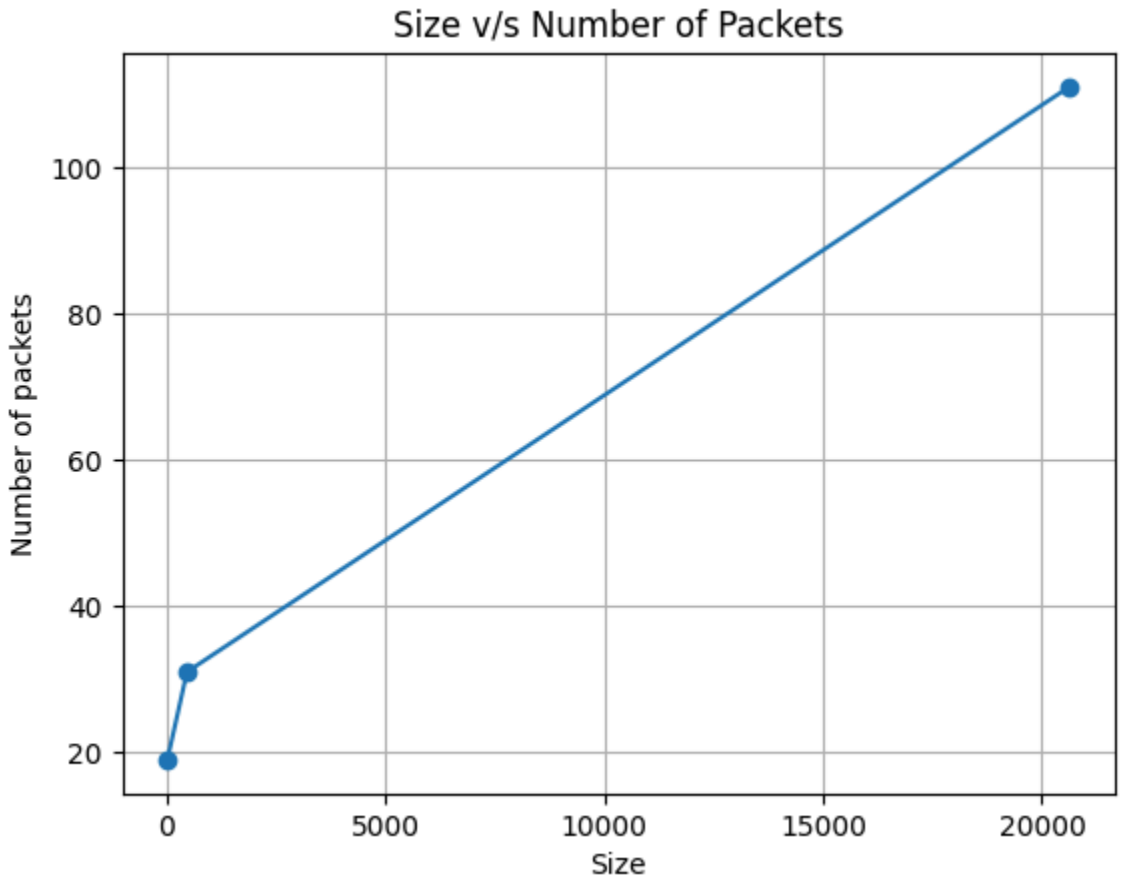
# 3. CONNECTION CLOSURE PROCEDURE:




# 4. FILESIZE v/s NUMBER OF PACKETS

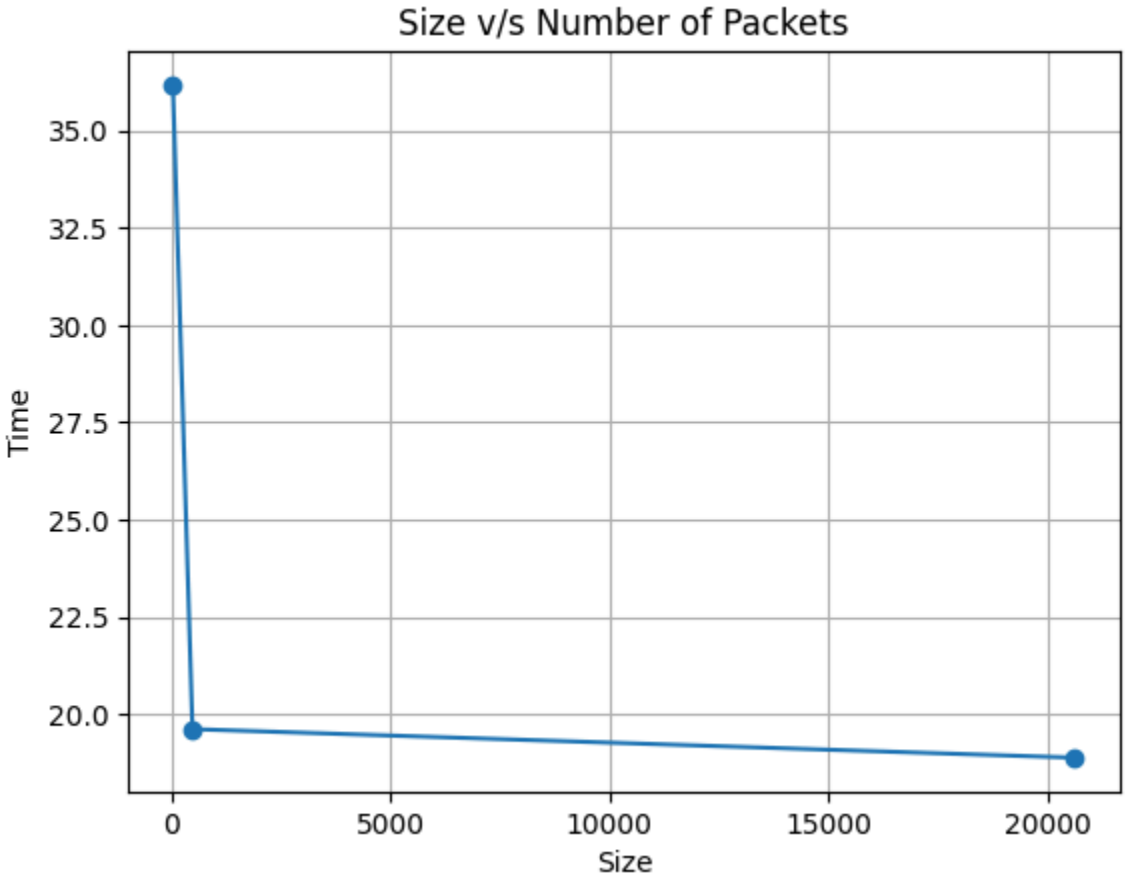
| File Name | Size | Number of packets |
|---|---|---|
| test.txt | 27 | 19 |
| dsp1.txt | 474 | 31 |
| dsp.txt | 20623 | 111 |

Based on the above observations:




5. FILESIZE v/s TIME:

| FILENAME | SIZE | TIME |
|---|---|---|
| test.txt | 27 | 39.9597 - 3.785 = 36.1747 |
| dsp1.txt | 474 | 30.8747 - 11.259 = 19.6157 |
| dsp.txt | 20623 | 21.422 - 2.54 = 18.882 |

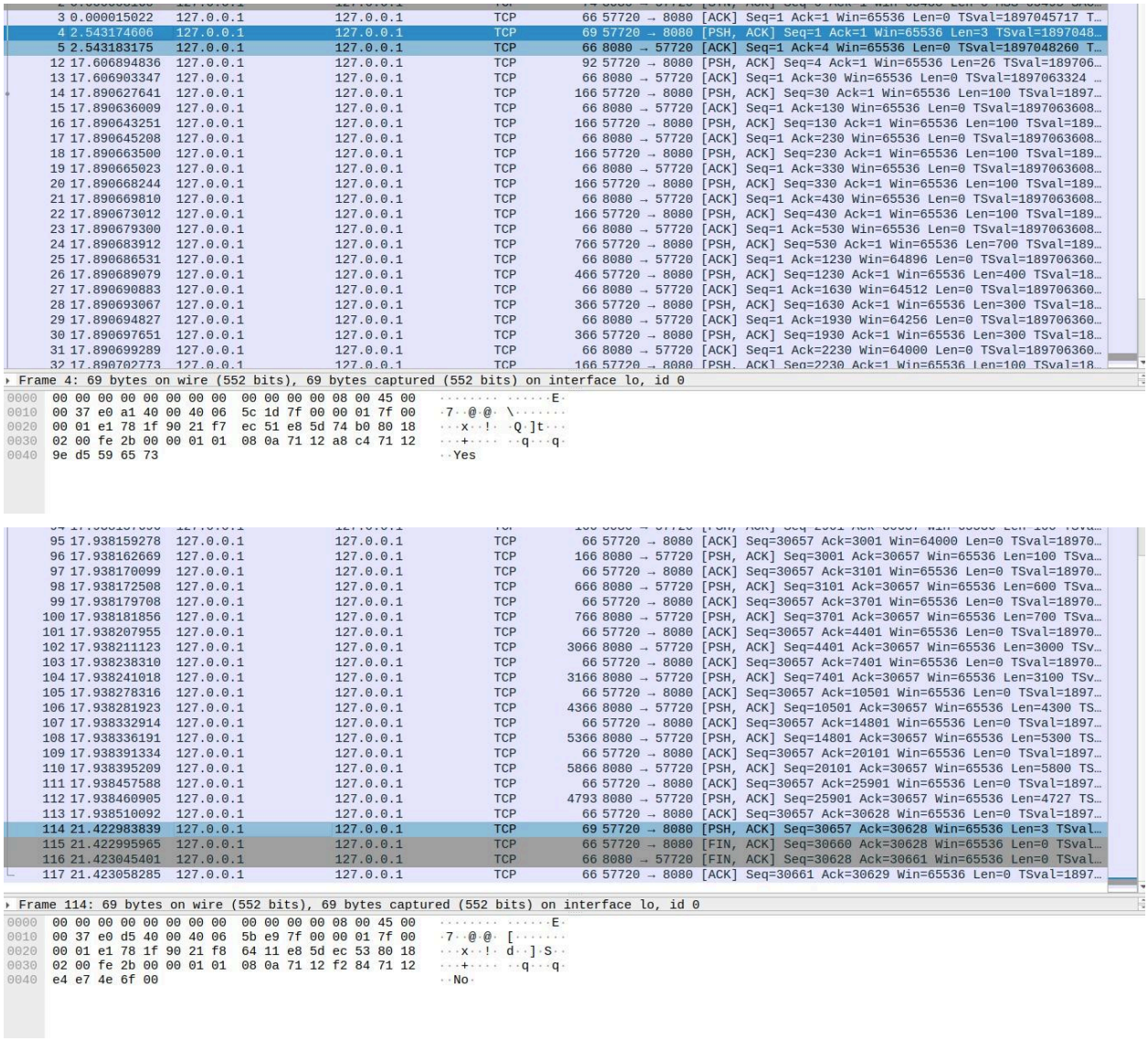



It may seem counterintuitive that **larger files take less time per unit of data to transmit**. However, this behavior is due to the **efficiency of TCP's congestion control.**

| | | | | | | |
|---|---|---|---|---|---|---|
| 9 | 8.931758702 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 38296 → 8080 [ACK] Seq=1 Ack=1 Win=65536 Len=0 TSval=1896760528 TSecr=… |
| 10 | 11.259042344 | 127.0.0.1 | 127.0.0.1 | TCP | 69 | 38296 → 8080 [PSH, ACK] Seq=1 Ack=1 Win=65536 Len=3 TSval=1896762856 T… |
| 11 | 11.259051372 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 38296 [ACK] Seq=1 Ack=4 Win=65536 Len=0 TSval=1896762856 TSecr=… |
| 16 | 24.266424860 | 127.0.0.1 | 127.0.0.1 | TCP | 92 | 38296 → 8080 [PSH, ACK] Seq=4 Ack=1 Win=65536 Len=26 TSval=1896775863 … |
| 17 | 24.266447818 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 38296 [ACK] Seq=1 Ack=30 Win=65536 Len=0 TSval=1896775863 TSecr… |
| 18 | 24.296531579 | 127.0.0.1 | 127.0.0.1 | TCP | 166 | 38296 → 8080 [PSH, ACK] Seq=30 Ack=1 Win=65536 Len=100 TSval=189677589… |
| 19 | 24.296554952 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 38296 [ACK] Seq=1 Ack=130 Win=65536 Len=0 TSval=1896775893 TSec… |
| 20 | 24.296570339 | 127.0.0.1 | 127.0.0.1 | TCP | 166 | 38296 → 8080 [PSH, ACK] Seq=130 Ack=1 Win=65536 Len=100 TSval=18967758… |
| 21 | 24.296573630 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 38296 [ACK] Seq=1 Ack=230 Win=65536 Len=0 TSval=1896775893 TSec… |
| 22 | 24.296577575 | 127.0.0.1 | 127.0.0.1 | TCP | 166 | 38296 → 8080 [PSH, ACK] Seq=230 Ack=1 Win=65536 Len=100 TSval=18967758… |
| 23 | 24.296579111 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 38296 [ACK] Seq=1 Ack=330 Win=65536 Len=0 TSval=1896775893 TSec… |
| 24 | 24.296582905 | 127.0.0.1 | 127.0.0.1 | TCP | 166 | 38296 → 8080 [PSH, ACK] Seq=330 Ack=1 Win=65536 Len=100 TSval=18967758… |
| 25 | 24.296584414 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 38296 [ACK] Seq=1 Ack=430 Win=65536 Len=0 TSval=1896775893 TSec… |
| 26 | 24.296596367 | 127.0.0.1 | 127.0.0.1 | TCP | 140 | 38296 → 8080 [PSH, ACK] Seq=430 Ack=1 Win=65536 Len=74 TSval=189677589… |
| 27 | 24.296612459 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 38296 [ACK] Seq=1 Ack=504 Win=65536 Len=0 TSval=1896775893 TSec… |
| 28 | 24.296622833 | 127.0.0.1 | 127.0.0.1 | TCP | 70 | 38296 → 8080 [PSH, ACK] Seq=504 Ack=1 Win=65536 Len=4 TSval=1896775893… |
| 29 | 24.296624492 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 38296 [ACK] Seq=1 Ack=508 Win=65536 Len=0 TSval=1896775893 TSec… |
| 30 | 24.296953243 | 127.0.0.1 | 127.0.0.1 | TCP | 166 | 8080 → 38296 [PSH, ACK] Seq=1 Ack=508 Win=65536 Len=100 TSval=18967758… |
| 31 | 24.296967602 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 38296 → 8080 [ACK] Seq=508 Ack=101 Win=65536 Len=0 TSval=1896775894 TS… |
| 32 | 24.296979957 | 127.0.0.1 | 127.0.0.1 | TCP | 166 | 8080 → 38296 [PSH, ACK] Seq=101 Ack=508 Win=65536 Len=100 TSval=189677… |
| 33 | 24.296986255 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 38296 → 8080 [ACK] Seq=508 Ack=201 Win=65536 Len=0 TSval=1896775894 TS… |
| 34 | 24.296991279 | 127.0.0.1 | 127.0.0.1 | TCP | 166 | 8080 → 38296 [PSH, ACK] Seq=201 Ack=508 Win=65536 Len=100 TSval=189677… |
| 35 | 24.296993218 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 38296 → 8080 [ACK] Seq=508 Ack=301 Win=65536 Len=0 TSval=1896775894 TS… |
| 36 | 24.296996493 | 127.0.0.1 | 127.0.0.1 | TCP | 166 | 8080 → 38296 [PSH, ACK] Seq=301 Ack=508 Win=65536 Len=100 TSval=189677… |
| 37 | 24.297000007 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 38296 → 8080 [ACK] Seq=508 Ack=401 Win=65536 Len=0 TSval=1896775894 TS… |
| 38 | 24.297007214 | 127.0.0.1 | 127.0.0.1 | TCP | 140 | 8080 → 38296 [PSH, ACK] Seq=401 Ack=508 Win=65536 Len=74 TSval=1896775… |
| 39 | 24.297009194 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 38296 → 8080 [ACK] Seq=508 Ack=475 Win=65536 Len=0 TSval=1896775894 TS… |
| 40 | 24.297018720 | 127.0.0.1 | 127.0.0.1 | TCP | 70 | 8080 → 38296 [PSH, ACK] Seq=475 Ack=508 Win=65536 Len=4 TSval=18967758… |
| 41 | 24.297021269 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 38296 → 8080 [ACK] Seq=508 Ack=479 Win=65536 Len=0 TSval=1896775894 TS… |
| 42 | 30.874711464 | 127.0.0.1 | 127.0.0.1 | TCP | 69 | 38296 → 8080 [PSH, ACK] Seq=508 Ack=479 Win=65536 Len=3 TSval=18967824… |
| 43 | 30.874725251 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 38296 → 8080 [FIN, ACK] Seq=511 Ack=479 Win=65536 Len=0 TSval=18967824… |
| 44 | 30.874747384 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 38296 [FIN, ACK] Seq=479 Ack=512 Win=65536 Len=0 TSval=18967824… |
| 45 | 30.874760792 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 38296 → 8080 [ACK] Seq=512 Ack=480 Win=65536 Len=0 TSval=1896782471 TS… |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 | 8.931744397 | 127.0.0.1 | 127.0.0.1 | TCP | 74 | 38296 → 8080 [SYN] Seq=0 Win=65495 Len=0 MSS=65495 SACK_PERM=1 TSval=1896760528 TSecr=0 |
| 8 | 8.931751861 | 127.0.0.1 | 127.0.0.1 | TCP | 74 | 8080 → 38296 [SYN, ACK] Seq=0 Ack=1 Win=65483 Len=0 MSS=65495 SACK_PERM=1 TSval=18967605 |
| 9 | 8.931758702 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 38296 → 8080 [ACK] Seq=1 Ack=1 Win=65536 Len=0 TSval=1896760528 TSecr=1896760528 |
| 10 | 11.259042344 | 127.0.0.1 | 127.0.0.1 | TCP | 69 | 38296 → 8080 [PSH, ACK] Seq=1 Ack=1 Win=65536 Len=3 TSval=1896762856 TSecr=1896760528 [T |
| 11 | 11.259051372 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 38296 [ACK] Seq=1 Ack=4 Win=65536 Len=0 TSval=1896762856 TSecr=1896762856 |
| 16 | 24.266424860 | 127.0.0.1 | 127.0.0.1 | TCP | 92 | 38296 → 8080 [PSH, ACK] Seq=4 Ack=1 Win=65536 Len=26 TSval=1896775863 TSecr=1896762856 [ |
| 17 | 24.266447818 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 38296 [ACK] Seq=1 Ack=30 Win=65536 Len=0 TSval=1896775863 TSecr=1896775863 |
| 18 | 24.296531579 | 127.0.0.1 | 127.0.0.1 | TCP | 166 | 38296 → 8080 [PSH, ACK] Seq=30 Ack=1 Win=65536 Len=100 TSval=1896775893 TSecr=1896775863 |
| 19 | 24.296554952 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 38296 [ACK] Seq=1 Ack=130 Win=65536 Len=0 TSval=1896775893 TSecr=1896775893 |
| 20 | 24.296570339 | 127.0.0.1 | 127.0.0.1 | TCP | 166 | 38296 → 8080 [PSH, ACK] Seq=130 Ack=1 Win=65536 Len=100 TSval=1896775893 TSecr=189677589 |
| 21 | 24.296573630 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 38296 [ACK] Seq=1 Ack=230 Win=65536 Len=0 TSval=1896775893 TSecr=1896775893 |
| 22 | 24.296577575 | 127.0.0.1 | 127.0.0.1 | TCP | 166 | 38296 → 8080 [PSH, ACK] Seq=230 Ack=1 Win=65536 Len=100 TSval=1896775893 TSecr=189677589 |
| 23 | 24.296579111 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 38296 [ACK] Seq=1 Ack=330 Win=65536 Len=0 TSval=1896775893 TSecr=1896775893 |
| 24 | 24.296582905 | 127.0.0.1 | 127.0.0.1 | TCP | 166 | 38296 → 8080 [PSH, ACK] Seq=330 Ack=1 Win=65536 Len=100 TSval=1896775893 TSecr=189677589 |
| 25 | 24.296584414 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 38296 [ACK] Seq=1 Ack=430 Win=65536 Len=0 TSval=1896775893 TSecr=1896775893 |
| 26 | 24.296596367 | 127.0.0.1 | 127.0.0.1 | TCP | 140 | 38296 → 8080 [PSH, ACK] Seq=430 Ack=1 Win=65536 Len=74 TSval=1896775893 TSecr=1896775893 |
| 27 | 24.296612459 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 38296 [ACK] Seq=1 Ack=504 Win=65536 Len=0 TSval=1896775893 TSecr=1896775893 |
| 28 | 24.296622833 | 127.0.0.1 | 127.0.0.1 | TCP | 70 | 38296 → 8080 [PSH, ACK] Seq=504 Ack=1 Win=65536 Len=4 TSval=1896775893 TSecr=1896775893 |
| 29 | 24.296624492 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 38296 [ACK] Seq=1 Ack=508 Win=65536 Len=0 TSval=1896775893 TSecr=1896775893 |
| 30 | 24.296953243 | 127.0.0.1 | 127.0.0.1 | TCP | 166 | 8080 → 38296 [PSH, ACK] Seq=1 Ack=508 Win=65536 Len=100 TSval=1896775894 TSecr=189677589 |
| 31 | 24.296967602 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 38296 → 8080 [ACK] Seq=508 Ack=101 Win=65536 Len=0 TSval=1896775894 TSecr=1896775894 |
| 32 | 24.296979957 | 127.0.0.1 | 127.0.0.1 | TCP | 166 | 8080 → 38296 [PSH, ACK] Seq=101 Ack=508 Win=65536 Len=100 TSval=1896775894 TSecr=1896775 |
| 33 | 24.296986255 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 38296 → 8080 [ACK] Seq=508 Ack=201 Win=65536 Len=0 TSval=1896775894 TSecr=1896775894 |
| 34 | 24.296991279 | 127.0.0.1 | 127.0.0.1 | TCP | 166 | 8080 → 38296 [PSH, ACK] Seq=201 Ack=508 Win=65536 Len=100 TSval=1896775894 TSecr=1896775 |
| 35 | 24.296993218 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 38296 → 8080 [ACK] Seq=508 Ack=301 Win=65536 Len=0 TSval=1896775894 TSecr=1896775894 |
| 36 | 24.296996493 | 127.0.0.1 | 127.0.0.1 | TCP | 166 | 8080 → 38296 [PSH, ACK] Seq=301 Ack=508 Win=65536 Len=100 TSval=1896775894 TSecr=1896775 |
| 37 | 24.297000007 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 38296 → 8080 [ACK] Seq=508 Ack=401 Win=65536 Len=0 TSval=1896775894 TSecr=1896775894 |
| 38 | 24.297007214 | 127.0.0.1 | 127.0.0.1 | TCP | 140 | 8080 → 38296 [PSH, ACK] Seq=401 Ack=508 Win=65536 Len=74 TSval=1896775894 TSecr=18967758 |
| 39 | 24.297009194 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 38296 → 8080 [ACK] Seq=508 Ack=475 Win=65536 Len=0 TSval=1896775894 TSecr=1896775894 |
| 40 | 24.297018720 | 127.0.0.1 | 127.0.0.1 | TCP | 70 | 8080 → 38296 [PSH, ACK] Seq=475 Ack=508 Win=65536 Len=4 TSval=1896775894 TSecr=189677589 |
| 41 | 24.297021269 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 38296 → 8080 [ACK] Seq=508 Ack=479 Win=65536 Len=0 TSval=1896775894 TSecr=1896775894 |
| 42 | 30.874711464 | 127.0.0.1 | 127.0.0.1 | TCP | 69 | 38296 → 8080 [PSH, ACK] Seq=508 Ack=479 Win=65536 Len=3 TSval=1896782471 TSecr=189677589 |
| 43 | 30.874725251 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 38296 → 8080 [FIN, ACK] Seq=511 Ack=479 Win=65536 Len=0 TSval=1896782471 TSecr=189677589 |
| 44 | 30.874747384 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 38296 [FIN, ACK] Seq=479 Ack=512 Win=65536 Len=0 TSval=1896782471 TSecr=189678247 |
| 45 | 30.874760792 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 38296 → 8080 [ACK] Seq=512 Ack=480 Win=65536 Len=0 TSval=1896782471 TSecr=1896782471 |

TCP payload (3 bytes)



| | | | | | | |
|---|---|---|---|---|---|---|
| 3 | 0.000015022 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 57720 → 8080 [ACK] Seq=1 Ack=1 Win=65536 Len=0 TSval=1897045717 T… |
| 4 | 2.543174606 | 127.0.0.1 | 127.0.0.1 | TCP | 69 | 57720 → 8080 [PSH, ACK] Seq=1 Ack=1 Win=65536 Len=3 TSval=1897048… |
| 5 | 2.543183175 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 57720 [ACK] Seq=1 Ack=4 Win=65536 Len=0 TSval=1897048260 T… |
| 12 | 17.606894836 | 127.0.0.1 | 127.0.0.1 | TCP | 92 | 57720 → 8080 [PSH, ACK] Seq=4 Ack=1 Win=65536 Len=26 TSval=189706… |
| 13 | 17.606903347 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 57720 [ACK] Seq=1 Ack=30 Win=65536 Len=0 TSval=1897063324 … |
| 14 | 17.890627641 | 127.0.0.1 | 127.0.0.1 | TCP | 166 | 57720 → 8080 [PSH, ACK] Seq=30 Ack=1 Win=65536 Len=100 TSval=1897… |
| 15 | 17.890636009 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 57720 [ACK] Seq=1 Ack=130 Win=65536 Len=0 TSval=1897063608… |
| 16 | 17.890643251 | 127.0.0.1 | 127.0.0.1 | TCP | 166 | 57720 → 8080 [PSH, ACK] Seq=130 Ack=1 Win=65536 Len=100 TSval=189… |
| 17 | 17.890645208 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 57720 [ACK] Seq=1 Ack=230 Win=65536 Len=0 TSval=1897063608… |
| 18 | 17.890663500 | 127.0.0.1 | 127.0.0.1 | TCP | 166 | 57720 → 8080 [PSH, ACK] Seq=230 Ack=1 Win=65536 Len=100 TSval=189… |
| 19 | 17.890665023 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 57720 [ACK] Seq=1 Ack=330 Win=65536 Len=0 TSval=1897063608… |
| 20 | 17.890668244 | 127.0.0.1 | 127.0.0.1 | TCP | 166 | 57720 → 8080 [PSH, ACK] Seq=330 Ack=1 Win=65536 Len=100 TSval=189… |
| 21 | 17.890669810 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 57720 [ACK] Seq=1 Ack=430 Win=65536 Len=0 TSval=1897063608… |
| 22 | 17.890673012 | 127.0.0.1 | 127.0.0.1 | TCP | 166 | 57720 → 8080 [PSH, ACK] Seq=430 Ack=1 Win=65536 Len=100 TSval=189… |
| 23 | 17.890679300 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 57720 [ACK] Seq=1 Ack=530 Win=65536 Len=0 TSval=1897063608… |
| 24 | 17.890683912 | 127.0.0.1 | 127.0.0.1 | TCP | 766 | 57720 → 8080 [PSH, ACK] Seq=530 Ack=1 Win=65536 Len=700 TSval=189… |
| 25 | 17.890686531 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 57720 [ACK] Seq=1 Ack=1230 Win=64896 Len=0 TSval=189706360… |
| 26 | 17.890689079 | 127.0.0.1 | 127.0.0.1 | TCP | 466 | 57720 → 8080 [PSH, ACK] Seq=1230 Ack=1 Win=65536 Len=400 TSval=18… |
| 27 | 17.890690883 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 57720 [ACK] Seq=1 Ack=1630 Win=64512 Len=0 TSval=189706360… |
| 28 | 17.890693067 | 127.0.0.1 | 127.0.0.1 | TCP | 366 | 57720 → 8080 [PSH, ACK] Seq=1630 Ack=1 Win=65536 Len=300 TSval=18… |
| 29 | 17.890694827 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 57720 [ACK] Seq=1 Ack=1930 Win=64256 Len=0 TSval=189706360… |
| 30 | 17.890697651 | 127.0.0.1 | 127.0.0.1 | TCP | 366 | 57720 → 8080 [PSH, ACK] Seq=1930 Ack=1 Win=65536 Len=300 TSval=18… |
| 31 | 17.890699289 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 57720 [ACK] Seq=1 Ack=2230 Win=64000 Len=0 TSval=189706360… |
| 32 | 17.890702773 | 127.0.0.1 | 127.0.0.1 | TCP | 166 | 57720 → 8080 [PSH, ACK] Seq=2230 Ack=1 Win=65536 Len=100 TSval=18… |

▸ Frame 4: 69 bytes on wire (552 bits), 69 bytes captured (552 bits) on interface lo, id 0

```
0000  00 00 00 00 00 00 00 00  00 00 00 00 08 00 45 00   ........ ......E·
0010  00 37 e0 a1 40 00 40 06  5c 1d 7f 00 00 01 7f 00   ·7··@·@· \·......
0020  00 01 e1 78 1f 90 21 f7  ec 51 e8 5d 74 b0 80 18   ···x··!· ·Q·]t···
0030  02 00 fe 2b 00 00 01 01  08 0a 71 12 a8 c4 71 12   ···+···· ··q···q·
0040  9e d5 59 65 73                                     ··Yes
```

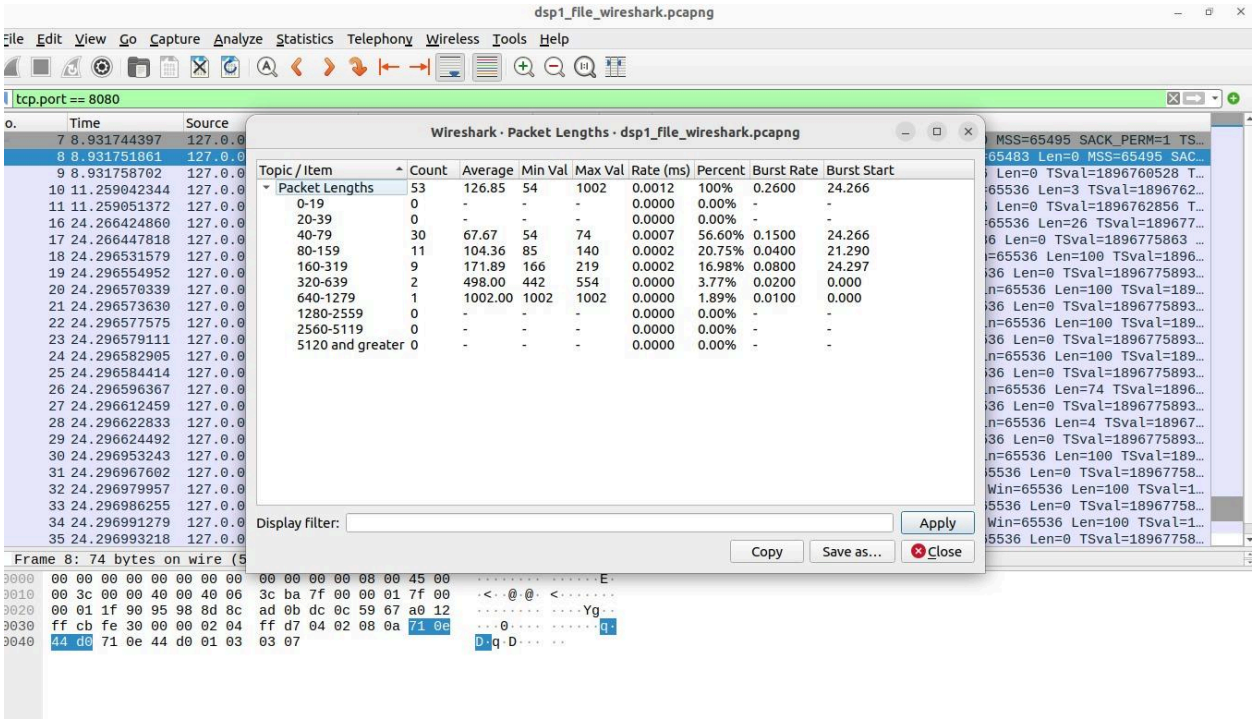


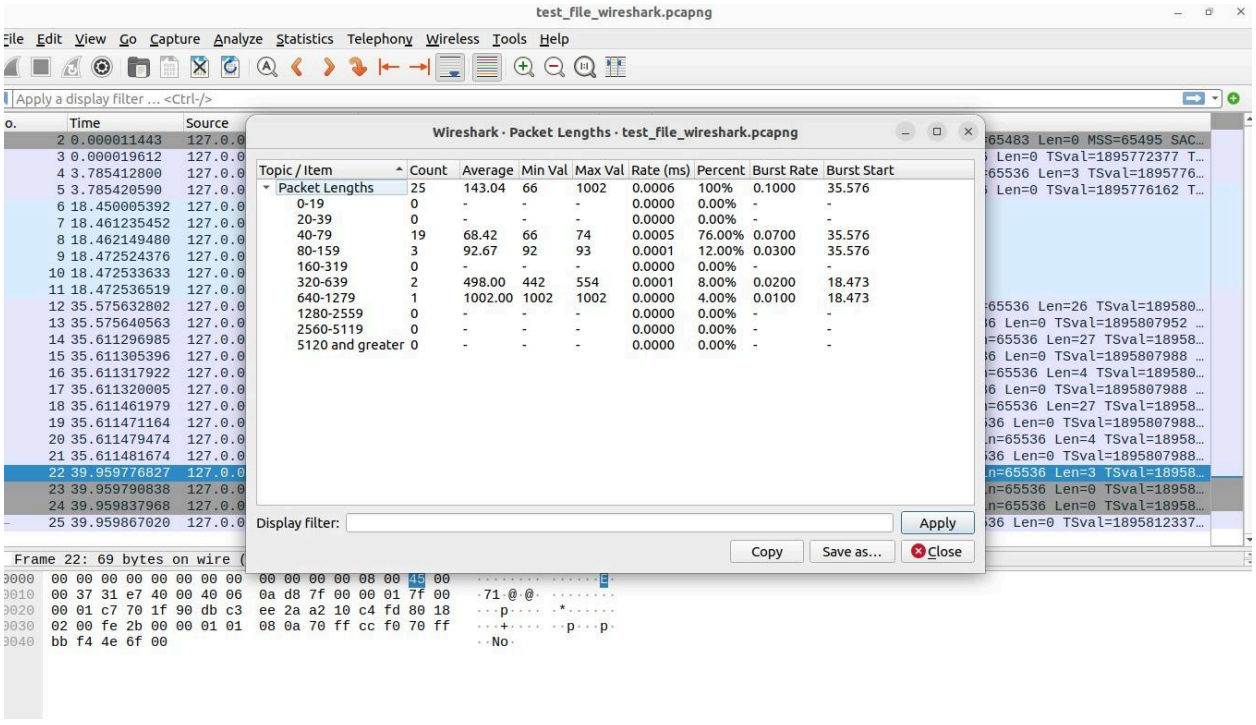
| | | | | | | |
|---|---|---|---|---|---|---|
| 95 | 17.938159278 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 57720 → 8080 [ACK] Seq=30657 Ack=3001 Win=64000 Len=0 TSval=18970… |
| 96 | 17.938162669 | 127.0.0.1 | 127.0.0.1 | TCP | 166 | 8080 → 57720 [PSH, ACK] Seq=3001 Ack=30657 Win=65536 Len=100 TSva… |
| 97 | 17.938170099 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 57720 → 8080 [ACK] Seq=30657 Ack=3101 Win=65536 Len=0 TSval=18970… |
| 98 | 17.938172508 | 127.0.0.1 | 127.0.0.1 | TCP | 666 | 8080 → 57720 [PSH, ACK] Seq=3101 Ack=30657 Win=65536 Len=600 TSva… |
| 99 | 17.938179708 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 57720 → 8080 [ACK] Seq=30657 Ack=3701 Win=65536 Len=0 TSval=18970… |
| 100 | 17.938181856 | 127.0.0.1 | 127.0.0.1 | TCP | 766 | 8080 → 57720 [PSH, ACK] Seq=3701 Ack=30657 Win=65536 Len=700 TSva… |
| 101 | 17.938207955 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 57720 → 8080 [ACK] Seq=30657 Ack=4401 Win=65536 Len=0 TSval=18970… |
| 102 | 17.938211123 | 127.0.0.1 | 127.0.0.1 | TCP | 3066 | 8080 → 57720 [PSH, ACK] Seq=4401 Ack=30657 Win=65536 Len=3000 TSv… |
| 103 | 17.938238310 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 57720 → 8080 [ACK] Seq=30657 Ack=7401 Win=65536 Len=0 TSval=18970… |
| 104 | 17.938241018 | 127.0.0.1 | 127.0.0.1 | TCP | 3166 | 8080 → 57720 [PSH, ACK] Seq=7401 Ack=30657 Win=65536 Len=3100 TSv… |
| 105 | 17.938278316 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 57720 → 8080 [ACK] Seq=30657 Ack=10501 Win=65536 Len=0 TSval=1897… |
| 106 | 17.938281923 | 127.0.0.1 | 127.0.0.1 | TCP | 4366 | 8080 → 57720 [PSH, ACK] Seq=10501 Ack=30657 Win=65536 Len=4300 TS… |
| 107 | 17.938332914 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 57720 → 8080 [ACK] Seq=30657 Ack=14801 Win=65536 Len=0 TSval=1897… |
| 108 | 17.938336191 | 127.0.0.1 | 127.0.0.1 | TCP | 5366 | 8080 → 57720 [PSH, ACK] Seq=14801 Ack=30657 Win=65536 Len=5300 TS… |
| 109 | 17.938391334 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 57720 → 8080 [ACK] Seq=30657 Ack=20101 Win=65536 Len=0 TSval=1897… |
| 110 | 17.938395209 | 127.0.0.1 | 127.0.0.1 | TCP | 5866 | 8080 → 57720 [PSH, ACK] Seq=20101 Ack=30657 Win=65536 Len=5800 TS… |
| 111 | 17.938457588 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 57720 → 8080 [ACK] Seq=30657 Ack=25901 Win=65536 Len=0 TSval=1897… |
| 112 | 17.938460905 | 127.0.0.1 | 127.0.0.1 | TCP | 4793 | 8080 → 57720 [PSH, ACK] Seq=25901 Ack=30657 Win=65536 Len=4727 TS… |
| 113 | 17.938510092 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 57720 → 8080 [ACK] Seq=30657 Ack=30628 Win=65536 Len=0 TSval=1897… |
| 114 | 21.422983839 | 127.0.0.1 | 127.0.0.1 | TCP | 69 | 57720 → 8080 [PSH, ACK] Seq=30657 Ack=30628 Win=65536 Len=3 TSval… |
| 115 | 21.422995965 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 57720 → 8080 [FIN, ACK] Seq=30660 Ack=30628 Win=65536 Len=0 TSval… |
| 116 | 21.423045401 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 8080 → 57720 [FIN, ACK] Seq=30628 Ack=30661 Win=65536 Len=0 TSval… |
| 117 | 21.423058285 | 127.0.0.1 | 127.0.0.1 | TCP | 66 | 57720 → 8080 [ACK] Seq=30661 Ack=30629 Win=65536 Len=0 TSval=1897… |

▸ Frame 114: 69 bytes on wire (552 bits), 69 bytes captured (552 bits) on interface lo, id 0

```
0000  00 00 00 00 00 00 00 00  00 00 00 00 08 00 45 00   ........ ......E·
0010  00 37 e0 d5 40 00 40 06  5b e9 7f 00 00 01 7f 00   ·7··@·@· [·......
0020  00 01 e1 78 1f 90 21 f8  64 11 e8 5d ec 53 80 18   ···x··!· d··]·S··
0030  02 00 fe 2b 00 00 01 01  08 0a 71 12 f2 84 71 12   ···+···· ··q···q·
0040  e4 e7 4e 6f 00                                     ··No·
```

# 6. AVERAGE SIZE PACKET:




From the above screenshots, the average packet length is around 70 bytes.