NETWORKS LAB

ASSIGNMENT 2: UDP SOCKETS PART-2: WIRESHARK ANALYSIS

Q1. Screenshot for all the packets exchanged between the client and server during the execution.

```
■ udp && ip.src==127.0.0.1 && ip.dst==127.0.0.1
                                                                                                                                                                                                                   X 🖘 - 🐽
      213 7.266642499
215 7.267066141
                                                              127.0.0.1
127.0.0.1
                                                                                                      53 53950 → 5000 Len=9
49 5000 → 53950 Len=5
                                127.0.0.1
       216 7.267346926
                                127.0.0.1
                                                              127.0.0.1
                                                                                      UDP
                                                                                                      49 53950 → 5000 Len=5
       217 7.267592056
       218 7,267810717
                                                              127.0.0.1
                                                                                                      49 53950 → 5000 Len=5
                                127.0.0.1
                                                                                      UDP
      219 7.268016906
220 7.268207566
                                127.0.0.1
127.0.0.1
                                                              127.0.0.1
127.0.0.1
                                                                                                      51 5000 → 53950 Len=7
49 53950 → 5000 Len=5
                                                                                      UDP
      221 7.268356096
222 7.268449450
                                127.0.0.1
127.0.0.1
                                                              127.0.0.1
127.0.0.1
                                                                                                     51 5000 → 53950 Len=7
49 53950 → 5000 Len=5
                                                                                      UDP
                                                                                                                   → 5000 Len=5
       223 7.268558121
                                127.0.0.1
                                                              127.0.0.1
                                                                                      UDP
                                                                                                      50 5000 → 53950 Len=6
```

Q2. The protocol used for the communication is UDP (User Datagram Protocol)

Q3. Source IP Address: 127.0.0.1 Destination IP Address: 127.0.0.1

> Source Port : 53950 Destination Port : 5000

Q4. The size of the FILENAME request sent by the client is 53 bytes (424 bits)

```
Frame 213: 53 bytes on wire (424 bits), 53 bytes captured (424 bits) on interface any, id 0
Linux cooked capture v1
Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
User Datagram Protocol, Src Port: 53950, Dst Port: 5000
Source Port: 53950
Destination Port: 5000
Length: 17
Checksum: 0xfe24 [unverified]
[Checksum Status: Unverified]
[Stream index: 4]
ITimestamps
UDP payload (9 bytes)
Data: 696e7075742e747874
[Length: 9]
```

Q5. The size of the server's response for HELLO was 49 bytes, and that for the first word i.e. WORD1 is 51 bytes.

```
    Frame 215: 49 bytes on wire (392 bits), 49 bytes captured (392 bits)
    Linux cooked capture v1
    Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
    User Datagram Protocol, Src Port: 5000, Dst Port: 53950
    Source Port: 5000
    Destination Port: 53950
    Length: 13
    Checksum: 0xfe20 [unverified]
    [Stream index: 4]
    ITimestamps
    UDP payload (5 bytes)
    Data (5 bytes)
    Data: 48454c4c4f
    [Length: 5]
```

```
Frame 217: 51 bytes on wire (408 bits), 51 bytes captured (408 bits)
                                                                                    0000 00 00 03 04
                                                                                    0010 45 00 00 23
0020 7f 00 00 01
▶ Linux cooked capture v1
▶ Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
▼ User Datagram Protocol, Src Port: 5000, Dst Port: 53950
                                                                                    0030 32 30 36
    Source Port: 5000
    Destination Port: 53950
    Length: 15
    Checksum: 0xfe22 [unverified]
    [Checksum Status: Unverified]
    [Stream index: 4]
    [Timestamps]
    UDP payload (7 bytes)
 Data (7 bytes)
    Data: 43533331323036
    [Length: 7]
```

Q6. Following are the payload of packets where words are transmitted.

```
Frame 221: 51 bytes on wire (408 bits), 51 bytes captured (408 bits)

Linux cooked capture v1

Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1

Source Port: 5000
Destination Port: 50900
Length: 15
Checksum: 0xfe22 [unverified]
[Stream index: 4]

Immestamps]
UDP payload (7 bytes)

Data (7 bytes)

Data (7 bytes)

Data (75 bytes)
```

Q7. The total time taken for the file transfer from start to finish is: 0.001916s

```
Frame 213: 53 bytes on wire (424 bits), 53 bytes captured (424 bits)  
Encapsulation type: Linux cooked-mode capture v1 (25)  
Arrival Time: Jan 21, 2025 23:49:28.848071517 IST  
UTC Arrival Time: Jan 21, 2025 18:19:28.848071517 UTC  
Epoch Arrival Time: Jan 22, 2025 18:19:28.488071517 UTC  
Epoch Arrival Time: Jan 22, 2025 18:19:29:29:29:29:29:29:29:29:29:29:29
```

By analyzing the arrival times of the first and last packet.

Q8. The average size of each packet during the communication is : 50.1 bytes (calculated by analyzing sizes of each packet from Wireshark) (We can also check this data within the packet analysis part of the Wireshark).