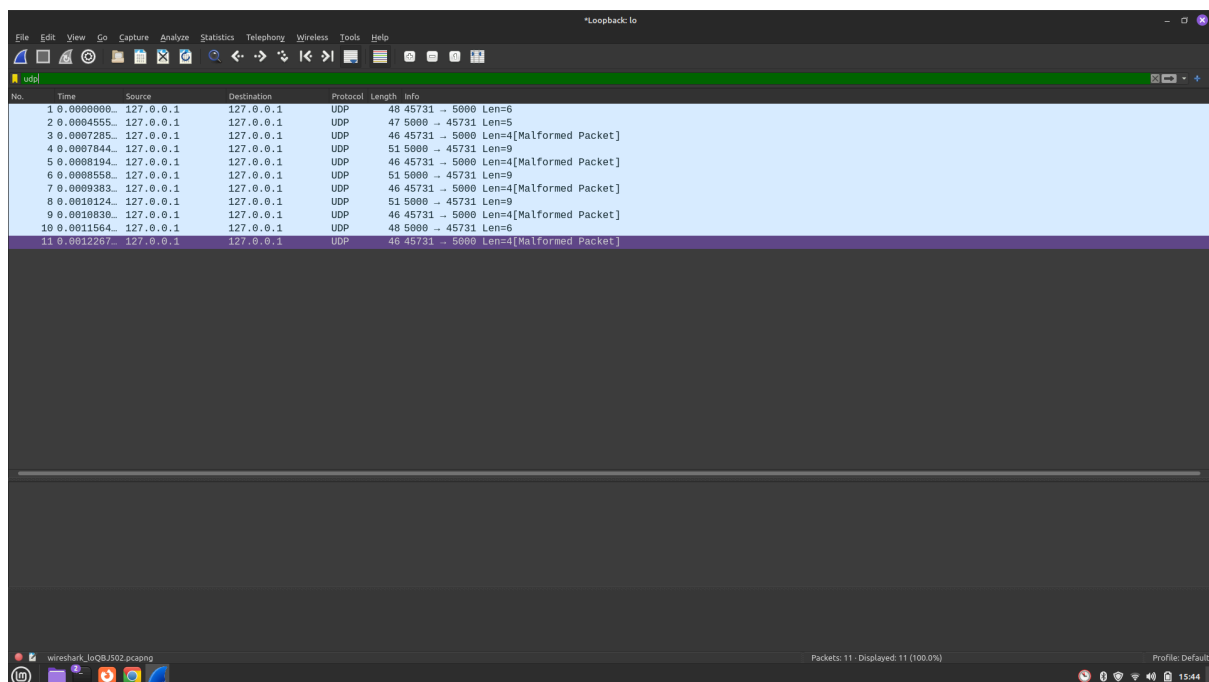_____

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INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR

NAME - ANSH SAHU
ROLL NO - 22CS30010
DEPARTMENT - CSE

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Wireshark Analysis

1. Capture all packets exchanged between the client and server during execution. Show the screenshots.
Answer:

2. What protocol is used for communication?
Answer : udp

3. What are the source and destination IP addresses and ports?
Answer
Source ip, destination ip - 127.0.0.1
Port - 5000

4. What is the size (in bytes) of the FILENAME request sent by the client?
Answer : 48 byte

5. What is the size of the server's response for HELLO and the first word
(*WORD*)?
Answer
Size of the response packet of hello : 47 byte
Size of the the first word sent by server packet size : 51 byte

6. Inspect the payload of packets where the words are transmitted. Show
the UDP payloads of those packets.
Answer :

```
+ Frame 2: 47 bytes on wire (376 bits), 47 bytes captured (376 bits) on interface lo, id 0
+ Ethernet II, Src: 00:00:00_00:00:00 (00:00:00:00:00:00), Dst: 00:00:00_00:00:00 (00:00:00:00:00:00)
+ Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
- User Datagram Protocol, Src Port: 5000, Dst Port: 45731
    Source Port: 5000
    Destination Port: 45731
    Length: 13
    Checksum: 0xfe20 [unverified]
    [Checksum Status: Unverified]
    [Stream index: 0]
  - [Timestamps]
      [Time since first frame: 0.000455564 seconds]
      [Time since previous frame: 0.000455564 seconds]
    UDP payload (5 bytes)
- Data (5 bytes)
    Data: 48454c4c4f
0000  00 00 00 00 00 00 00 00  00 00 00 00 08 00 45 00   ········ ······E·
0010  00 21 a3 fe 40 00 40 11  98 cb 7f 00 00 01 7f 00   ·!··@·@· ········
0020  00 01 13 88 b2 a3 00 0d  fe 20 48 45 4c 4c 4f       ········ ·HELLO
```

```
+ Frame 4: 51 bytes on wire (408 bits), 51 bytes captured (408 bits) on interface lo, id 0
+ Ethernet II, Src: 00:00:00_00:00:00 (00:00:00:00:00:00), Dst: 00:00:00_00:00:00 (00:00:00:00:00:00)
+ Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
- User Datagram Protocol, Src Port: 5000, Dst Port: 45731
    Source Port: 5000
    Destination Port: 45731
    Length: 17
    Checksum: 0xfe24 [unverified]
    [Checksum Status: Unverified]
    [Stream index: 0]
  - [Timestamps]
      [Time since first frame: 0.000784456 seconds]
      [Time since previous frame: 0.000055891 seconds]
    UDP payload (9 bytes)
- Data (9 bytes)
    Data: 323243533330303130
0000  00 00 00 00 00 00 00 00  00 00 00 00 08 00 45 00   ········ ······E·
0010  00 25 a4 00 40 00 40 11  98 c5 7f 00 00 01 7f 00   ·%··@·@· ········
0020  00 01 13 88 b2 a3 00 11  fe 24 32 32 43 53 33 30   ········ ·$22CS30
0030  30 31 30                                           010
```

```
 Frame 6: 51 bytes on wire (408 bits), 51 bytes captured (408 bits) on interface lo, id 0
 Ethernet II, Src: 00:00:00_00:00:00 (00:00:00:00:00:00), Dst: 00:00:00_00:00:00 (00:00:00:00:00:00)
 Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
 User Datagram Protocol, Src Port: 5000, Dst Port: 45731
    Source Port: 5000
    Destination Port: 45731
    Length: 17
    Checksum: 0xfe24 [unverified]
    [Checksum Status: Unverified]
    [Stream index: 0]
  [Timestamps]
     [Time since first frame: 0.000855848 seconds]
     [Time since previous frame: 0.000036352 seconds]
    UDP payload (9 bytes)
 Data (9 bytes)
    Data: 323243533330303330
    [Length: 9]


0000   00 00 00 00 00 00 00 00   00 00 00 00 08 00 45 00    ........ ......E.
0010   00 25 a4 02 40 00 40 11   98 c3 7f 00 00 01 7f 00    .%..@.@. ........
0020   00 01 13 88 b2 a3 00 11   fe 24 32 32 43 53 33 30    ........ .$22CS30
0030   30 33 30                                             030
```

```
 Frame 10: 48 bytes on wire (384 bits), 48 bytes captured (384 bits) on interface lo, id 0
 Ethernet II, Src: 00:00:00_00:00:00 (00:00:00:00:00:00), Dst: 00:00:00_00:00:00 (00:00:00:00:00:00)
 Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
 User Datagram Protocol, Src Port: 5000, Dst Port: 45731
    Source Port: 5000
    Destination Port: 45731
    Length: 14
    Checksum: 0xfe21 [unverified]
    [Checksum Status: Unverified]
    [Stream index: 0]
  [Timestamps]
     [Time since first frame: 0.001156494 seconds]
     [Time since previous frame: 0.000073475 seconds]
    UDP payload (6 bytes)
 Data (6 bytes)
    Data: 46494e495348
0000   00 00 00 00 00 00 00 00   00 00 00 08 00 45 00    ........ ......E.
0010   00 22 a4 06 40 00 40 11   98 c2 7f 00 00 01 7f 00    ."..@.@. ........
0020   00 01 13 88 b2 a3 00 0e   fe 21 46 49 4e 49 53 48    ........ .!FINISH
```

7. Measure the total time taken for the file transfer from start to finish.
Answer :
Total time from start to finish for all information transfer : 12.26774 millisecond

8. What is the average size of each packet during the communication?
Answer : 47.82