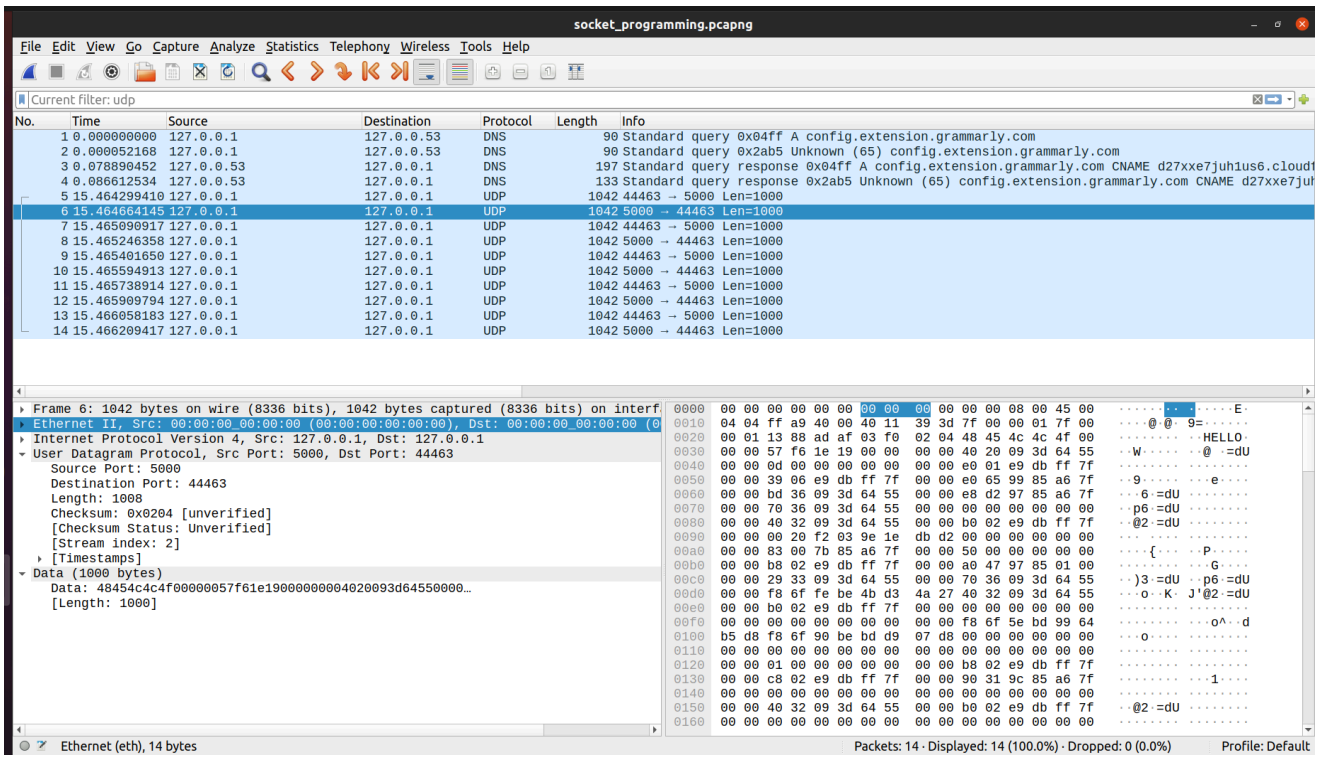
Assignment 2: UDP Sockets

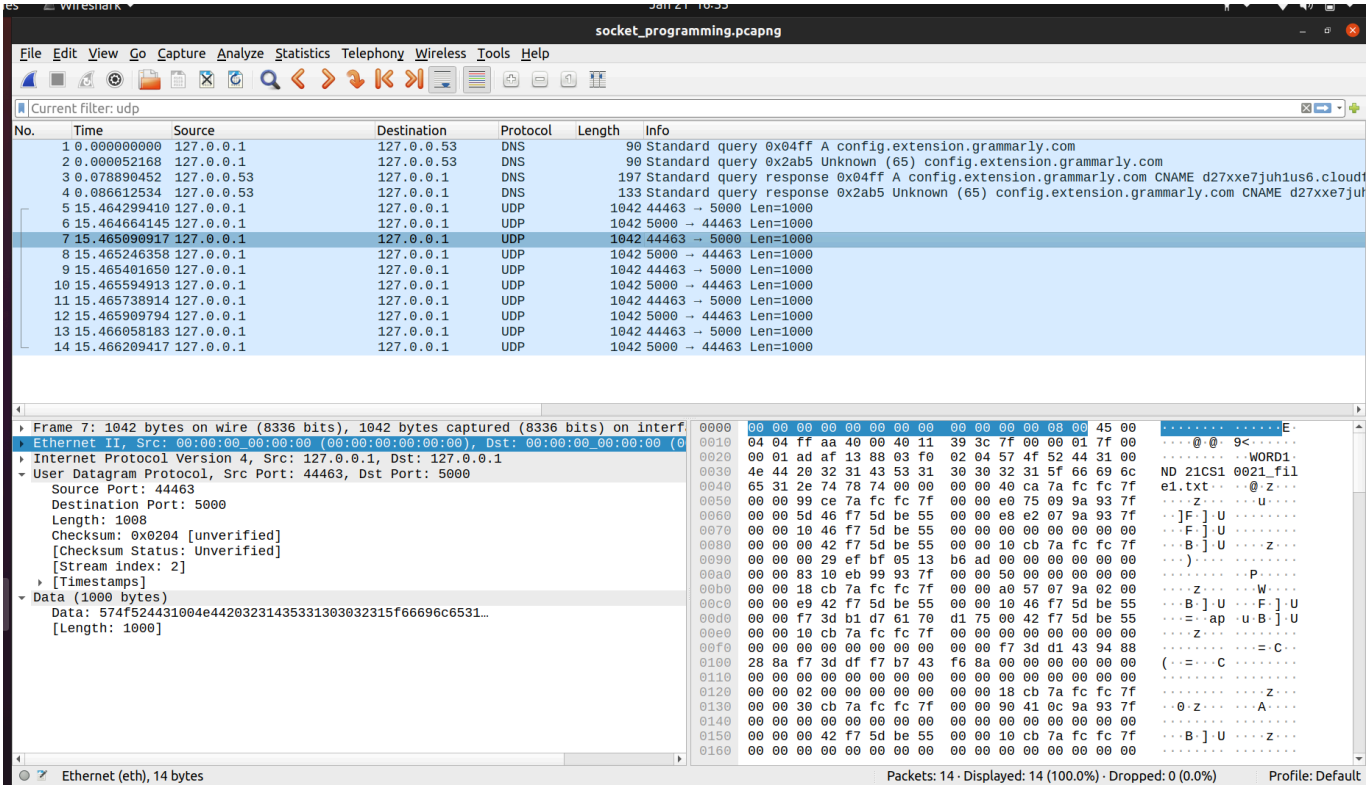
1. Capture all packets exchanged between the client and server during execution. Show the screenshots.

Sol:

From server to client, with “HELLO” message.



From client to server, with “WORD1” message.



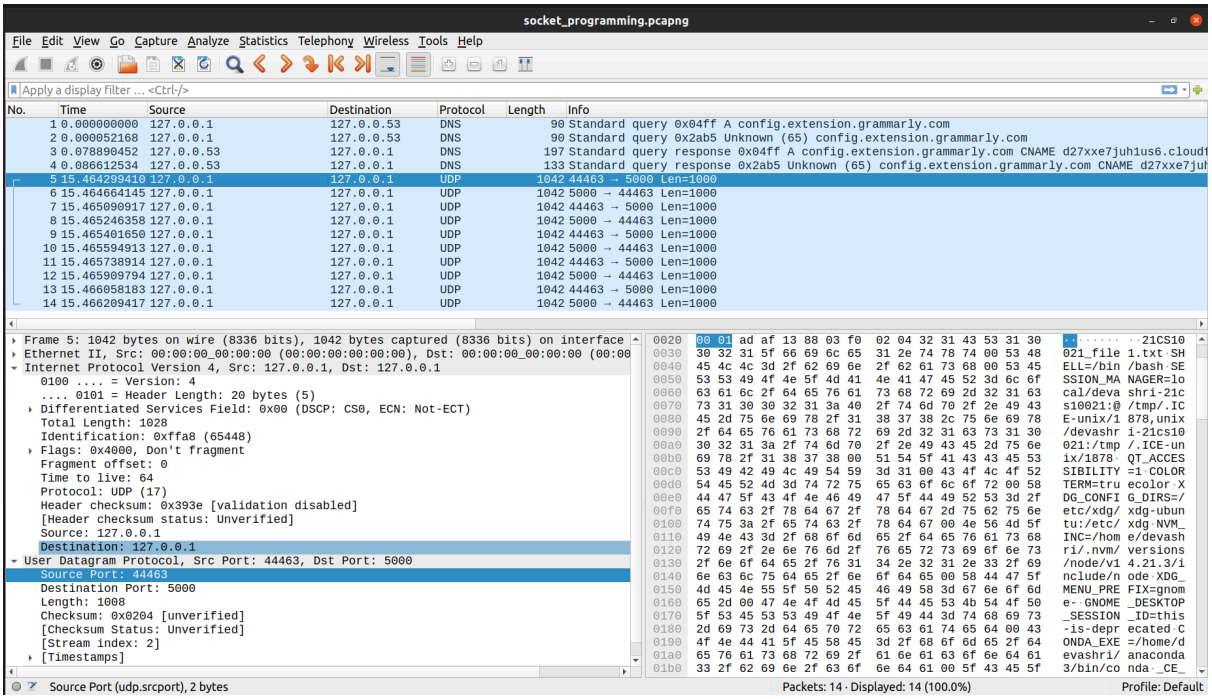
2.What protocol is used for communication?

Sol: UDP protocol is used for communication. We used SOCK_DGRAM in .c file for UDP protocol, so it matches the result.

3.What are the source and destination IP addresses and ports?

Sol: Both IP addresses are the same : 127.0.0.1 as they are on the same machine and it is an Inter-Process-Communication.

Client port = 44463



Server port = 5000

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

Sol:

UDP “Length” = 1008 bytes (this is the UDP header 8 bytes + client’s 1000-byte payload).

Frame size on wire = 1042 bytes (this includes Ethernet/IP/UDP headers, etc.).

The application-layer payload of the filename request is 1000 bytes.

(Wireshark’s “Length” field of 1008 includes the 8-byte UDP header.)

5. What is the size of the server's response for HELLO and the first word (WORD)?

Sol:

The server’s responses for HELLO and the first WORD1 also show a 1000-byte payload each (1008 bytes including the UDP header). Shown below:

HELLO:

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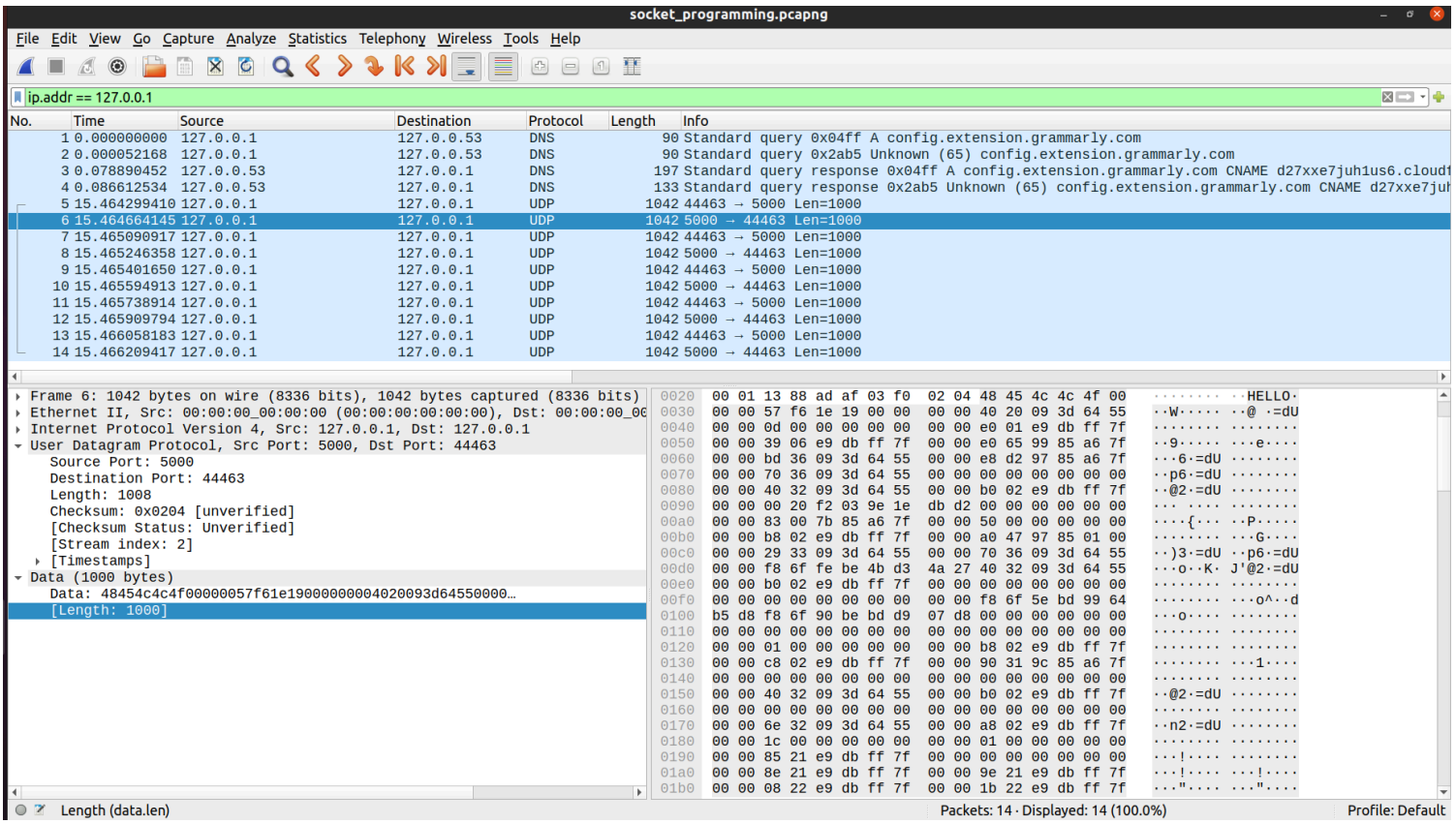
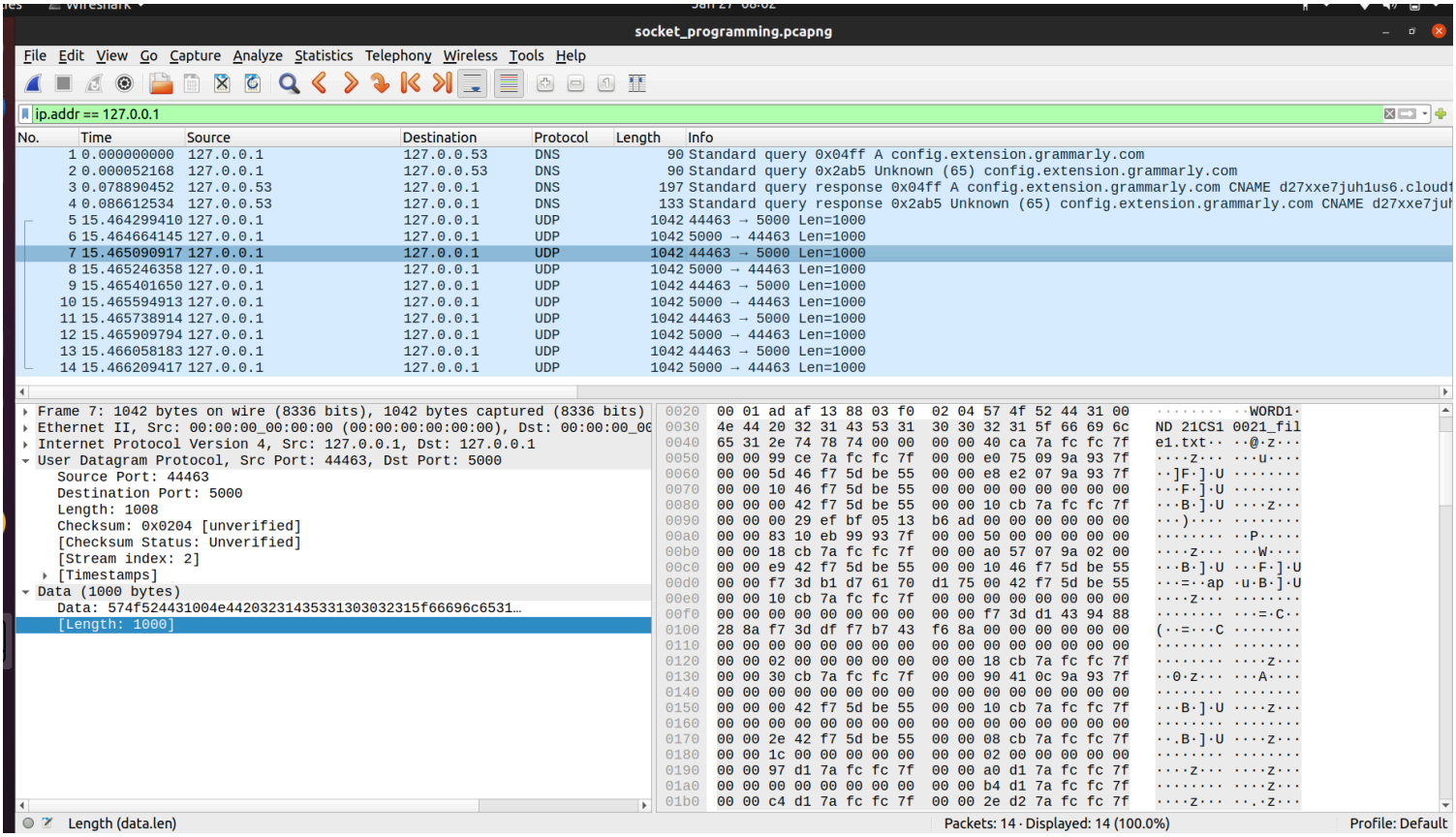


WORD1:



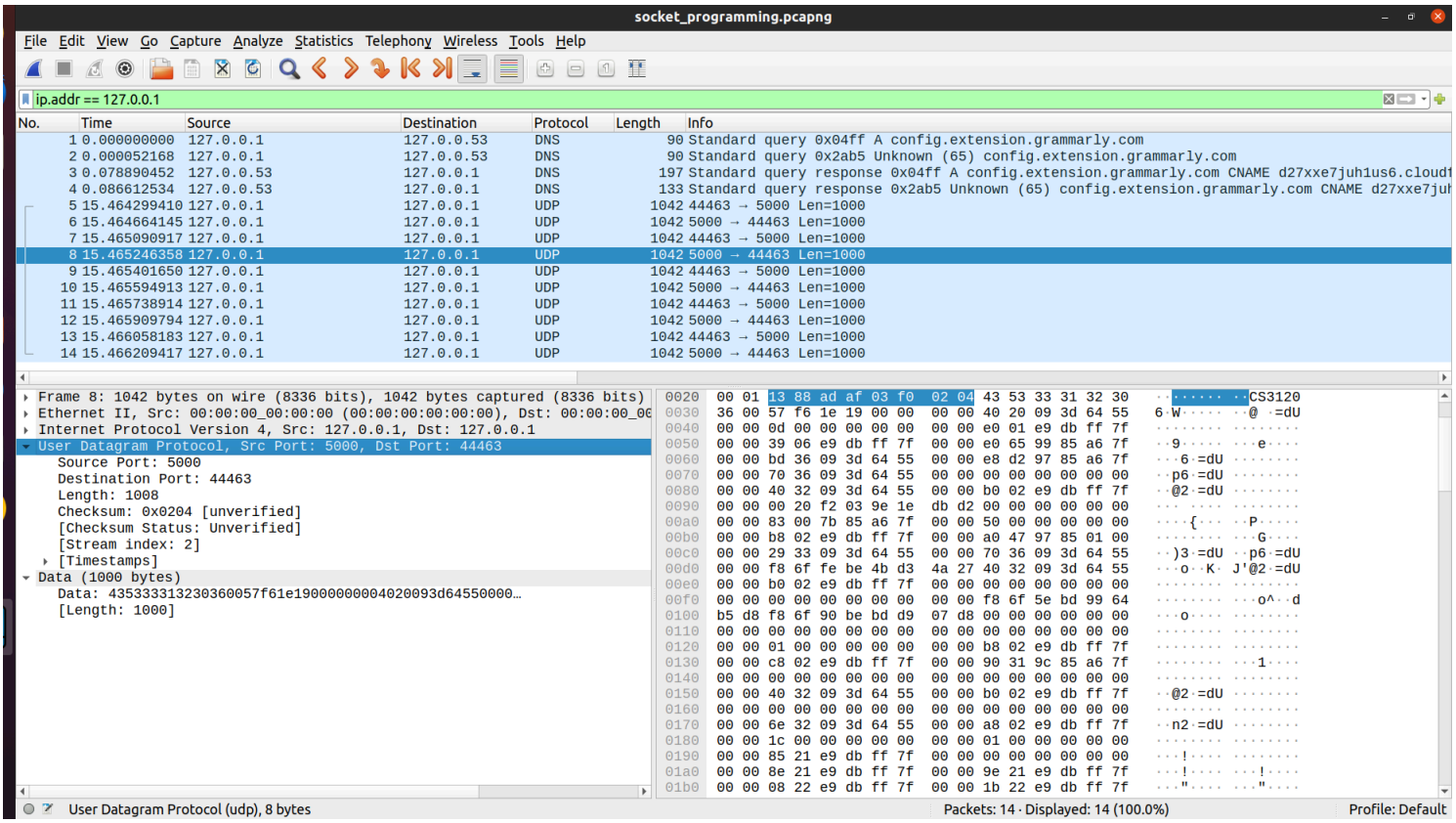
6. Inspect the payload of packets where the words are transmitted. Show the UDP payloads of those packets.

Sol:

The UDP payloads in the hex/ASCII pane contain the alphanumeric words:

Frame containing CS31206: starts with 43 53 33 31 32 30 in hex (ASCII “CS21206”), followed by padding.

Subsequent frames contain each line from the file (e.g. “CS31206”, “CS39006”) at the start of the 1000-byte payload.

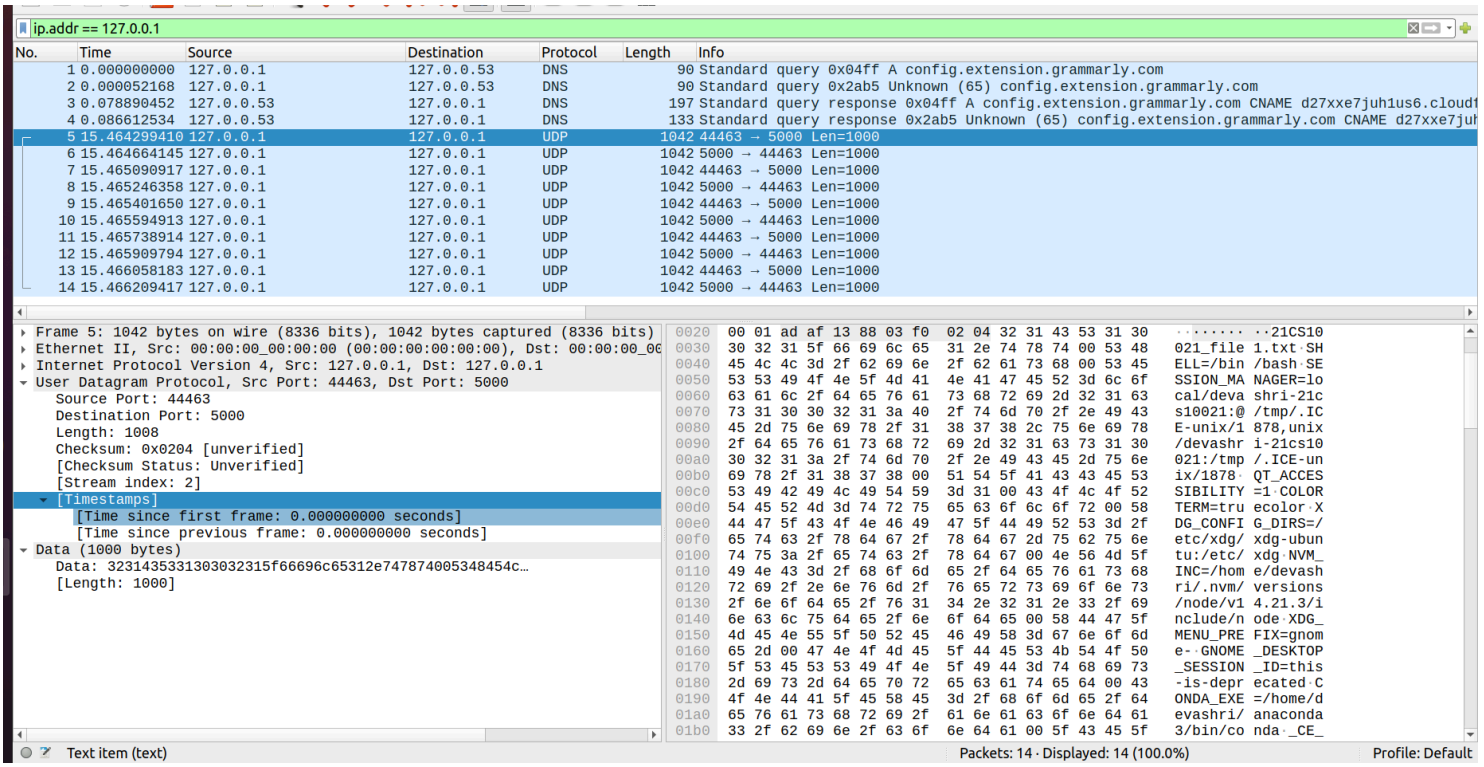


7. Measure the total time taken for the file transfer from start to finish.

Sol:

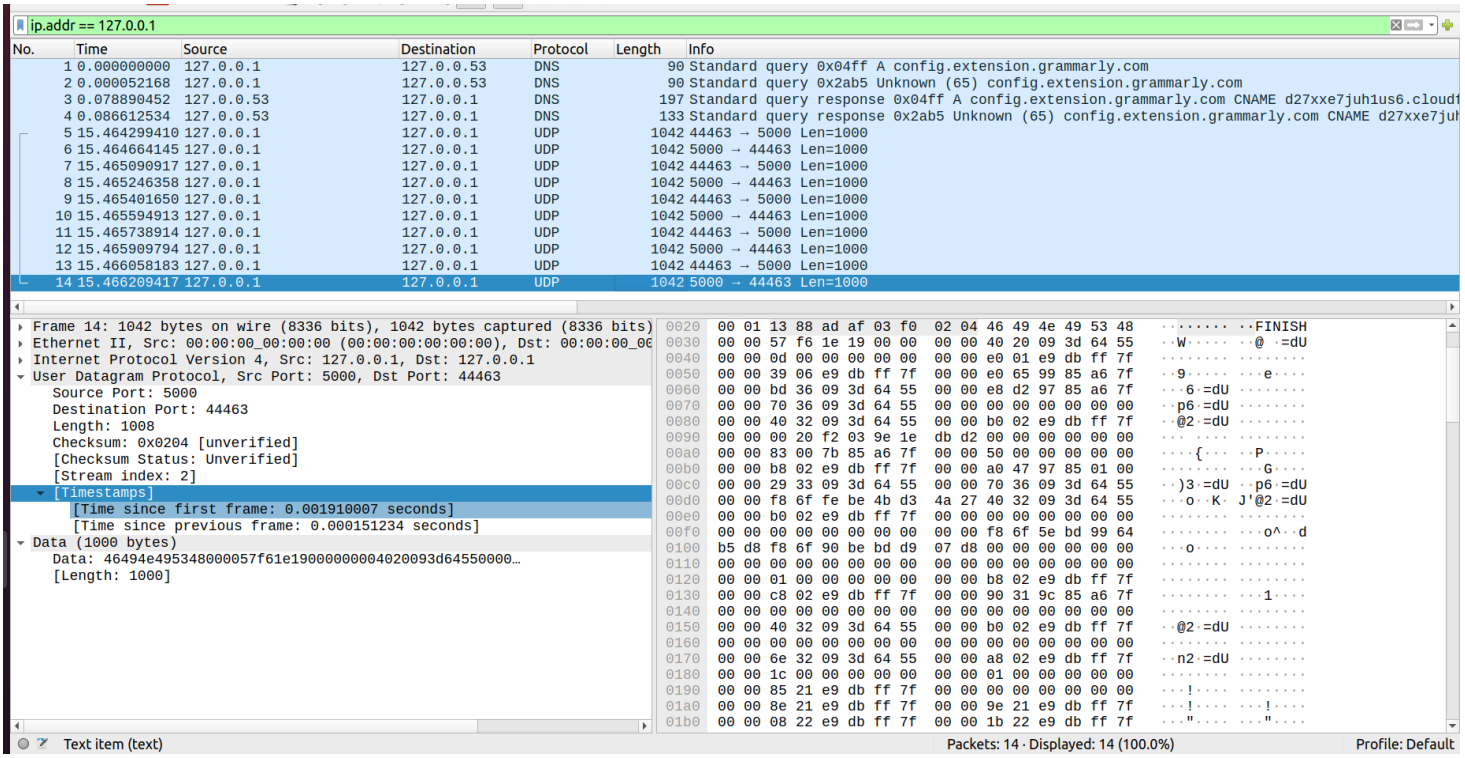
By examining the timestamps of the first UDP packet (the filename request) and the last UDP packet carrying FINISH, the total time on the loopback interface is approximately 0.00191 seconds (≈1.91 ms).

the filename request:



Time : 0 sec

FINISH:



Time: 0.00191 second (1.91 ms)

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

Sol: Each packet is sent with a 1000-byte payload plus (8-bytes) protocol headers. Observing the "Frame length" in Wireshark, the average size on the wire is about 1042 bytes per frame.