Midsem Lab

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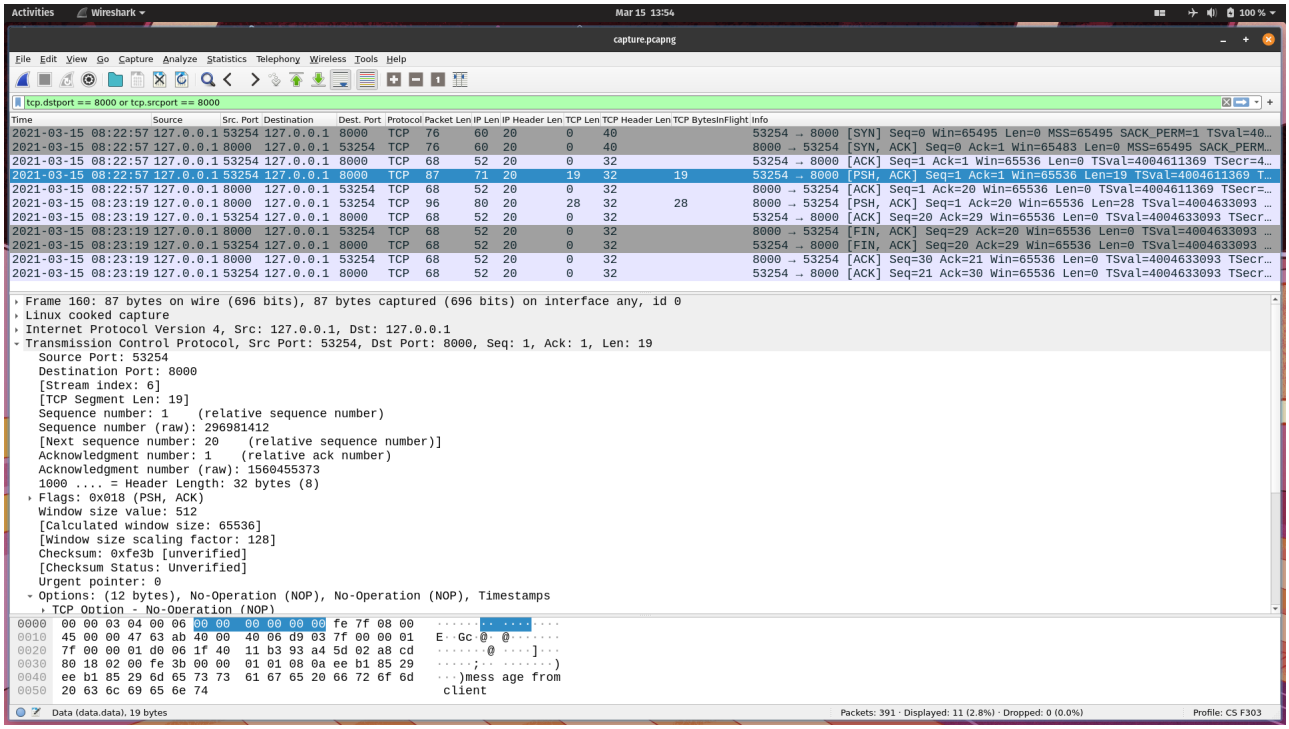
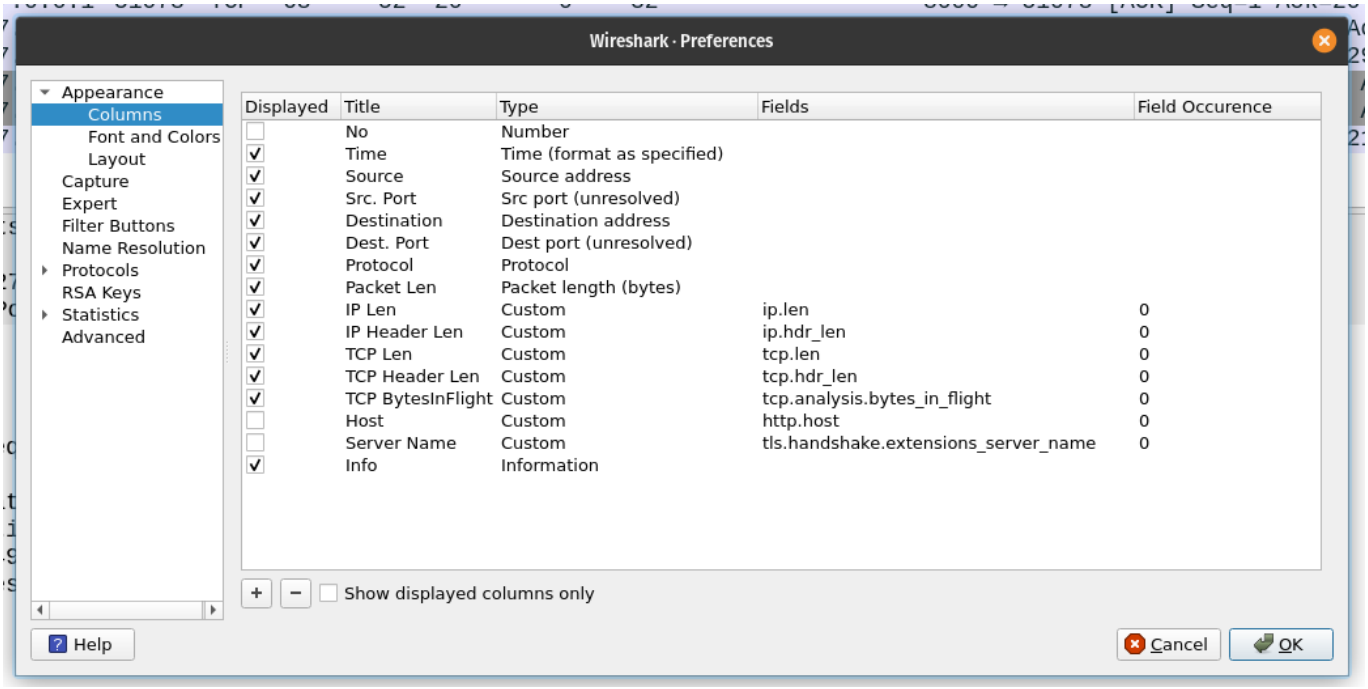
Customizing Wireshark

Columns:

- No. (Hidden)
- Date & time in UTC
- Source IP
- Source port
- Destination IP
- Destination port
- Protocol
- Packet Length
- IP Length `ip.len`
- IP Header Length `ip.hdr_len`
- TCP Length `tcp.len`
- TCP Header Length `tcp.hdr_len`
- TCP Bytes in Flight `tcp.analysis.bytes_in_flight` - Tells bytes that are sent but not ACKed
- HTTP host (Hidden) `http.host`
- HTTPS server (Hidden) `tls.handshake.extensions_server_name`
- Info

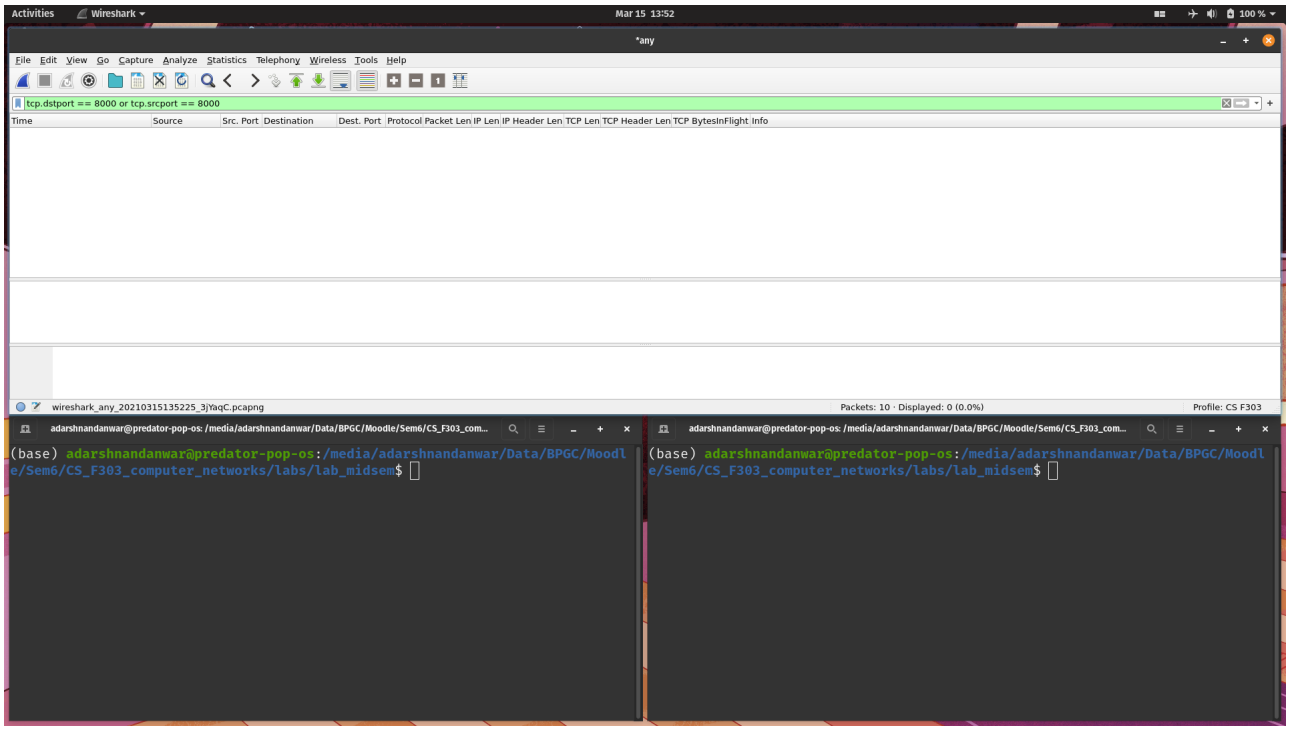


Column Preferences

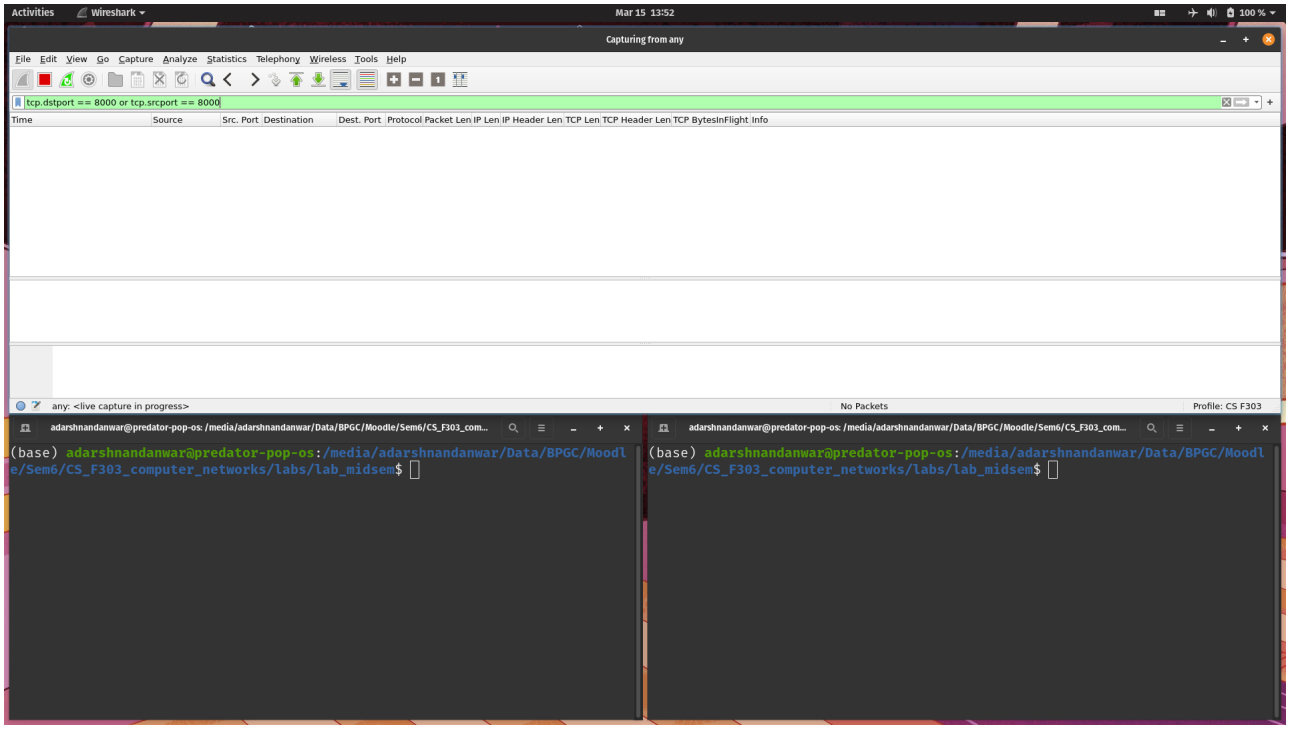


Program Screenshots

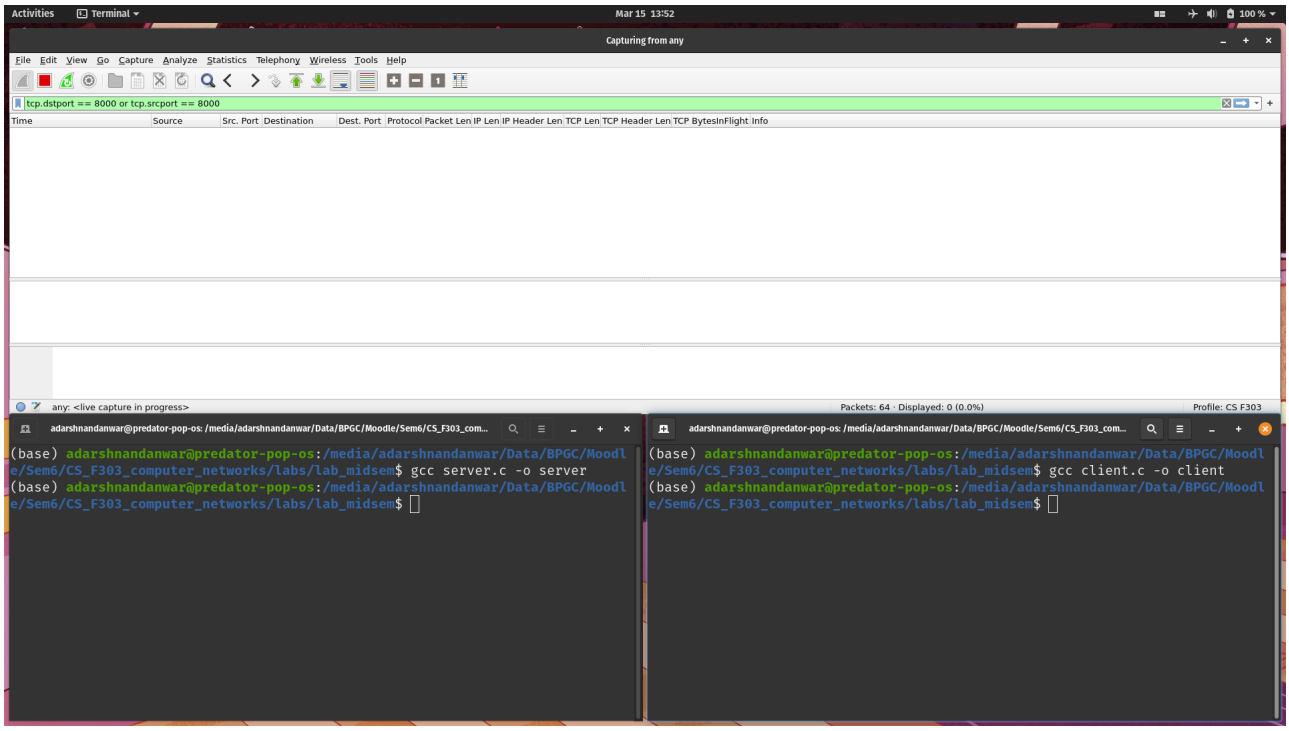
1. Open wireshark and 2 terminals. Change the working directory of the terminals to the directory containing the `server.c` and `client.c` files.



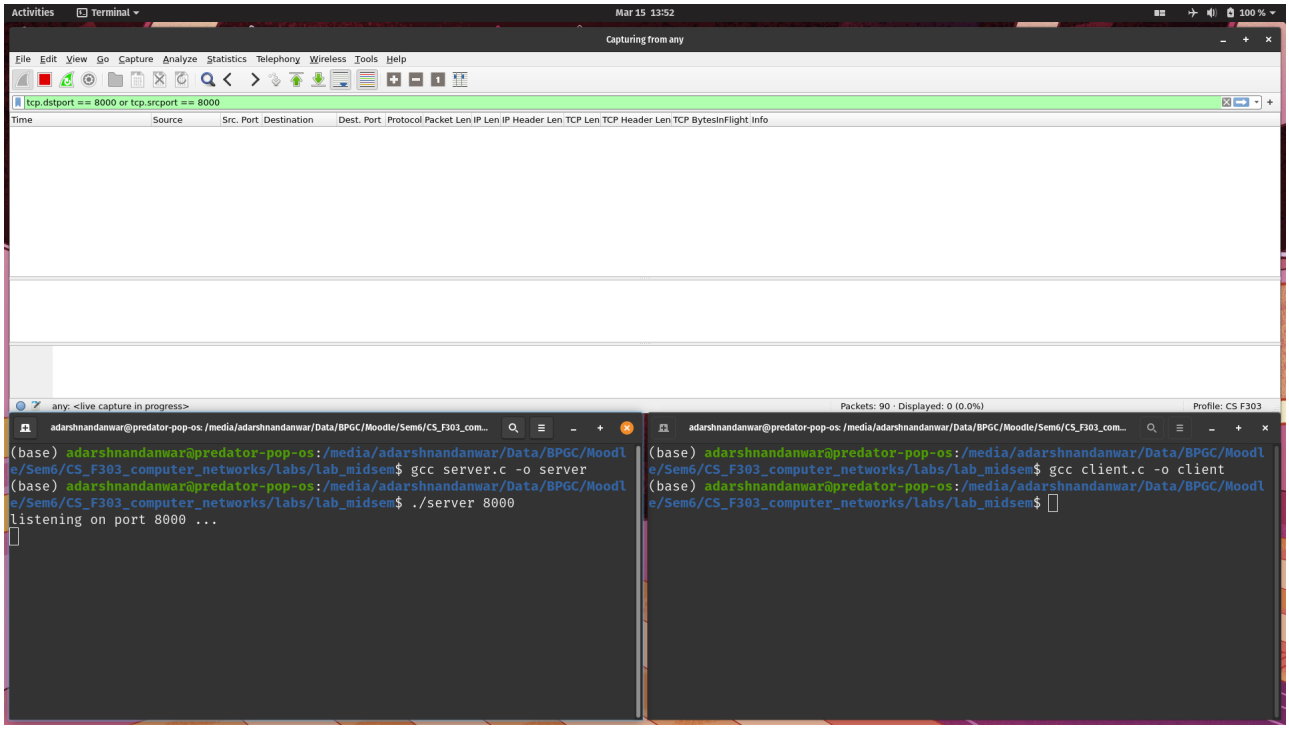
2. Start the wireshark packet capture



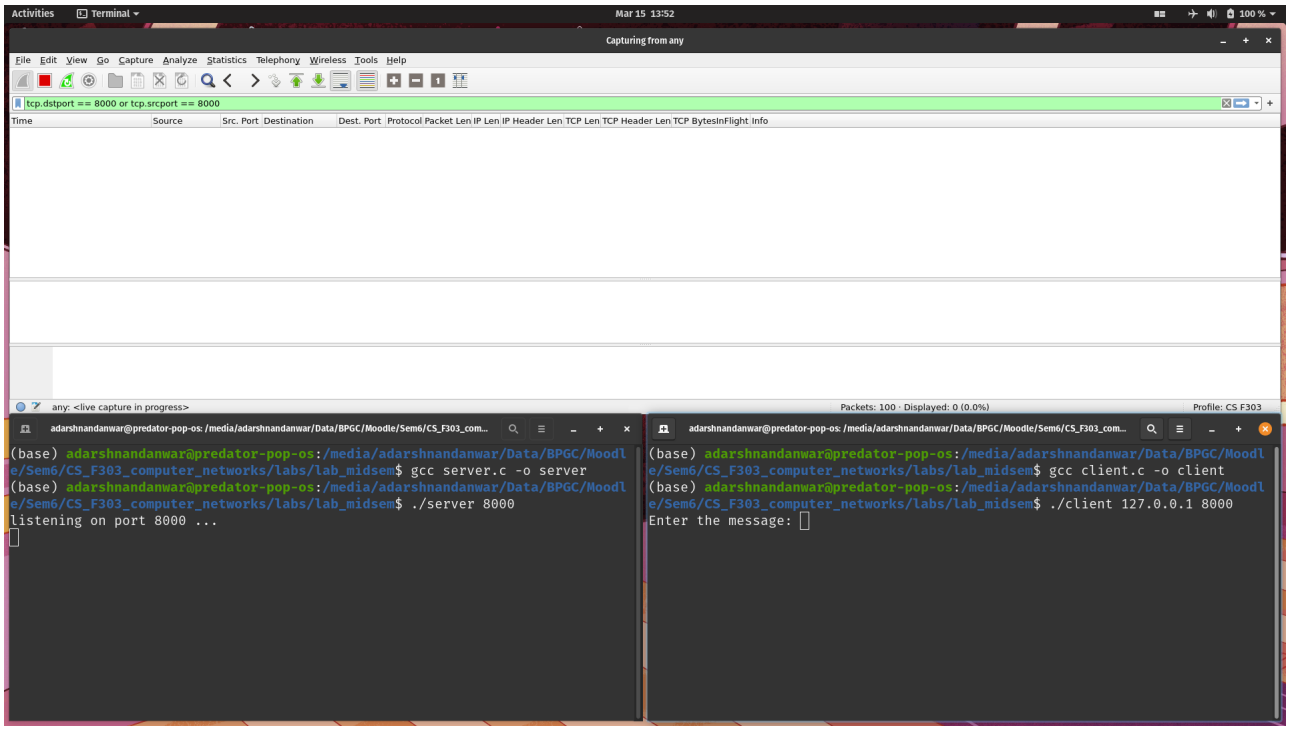
3. Compiling the `server.c` and `client.c` programs.



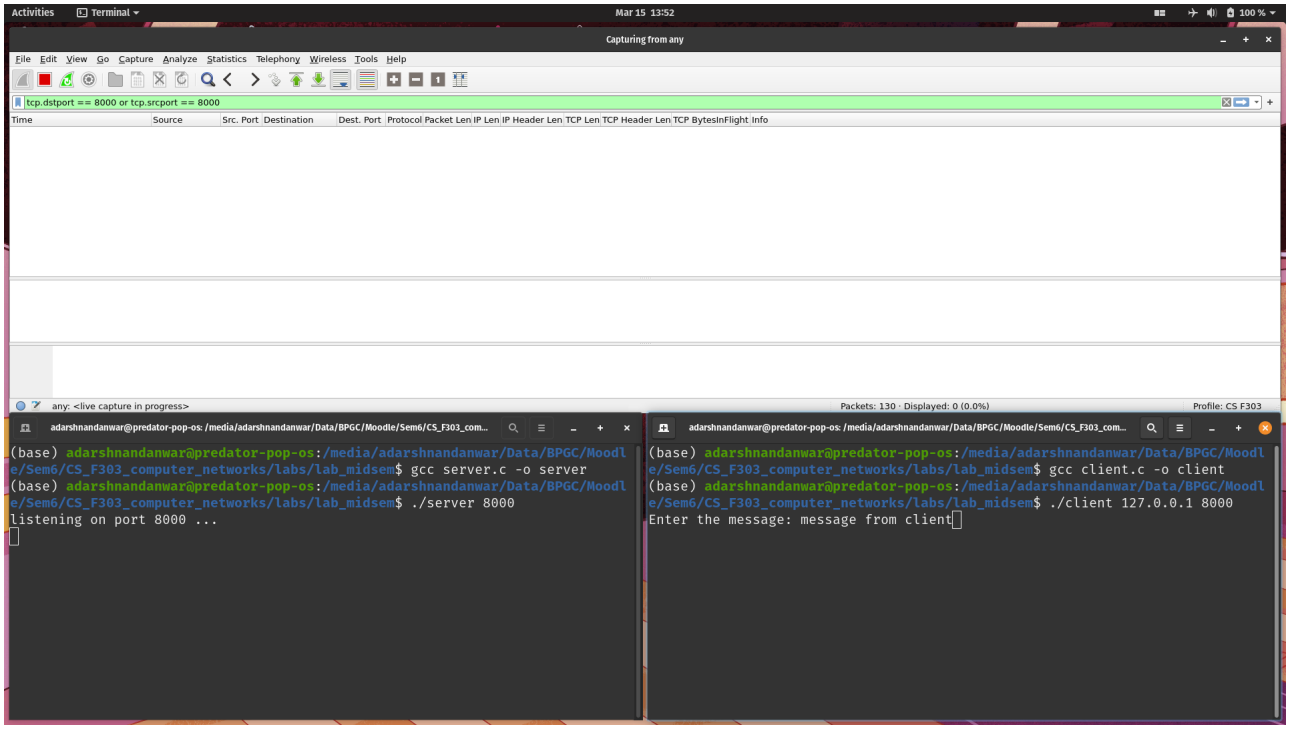
4. Run the server with {port_number} as arguement.



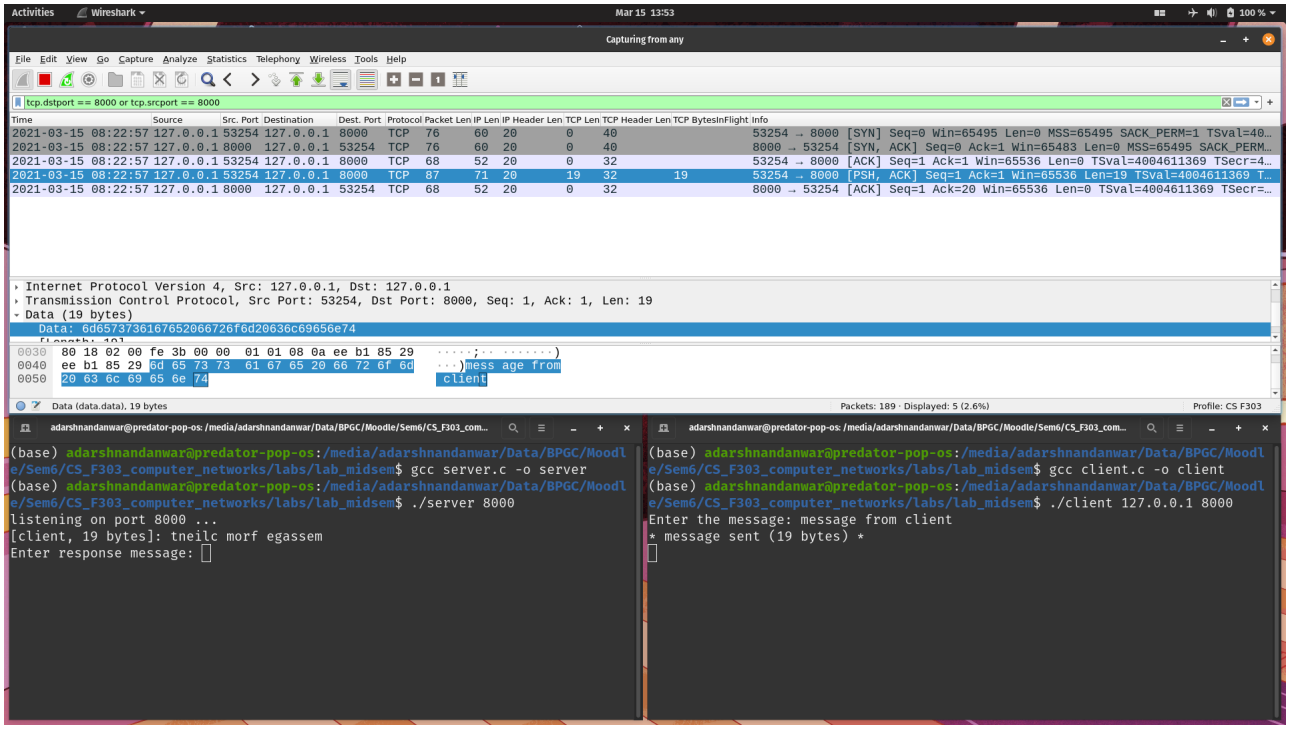
5. Run the client with {server_ip_address, port_number} as arguements.



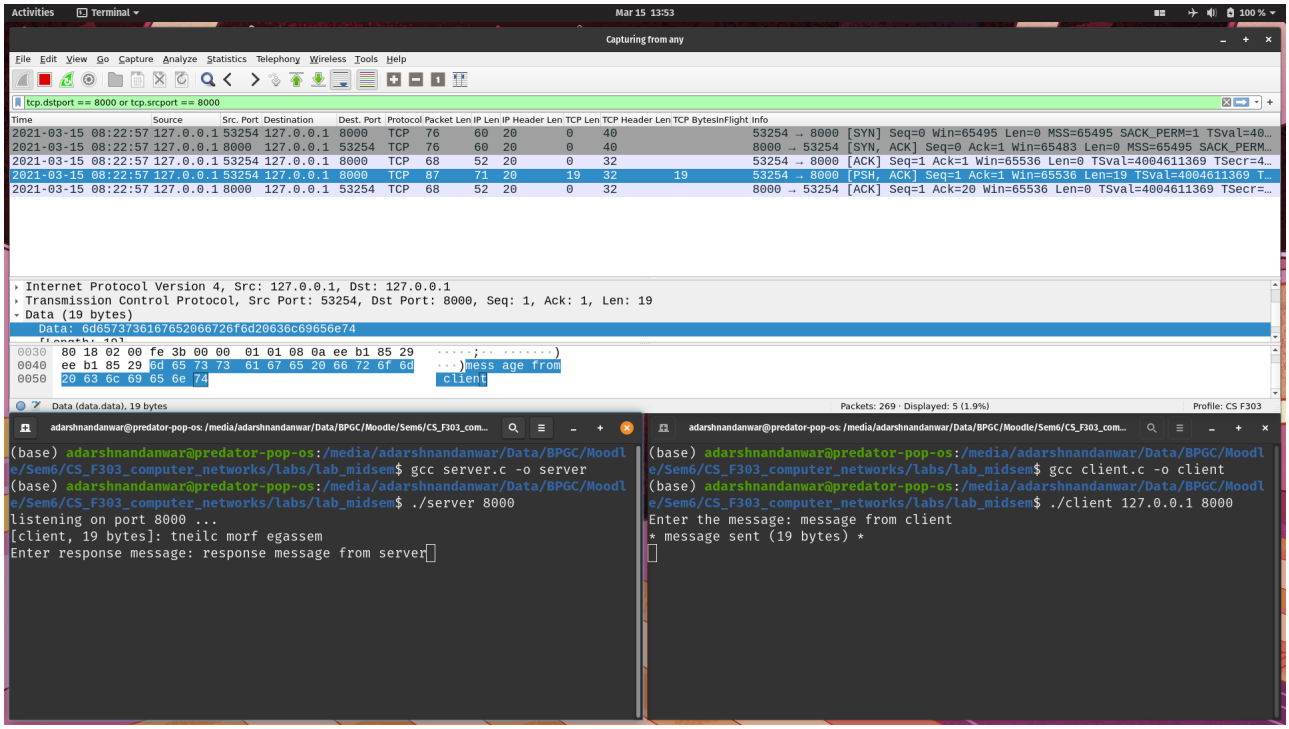
6. Type the message to be sent to the server in the client terminal.



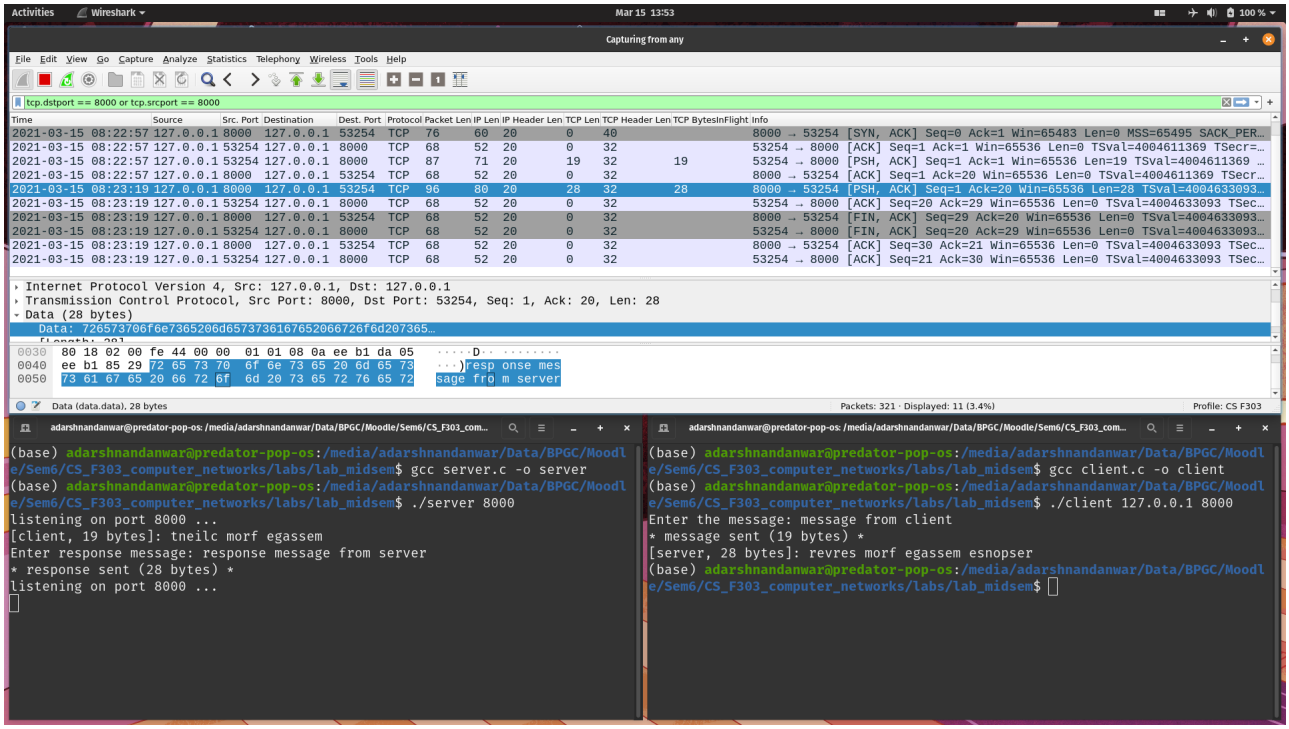
7. Press enter to send the message. The reverse message is printed in the server terminal. The message can be seen in the wireshark packet data.



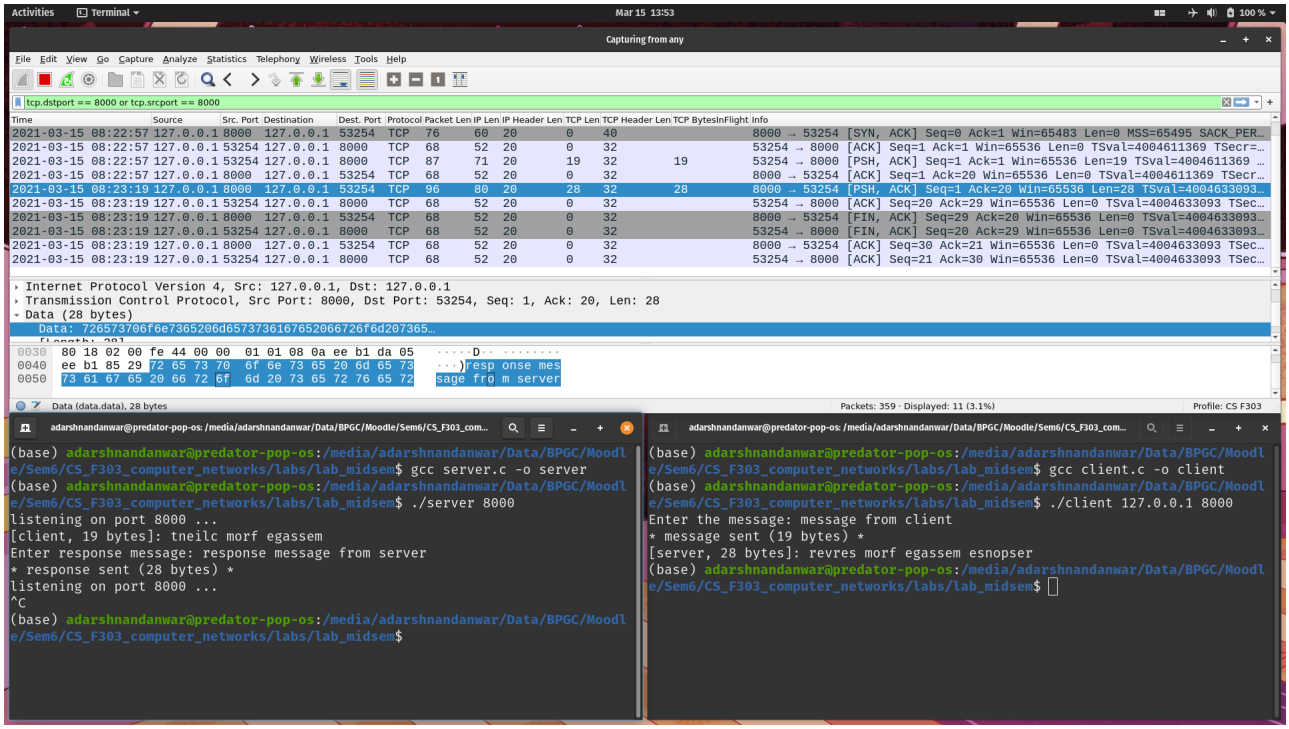
8. Type the response message to be sent to the client in the server terminal.



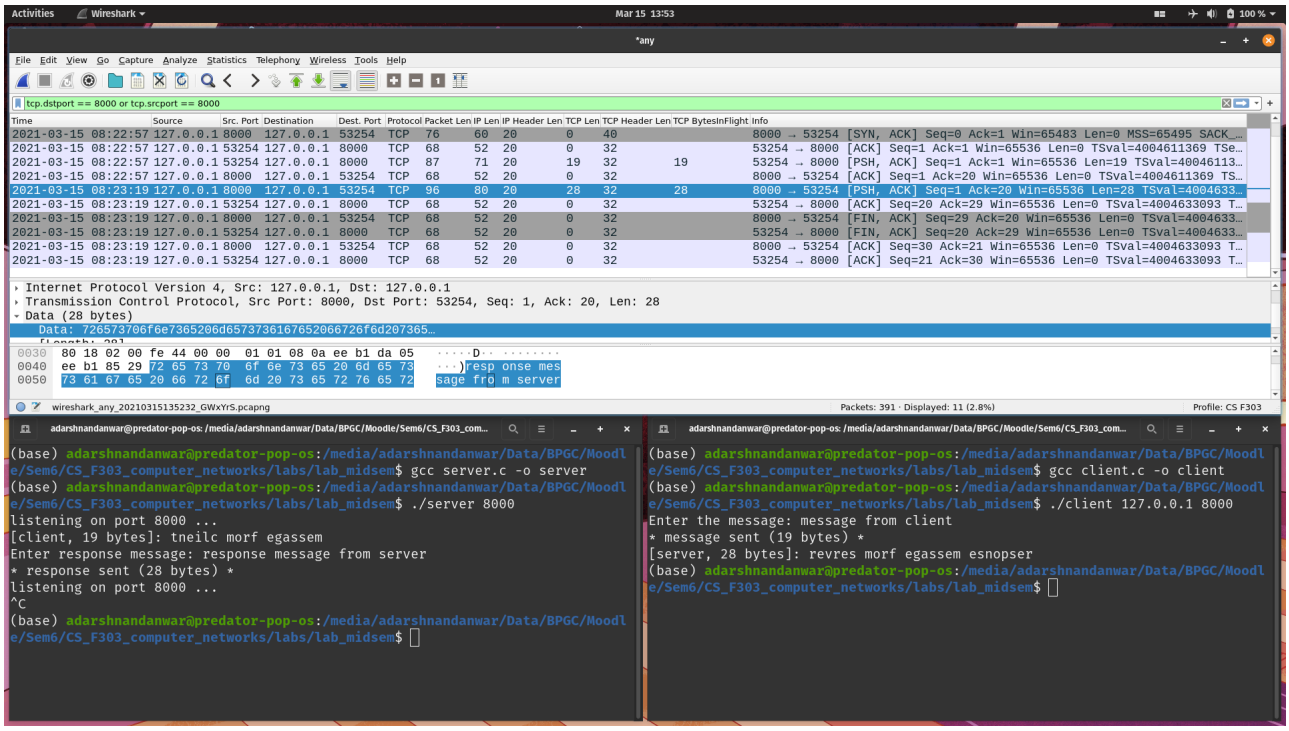
9. Press enter to send the message. The reverse message is printed in the client terminal. The message can be seen in the wireshark packet data.



10. To exit the server, press ctrl+c.



11. Stop the wireshark packet capture.



Wireshark Capture Analysis

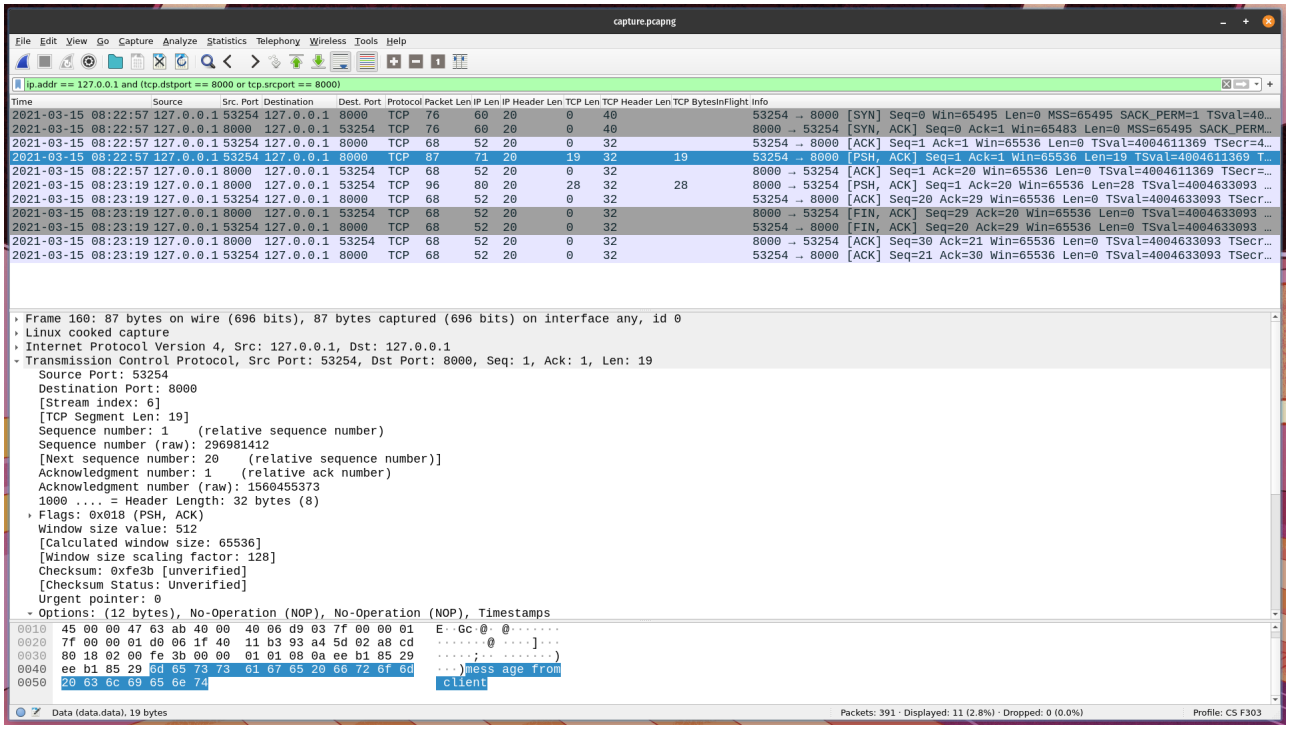
Capturing the packets between the client and server

All packets going in and out of the server

```
ip.addr == 127.0.0.1 and (tcp.dstport == 8000 or tcp.srcport == 8000)
```

- `ip.addr` is used get packet's IP address

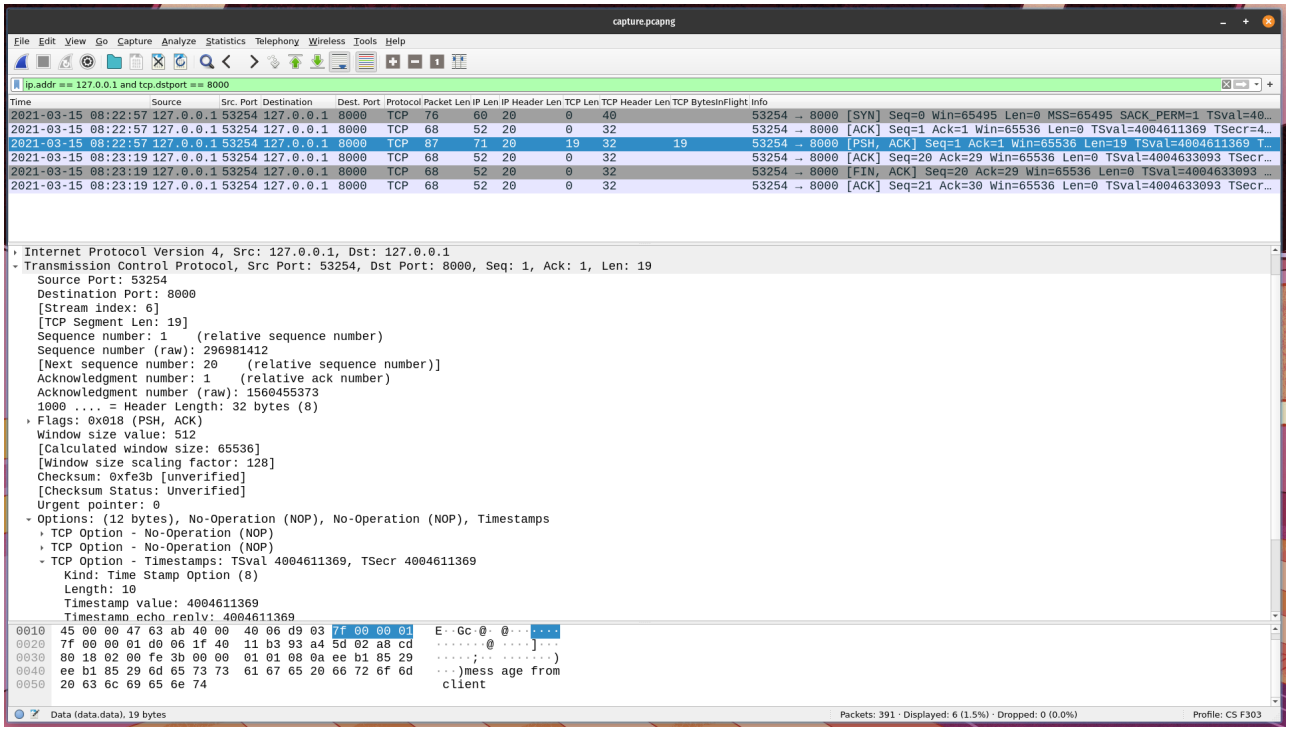
- `.dstport` is used to get the destination port of the packet.
- `.srcport` is used to get the source port of the packet.
- `==` logical operator is used to compare values.
- Using the above filter, we can capture all the tcp packets going in and out of the server port (8000).



Packets sent to the server

```
ip.addr == 127.0.0.1 and tcp.dstport == 8000
```

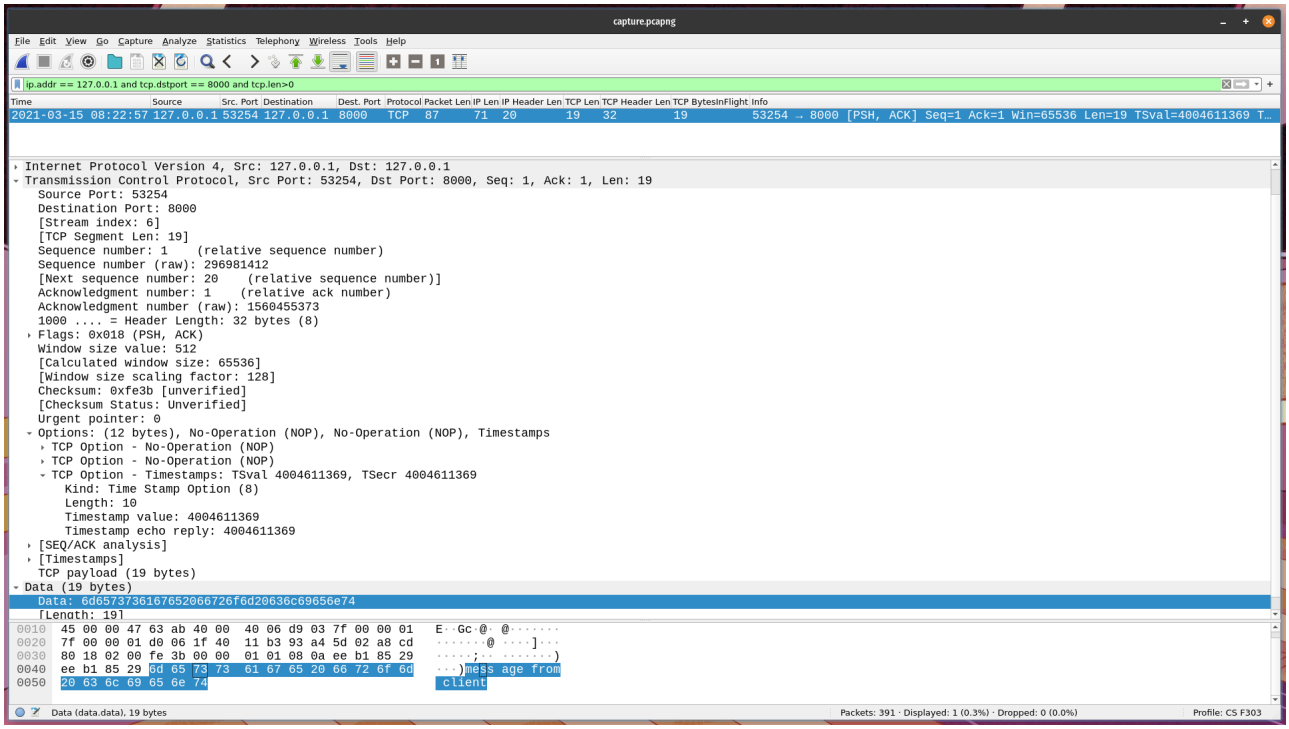
- Using the above filter, we can capture all the tcp packets whose destination is the server port (8000).



Packet sent to the server containing data

```
ip.addr == 127.0.0.1 and tcp.dstport == 8000 and tcp.len>0
```

- Using the above filter, we can capture all the tcp packets whose destination is the server port (8000).



Size Comparision

- IP Length includes the IP Header, TCP Header and the application data.

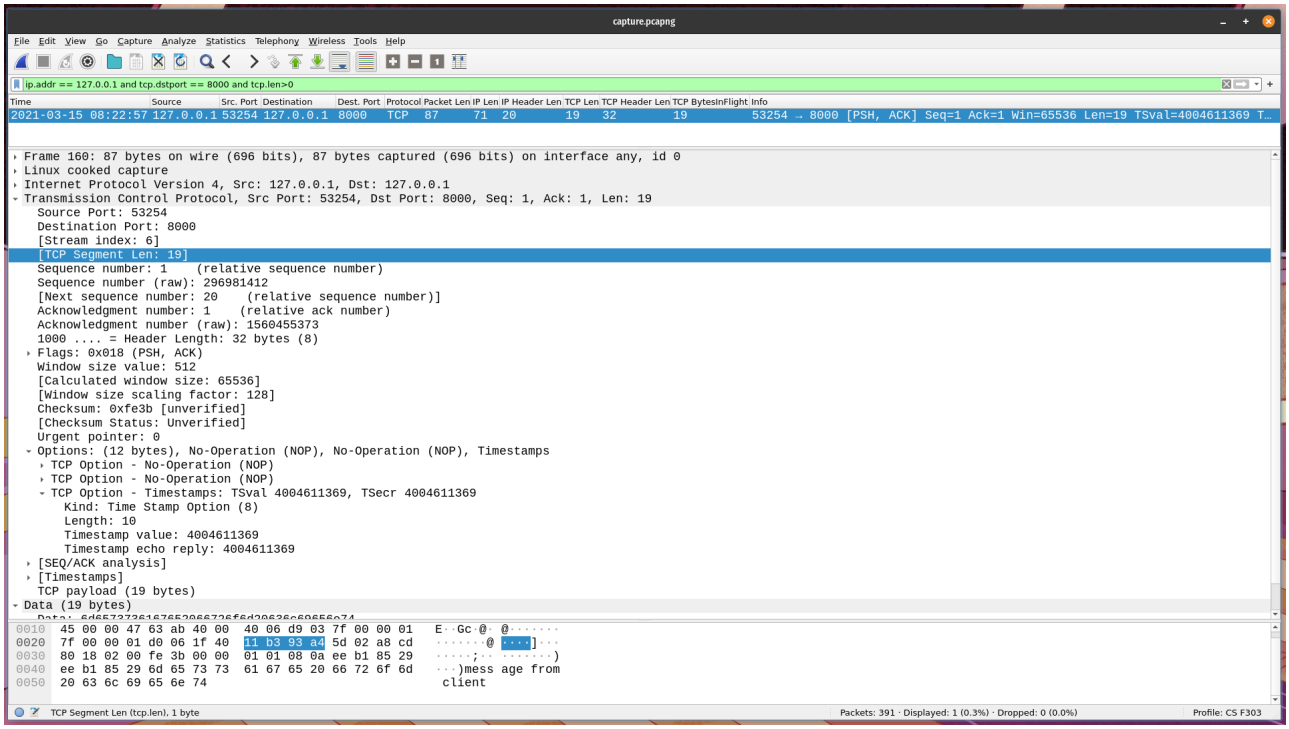
```
ip.len = ip.hdr_len + tcp.hdr_len + tcp.len
```

- The custom columns added are described in the section Customizing Wireshark

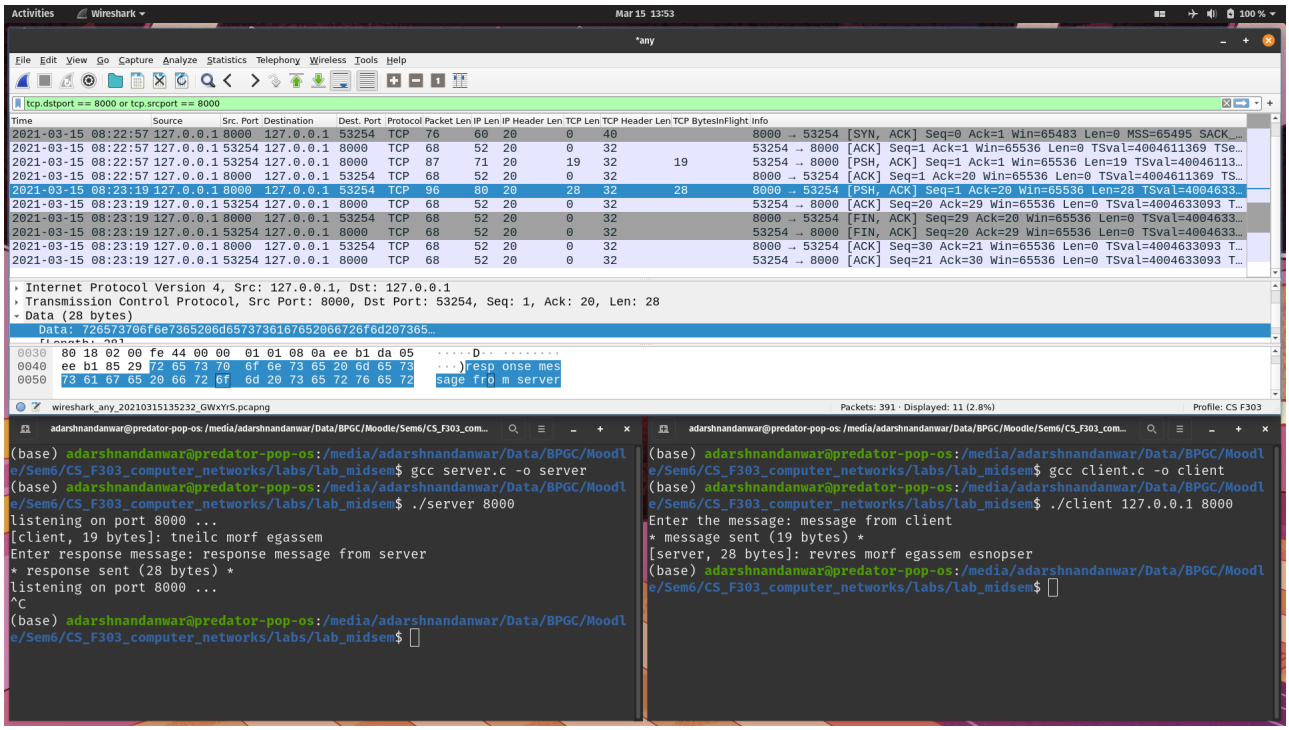
Client to Server

- In the packet sent from the client to the server containing the data, the frame size is 87 (column "Packet Len") bytes. The frame header takes 16 bytes.
- The remaining 87-16 = 71 bytes is the IP length (column "IP Len" `ip.len`). The IP header length is 20 bytes (column "IP Header Len" `ip.hdr_len`) and the TCP header length is 32 bytes (column "TCP Header Len" `tcp.hdr_len`). The TCP segment length or the payload length is given by the above

formula = 71-20-32 = 19 bytes. This value can be seen highlighted in the screenshot:



- This value matches with the value of TCP Segment Length `tcp.len` given in the "TCP Len" column.
- This value also matches with the number of bytes sent by the client and the number of bytes received by the server which is printed in `STDOUT` in their respective terminals.



- The data is stored in byte number 68 to 86 of the packet which can be seen in the byte view of the wireshark window.