Computer Networks: Socket Programming Report

Bhavya Chopra | 2018333

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File structure and working:

The submission contains four folders:

- server
  - Contains the server.c program file
- client
  - Contains the client.c program file
- shared_drive
  - Acts as the shared drive/folder between the client and the server
  - Contains sample.txt file for testing file transfer
- local_drive
  - Acts as the local drive to which the client fetches and downloads files

To run the programs, execute the commands:

- Run ‘make’
- In one terminal, cd into the server directory, and in another terminal, cd into the client directory if running on the same machine
- Run ./server in the first terminal, and ./client 127.0.0.1 in the other. (Client takes the IP address of the server as an argument, localhost in this case)

The server will create and bind its socket and listen for clients connecting to it. At a given time, only one client can connect to the server.

The client will create and bind its socket and make a connection to the server. Once connected, it will prompt the user to enter a filename. The client will send the filename to the server. If the file is not found in the shared drive, the server sends the status to the client and again waits to receive the filename. The client shall prompt the user for the filename and communicate with the server unless the user provides a filename that is present in the shared drive.

Once the file has been located in the shared drive by the server, it begins the file transfer and sends the file content in streams of 1024 bytes to the client. The client receives the file content and writes it to a file in the local drive.

Once the file download is complete, the client closes its connection to the server and its execution terminates. The server continues to listen for other clients.

Question 2: Wireshark Trace

How many TCP connections are made

ONE connection: 1 TCP connection is made when the client connects to the server.
(refer image 1)

What is the port number of the server and what is that of the client

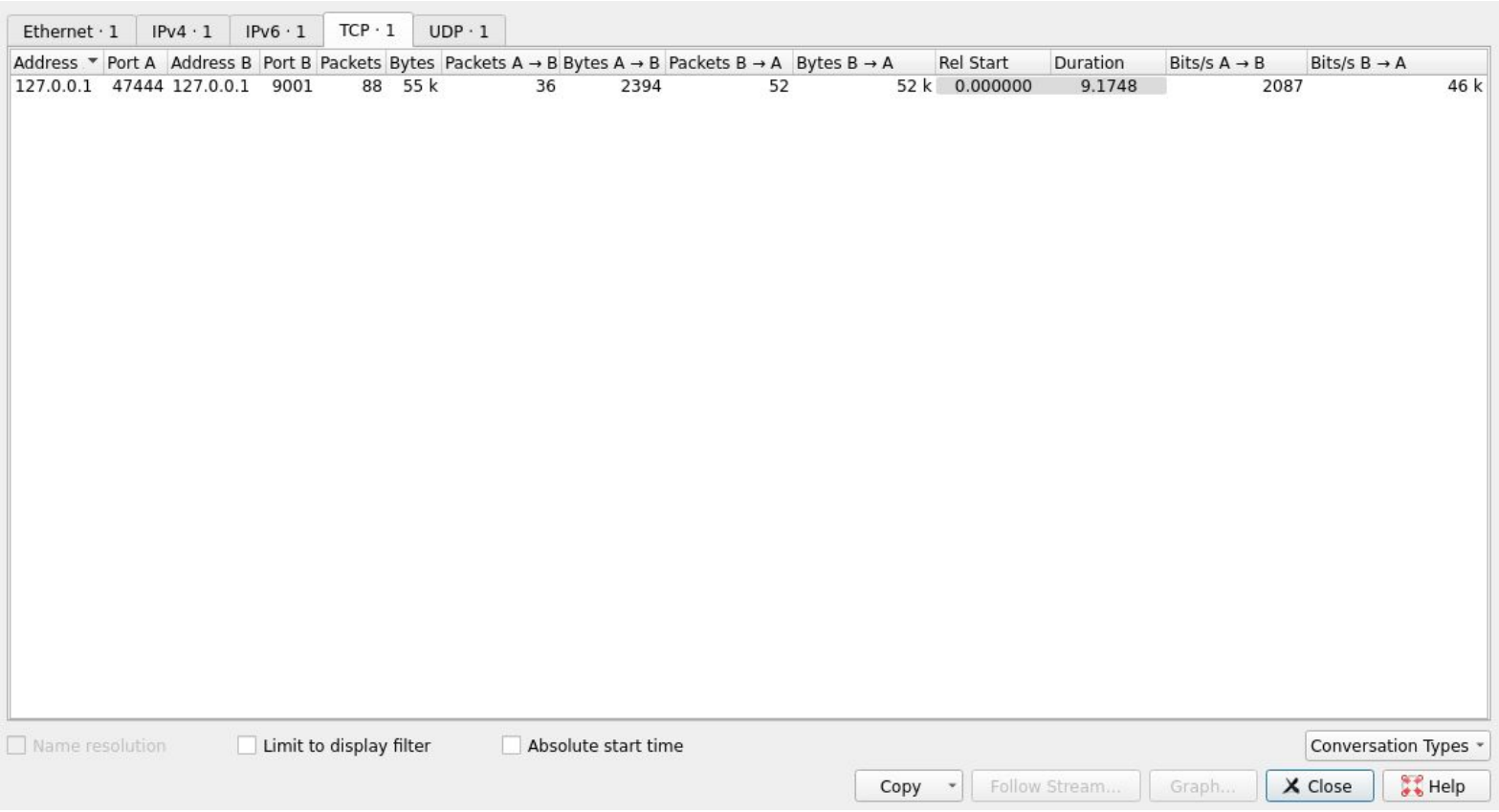
Port number of client (A): **47444**
Port number of server (B): **9001**
(refer image 1)

How many packets are exchanged between client and server

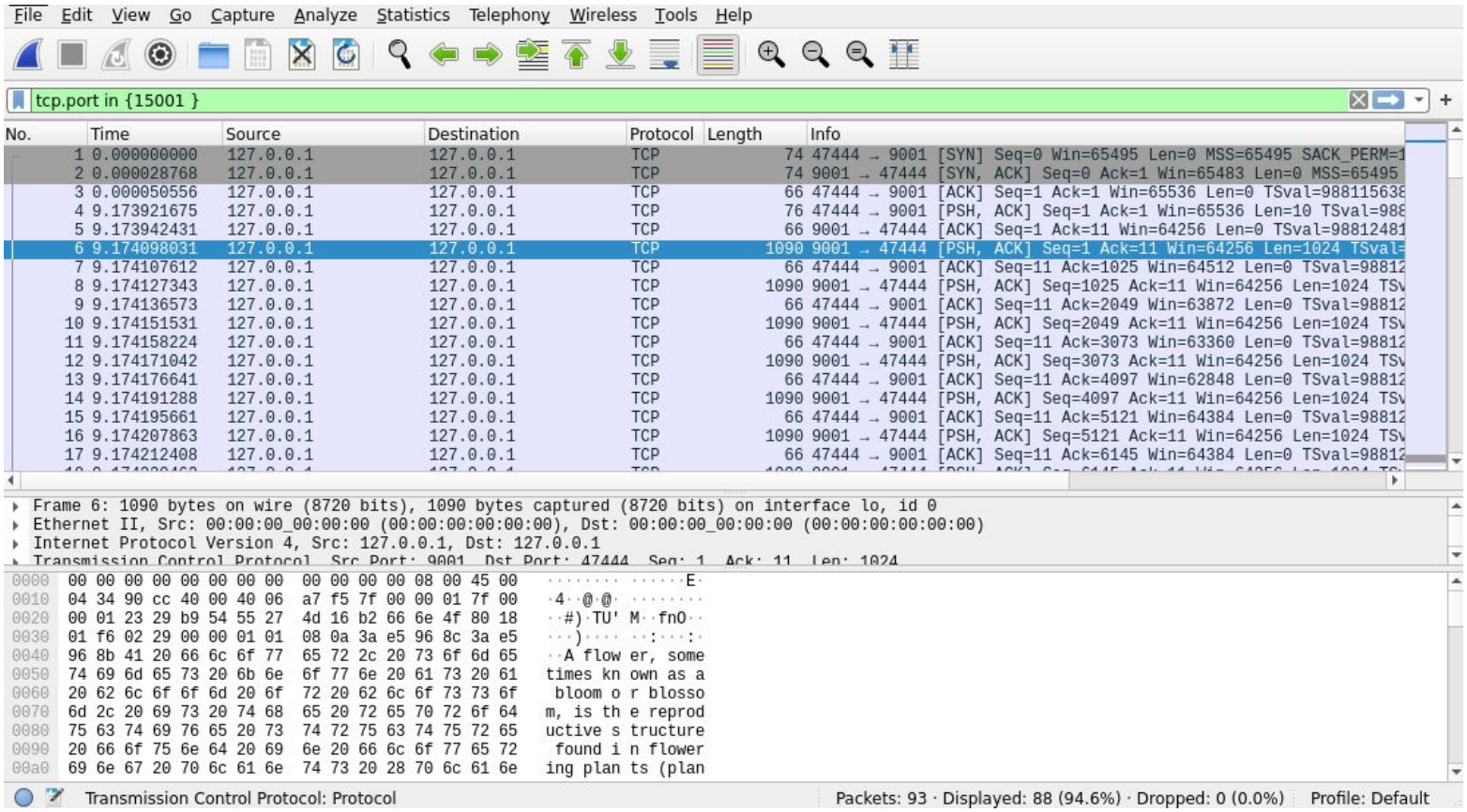
Total packets exchanged: **88**
Packets from client to server (A→B): **36**
Packets from server to client (B→A): **52**
(refer image 1)

How much time is needed to download the file

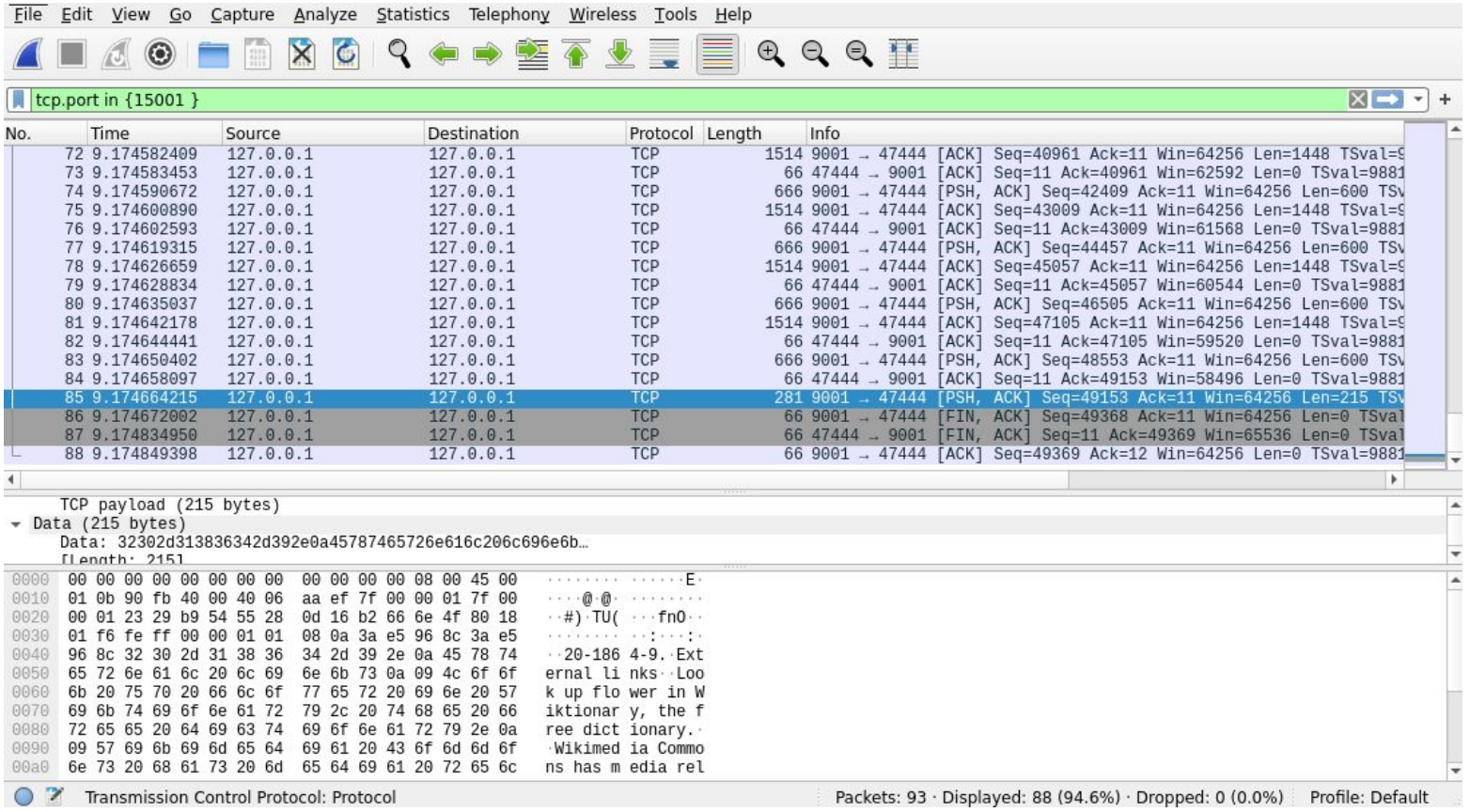
Time taken for file download (in seconds): **0.000566184**
Time when download started: **9.174098031 s** *(refer image 2)*
Time when download completed: **9.174664215 s** *(refer image 3)*



(Image 1)



(Image 2)



(Image 3)