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COE18B056

Objective:
Write a Client and Server program to send a BITMAP image file from client to server in a binary encoded form. It means you have to transform the Image into a binary bit-stream and send it through the Client socket. At the Server side same bit stream you have to store into a file with the same file extension (Bitmap). After completing the program in TCP/UDP, you have to analyse the performance in terms of Latency between the binary encoded text file and bitmap image file.

Approach:

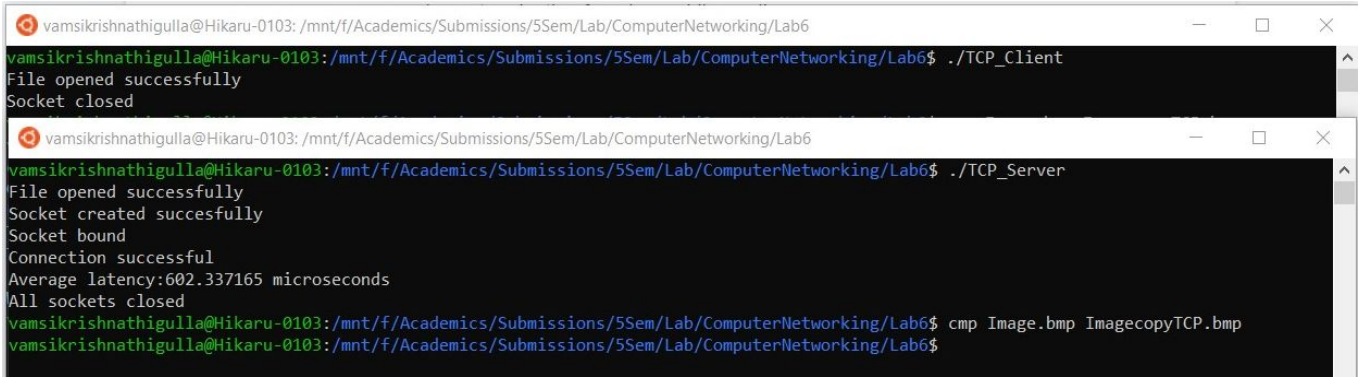
1. Open the file on the client side and store the contents of the file into a buffer. Then send the buffer to the server, i.e. send a stream of bits to the server, through the buffer.

- **Note:**
    - Since the file is a .bmp file, the content is stored in binary format, thus opening the file for reading should be done with rb mode i.e binary encoded.
    - Take a buffer of sufficient size.
    - As the data is binary, '\0' is a valid character in the file and thus it should not be used as a termination for a loop while reading.
    - The data of the buffer is not a string.

1. On the server side, open a file in write binary mode (wb) and then store the contents of the received buffer into the file.
2. After copying the contents into the file, close the file and socket (for secure transfer of contents).

1. Use timeval for time measurement.
    a. Use gettimeofday to measure time accurately before and after receiving the file on the server side.
    b. Take the difference between the times and calculate the latency in microseconds.
2. Use the cmp command to compare the two files to verify that the file has been copied successfully without any differences between the two.

TCP Method Output:



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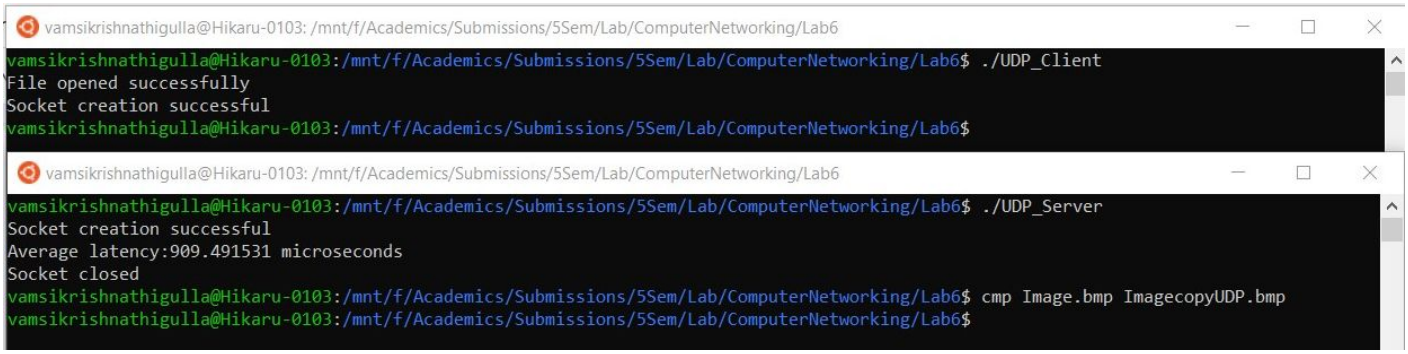
UDP Method Output:



Note: Source codes and BITMAP input file and outputs have been uploaded in the respective folders in the drive.