Networks Lab - Assignment 1

1. Different protocols used -

Steps

- ➢ Start wireshark with capture filter set to - host 10.5.18.163
- ➢ Now make connection with TCP server using command-

  wget --no-proxy http://10.5.18.163:8000/1.jpg

  And with UDP server using command-

  iperf -c 10.5.18.163 -u -b 28000

Observations

For TCP test cases-

- ➔ Application layer protocol- HTTP
- ➔ Transport layer protocol- TCP
- ➔ Network layer protocol- IPv4

For UDP test cases-

- ➔ Transport layer protocol- UDP
- ➔ Network layer protocol- IPv4

2. Analysis of packet trace using Wireshark

a. TCP packet transfers for each of the images from 1.jpg to 5.jpg-

- Each TCP packet is of different length

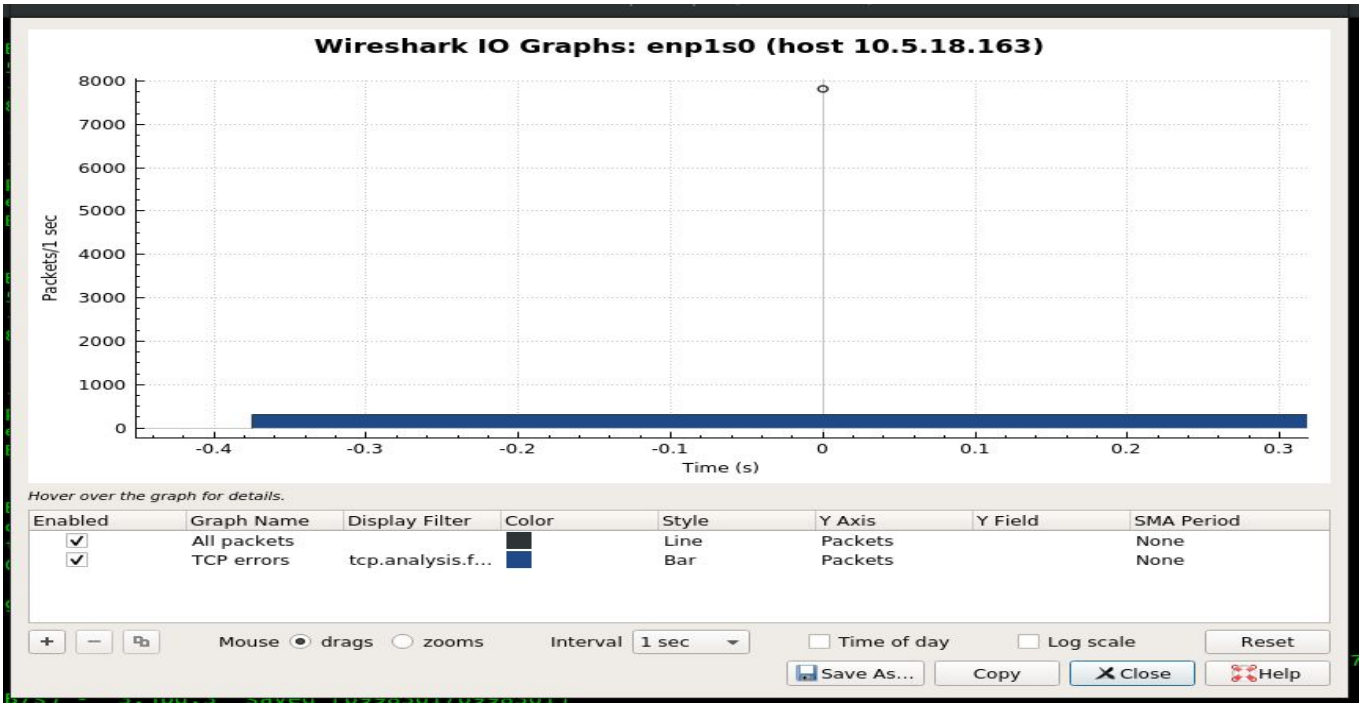
- Packet analysis for each image-

Image	**1.jpg**	**2.jpg**	**3.jpg**	**4.jpg**	**5.jpg**
Number of packets	1066	2778	7099	3240	3283
Different packet sizes (Bytes)	66,74,214, 83,5858,15 14,2962, 4410,2486	66,74,214, 83,5858,15 14,2962, 4410,10202 ,7306,1751, 18890	66,74,214,8 3,5858,1514 ,2962, 4410,1864, 13098	66,74,214 ,83,5858, 1514, 2962, 4410, 1864, 1974	66,74,214 ,83,5858, 1514, 2962, 4410, 7306,140 2, 13098
Average pkt size(bytes)	917	1222	1052	1109	1089

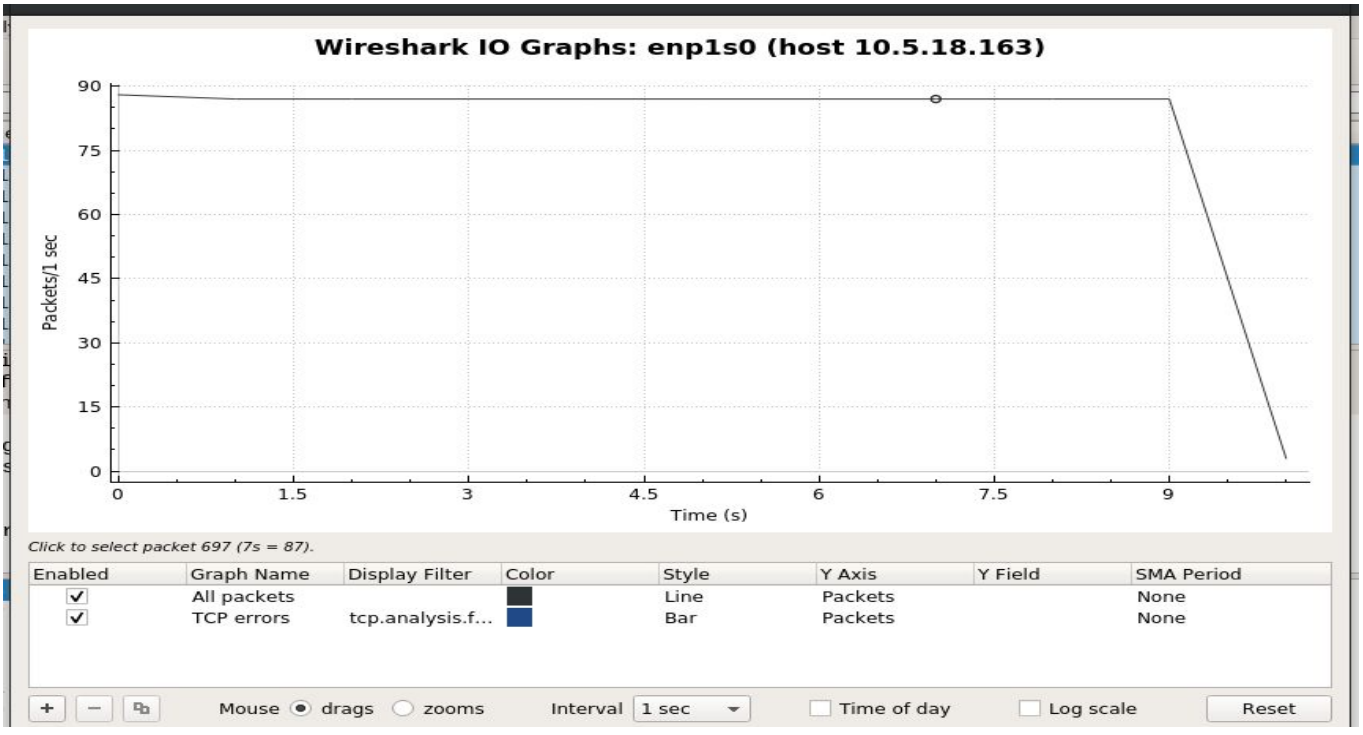
b. UDP packets are of same size - 1512 bytes each

c. <u>Throughputs (I/O Graphs)-</u>

I. TCP throughput for 3.jpg-



II. UDP throughput for 1024Kbps-



d. UDP throughput for each bandwidth-

Bandwidth - Throughput - Total Packets sent

(i) 64 Kbps- 8510 Bytes/sec - 58

(ii) 128 Kbps- 16k Bytes/sec - 112

(iii) 256 Kbps- 33k Bytes/sec - 221

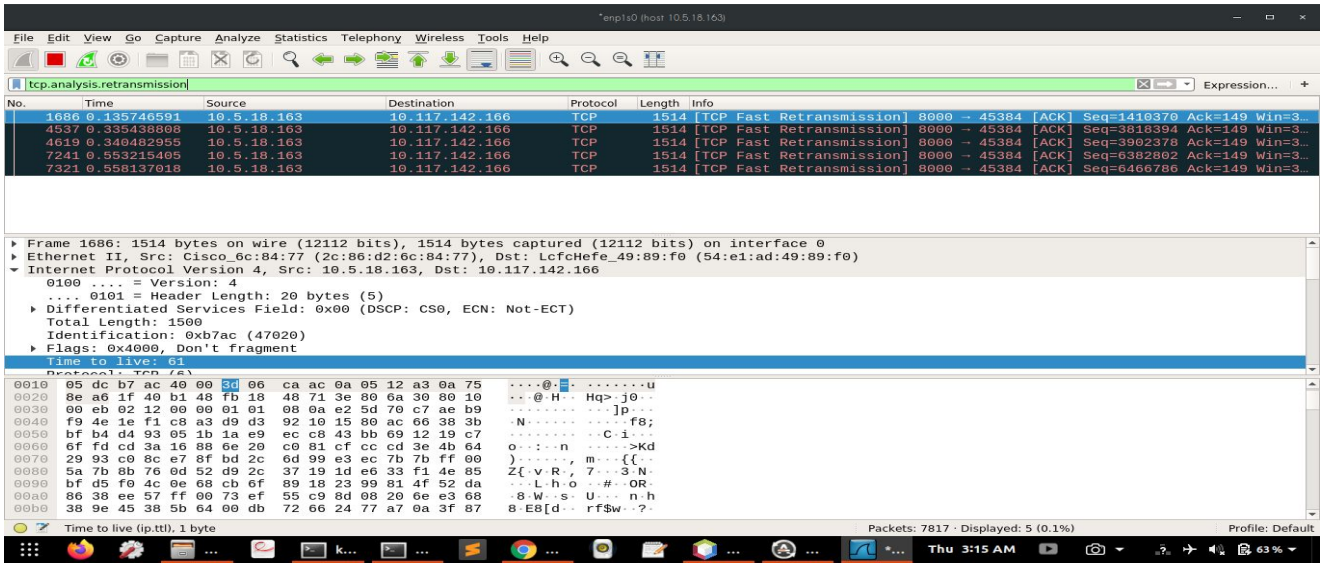
(iv) 512 Kbps- 66k Bytes/sec - 439

(v) 1024 Kbps- 131k Bytes/sec - 874

(vi) 2048 Kbps- 263k Bytes/sec - 1745

3. Analysis of TCP retransmitted packets-

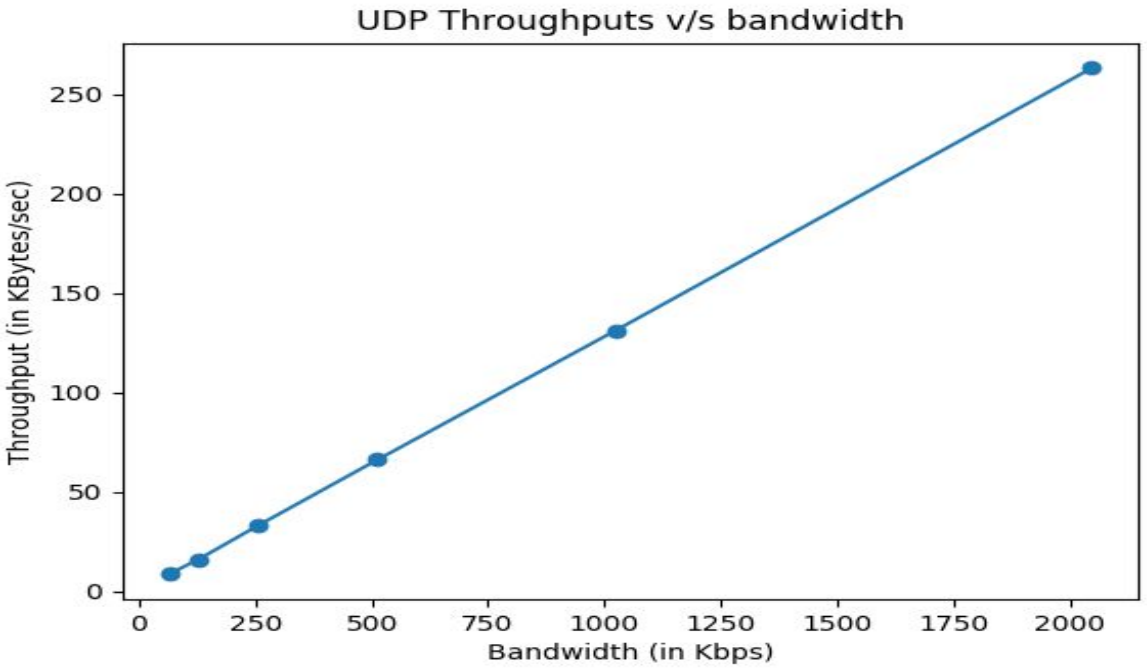
- ➢ 1.jpg - 0 retransmitted packets
- ➢ 2.jpg - 0 retransmitted packets
- ➢ 3.jpg - 5 retransmitted packets (1514 Bytes each) sent from server to client



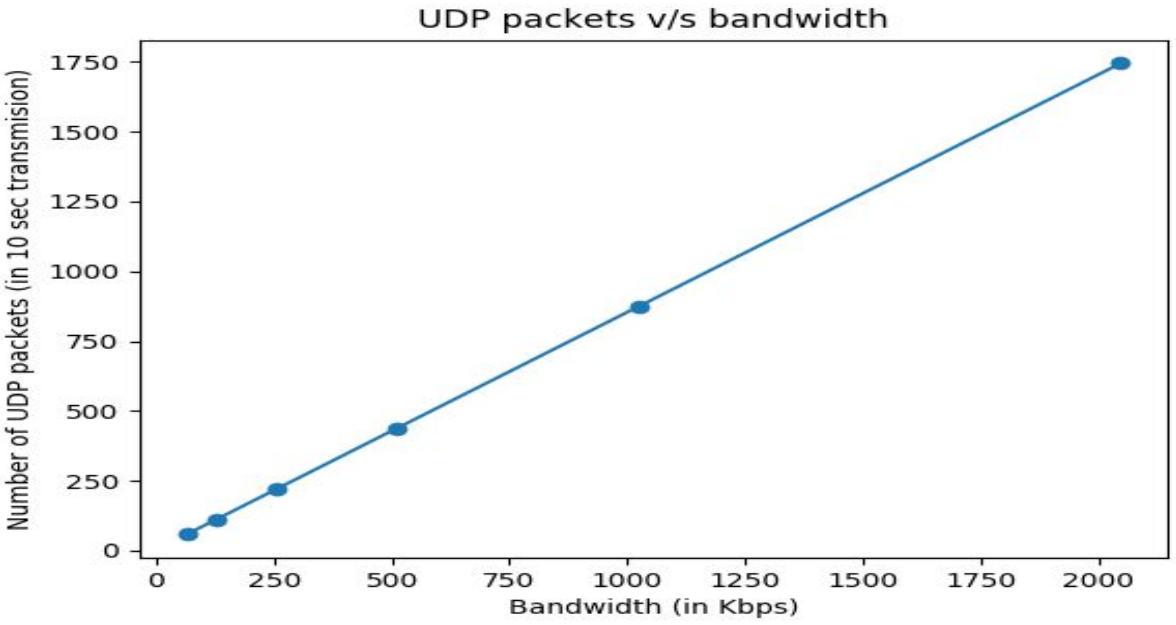
- ➢ 4.jpg - 0 retransmitted packets
- ➢ 5.jpg - 0 retransmitted packets

4. Plots for UDP transmissions-

a. UDP throughputs v/s bandwidth-



b. UDP number of packets v/s bandwidth (for a 10 sec duration transmission for each bandwidth)-



Observations- in case of UDP transfer packet size is constant and number of packets sent varies linearly with transmission bandwidth.