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# CS 39006: Networks Lab

## Assignment 1: Using Wireshark for Analyzing Network Packet Traces

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### Report

**Objective:** Objective: The objective of this assignment is to understand the Wireshark tool and how we can analyse network packet traces.

### Experiment:

1. Applied a capture filter to isolate only packets communicated with the address 10.5.18.163 for the experiment.
  2. Used “wget --no-proxy http://10.5.18.163:8000/[file]” for files 1.jpg to 5.jpg for TCP analysis.
  3. Used “iperf3 -c 10.5.18.163 -u -b [bandwidth]” for UDP analysis.
  4. Packets information and throughput was observed from Wireshark capture.
  5. Used display filter - “tcp.analysis.retransmission” for displaying retransmitted tcp packets.
- Computed UDP throughput by calculating data transferred per second and plotted UDP throughput & packets transferred vs bandwidth.

- 1) Protocols in UDP test cases: UDP, ICMP.  
Protocols in TCP test cases: TCP, HTTP.

2)

- A) The number of packets were not the same when downloading images from 1 to 7.

<u>Image</u>	<u>Number of packets</u>	<u>Different Packet Sizes(in bytes)</u>
1.jpg	196	66,74,83,1514
2.jpg	570	66,74,78,83,86,151 4,2962
3.jpg	1454	66,74,78,83,86,151 4,2962,4410
4.jpg	716	66,74,78,83,86,94, 1514,2962
5.jpg	603	66,74,78,83,86,94, 1514
6.jpg	336	66,74,83,1514
7.jpg	284	66,74,83,1514

By checking the **TCP Payload** we can see the length of the packets, we realize the length is not the same.

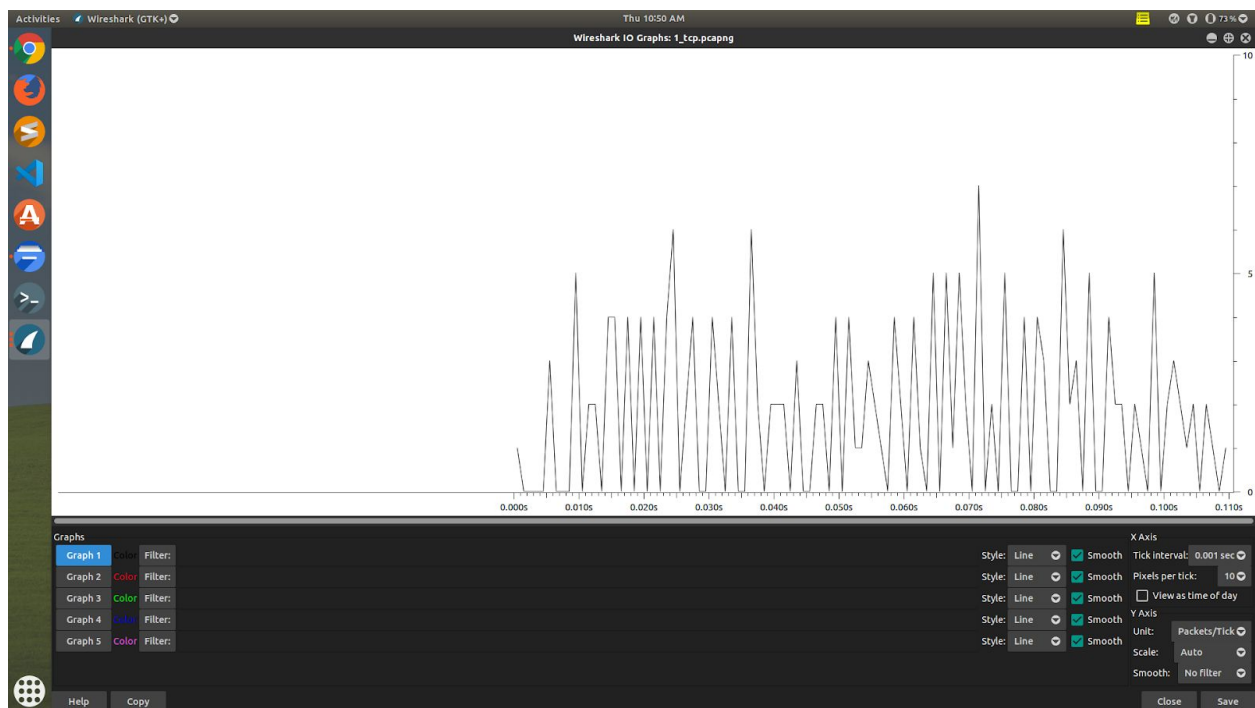
For each of the files, we see packets of variable size.

Also, the window size is not being the same. This probably could be due to congestion control algorithm

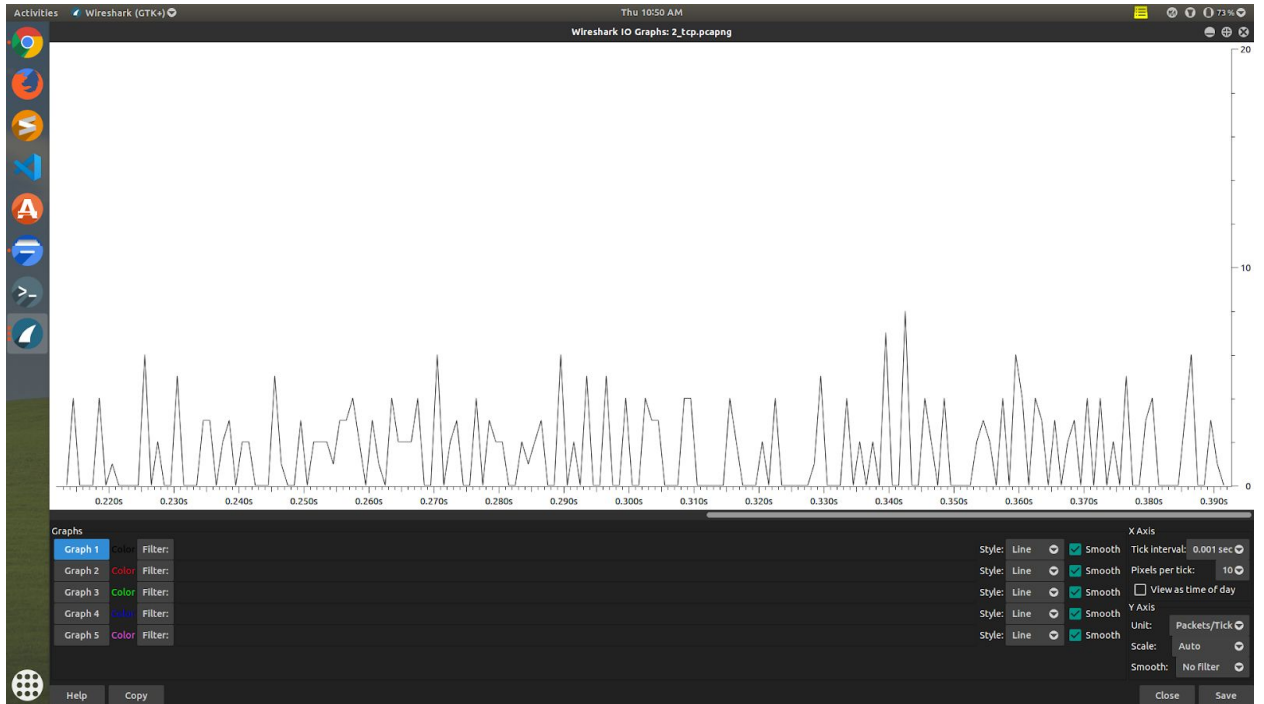
- B) The UDP packets are of the same length. This is because upon running the iperf command, we can see that it shows it is “sending datagrams of length 1470”. This, when applied with the headers of protocols of lower layers, make the total length of the packet to be 1512.

C)

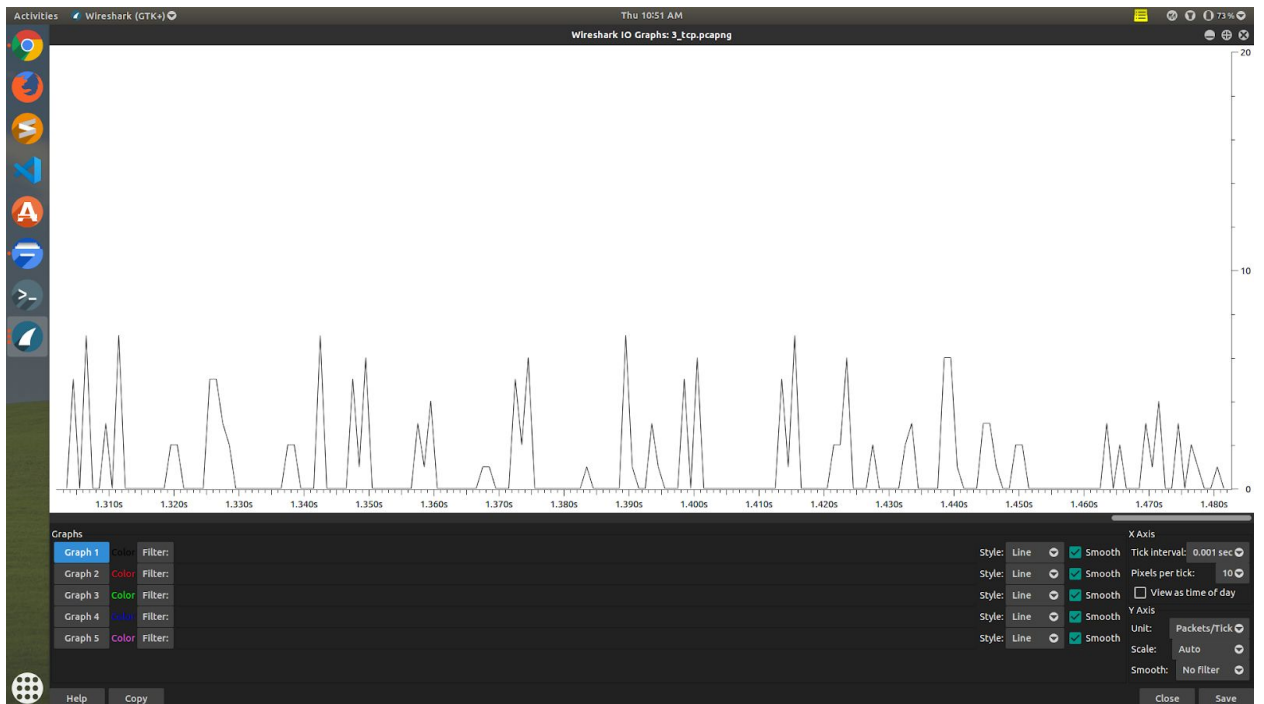
1.jpg



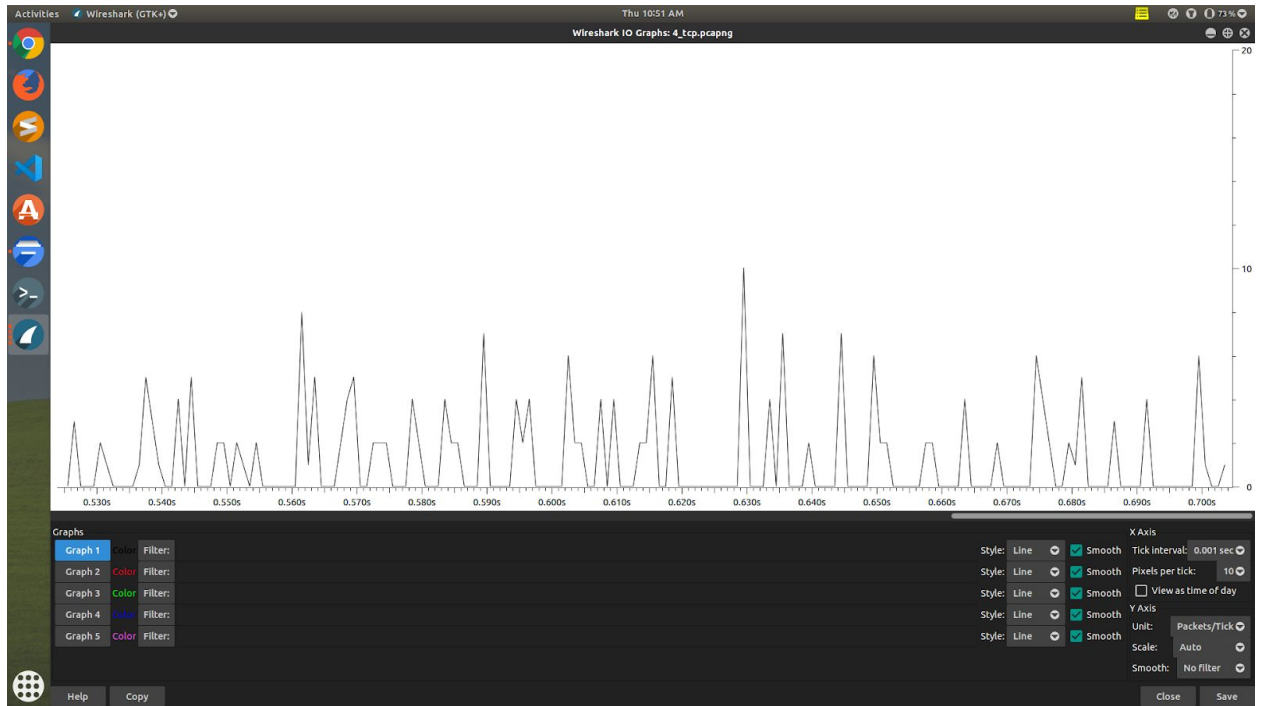
2.jpg



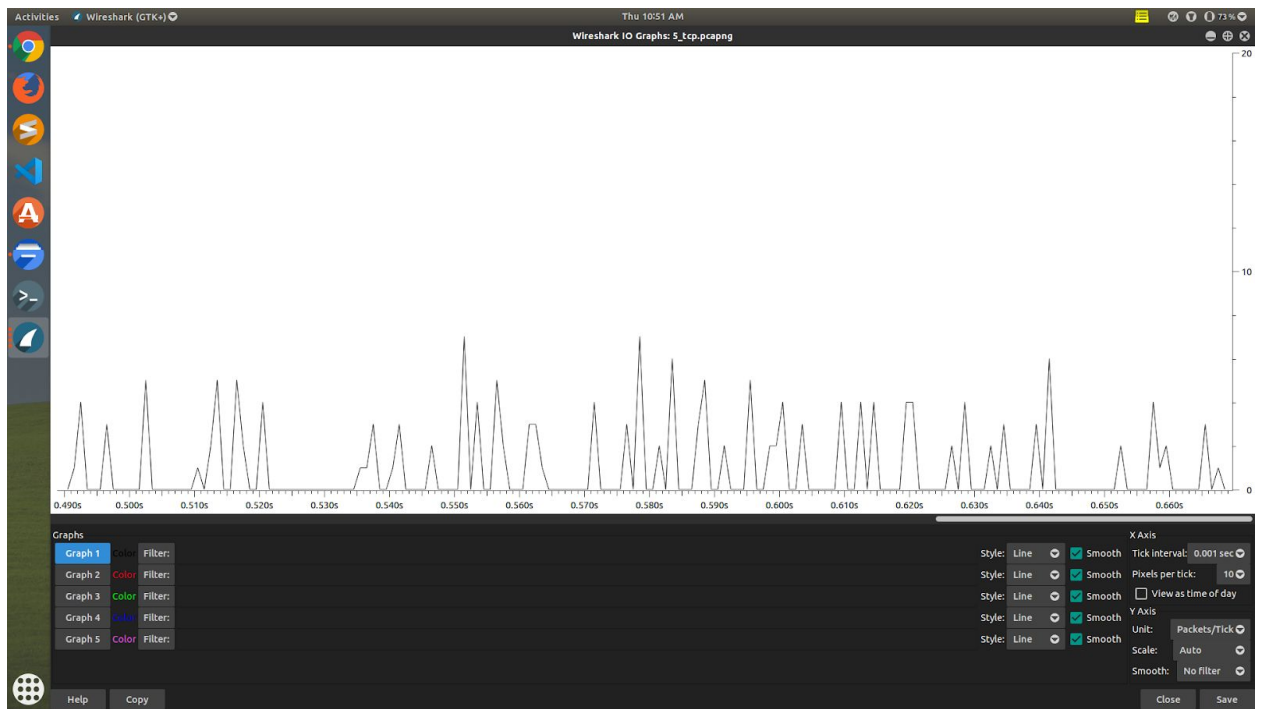
3.jpg



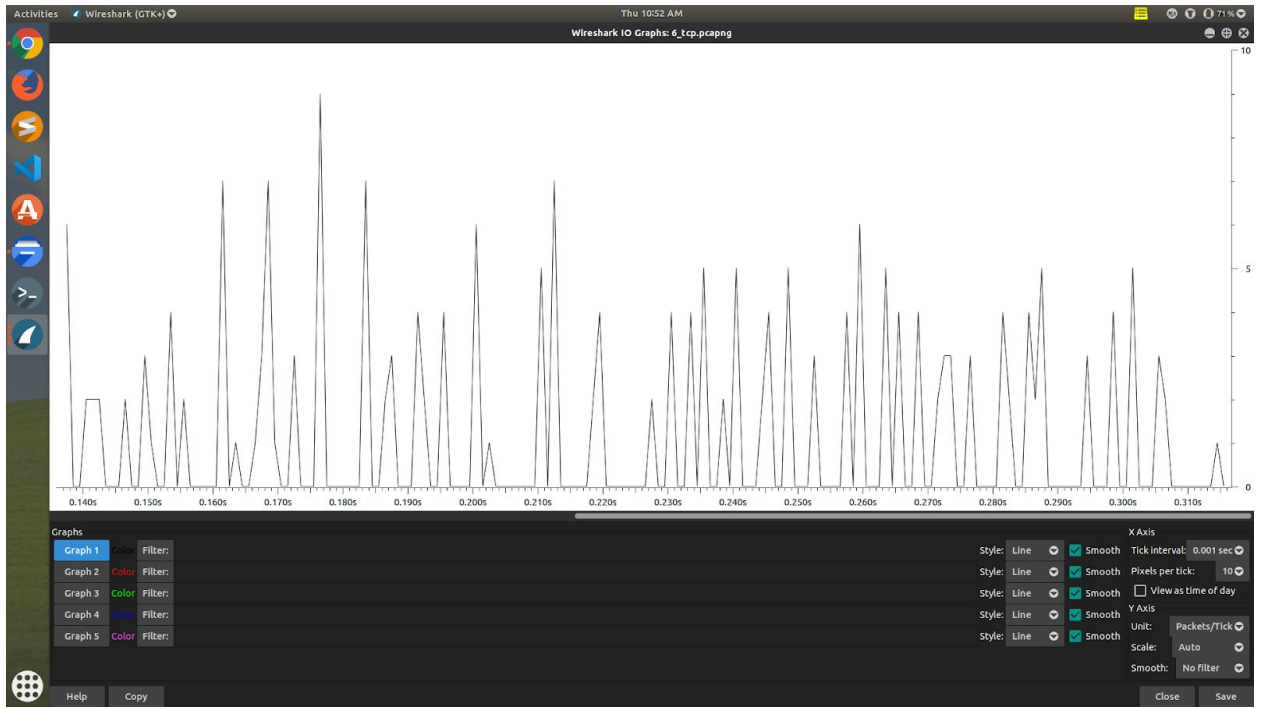
4.jpg



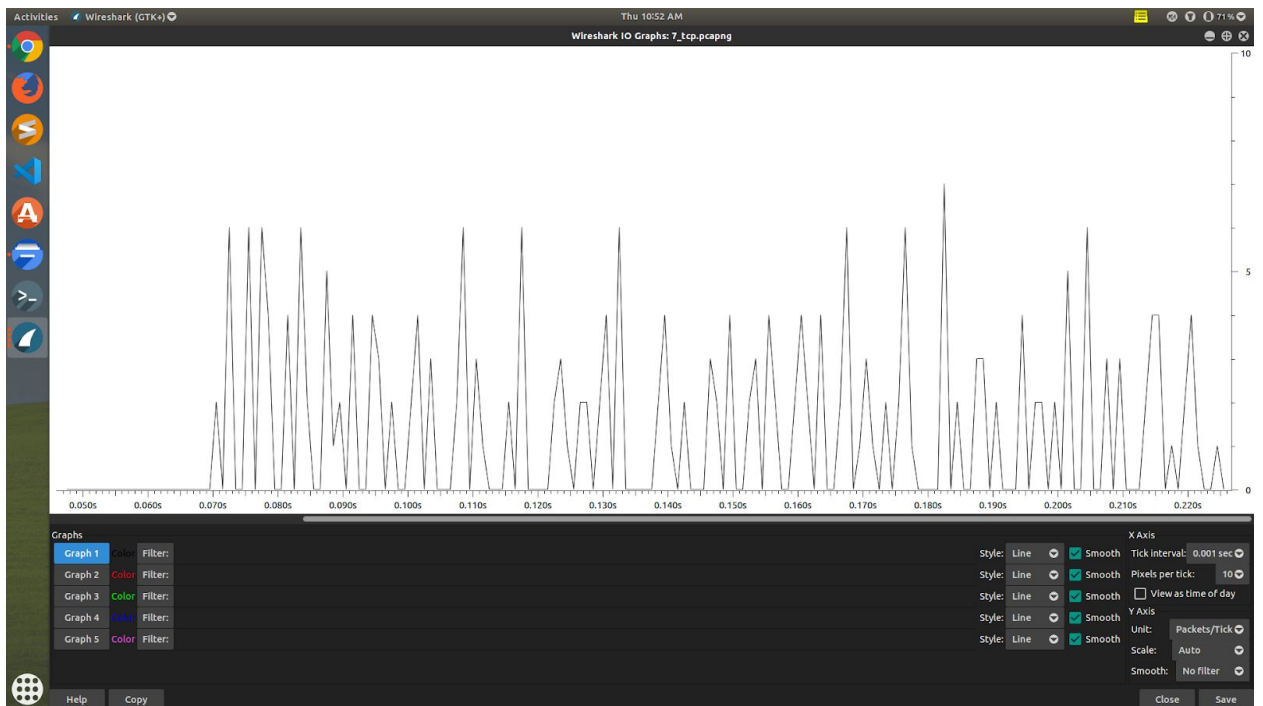
5.jpg



6.jpg



7.jpg



D)

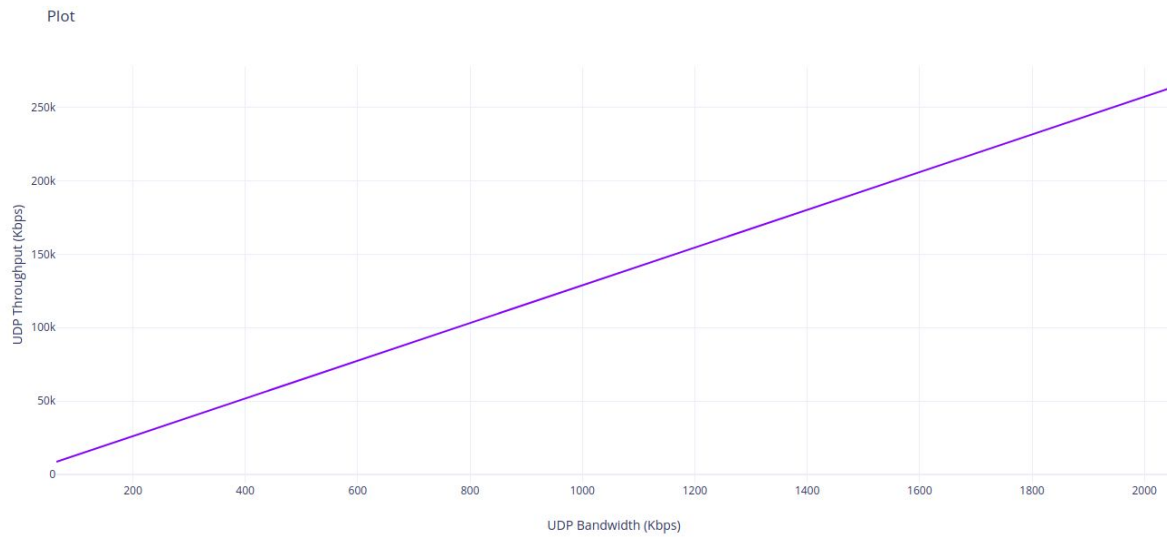
UDP Bandwidth (Kbps)	UDP Throughput (Kbps)
64	8508.12
128	16721.6
256	33177.560
512	65978.890
1024	131706.460
2048	263495.4

3)

File	No. of TCP packets retransmitted
1.jpg	1
2.jpg	4
3.jpg	7
4.jpg	4
5.jpg	4

4)

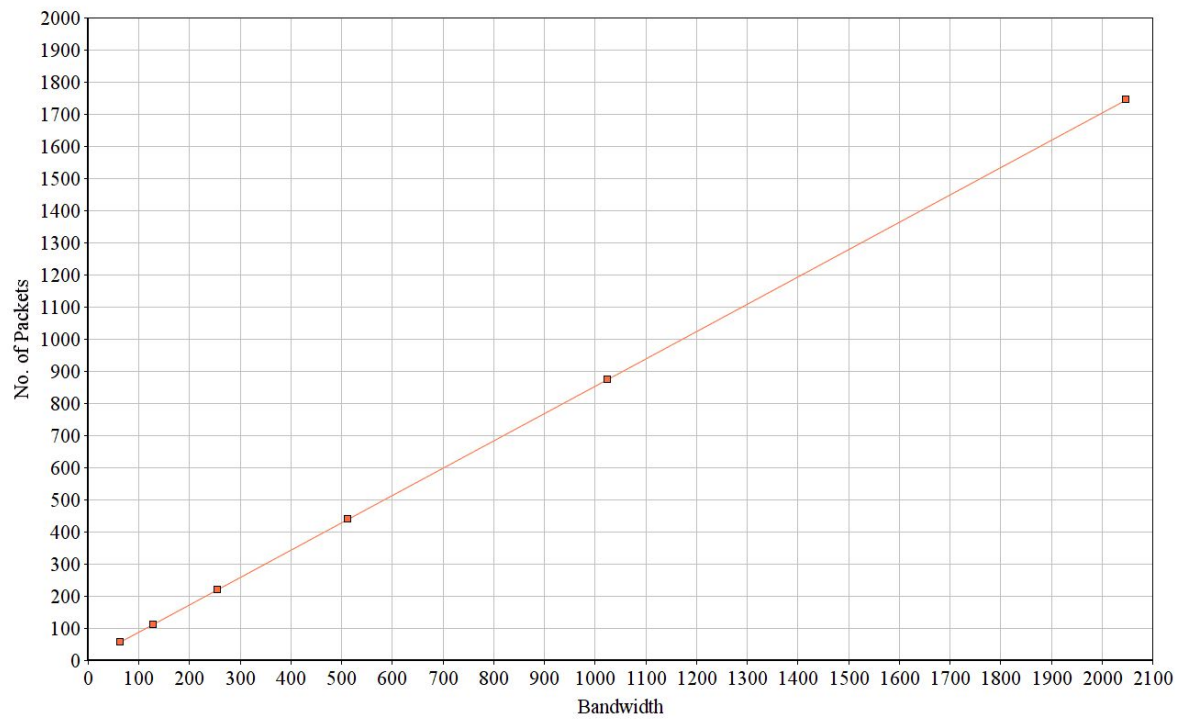
A)



B)



Packets vs bandwidth



Clearly from these plots, we can clearly observe that given a specific bandwidth to iperf, it will send datagrams accordingly and also with increasing bandwidth, both the throughput as well as the total number of packets are increasing.