Assignment - 3

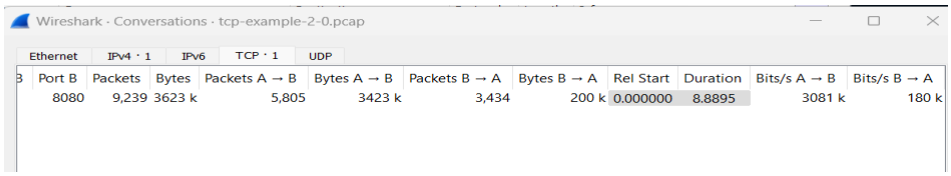
1.

a. As given minimum transferrate is 7 mbps between N1 and N2 so maximum throughput is 7mbps as maximum 7 mb of packets can transfer per second.

b.

BDP = Bottleneck bandwidth x RTT (Round trip time)
One way delay = 100+10=110 ms
RTT = 110ms x 2 = 220ms
BDP = 7 mbps x 220 ms = 1.54 mb
(1460 is a packet size here)
BDP = 1540000 bits / 11680 bits
= 131.85 packets (Approx)

c.

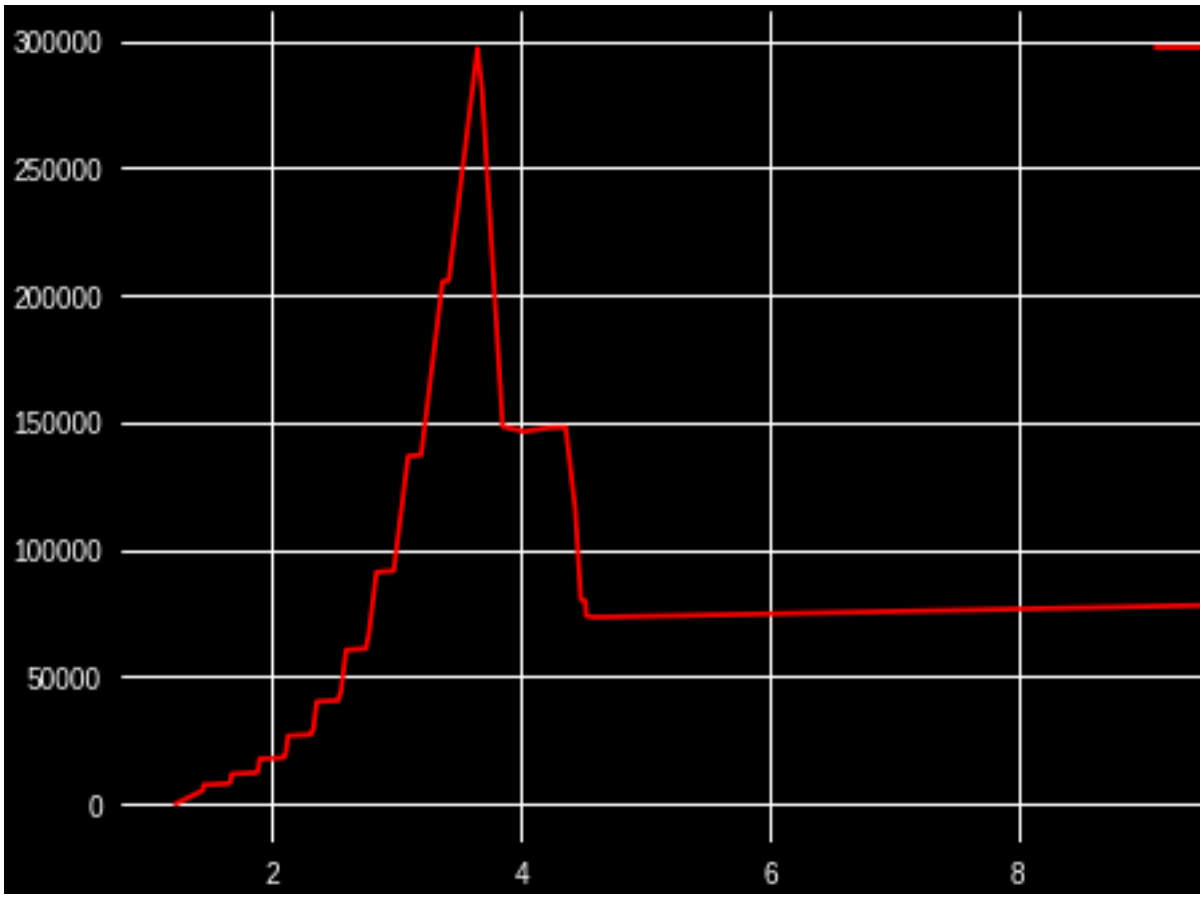


throughput = 3.1 mbps (approx)

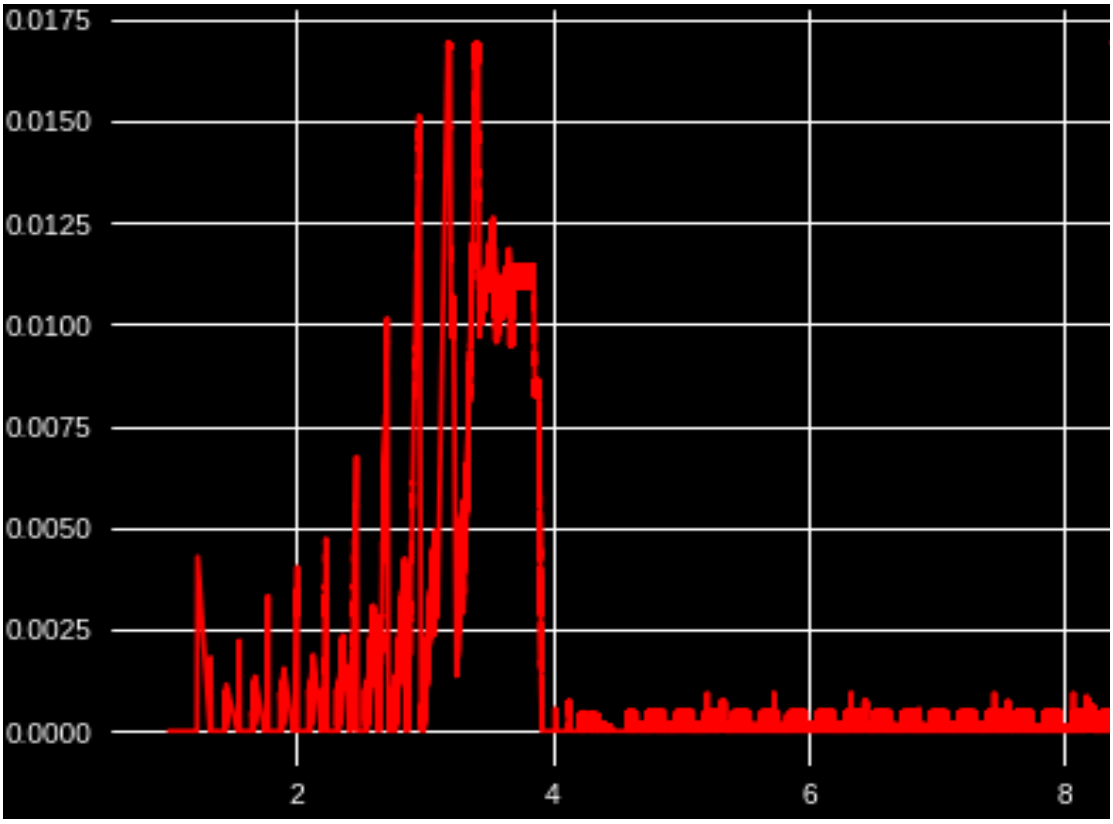
d.

No, both are not equal as there are delays and errors that causes average computed throughput to be lesser than the theoretical throughput.

e.



f.

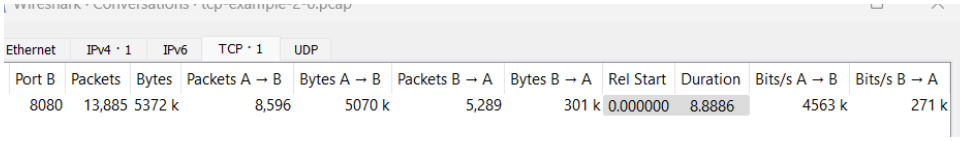


g.

Yes they are related.

2.

a.

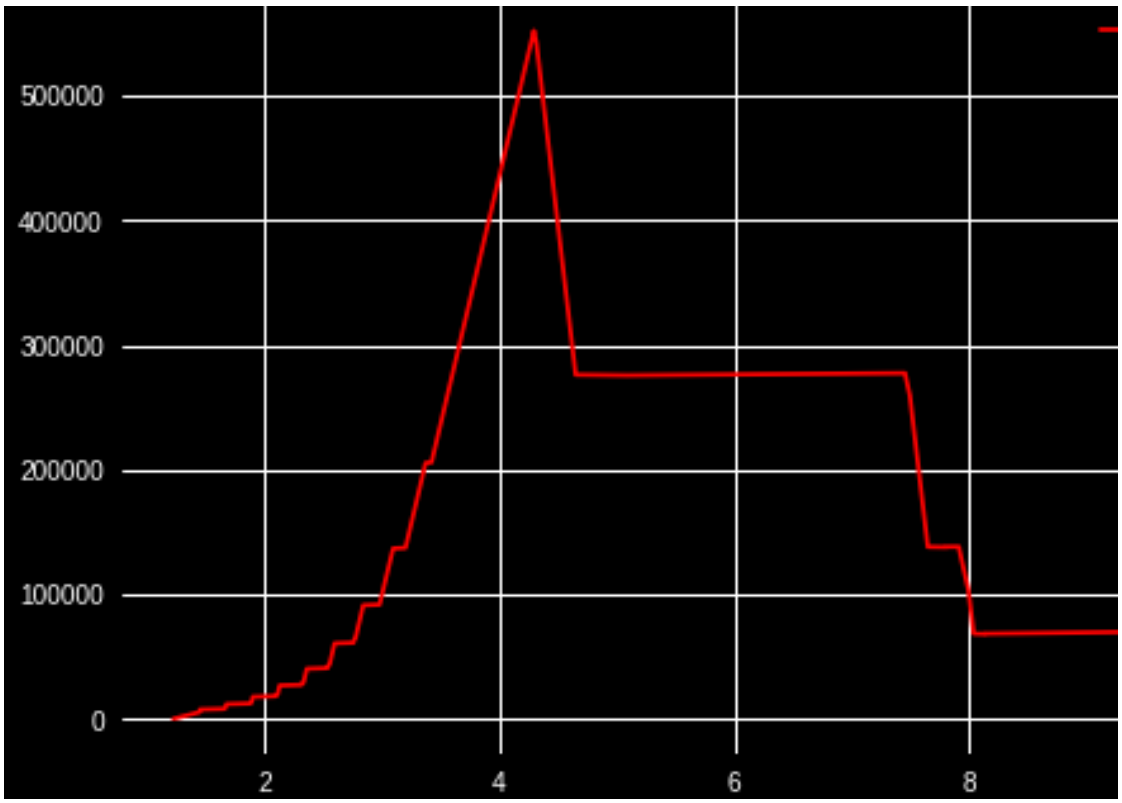


Ethernet | IPv4 · 1 | IPv6 | TCP · 1 | UDP

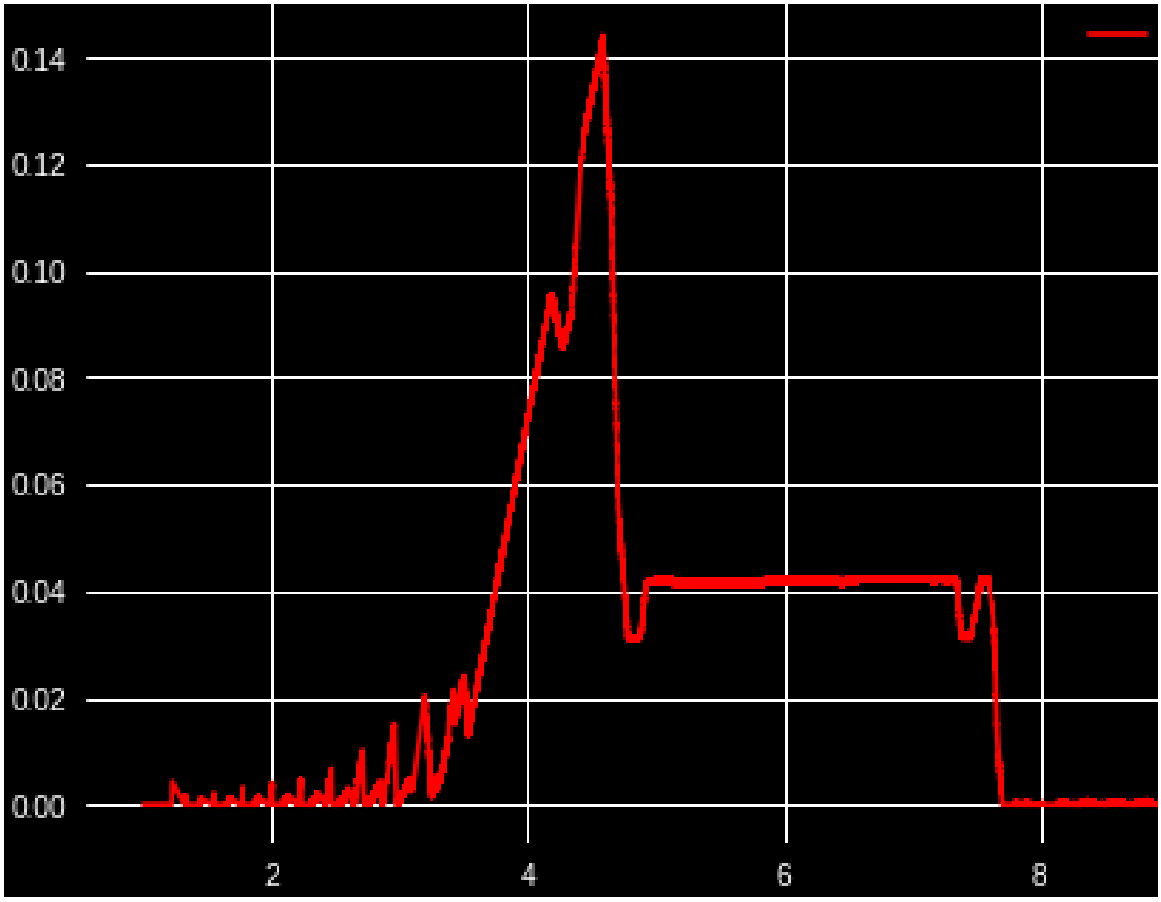
Port B	Packets	Bytes	Packets A → B	Bytes A → B	Packets B → A	Bytes B → A	Rel Start	Duration	Bits/s A → B	Bits/s B → A
8080	13,885	5372 k	8,596	5070 k	5,289	301 k	0.000000	8.8886	4563 k	271 k

throughput = 4.6 mbps (approx)

b.



c.

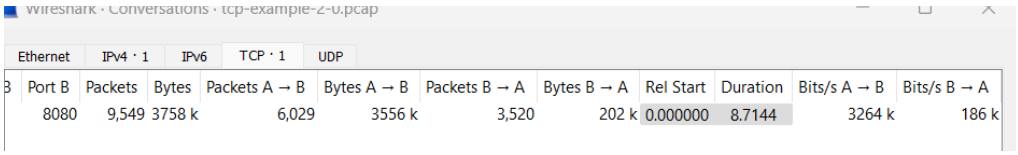


d.

When we increase the queue size to 1000 from 50 in Q2, buffer overflow is delayed.

3.

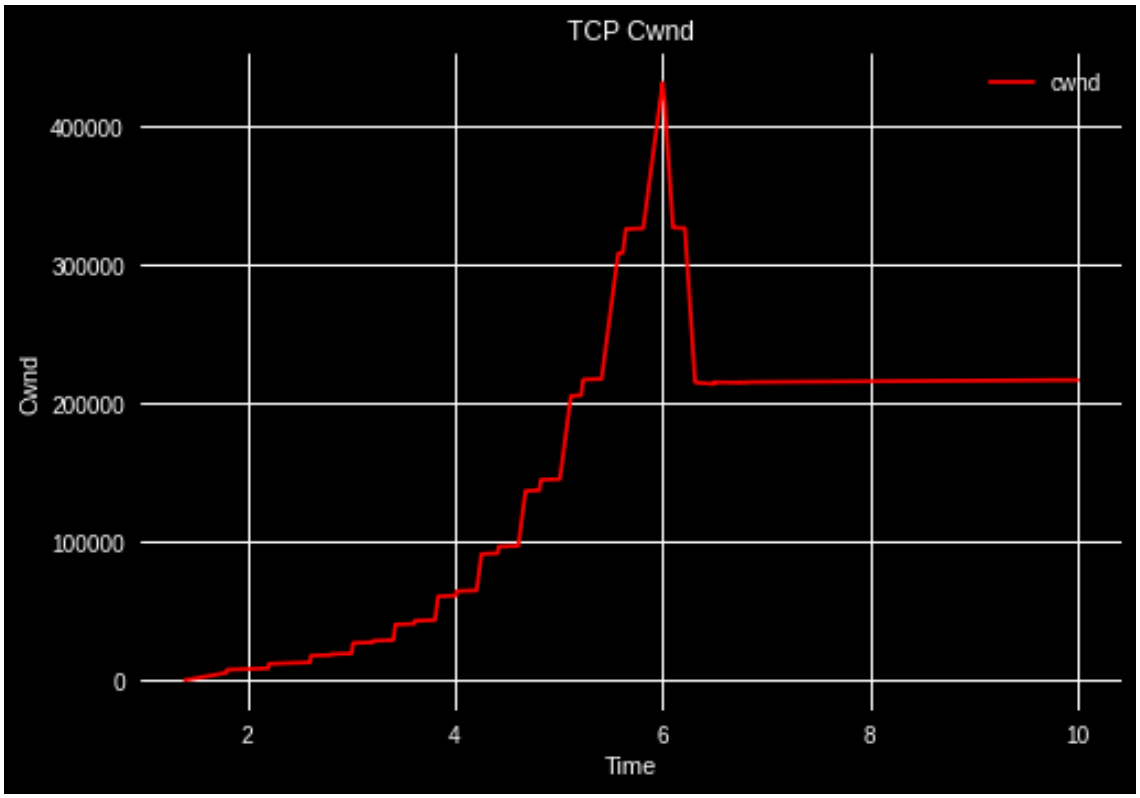
a.



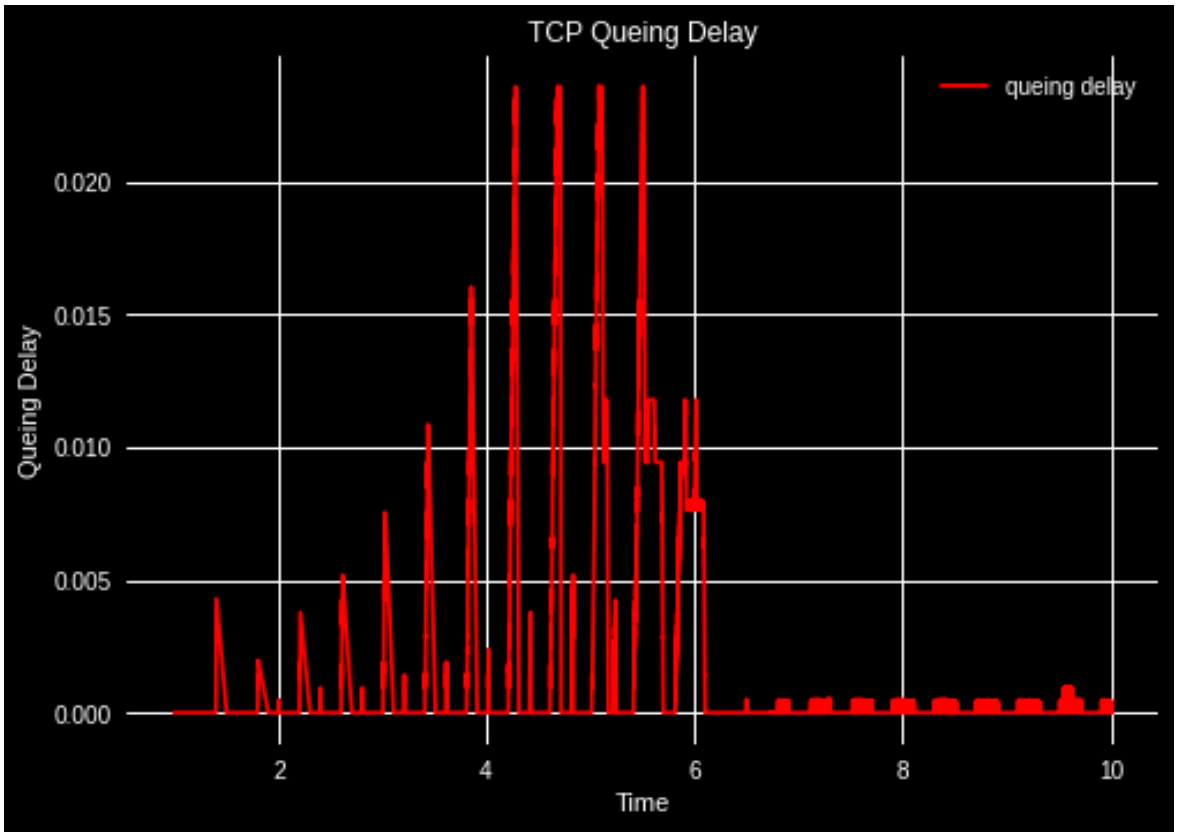
Port B	Packets	Bytes	Packets A → B	Bytes A → B	Packets B → A	Bytes B → A	Rel Start	Duration	Bits/s A → B	Bits/s B → A
8080	9,549	3758 k	6,029	3556 k	3,520	202 k	0.000000	8.7144	3264 k	186 k

throughput = 3.3 mbps (approx)

b.



c.



d.

As changing the bandwidth and delay to the same level flow of data becomes very smooth hence at level 0 the graph is a straight line