

1) 10 packets transmitted, 10 received, 0% packet loss, time 1834ms
rtt min/avg/max/mdev = 0.359/0.447/0.487/0.045 ms

2) 10 packets transmitted, 10 received, 0% packet loss, time 1808ms
rtt min/avg/max/mdev = 0.373/0.484/0.621/0.075 ms

3) 100 packets transmitted, 100 received, 0% packet loss, time 109ms

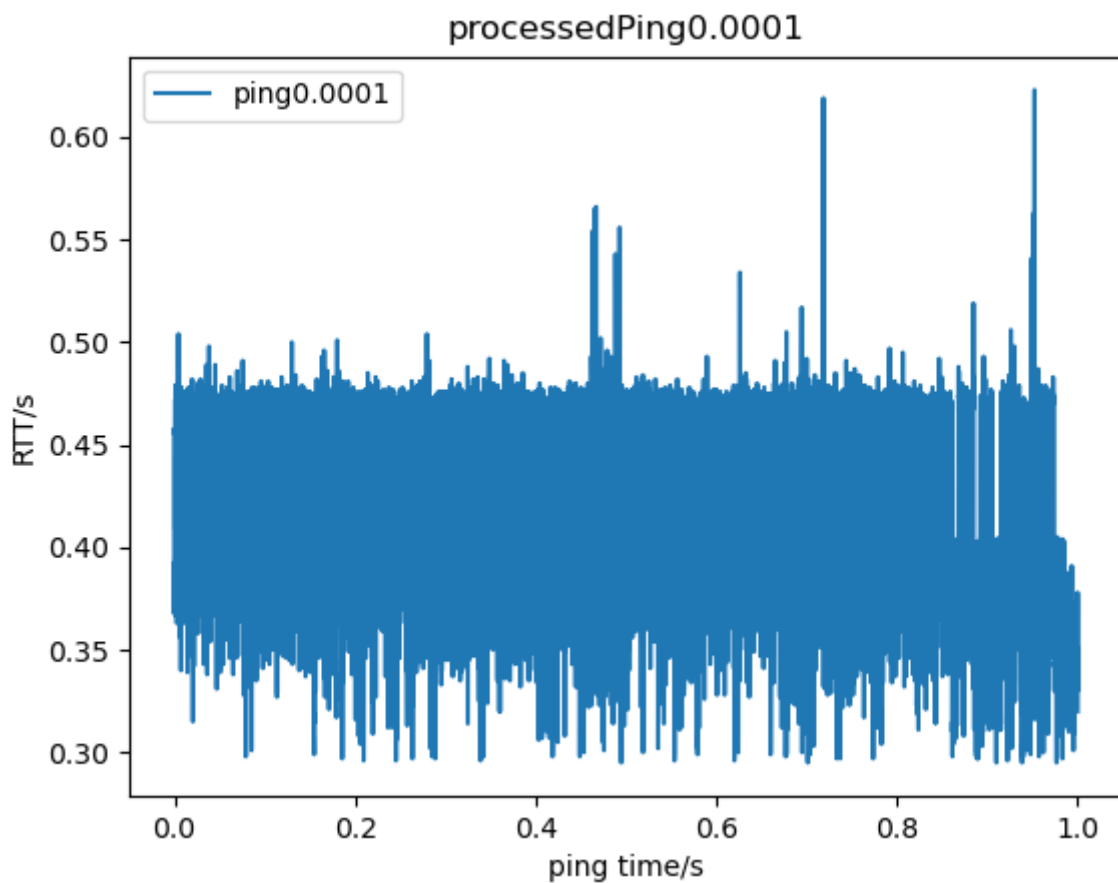
rtt min/avg/max/mdev = 0.331/0.433/0.584/0.059 ms

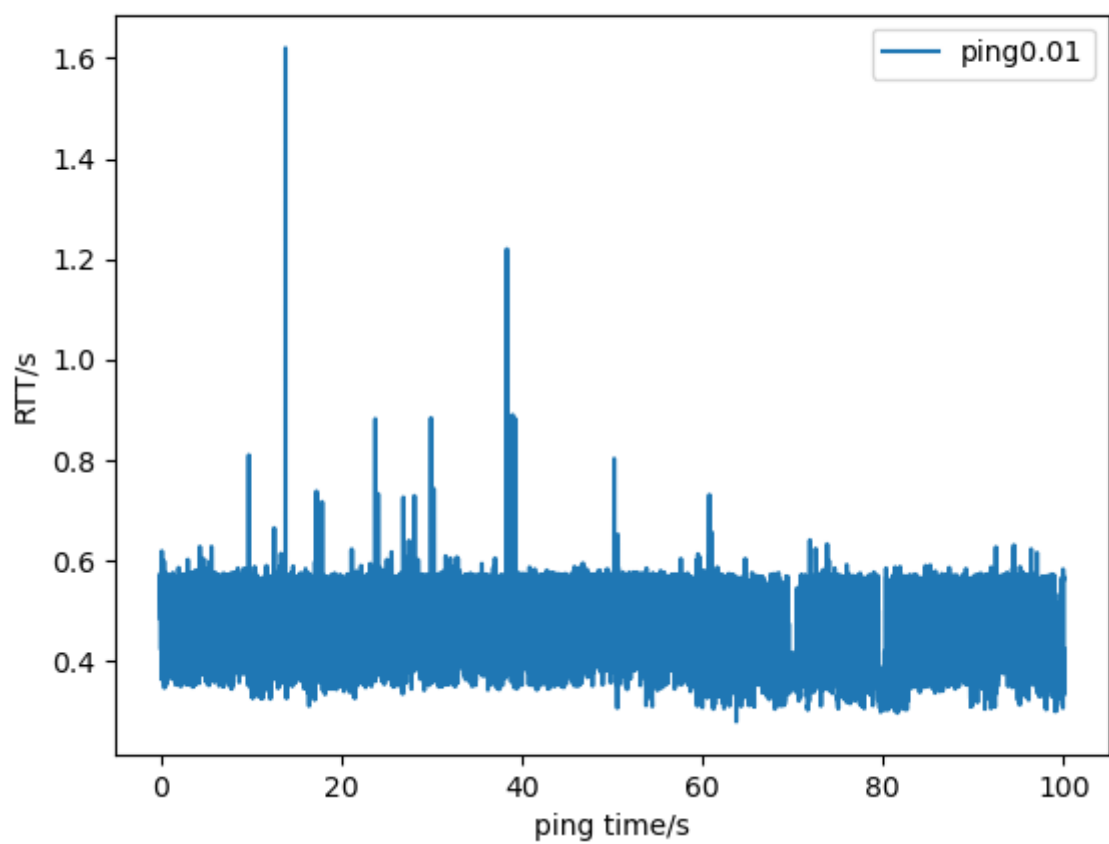
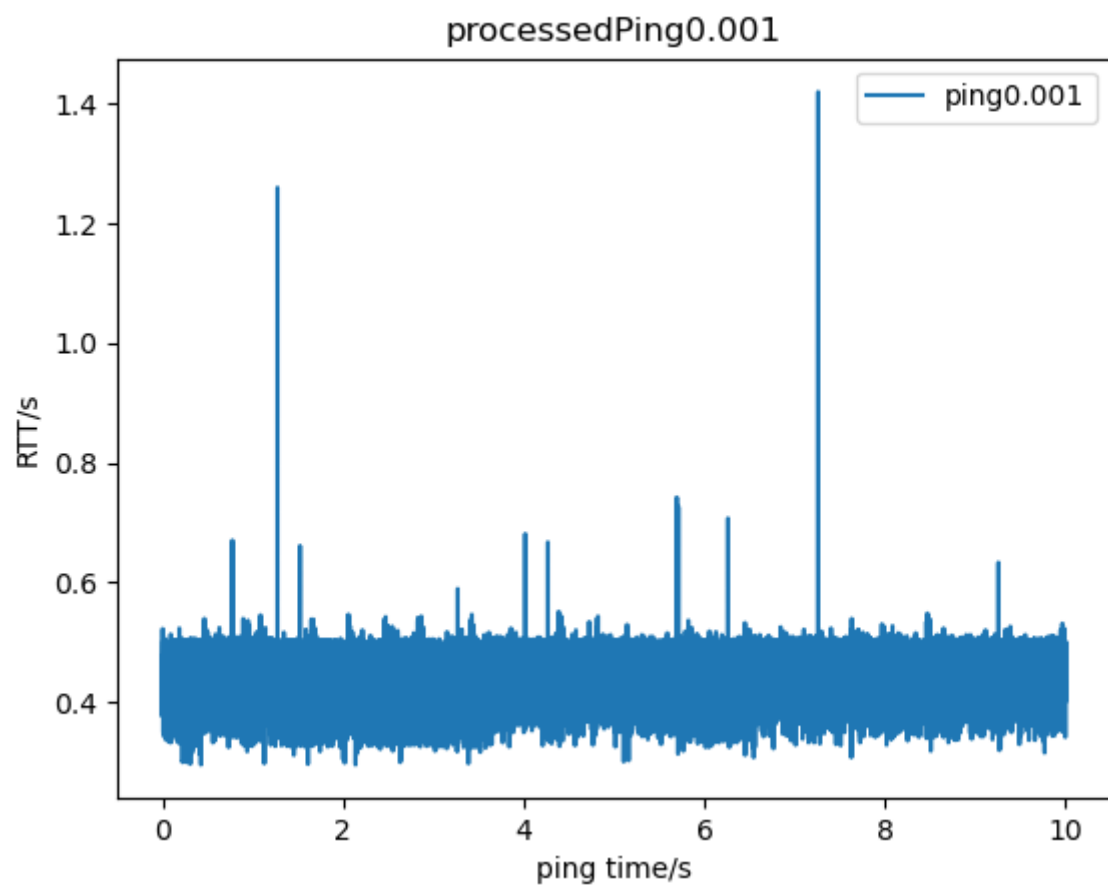
min is shortest for round trip time for a packet, while max is longest, representing best case and worst case latency. Average is calculated over 100 packets

4) 10000 packet transmitted, 10000 received, 0% packet loss, time 4114ms

rtt min/avg/max/mdev = 0.284/0.375/0.707/0.046 ms, ipf/ewma 0.411/0.414ms

5)





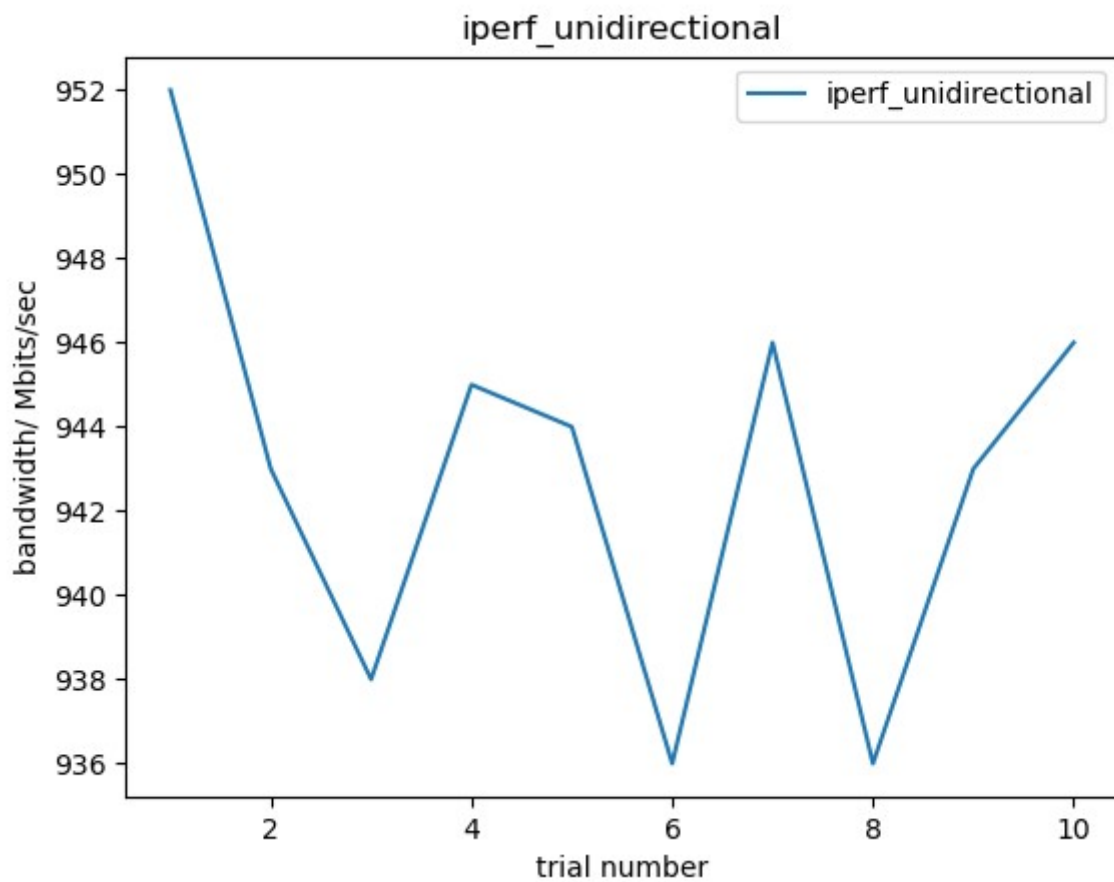
6)When the interval between packets is very short, the network may become congested, leading to increased delays and higher RTT values

The average is the most accurate as it remove the influence of individual fluctuations.

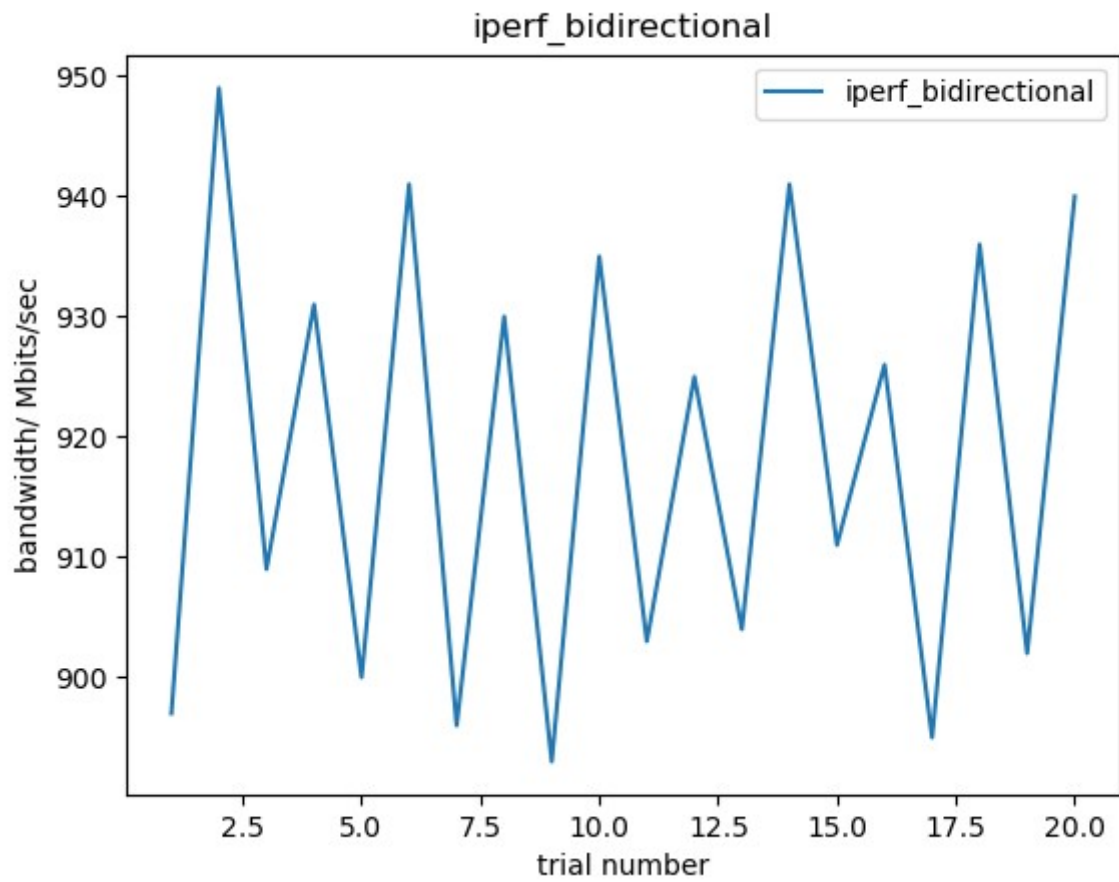
Iperf

1) 0.0000 – 10.0038 sec 1.09Gytes 940Mbits/sec

2)



3)

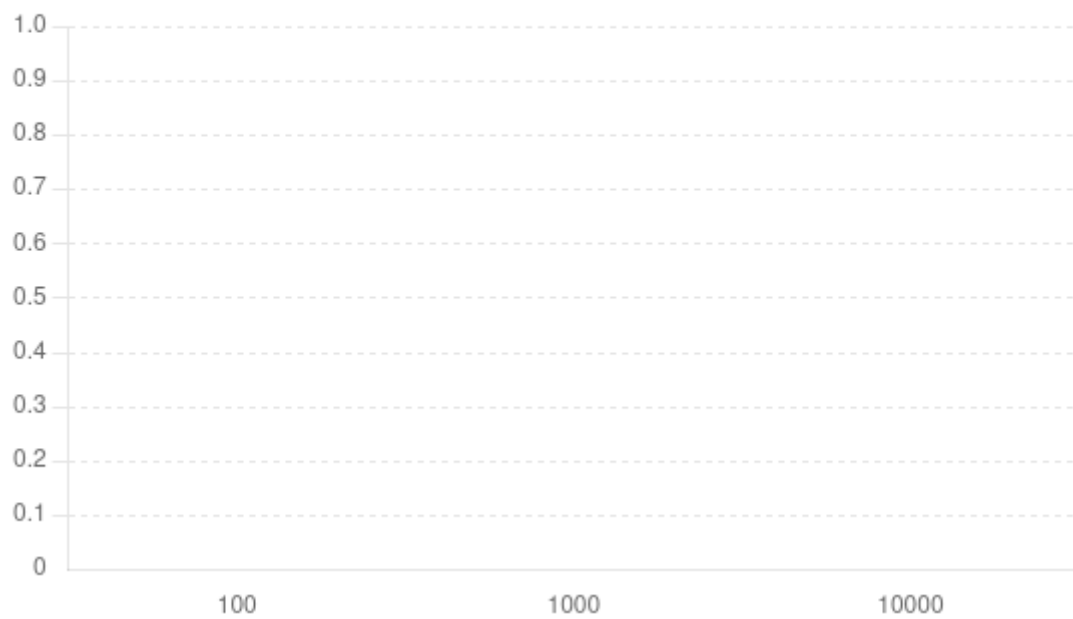


4)

Packet Drop Rate Vs Bandwidth



Packet Drop Percentage (%) by Bandwidth (Kbit/sec)



local 192.168.10.1 port 45772 connected with 192.168.10.2 port 5001

Interval	Transfer	Bandwidth
0.0000-5.1748 sec	66.0 KBytes	105 Kbits/sec

Sent 47 datagrams

Server Report:

Interval	Transfer	Bandwidth	Jitter	Lost/Total Datagrams
0.0000-5.1744 sec	66.0 KBytes	105 Kbits/sec	0.009 ms	0/46 (0%)

6 [1] local 192.168.10.1 port 34504 connected with 192.168.10.2 port 5001

7 [ID] Interval Transfer Bandwidth

8 [1] 0.0000-5.0219 sec 616 KBytes 1.00 Mbits/sec

9 [1] Sent 430 datagrams

10 [1] Server Report:

ID	Interval	Transfer	Bandwidth	Jitter	Lost/Total Datagrams
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12 [1]	0.0000-5.0215 sec	616 KBytes	1.00 Mbits/sec	0.006 ms	0/429 (0%)
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6 [1] local 192.168.10.1 port 49715 connected with 192.168.10.2 port 5001

7 [ID] Interval Transfer Bandwidth

8 [1] 0.0000-5.0018 sec 5.97 MBytes 10.0 Mbits/sec

9 [1] Sent 4256 datagrams

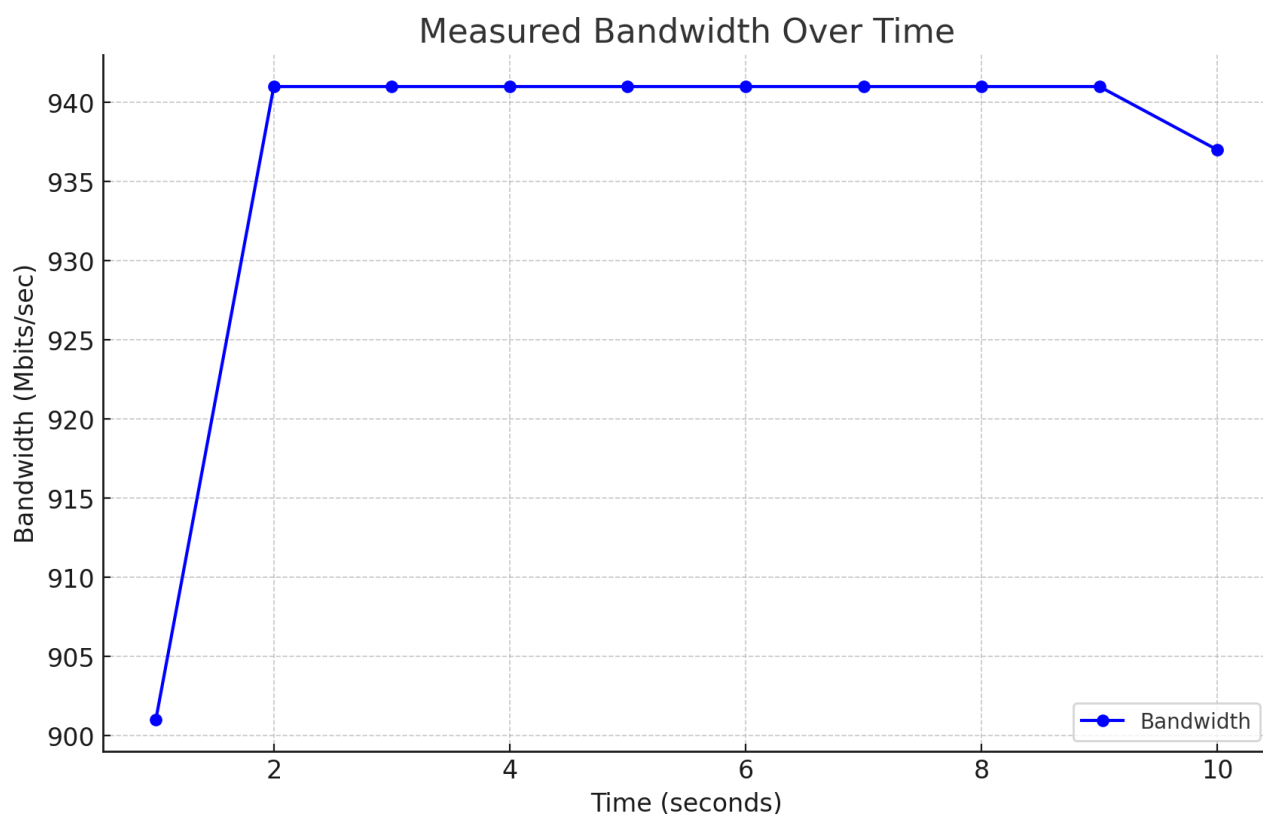
10 [1] Server Report:

ID	Interval	Transfer	Bandwidth	Jitter	Lost/Total Datagrams
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12 [1]	0.0000-5.0015 sec	5.97 MBytes	10.0 Mbits/sec	0.016 ms	0/4255 (0%)
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iperf3

1)



2)

Packet Drop Rate Vs Bandwidth



☒ Packet Drop Percentage (%) by ☒ Bandwidth (Kbit/sec)



iperf3 homepage: <https://github.com/esnet/iperf3>
Report bugs to: <https://github.com/esnet/iperf3>
pi@p4pi: \$ iperf3 -s -B 192.168.10.2

Server listening on 5201

```
Accepted connection from 192.168.10.1, port 49964
[ 5] local 192.168.10.2 port 5201 connected to 192.168.10.1 port 41141
[ ID] Interval      Transfer     Bitrate      Jitter    Lost/Totl  Datagrams
[ 5] 0.00-1.00 sec  12.7 KBytes  104 Kbits/sec  0.005 ms  0/9 (0%)
[ 5] 1.00-2.00 sec  11.3 KBytes  92.7 Kbits/sec  0.008 ms  0/8 (0%)
[ 5] 2.00-3.00 sec  12.7 KBytes  104 Kbits/sec  0.010 ms  0/9 (0%)
[ 5] 3.00-4.00 sec  12.7 KBytes  104 Kbits/sec  0.013 ms  0/9 (0%)
[ 5] 4.00-5.00 sec  11.3 KBytes  92.7 Kbits/sec  0.010 ms  0/8 (0%)
[ 5] 5.00-5.04 sec  1.41 KBytes  283 Kbits/sec  0.010 ms  0/1 (0%)
```

```
[ ID] Interval      Transfer     Bitrate      Jitter    Lost/Totl  Datagrams
[ 5] 0.00-5.04 sec  62.2 KBytes  101 Kbits/sec  0.010 ms  0/44 (0%) receiver
```

Server listening on 5201

```
Accepted connection from 192.168.10.1, port 42490
[ 5] local 192.168.10.2 port 5201 connected to 192.168.10.1 port 50127
[ ID] Interval      Transfer     Bitrate      Jitter    Lost/Totl  Datagrams
[ 5] 0.00-1.00 sec  117 KBytes  961 Kbits/sec  0.005 ms  0/83 (0%)
[ 5] 1.00-2.00 sec  123 KBytes  1.01 Mbits/sec  0.007 ms  0/87 (0%)
[ 5] 2.00-3.00 sec  122 KBytes  996 Kbits/sec  0.005 ms  0/86 (0%)
[ 5] 3.00-4.00 sec  122 KBytes  996 Kbits/sec  0.007 ms  0/86 (0%)
[ 5] 4.00-5.00 sec  123 KBytes  1.01 Mbits/sec  0.006 ms  0/87 (0%)
[ 5] 5.00-5.04 sec  4.24 KBytes  840 Kbits/sec  0.005 ms  0/3 (0%)
```

```
[ ID] Interval      Transfer     Bitrate      Jitter    Lost/Totl  Datagrams
[ 5] 0.00-5.04 sec  611 KBytes  993 Kbits/sec  0.005 ms  0/432 (0%) receiver
```

Server listening on 5201

```
Accepted connection from 192.168.10.1, port 60134
[ 5] local 192.168.10.2 port 5201 connected to 192.168.10.1 port 39366
[ ID] Interval      Transfer     Bitrate      Jitter    Lost/Totl  Datagrams
[ 5] 0.00-1.00 sec  1.14 MBytes  9.59 Mbits/sec  0.004 ms  0/828 (0%)
[ 5] 1.00-2.00 sec  1.19 MBytes  10.0 Mbits/sec  0.003 ms  0/863 (0%)
[ 5] 2.00-3.00 sec  1.19 MBytes  10.0 Mbits/sec  0.006 ms  0/863 (0%)
[ 5] 3.00-4.00 sec  1.19 MBytes  10.0 Mbits/sec  0.001 ms  0/863 (0%)
[ 5] 4.00-5.00 sec  1.19 MBytes  10.0 Mbits/sec  0.002 ms  0/864 (0%)
[ 5] 5.00-5.04 sec  49.5 KBytes  9.75 Mbits/sec  0.010 ms  0/35 (0%)
```

```
[ ID] Interval      Transfer     Bitrate      Jitter    Lost/Totl  Datagrams
[ 5] 0.00-5.04 sec  5.96 MBytes  9.92 Mbits/sec  0.010 ms  0/4316 (0%) receiver
```

3) the reports from iperf3 is more detailed, including bit rates at different time interval. Both has 0 packet drop rate

url:<https://github.com/Sिताoooo/CWM-ProgNets/tree/a143fdd1670907667b7adbef98ee6f7920b403a1/assignment2>