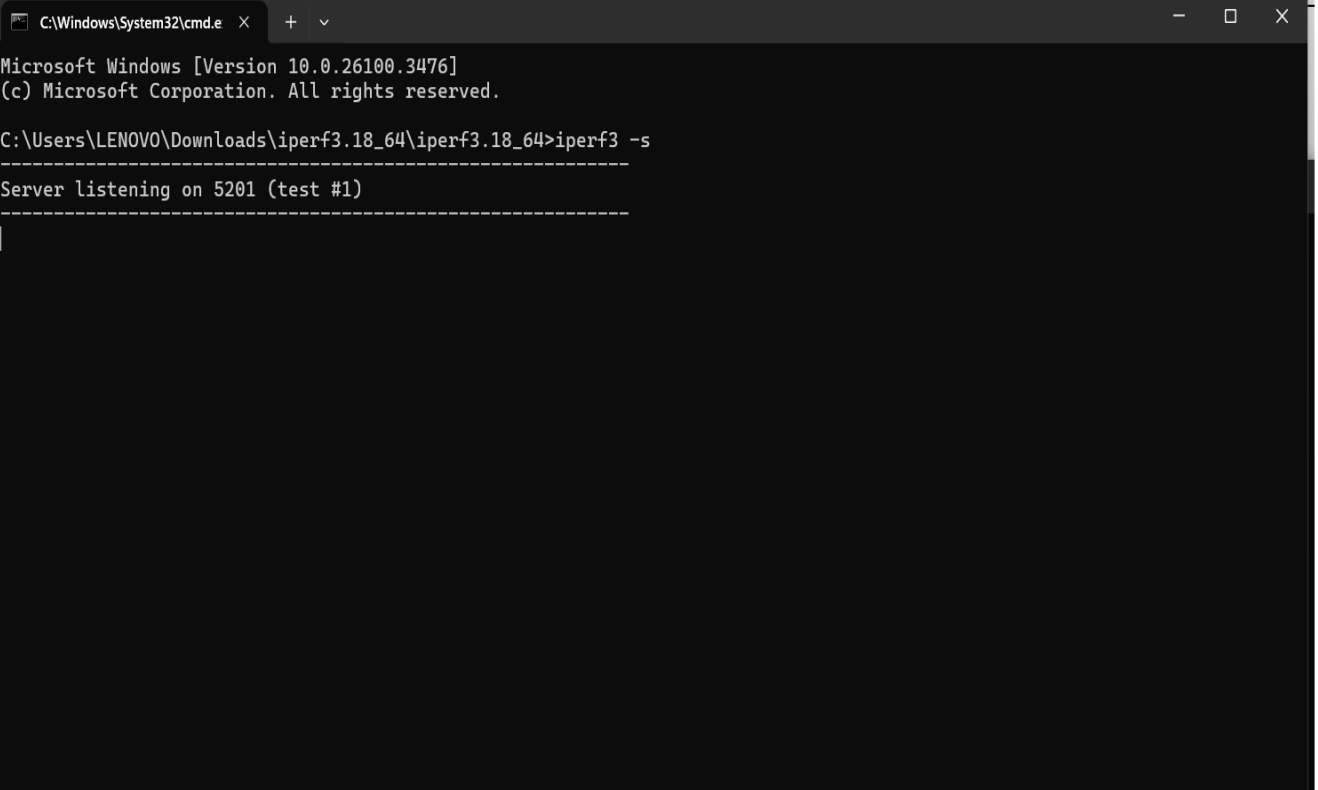


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Network Training Programme

Module 7 and 8

Q15. Download iperf in laptop/phone and make sure they are in same network. Try different iperf commands with tcp, udp, bidirectional, reverse, multicast, parallel options and analyze the bandwidth and rate of transmission, delay, jitter etc.



```
C:\Windows\System32\cmd.e  x  +  v
Microsoft Windows [Version 10.0.26100.3476]
(c) Microsoft Corporation. All rights reserved.

C:\Users\LENOVO\Downloads\iperf3.18_64\iperf3.18_64>iperf3 -s
-----
Server listening on 5201 (test #1)
-----
```

UDP TEST

```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.26100.3476]
(c) Microsoft Corporation. All rights reserved.

C:\Users\LENOVO\Downloads\iperf3.18_64\iperf3.18_64>iperf3 -s

-----
Server listening on 5201 (test #1)
-----
Accepted connection from 192.168.24.39, port 35612
[ 5] local 192.168.24.140 port 5201 connected to 192.168.24.39 port 32854
[ ID] Interval      Transfer    Bitrate      Jitter    Lost/TOTAL  Datagrams
[ 5]  0.00-1.00    sec      120 KBytes    979 Kbits/sec  0.287 ms   0/15 (0%)
[ 5]  1.00-2.01    sec      144 KBytes    1.18 Mbits/sec  3.846 ms   0/18 (0%)
[ 5]  2.01-3.01    sec      128 KBytes    1.05 Mbits/sec  6.930 ms   0/16 (0%)
[ 5]  3.01-4.01    sec      112 KBytes    918 Kbits/sec  10.639 ms   0/14 (0%)
[ 5]  4.01-5.00    sec      128 KBytes    1.05 Mbits/sec  4.909 ms   0/16 (0%)
[ 5]  5.00-6.01    sec      144 KBytes    1.17 Mbits/sec  6.034 ms   0/18 (0%)
[ 5]  6.01-7.01    sec      128 KBytes    1.05 Mbits/sec  9.025 ms   0/16 (0%)
[ 5]  7.01-8.01    sec      112 KBytes    923 Kbits/sec  3.881 ms   0/14 (0%)
[ 5]  8.01-9.00    sec      144 KBytes    1.18 Mbits/sec  5.167 ms   0/18 (0%)
[ 5]  9.00-10.00   sec      112 KBytes    918 Kbits/sec  8.301 ms   0/14 (0%)
-----
[ ID] Interval      Transfer    Bitrate      Jitter    Lost/TOTAL  Datagrams
[ 5]  0.00-10.00   sec      1.24 MBytes    1.04 Mbits/sec  8.301 ms   0/159 (0%)  receiver
-----
Server listening on 5201 (test #2)
-----
```

TCP TEST

```
-----
Server listening on 5201 (test #2)
-----
Accepted connection from 192.168.24.39, port 35638
[ 5] local 192.168.24.140 port 5201 connected to 192.168.24.39 port 35640
[ ID] Interval      Transfer    Bitrate
[ 5]  0.00-1.01    sec      9.12 MBytes    76.0 Mbits/sec
[ 5]  1.01-2.01    sec      9.75 MBytes    81.9 Mbits/sec
[ 5]  2.01-3.01    sec     10.8 MBytes    89.4 Mbits/sec
[ 5]  3.01-4.01    sec     12.2 MBytes   103 Mbits/sec
[ 5]  4.01-5.01    sec     13.1 MBytes   110 Mbits/sec
[ 5]  5.01-6.01    sec     12.5 MBytes   105 Mbits/sec
[ 5]  6.01-7.02    sec     12.5 MBytes   104 Mbits/sec
[ 5]  7.02-8.01    sec     13.4 MBytes   113 Mbits/sec
[ 5]  8.01-9.00    sec     12.4 MBytes   104 Mbits/sec
[ 5]  9.00-10.00   sec     13.6 MBytes   114 Mbits/sec
[ 5] 10.00-10.20   sec      2.25 MBytes    95.9 Mbits/sec
-----
[ ID] Interval      Transfer    Bitrate
[ 5]  0.00-10.20   sec     122 MBytes   100 Mbits/sec
-----
Server listening on 5201 (test #3)
-----
```

Bidirectional TEST

```
Server listening on 5201 (test #3)
-----
Accepted connection from 192.168.24.39, port 35642
[ 5] local 192.168.24.140 port 5201 connected to 192.168.24.39 port 35644
[ ID] Interval      Transfer    Bitrate
[ 5] 0.00-1.00    sec 8.50 MBytes 71.0 Mbits/sec
[ 5] 1.00-2.01    sec 8.12 MBytes 67.4 Mbits/sec
[ 5] 2.01-3.01    sec 10.6 MBytes 89.7 Mbits/sec
[ 5] 3.01-4.01    sec 9.00 MBytes 75.4 Mbits/sec
[ 5] 4.01-5.00    sec 9.50 MBytes 80.1 Mbits/sec
[ 5] 5.00-6.00    sec 9.75 MBytes 81.9 Mbits/sec
[ 5] 6.00-7.00    sec 9.88 MBytes 83.0 Mbits/sec
[ 5] 7.00-8.00    sec 10.2 MBytes 85.8 Mbits/sec
[ 5] 8.00-9.01    sec 9.88 MBytes 82.1 Mbits/sec
[ 5] 9.01-10.01   sec 10.4 MBytes 87.7 Mbits/sec
[ 5] 10.01-10.01  sec 128 KBytes 136 Mbits/sec
-----
[ ID] Interval      Transfer    Bitrate
[ 5] 0.00-10.01    sec 96.0 MBytes 80.4 Mbits/sec
-----
Server listening on 5201 (test #4)
```

receiver

Reverse TEST

```
Server listening on 5201 (test #4)
-----
Accepted connection from 192.168.24.39, port 35646
[ 5] local 192.168.24.140 port 5201 connected to 192.168.24.39 port 35648
[ ID] Interval      Transfer    Bitrate
[ 5] 0.00-1.01    sec 12.2 MBytes 102 Mbits/sec
[ 5] 1.01-2.00    sec 11.0 MBytes 92.8 Mbits/sec
[ 5] 2.00-3.00    sec 9.88 MBytes 82.5 Mbits/sec
[ 5] 3.00-4.01    sec 13.1 MBytes 110 Mbits/sec
[ 5] 4.01-5.00    sec 12.2 MBytes 104 Mbits/sec
[ 5] 5.00-6.00    sec 11.2 MBytes 94.1 Mbits/sec
[ 5] 6.00-7.01    sec 11.4 MBytes 94.5 Mbits/sec
[ 5] 7.01-8.00    sec 10.2 MBytes 86.9 Mbits/sec
[ 5] 8.00-9.01    sec 9.00 MBytes 74.8 Mbits/sec
[ 5] 9.01-10.00   sec 9.62 MBytes 81.6 Mbits/sec
-----
[ ID] Interval      Transfer    Bitrate
[ 5] 0.00-10.00    sec 110 MBytes 92.4 Mbits/sec
-----
Server listening on 5201 (test #5)
```

sender

Parallel TEST

```
Server listening on 5201 (test #5)
-----
Accepted connection from 192.168.24.39, port 35660
[ 5] local 192.168.24.140 port 5201 connected to 192.168.24.39 port 35662
[ 7] local 192.168.24.140 port 5201 connected to 192.168.24.39 port 35664
[10] local 192.168.24.140 port 5201 connected to 192.168.24.39 port 35666
[12] local 192.168.24.140 port 5201 connected to 192.168.24.39 port 35668
[14] local 192.168.24.140 port 5201 connected to 192.168.24.39 port 35670
[ ID] Interval      Transfer    Bitrate
[ 5] 0.00-1.01 sec  2.50 MBytes 20.7 Mbits/sec
[ 7] 0.00-1.01 sec  2.62 MBytes 21.7 Mbits/sec
[10] 0.00-1.01 sec  1.50 MBytes 12.4 Mbits/sec
[12] 0.00-1.01 sec  1.62 MBytes 13.4 Mbits/sec
[14] 0.00-1.01 sec  2.50 MBytes 20.7 Mbits/sec
[SUM] 0.00-1.01 sec 10.8 MBytes 88.9 Mbits/sec
-----
[ 5] 1.01-2.01 sec  2.38 MBytes 20.1 Mbits/sec
[ 7] 1.01-2.01 sec  4.12 MBytes 34.9 Mbits/sec
[10] 1.01-2.01 sec  1.12 MBytes  9.52 Mbits/sec
[12] 1.01-2.01 sec  1.12 MBytes  9.52 Mbits/sec
[14] 1.01-2.01 sec  2.50 MBytes 21.2 Mbits/sec
[SUM] 1.01-2.01 sec 11.2 MBytes 95.2 Mbits/sec
-----
[ 5] 2.01-3.01 sec  2.25 MBytes 18.8 Mbits/sec
[ 7] 2.01-3.01 sec  4.50 MBytes 37.5 Mbits/sec
[10] 2.01-3.01 sec  1.12 MBytes  9.38 Mbits/sec
[12] 2.01-3.01 sec  1.38 MBytes 11.5 Mbits/sec
[14] 2.01-3.01 sec  3.88 MBytes 32.3 Mbits/sec
[SUM] 2.01-3.01 sec 13.1 MBytes 109 Mbits/sec
-----
```

```
[10] 8.02-9.00 sec  1.88 MBytes 15.9 Mbits/sec
[12] 8.02-9.00 sec  1.88 MBytes 15.9 Mbits/sec
[14] 8.02-9.00 sec  3.75 MBytes 31.9 Mbits/sec
[SUM] 8.02-9.00 sec 13.1 MBytes 111 Mbits/sec
-----
[ 5] 9.00-10.01 sec  1.88 MBytes 15.5 Mbits/sec
[ 7] 9.00-10.01 sec  3.62 MBytes 30.0 Mbits/sec
[10] 9.00-10.01 sec  1.88 MBytes 15.5 Mbits/sec
[12] 9.00-10.01 sec  1.88 MBytes 15.5 Mbits/sec
[14] 9.00-10.01 sec  3.62 MBytes 30.0 Mbits/sec
[SUM] 9.00-10.01 sec 12.9 MBytes 107 Mbits/sec
-----
[ 5] 10.01-10.05 sec  0.00 Bytes 0.00 bits/sec
[ 7] 10.01-10.05 sec  256 KBytes 56.0 Mbits/sec
[10] 10.01-10.05 sec  128 KBytes 28.0 Mbits/sec
[12] 10.01-10.05 sec  0.00 Bytes 0.00 bits/sec
[14] 10.01-10.05 sec  256 KBytes 56.0 Mbits/sec
[SUM] 10.01-10.05 sec  640 KBytes 140 Mbits/sec
-----
[ ID] Interval      Transfer    Bitrate
[ 5] 0.00-10.05 sec 19.4 MBytes 16.2 Mbits/sec receiver
[ 7] 0.00-10.05 sec 36.0 MBytes 30.0 Mbits/sec receiver
[10] 0.00-10.05 sec 16.0 MBytes 13.4 Mbits/sec receiver
[12] 0.00-10.05 sec 16.6 MBytes 13.9 Mbits/sec receiver
[14] 0.00-10.05 sec 33.8 MBytes 28.2 Mbits/sec receiver
[SUM] 0.00-10.05 sec 122 MBytes 102 Mbits/sec receiver
-----
Server listening on 5201 (test #6)
-----
```

Key Learnings:

1. iPerf helps measure network speed, delay, and stability.
2. TCP vs. UDP tests give different performance insights (TCP is reliable, UDP is faster but lossy).
3. Bidirectional and parallel tests help check real-world performance.