

COMP90007 Internet Technologies

Project 1 – Network Analysis

Student Name: Sakshi Chandel

Login username : schandel@student.unimelb.edu.au

Student ID: 1124298

Question 2 :

Answer 2.1): “-d” in “tracert -d-wl” (in Windows) stands for do not resolve host addresses to host names.

“-w” stands for wait timeout milliseconds for each reply.

“-w1” stands for setting waiting time response to 1

Question 2.2

Answer 2.2: From Appendix Section 2

We can find the data of all the IP addresses

1) iperf.he.net (Section 2.a)

Distance between source and destination = 12752.384 km

Hop counts = 8

2) bouygues.testdebit.info (Section 2.b)

Distance between source and destination = 7208.271 km

Hop counts = 12

3) iperf.comneonext.de Section (2.c)

Distance between source and destination = 6854.0 km

Hop counts = 11

4) ikoula.testdebit.info (Section 2.d)

Distance between source and destination = 7202.2 km

Hop counts = 9

5) st2.nn.ertelecom.ru (Section 2.e)

Distance between source and destination = 4699.0 km

Hop counts = 9

6) iperf.biznetnetworks.com (Section 2.f)

Distance between source and destination = 4378.03 km

Hop counts = 7

7) iperf.scottlinux.com (Section 2.g)

Distance between source and destination = 12820.9 km

Hop counts = 6

8) speedtest.serverius.net (Section 2.h)

Distance between source and destination = 6931.4 km

Hop counts 8

9) iperf.volia.net (Section 2.i)

Distance between source and destination = 5644.345 km

Hop counts = 8

10) iperf.eenet.ee (Section 2.j) (Not mentioned in project,searched by myself)

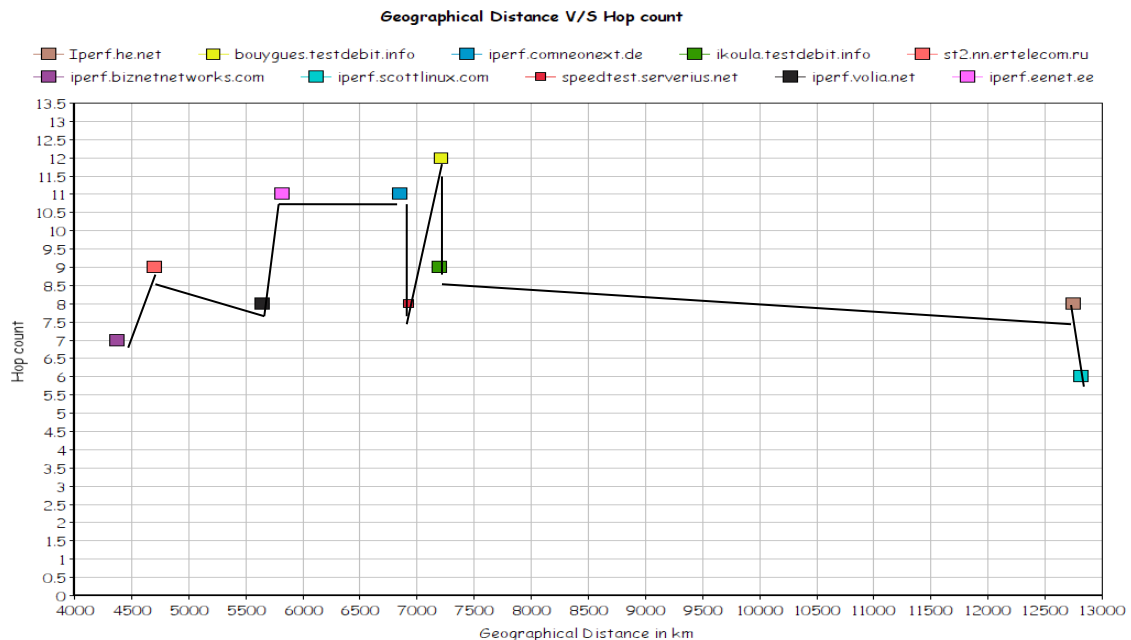
Distance between source and destination = 5819.501 km

Hop count = 11

The plot of graph shows distance between source and destination V/S Hop count below:

Analysis shows there is a loose relation between hop counts and distance b/w source destination

Generally thinking ,there should be a linear relation between both but it is not absolute as I can see in the graph.Because we can see two servers having same hop count but having a large difference in geographical distance .



Question 3.1 :

Answer 3.1: Delay time of all the hosts below: From Appendix ,Section 3

Reference for finding the distance : My city : "Jabalpur,Madhya Pradesh,India"

<https://www.freemaptools.com/how-far-is-it-between.html>

1)Iperf.he.net (Section 2.a)

Average = 338.3 ms, Jitter = 46.49 ms,Distance = 12752.3

2) bouygues.testdebit.info (Section 2.b)

Average= 215.6 ms,Jitter = 20.52 ms,Distance= 7208.27

3) iperf.comneonext.de (Section 2.c)

Average = 340 ms,Jitter : 188 ms ,Distance= 6854.00

4) ikoula.testdebit.info (Section 2.d)

Average = 240 ms,Jitter =51.61 ms,Distance= 7202.2

5) st2.nn.ertelecom.ru (Section 2.e)

Average = 270.3 ms,Jitter = 85.73,Distance=4699.0

6) iperf.biznetnetworks.com (Section 2.f)

Average = 248.33 ms,Jitter = 8 ms,Distance = 4378.0

7) iperf.scottlinux.com (Section 2.g)

Average = 333ms ,Jitter = 45.53 ms,Distance=12820.98

8) speedtest.serverius.net (Section 2.h)

Average = 238 ms,Jitter = 41.40 ms ,Distance = 6932.49

9) iperf.volia.net (Section 2.i)

Average = 180 ms,Jitter = 4.53 ms,Distance=5644.34

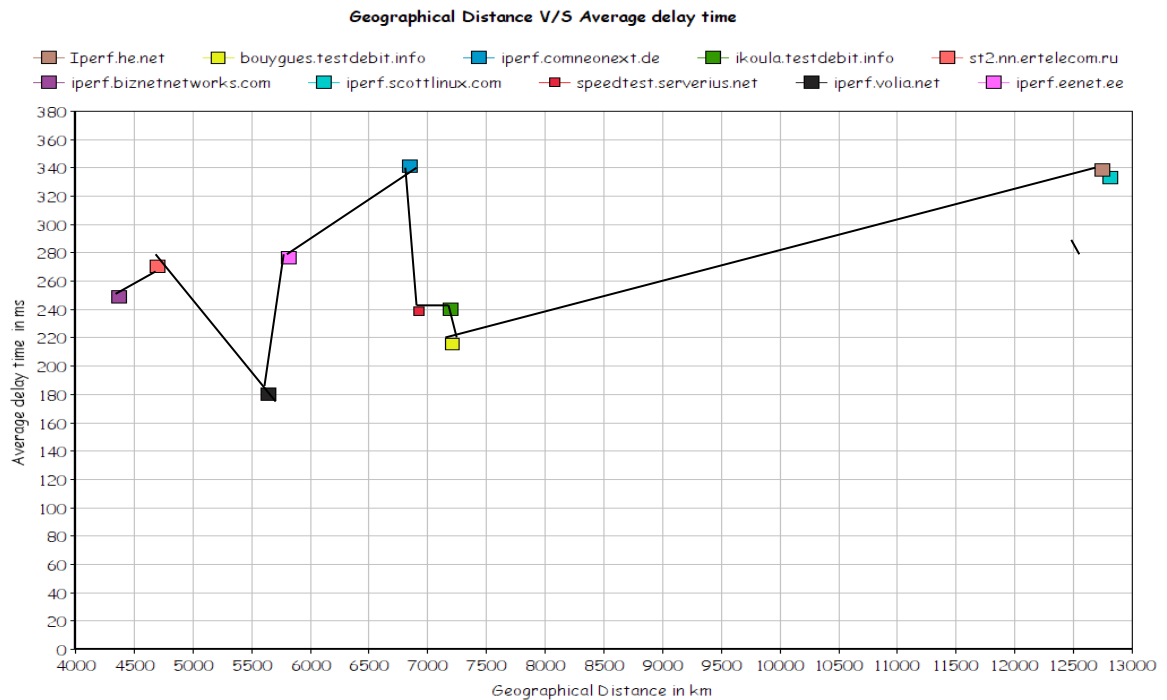
10) iperf.eenet.ee (Section 2.j)

Average = 276 ms ,Jitter = 0 ms ,Distane = 5819.501

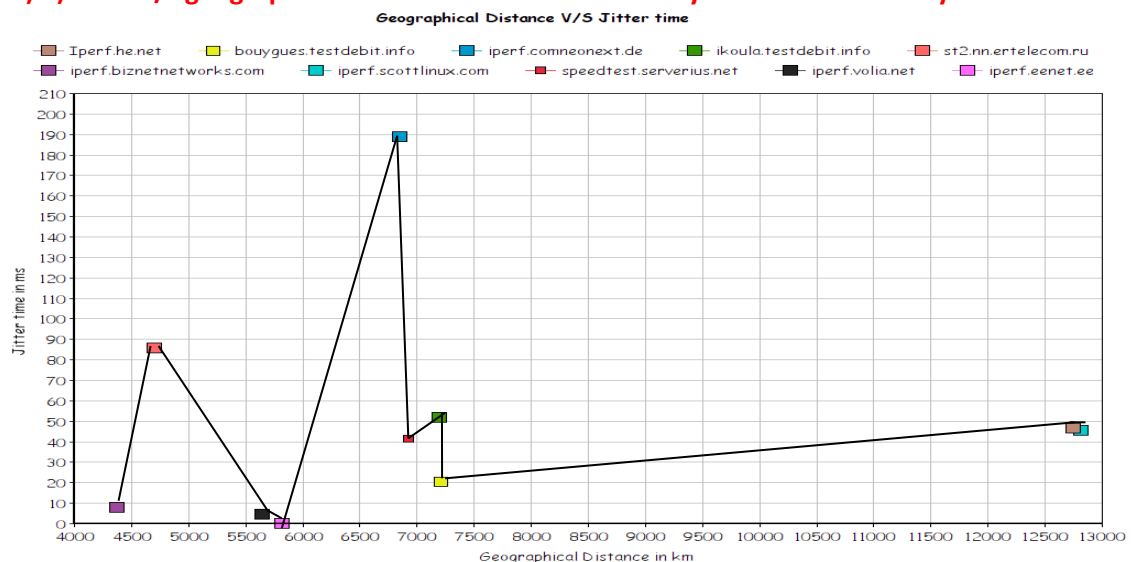
Below are the graphs for jitter and average delay time v/s geographical distance

GRAPHS

a)Average delay time v/s geographical distance between source city and destination city



Graph 2) b) Jitter v/s geographical distance between source city and destination city

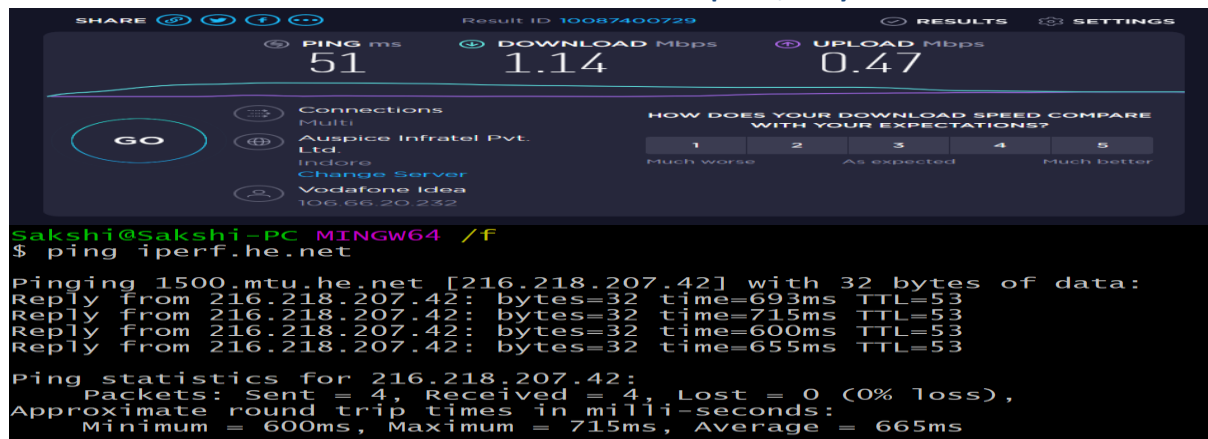


Question 3.2

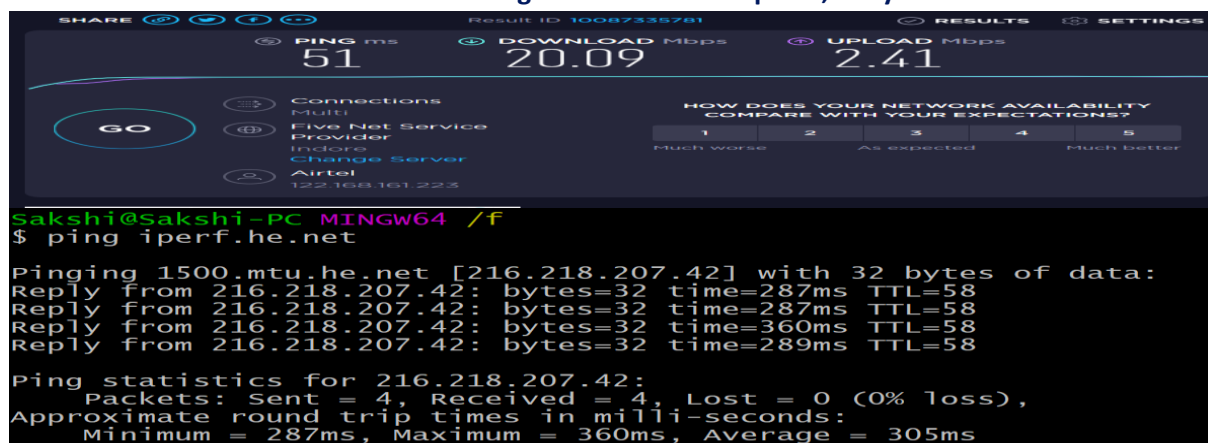
Answer 3.2) Jitter and average delay time is loosely dependent on geo graphical distance because even if distance is increasing jitter and average delay time is not increasing .But if my judgement is

wrong can be because of my ISP (Internet service provider) or due to network traffic and network speed. Average delay time and jitter is dependent on the network environment like network latency, change in routes, congestion. I have ran two three commands for each IP address when I used wifi (greater download speed), delay time was less as compared to when I used mobile data/hotspot (less download speed). Following are the details about it :

Network details when ran command with less download speed ,delay time was le



Network details when ran command with greater download speed ,delay time was less.



Question 4.1

Answer 4.1 : From Appendix, section 4

Bandwidth delay product is a measurement of how many bits can fill up a network link. It gives the maximum amount of data that can be transmitted by the sender at a given time before waiting for acknowledgment.

- 1) **iperf.he.net** (Section 2.a)
Mean bandwidth = 1.99 Mbits/sec
- 2) **bouygues.testdebit.info** (Section 2.b)
Mean Bandwidth : 5.37 Mbits/sec
- c) **iperf.comneonext.de** (Section 2.c)
Mean bandwidth = 4.9 Mbits/sec
- d) **ikoula.testdebit.info** (Section 2.d)
Mean Bandwidth : 5.48 Mbits/sec
- e) **st2.nn.ertelecom.ru** (Section 2.e)
Mean bandwidth: 2.41 Mbits/sec

f) iperf.biznetnetworks.com (Section 2.f)

Mean bandwidth : 2.39 Mbits/sec

g) iperf.scottlinux.com (Section 2.g)

Mean bandwidth = 981 Kbits/sec

h) speedtest.serverius.net (Section 2.h)

Mean bandwidth : 70.3 Kbits/sec

i) iperf.volia.net (Section 2.i)

Mean bandwidth : 59.8 Kbits/sec

j) iperf.eenet.ee (Section 2.j)

Mean bandwidth : 1.68 Mbits/sec

Question 4.2)

Answer 4.2: From Appendix, Section 4

Calculating Bandwidthdelay of all Ip addresses

sa) iperf.he.net

Delay = 338 ms (from question3), Bandwidth = 1.99 Mbits/sec (from question 4.1)

Bandwidth delay product = $338 \times 1.99 = 672.6$ Kbits

b) bouygues.testdebit.info

Delay = 215.6ms (from question3), Bandwidth = 5.37 Mbits/sec (from question 4.1)

Bandwidth delay product = $215.6 \times 5.37 = 1157.772$ Kbits

(c) iperf.comneonext.de

Delay = 340.66 ms (from question3), Bandwidth = 4.9 Mbits/sec (from question 4.1)

Bandwidth delay product = $340.66 \times 4.9 = 1669.234$ Kbits

d) ikoula.testdebit.info

Delay = 240 ms (from question3), Bandwidth = 5.48 Mbits/sec (from question 4.1)

Bandwidth delay product = $240 \times 5.48 = 1315.2$ Kbits

e) st2.nn.ertelecom.ru

Delay = 270.3ms (from question3), Bandwidth = 2.41 Mbits/sec (from question 4.1)

Bandwidth delay product = $270.3 \times 2.41 = 651.423$ Kbits

f) iperf.biznetnetworks.com

Delay = 248.33ms (from question3), Bandwidth = 2.39 Mbits/sec (from question 4.1)

Bandwidth delay product = $248.33 \times 2.39 = 593.5$ Kbits

g) iperf.scottlinux.com

Delay = 333 ms (from question3), Bandwidth = 981 Kbits/sec (from question 4.1)

Bandwidth delay product = $333 \times 981 = 326.673$ Kbits

h) speedtest.serverius.net

Delay = 238.33 ms (from question3), Bandwidth = 70.3 Kbits/sec (from question 4.1)

Bandwidth delay product = $238.33 \times 70.3 = 16.754$ Kbits

i) iperf.volia.net

Delay = 180 ms (from question3), Bandwidth = 59.8 Kbits/sec (from question 4.1)

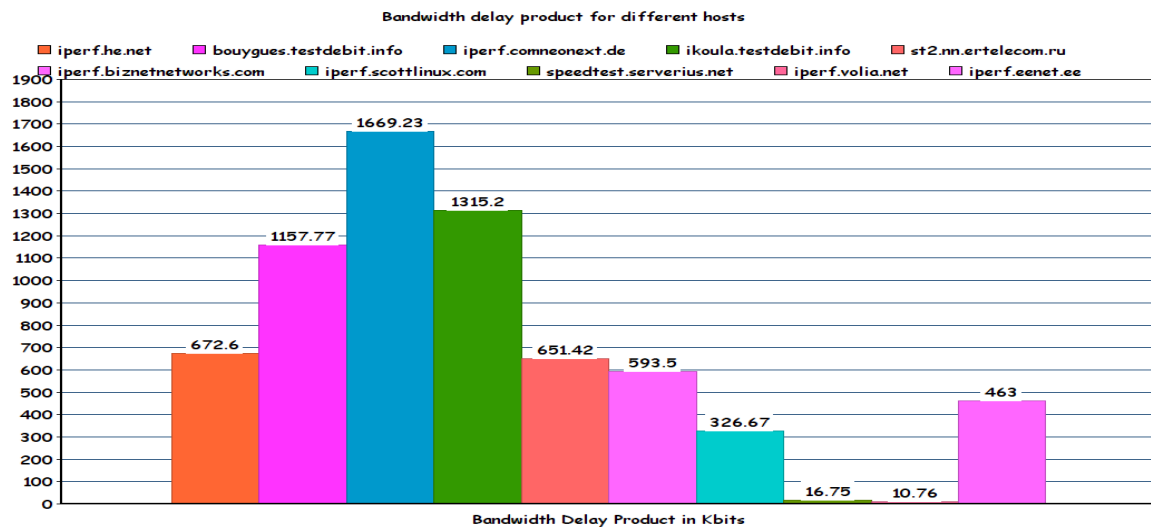
Bandwidth delay product = $180 \times 59.8 = 10.764$ Kbits

j) iperf.eenet.ee

Delay = 276 ms (from question 3), Bandwidth = 1.68 Mbits/sec (from question 4.1)

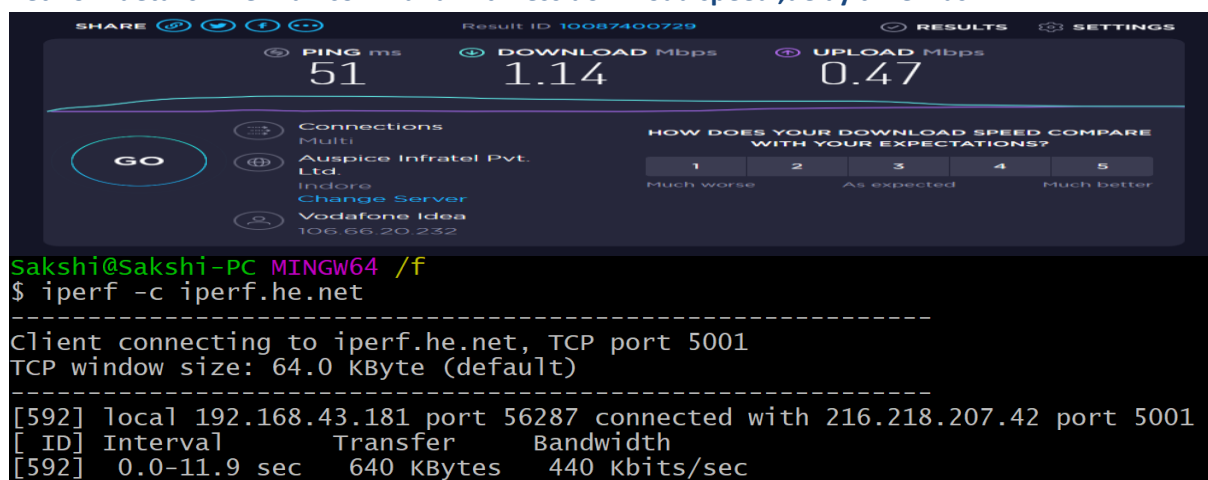
Bandwidth delay product = $276 \times 1.68 = 463$ Kbits

Bar graph depicting Bandwidth delay product of all IP addresses.

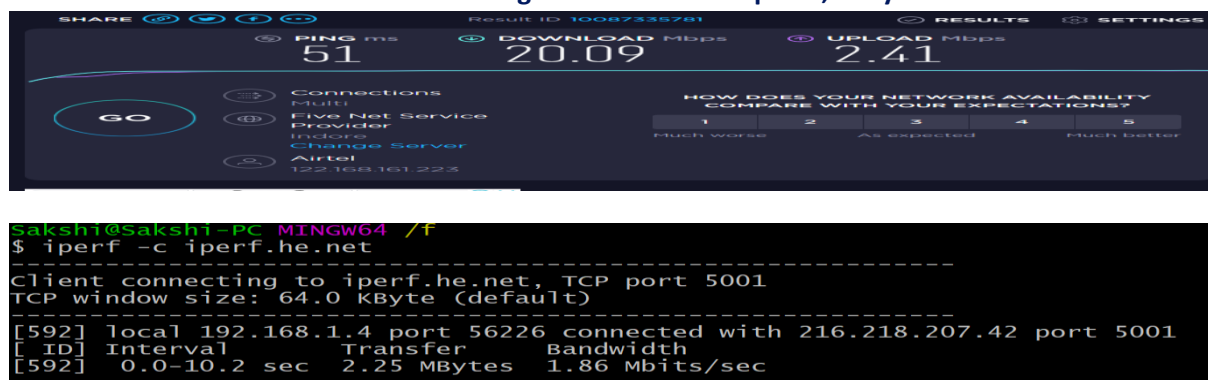


Bandwidth product delay depends on the network like traffic, congestion in the network and network speed.

Network details when ran command with less download speed, delay time was



Network details when ran command with greater download speed, delay time was less.



Question 4.3

Answer 4.3 From Appendix Section 4

a) **iperf.he.net** (Section 2.a)

Bandwidth delay product = $338 \times 1.99 = 672.6$ Kbits, Hop Count = 8

b) **bouygues.testdebit.info** (Section 2.b)

Bandwidth delay product = $470 \times 5.37 = 2523.9$ Kbits, Hop Count = 12

(c) **iperf.comneonext.de** (Section 2.c)

Bandwidth delay product = $442.6 \times 4.9 = 2168.74$ Kbits, Hop Count = 11

d) **ikoula.testdebit.info** (Section 2.d)

Bandwidth delay product = $475.3 \times 5.48 = 2604.6$ Kbits, Hop Count = 9

e) **st2.nn.ertelecom.ru** (Section 2.e)

Bandwidth delay product = $523 \times 2.41 = 1260.43$ Kbits, Hop Count = 9

f) **iperf.biznetnetworks.com** (Section 2.f)

Bandwidth delay product = $574.6 \times 2.39 = 1373.2$ Kbits, Hop Count = 7

g) **iperf.scottlinux.com** (Section 2.g)

Bandwidth delay product = $615 \times 981 = 603.315$ Kbits, Hop Count = 6

h) **speedtest.serverius.net** (Section 2.h)

Bandwidth delay product = $1089 \times 70.3 = 76.5$ Kbits, Hop Count = 8

i) **iperf.volia.net** (Section 2.i)

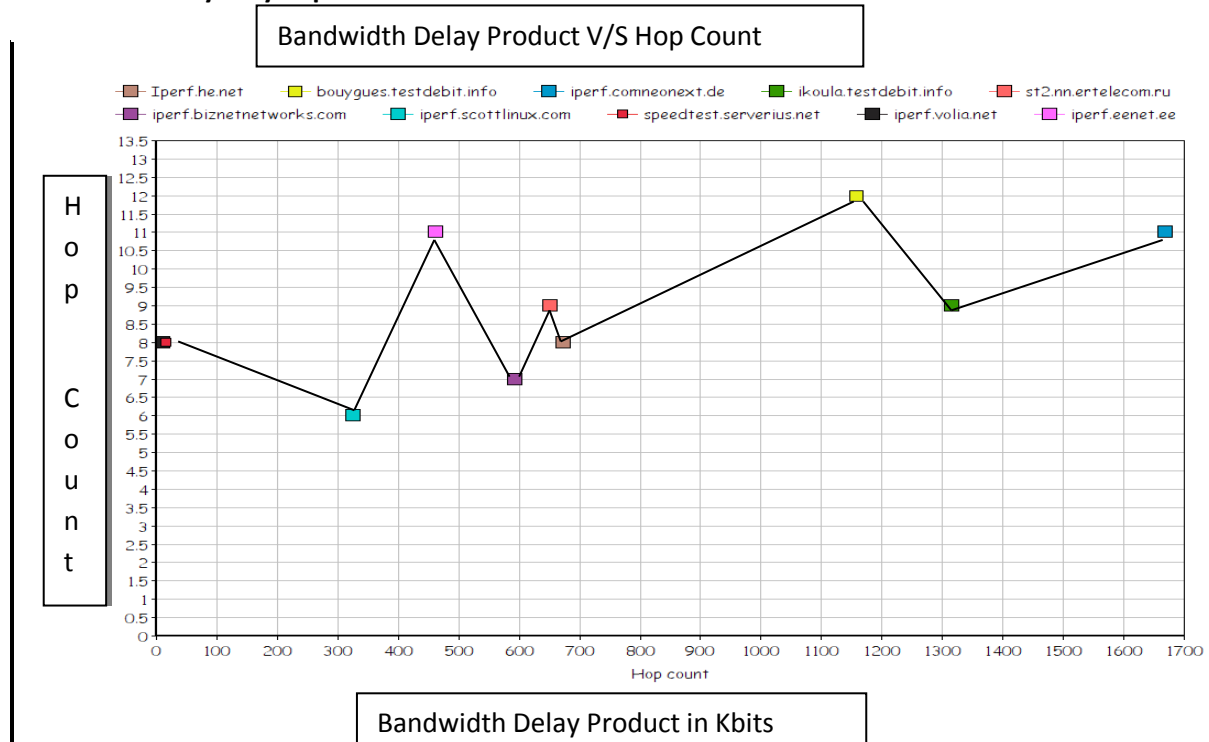
Bandwidth delay product = $178 \times 59.8 = 10.6$ Kbits, Hop Count = 8

j) **iperf.eenet.ee** (Section 2.j)

Bandwidth delay product = $276 \times 1.68 = 463$ Kbits, Hop Count = 11

Bandwidth delay product is loosely dependent on hop count. As we can see in the graph there is no linear relation between them. Hop count is not dependent on bandwidth delay product.

Bandwidth delay may depend on different other network factors.



Question 4.4

Answer 4.4 : After running tests for bandwidth, delay, and jitter the factor that depends on it are network like network speed and bandwidth.

To improve the result, better internet connection with good bandwidth and closing other applications running on system to reduce network traffic should be used.

References

Reference for finding the distance : My city : "Jabalpur, Madhya Pradesh, India"

<https://www.freemaptools.com/how-far-is-it-between.html>

Reference of finding standard deviation and mean :

<https://www.calculator.net/standard-deviation-calculator.html>

Appendix

Section 2: Details about all hosts

a) iperf.he.net

```
Sakshi@Sakshi-PC MINGW64 ~
$ tracert -d-wl iperf.he.net
Tracing route to 1500.mtu.he.net [216.218.207.42]
over a maximum of 30 hops:
  1          2 ms          1 ms          1 ms          192.168.1.1
  2          11 ms         12 ms         12 ms         125.21.20.121
  3          139 ms        100 ms         52 ms         125.21.18.205
  4          33 ms         99 ms         27 ms         125.21.18.205
  5          70 ms         118 ms        * ms         198.32.118.57
  6          77 ms         294 ms         581 ms        184.105.81.218
  7          247 ms        282 ms        385 ms        72.52.92.117
  8          285 ms        667 ms        292 ms        184.105.65.210
  9          292 ms          ms          ms          216.218.207.42
Trace complete.
```

b) bouygues.testdebit.info

```
Sakshi@Sakshi-PC MINGW64 ~
$ tracert -d-wl bouygues.testdebit.info
Tracing route to bouygues.testdebit.info [89.84.1.222]
over a maximum of 30 hops:
  1          1 ms          <1 ms          <1 ms          192.168.1.1
  2          11 ms         11 ms         11 ms         125.16.168.89
  3          157 ms        160 ms        157 ms         116.119.44.158
  4          161 ms        160 ms        161 ms         149.14.227.1
  5          151 ms        151 ms        150 ms         130.117.48.205
  6          150 ms        149 ms        149 ms         154.54.57.70
  7          158 ms        158 ms        158 ms         130.117.1.46
  8          152 ms        152 ms        152 ms         149.14.121.234
  9          151 ms        152 ms        151 ms         62.34.2.57
  10         * ms          * ms          * ms         Request timed out.
  11          150 ms        149 ms        149 ms         89.89.101.141
  12          160 ms        160 ms        160 ms         89.84.1.222
Trace complete.
```

c) iperf.comneonext.de

```
Sakshi@Sakshi-PC MINGW64 ~
$ tracert -d-wl iperf.comneonext.de
Tracing route to iperf.comneonext.de [91.195.241.136]
over a maximum of 30 hops:
  1          74 ms          <1 ms          <1 ms          192.168.1.1
  2          11 ms         11 ms         11 ms         125.21.20.121
  3          148 ms        148 ms        149 ms         116.119.36.144
  4          149 ms        149 ms        147 ms         62.115.42.118
  5          166 ms        165 ms        165 ms         62.115.114.200
  6          166 ms        166 ms        168 ms         62.115.124.47
  7          166 ms        167 ms        166 ms         62.115.120.78
  8          189 ms        188 ms        197 ms         62.115.160.178
  9          166 ms        165 ms        166 ms         91.195.241.102
  10         171 ms        169 ms        170 ms         91.195.241.106
  11         165 ms        165 ms        165 ms         91.195.241.136
Trace complete.
```

d) ikoula.testdebit.info


```

Sakshi@Sakshi-PC MINGW64 ~
$ tracert -d-wl ikoula.testdebit.info

Tracing route to ikoula.testdebit.info [213.246.63.45]
over a maximum of 30 hops:

  1    73 ms    <1 ms    1 ms    192.168.1.1
  2    11 ms    11 ms    12 ms    125.16.168.89
  3   159 ms    157 ms    156 ms    116.119.36.142
  4   162 ms    169 ms    165 ms    195.66.224.21
  5   164 ms    183 ms    165 ms    184.105.223.254
  6   152 ms    152 ms    160 ms    184.104.205.18
  7   154 ms    157 ms    154 ms    213.246.50.193
  8      *      155 ms    165 ms    213.246.50.182
  9   154 ms    153 ms    153 ms    213.246.63.45

Trace complete.

```

e) st2.nn.ertelecom.ru

```

Sakshi@Sakshi-PC MINGW64 ~
$ tracert -d-wl st2.nn.ertelecom.ru

Tracing route to st2.nn.ertelecom.ru [91.144.184.232]
over a maximum of 30 hops:

  1    73 ms    <1 ms    <1 ms    192.168.1.1
  2    10 ms    12 ms    10 ms    125.21.20.121
  3   147 ms    147 ms    147 ms    116.119.36.144
  4   192 ms    191 ms    192 ms    80.249.209.216
  5   205 ms    208 ms    206 ms    87.245.233.246
  6   205 ms    203 ms    201 ms    87.245.254.154
  7   220 ms    218 ms    218 ms    109.194.232.26
  8   218 ms    217 ms    217 ms    109.194.232.25
  9   217 ms    222 ms    218 ms    91.144.184.232

Trace complete.

```

f) iperf.biznetnetworks.com

```

Sakshi@Sakshi-PC MINGW64 ~
$ tracert -d-wl iperf.biznetnetworks.com

Tracing route to iperf.biznetnetworks.com [117.102.109.186]
over a maximum of 30 hops:

  1     1 ms     1 ms     <1 ms    192.168.1.1
  2    11 ms    10 ms    13 ms    125.21.20.121
  3   147 ms    129 ms    124 ms    116.119.44.184
  4   350 ms     *      150 ms    80.249.210.131
  5   195 ms    196 ms    199 ms    202.169.34.177
  6   203 ms    202 ms    206 ms    182.253.99.106
  7   202 ms    201 ms    201 ms    117.102.109.186

Trace complete.

```

g) iperf.scottlinux.com

```

Sakshi@Sakshi-PC MINGW64 ~
$ tracert -d-wl iperf.scottlinux.com

Tracing route to iperf.scottlinux.com [45.33.39.39]
over a maximum of 30 hops:

  1   340 ms    <1 ms     1 ms    192.168.1.1
  2    10 ms    10 ms     12 ms    125.16.168.89
  3   253 ms    250 ms    244 ms    116.119.44.136
  4   254 ms    254 ms    266 ms    206.72.211.198
  5   254 ms    254 ms    254 ms    173.230.159.65
  6   254 ms    254 ms    255 ms    45.33.39.39

Trace complete.

```

h) speedtest.serverius.net

```
Sakshi@Sakshi-PC MINGW64 ~  
$ tracert -d-wl speedtest.serverius.net  
  
Tracing route to speedtest.serverius.net [178.21.16.76]  
over a maximum of 30 hops:  
  
  1    76 ms    <1 ms    2 ms    192.168.1.1  
  2    11 ms    11 ms    11 ms    125.16.168.69  
  3   130 ms    131 ms    131 ms    116.119.44.184  
  4   176 ms    176 ms    177 ms    80.249.209.216  
  5   155 ms    155 ms    155 ms    87.245.232.44  
  6   160 ms    210 ms    160 ms    87.245.246.61  
  7   152 ms    152 ms    152 ms    185.8.179.33  
  8   154 ms    154 ms    153 ms    178.21.16.76  
  
Trace complete.
```

i) iperf.volia.net

```
Sakshi@Sakshi-PC MINGW64 ~  
$ tracert -d-wl iperf.volia.net  
  
Tracing route to speedtest.volia.net [77.120.3.236]  
over a maximum of 30 hops:  
  
  1    75 ms    1 ms    <1 ms    192.168.1.1  
  2    11 ms    11 ms    11 ms    125.16.168.89  
  3   135 ms    122 ms    122 ms    182.79.222.81  
  4   177 ms    171 ms    171 ms    80.249.209.216  
  5   177 ms    176 ms    176 ms    87.245.232.155  
  6   176 ms    177 ms    176 ms    87.245.237.57  
  7   175 ms    174 ms    176 ms    77.120.1.125  
  8   178 ms    177 ms    178 ms    77.120.1.49  
  9   172 ms    171 ms    172 ms    77.120.3.236  
  
Trace complete.
```

Section 3: Delay time of all the hosts below:

Reference of finding standard deviation and mean :

<https://www.calculator.net/standard-deviation-calculator.html>

a) iperf.he.net

```
Sakshi@Sakshi-PC MINGW64 ~  
$ ping iperf.he.net  
  
Pinging 1500.mtu.he.net [216.218.207.42] with 32 bytes of data:  
Reply from 216.218.207.42: bytes=32 time=291ms TTL=58  
Reply from 216.218.207.42: bytes=32 time=291ms TTL=58  
Reply from 216.218.207.42: bytes=32 time=291ms TTL=58  
Reply from 216.218.207.42: bytes=32 time=341ms TTL=58  
  
Ping statistics for 216.218.207.42:  
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
    Approximate round trip times in milli-seconds:  
        Minimum = 291ms, Maximum = 341ms, Average = 303ms
```

```

Sakshi@Sakshi-PC MINGW64 /f
$ ping iperf.he.net

Pinging 1500.mtu.he.net [216.218.207.42] with 32 bytes of data:
Reply from 216.218.207.42: bytes=32 time=587ms TTL=53
Reply from 216.218.207.42: bytes=32 time=338ms TTL=53
Reply from 216.218.207.42: bytes=32 time=320ms TTL=53
Reply from 216.218.207.42: bytes=32 time=320ms TTL=53

Ping statistics for 216.218.207.42:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 320ms, Maximum = 587ms, Average = 391ms

Sakshi@Sakshi-PC MINGW64 /f
$ ping iperf.he.net

Pinging 1500.mtu.he.net [216.218.207.42] with 32 bytes of data:
Reply from 216.218.207.42: bytes=32 time=321ms TTL=53
Reply from 216.218.207.42: bytes=32 time=322ms TTL=53
Reply from 216.218.207.42: bytes=32 time=321ms TTL=53
Reply from 216.218.207.42: bytes=32 time=322ms TTL=53

Ping statistics for 216.218.207.42:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 321ms, Maximum = 322ms, Average = 321ms

```

Standard Deviation Calculator

Result

Standard Deviation, s: **46.490142324296**

Count, N: 3
Sum, Σx : 1015
Mean, \bar{x} : 338.33333333333
Variance, s^2 : 2161.3333333333

Steps

$$s = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2}$$

$$s^2 = \frac{\sum (x_i - \bar{x})^2}{N-1}$$

$$= \frac{(303 - 338.33333333333)^2 + \dots + (321 - 338.33333333333)^2}{3-1}$$

$$= \frac{4322.6666666667}{2}$$

$$= 2161.3333333333$$

$$s = \sqrt{2161.3333333333}$$

$$= 46.490142324296$$

b) bouygues.testdebit.info

```

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 159ms, Maximum = 378ms, Average = 233ms

Sakshi@Sakshi-PC MINGW64 ~
$ ping bouygues.testdebit.info

Pinging bouygues.testdebit.info [89.84.1.222] with 32 bytes of data:
Reply from 89.84.1.222: bytes=32 time=266ms TTL=54
Reply from 89.84.1.222: bytes=32 time=184ms TTL=54
Reply from 89.84.1.222: bytes=32 time=206ms TTL=54
Reply from 89.84.1.222: bytes=32 time=229ms TTL=54

Ping statistics for 89.84.1.222:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 184ms, Maximum = 266ms, Average = 221ms

Sakshi@Sakshi-PC MINGW64 ~
$ ping bouygues.testdebit.info

Pinging bouygues.testdebit.info [89.84.1.222] with 32 bytes of data:
Reply from 89.84.1.222: bytes=32 time=171ms TTL=54
Reply from 89.84.1.222: bytes=32 time=271ms TTL=54
Reply from 89.84.1.222: bytes=32 time=158ms TTL=54
Reply from 89.84.1.222: bytes=32 time=172ms TTL=54

Ping statistics for 89.84.1.222:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 158ms, Maximum = 271ms, Average = 193ms

```

Standard Deviation Calculator

Result

Standard Deviation, s: **20.526405757788**

Count, N: 3
Sum, Σx : 647
Mean, \bar{x} : 215.666666666667
Variance, s^2 : 421.333333333333

Steps

$$s = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2}$$
$$s^2 = \frac{\Sigma(x_i - \bar{x})^2}{N-1}$$
$$= \frac{(233 - 215.666666666667)^2 + \dots + (193 - 215.666666666667)^2}{3-1}$$
$$= \frac{842.666666666667}{2}$$
$$= 421.333333333333$$
$$s = \sqrt{421.333333333333}$$
$$= 20.526405757788$$

c) iperf.comneonext.de

Approximate round trip times in milli-seconds:
Minimum = 178ms, Maximum = 1691ms, Average = 558ms

```
Sakshi@Sakshi-PC MINGW64 ~  
$ ping iperf.comneonext.de
```

```
Pinging iperf.comneonext.de [91.195.241.136] with 32 bytes of data:  
Reply from 91.195.241.136: bytes=32 time=214ms TTL=55  
Reply from 91.195.241.136: bytes=32 time=234ms TTL=55  
Reply from 91.195.241.136: bytes=32 time=256ms TTL=55  
Reply from 91.195.241.136: bytes=32 time=277ms TTL=55
```

```
Ping statistics for 91.195.241.136:  
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
Approximate round trip times in milli-seconds:  
Minimum = 214ms, Maximum = 277ms, Average = 245ms
```

```
Sakshi@Sakshi-PC MINGW64 ~  
$ ping iperf.comneonext.de
```

```
Pinging iperf.comneonext.de [91.195.241.136] with 32 bytes of data:  
Reply from 91.195.241.136: bytes=32 time=192ms TTL=55  
Reply from 91.195.241.136: bytes=32 time=214ms TTL=55  
Reply from 91.195.241.136: bytes=32 time=207ms TTL=55  
Reply from 91.195.241.136: bytes=32 time=266ms TTL=55
```

```
Ping statistics for 91.195.241.136:  
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
Approximate round trip times in milli-seconds:  
Minimum = 192ms, Maximum = 266ms, Average = 219ms
```

Standard Deviation Calculator

Result

Standard Deviation, s: **188.66460540688**

Count, N: 3
Sum, Σx : 1022
Mean, \bar{x} : 340.666666666667
Variance, s^2 : 35594.3333333333

Steps

$$s = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2}$$
$$s^2 = \frac{\Sigma(x_i - \bar{x})^2}{N-1}$$
$$= \frac{(558 - 340.666666666667)^2 + \dots + (219 - 340.666666666667)^2}{3-1}$$
$$= \frac{71188.6666666667}{2}$$
$$= 35594.3333333333$$
$$s = \sqrt{35594.3333333333}$$
$$= 188.66460540688$$

d) ikoula.testdebit.info

```
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
  Minimum = 169ms, Maximum = 579ms, Average = 297ms

Sakshi@Sakshi-PC MINGW64 ~
$ ping ikoula.testdebit.info

Pinging ikoula.testdebit.info [213.246.63.45] with 32 bytes of data:
Reply from 213.246.63.45: bytes=32 time=280ms TTL=58
Reply from 213.246.63.45: bytes=32 time=168ms TTL=58
Reply from 213.246.63.45: bytes=32 time=169ms TTL=58
Reply from 213.246.63.45: bytes=32 time=168ms TTL=58

Ping statistics for 213.246.63.45:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 168ms, Maximum = 280ms, Average = 196ms

Sakshi@Sakshi-PC MINGW64 ~
$ ping ikoula.testdebit.info

Pinging ikoula.testdebit.info [213.246.63.45] with 32 bytes of data:
Reply from 213.246.63.45: bytes=32 time=196ms TTL=58
Reply from 213.246.63.45: bytes=32 time=217ms TTL=58
Reply from 213.246.63.45: bytes=32 time=239ms TTL=58
Reply from 213.246.63.45: bytes=32 time=261ms TTL=58

Ping statistics for 213.246.63.45:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 196ms, Maximum = 261ms, Average = 228ms
```

Standard Deviation Calculator

Result

Standard Deviation, s: **51.617180602328**

Count, N: 3
Sum, Σx : 721
Mean, \bar{x} : 240.33333333333
Variance, s^2 : 2664.3333333333

Steps

$$s = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2},$$

$$\begin{aligned} s^2 &= \frac{\Sigma(x_i - \bar{x})^2}{N-1} \\ &= \frac{(297 - 240.33333333333)^2 + \dots + (228 - 240.33333333333)^2}{3-1} \\ &= \frac{5328.6666666667}{2} \\ &= 2664.3333333333 \\ s &= \sqrt{2664.3333333333} \\ &= 51.617180602328 \end{aligned}$$

e) st2.nn.ertelecom.ru

```
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
  Minimum = 196ms, Maximum = 261ms, Average = 228ms

Sakshi@Sakshi-PC MINGW64 ~
$ ping st2.nn.ertelecom.ru

Pinging st2.nn.ertelecom.ru [91.144.184.232] with 32 bytes of data:
Reply from 91.144.184.232: bytes=32 time=695ms TTL=56
Reply from 91.144.184.232: bytes=32 time=307ms TTL=56
Reply from 91.144.184.232: bytes=32 time=227ms TTL=56
Reply from 91.144.184.232: bytes=32 time=248ms TTL=56

Ping statistics for 91.144.184.232:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 227ms, Maximum = 695ms, Average = 369ms

Sakshi@Sakshi-PC MINGW64 ~
$ ping st2.nn.ertelecom.ru

Pinging st2.nn.ertelecom.ru [91.144.184.232] with 32 bytes of data:
Reply from 91.144.184.232: bytes=32 time=214ms TTL=56
Reply from 91.144.184.232: bytes=32 time=195ms TTL=56
Reply from 91.144.184.232: bytes=32 time=258ms TTL=56
Reply from 91.144.184.232: bytes=32 time=190ms TTL=56

Ping statistics for 91.144.184.232:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 190ms, Maximum = 258ms, Average = 214ms
```

Standard Deviation Calculator

Result

Standard Deviation, s: **85.734085014849**

Count, N: 3
Sum, Σx : 811
Mean, \bar{x} : 270.33333333333
Variance, s^2 : 7350.3333333333

Steps

$$s = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2},$$

$$\begin{aligned} s^2 &= \frac{\Sigma(x_i - \bar{x})^2}{N - 1} \\ &= \frac{(228 - 270.33333333333)^2 + \dots + (214 - 270.33333333333)^2}{3 - 1} \\ &= \frac{14700.666666667}{2} \\ &= 7350.3333333333 \\ s &= \sqrt{7350.3333333333} \\ &= 85.734085014849 \end{aligned}$$

f) iperf.biznetnetworks.com

```
Approximate round trip times in milli-seconds:
  Minimum = 217ms, Maximum = 306ms, Average = 239ms

Sakshi@Sakshi-PC MINGW64 ~
$ ping iperf.biznetnetworks.com

Pinging iperf.biznetnetworks.com [117.102.109.186] with 32 bytes of data:
Reply from 117.102.109.186: bytes=32 time=220ms TTL=58
Reply from 117.102.109.186: bytes=32 time=218ms TTL=58
Reply from 117.102.109.186: bytes=32 time=329ms TTL=58
Reply from 117.102.109.186: bytes=32 time=248ms TTL=58

Ping statistics for 117.102.109.186:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 218ms, Maximum = 329ms, Average = 253ms

Sakshi@Sakshi-PC MINGW64 ~
$ ping iperf.biznetnetworks.com

Pinging iperf.biznetnetworks.com [117.102.109.186] with 32 bytes of data:
Reply from 117.102.109.186: bytes=32 time=229ms TTL=58
Reply from 117.102.109.186: bytes=32 time=272ms TTL=58
Reply from 117.102.109.186: bytes=32 time=295ms TTL=58
Reply from 117.102.109.186: bytes=32 time=218ms TTL=58

Ping statistics for 117.102.109.186:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 218ms, Maximum = 295ms, Average = 253ms
```

Standard Deviation Calculator

Result

Standard Deviation, s: **8.0829037686548**

Count, N: 3
Sum, Σx : 745
Mean, \bar{x} : 248.33333333333
Variance, s^2 : 65.333333333333

Steps

$$s = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2},$$
$$s^2 = \frac{\Sigma(x_i - \bar{x})^2}{N-1}$$
$$= \frac{(239 - 248.33333333333)^2 + \dots + (253 - 248.33333333333)^2}{3-1}$$
$$= \frac{130.66666666667}{2}$$
$$= 65.333333333333$$
$$s = \sqrt{65.333333333333}$$
$$= 8.0829037686548$$

g)iperf.scottlinux.com

```
Packets: Sent = 4, Received = 2, Lost = 2 (50% loss),
Approximate round trip times in milli-seconds:
  Minimum = 378ms, Maximum = 387ms, Average = 382ms

Sakshi@Sakshi-PC MINGW64 ~
$ ping iperf.scottlinux.com

Pinging iperf.scottlinux.com [45.33.39.39] with 32 bytes of data:
Reply from 45.33.39.39: bytes=32 time=386ms TTL=55
Reply from 45.33.39.39: bytes=32 time=305ms TTL=55
Reply from 45.33.39.39: bytes=32 time=325ms TTL=55
Reply from 45.33.39.39: bytes=32 time=287ms TTL=55

Ping statistics for 45.33.39.39:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 287ms, Maximum = 386ms, Average = 325ms

Sakshi@Sakshi-PC MINGW64 ~
$ ping iperf.scottlinux.com

Pinging iperf.scottlinux.com [45.33.39.39] with 32 bytes of data:
Reply from 45.33.39.39: bytes=32 time=287ms TTL=55
Reply from 45.33.39.39: bytes=32 time=287ms TTL=55
Reply from 45.33.39.39: bytes=32 time=290ms TTL=55
Reply from 45.33.39.39: bytes=32 time=304ms TTL=55

Ping statistics for 45.33.39.39:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 287ms, Maximum = 304ms, Average = 292ms
```

Standard Deviation Calculator

Result

Standard Deviation, s: **45.530209751329**

Count, N: 3
Sum, Σx : 999
Mean, \bar{x} : 333
Variance, s^2 : 2073

Steps

$$s = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2},$$
$$s^2 = \frac{\Sigma(x_i - \bar{x})^2}{N-1}$$
$$= \frac{(325 - 333)^2 + \dots + (382 - 333)^2}{3-1}$$
$$= \frac{4146}{2}$$
$$= 2073$$
$$s = \sqrt{2073}$$
$$= 45.530209751329$$

h) speedtest.serverius.net

```
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
  Minimum = 160ms, Maximum = 560ms, Average = 285ms

Sakshi@Sakshi-PC MINGW64 ~
$ ping speedtest.serverius.net

Pinging speedtest.serverius.net [178.21.16.76] with 32 bytes of data:
Reply from 178.21.16.76: bytes=32 time=239ms TTL=56
Reply from 178.21.16.76: bytes=32 time=229ms TTL=56
Reply from 178.21.16.76: bytes=32 time=158ms TTL=56
Reply from 178.21.16.76: bytes=32 time=200ms TTL=56

Ping statistics for 178.21.16.76:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 158ms, Maximum = 239ms, Average = 206ms

Sakshi@Sakshi-PC MINGW64 ~
$ ping speedtest.serverius.net

Pinging speedtest.serverius.net [178.21.16.76] with 32 bytes of data:
Reply from 178.21.16.76: bytes=32 time=157ms TTL=56
Reply from 178.21.16.76: bytes=32 time=159ms TTL=56
Reply from 178.21.16.76: bytes=32 time=424ms TTL=56
Reply from 178.21.16.76: bytes=32 time=159ms TTL=56

Ping statistics for 178.21.16.76:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 157ms, Maximum = 424ms, Average = 224ms
```

Standard Deviation Calculator

Result

Standard Deviation, s: **41.404508611181**

Count, N: 3
Sum, Σx : 715
Mean, \bar{x} : 238.33333333333
Variance, s^2 : 1714.3333333333

Steps

$$s = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2},$$

$$\begin{aligned} s^2 &= \frac{\sum (x_i - \bar{x})^2}{N-1} \\ &= \frac{(285 - 238.33333333333)^2 + \dots + (224 - 238.33333333333)^2}{3-1} \\ &= \frac{3428.6666666667}{2} \\ &= 1714.3333333333 \\ s &= \sqrt{1714.3333333333} \\ &= 41.404508611181 \end{aligned}$$

i) iperf.volia.net

```
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
  Minimum = 175ms, Maximum = 242ms, Average = 191ms

Sakshi@Sakshi-PC MINGW64 ~
$ ping iperf.volia.net

Pinging speedtest.volia.net [77.120.3.236] with 32 bytes of data:
Reply from 77.120.3.236: bytes=32 time=175ms TTL=56
Reply from 77.120.3.236: bytes=32 time=175ms TTL=56
Reply from 77.120.3.236: bytes=32 time=175ms TTL=56
Reply from 77.120.3.236: bytes=32 time=175ms TTL=56

Ping statistics for 77.120.3.236:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 175ms, Maximum = 175ms, Average = 175ms

Sakshi@Sakshi-PC MINGW64 ~
$ ping iperf.volia.net

Pinging speedtest.volia.net [77.120.3.236] with 32 bytes of data:
Reply from 77.120.3.236: bytes=32 time=175ms TTL=56
Reply from 77.120.3.236: bytes=32 time=174ms TTL=56
Reply from 77.120.3.236: bytes=32 time=175ms TTL=56
Reply from 77.120.3.236: bytes=32 time=175ms TTL=56

Ping statistics for 77.120.3.236:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 174ms, Maximum = 175ms, Average = 174ms
```

Standard Deviation Calculator

Result

Standard Deviation, s: **9.5393920141695**

Count, N: 3
Sum, Σx : 540
Mean, \bar{x} : 180
Variance, s^2 : 91

Steps

$$s = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2},$$
$$s^2 = \frac{\Sigma(x_i - \bar{x})^2}{N-1}$$
$$= \frac{(191 - 180)^2 + \dots + (175 - 180)^2}{3 - 1}$$
$$= \frac{182}{2}$$
$$= 91$$
$$s = \sqrt{91}$$
$$= 9.5393920141695$$

j) iperf.eenet.ee

```
Approximate round trip times in milli-seconds:
  Minimum = 276ms, Maximum = 278ms, Average = 276ms

Sakshi@Sakshi-PC MINGW64 ~
$ ping iperf.eenet.ee

Pinging iperf.eenet.ee [193.40.55.7] with 32 bytes of data:
Reply from 193.40.55.7: bytes=32 time=276ms TTL=53
Reply from 193.40.55.7: bytes=32 time=276ms TTL=53
Reply from 193.40.55.7: bytes=32 time=276ms TTL=53
Reply from 193.40.55.7: bytes=32 time=276ms TTL=53

Ping statistics for 193.40.55.7:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 276ms, Maximum = 276ms, Average = 276ms

Sakshi@Sakshi-PC MINGW64 ~
$ ping iperf.eenet.ee

Pinging iperf.eenet.ee [193.40.55.7] with 32 bytes of data:
Reply from 193.40.55.7: bytes=32 time=276ms TTL=53
Reply from 193.40.55.7: bytes=32 time=276ms TTL=53
Reply from 193.40.55.7: bytes=32 time=277ms TTL=53
Reply from 193.40.55.7: bytes=32 time=276ms TTL=53

Ping statistics for 193.40.55.7:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 276ms, Maximum = 277ms, Average = 276ms
```

Standard Deviation Calculator

Result

Standard Deviation, s: **0**

Count, N: 3
Sum, Σx : 828
Mean, \bar{x} : 276
Variance, s^2 : 0

Steps

$$s = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2},$$
$$s^2 = \frac{\Sigma(x_i - \bar{x})^2}{N-1}$$
$$= \frac{(276 - 276)^2 + \dots + (276 - 276)^2}{3-1}$$
$$= \frac{0}{2}$$
$$= 0$$
$$s = \sqrt{0}$$
$$= 0$$

Section 4:

a) iperf.he.net

```
Sakshi@Sakshi-PC MINGW64 /f
$ iperf3 -c iperf.he.net 5002
Connecting to host iperf.he.net, port 5201
[ 4] local 192.168.1.4 port 50963 connected to 216.218.207.42 port 5201
[ ID] Interval      Transfer      Bandwidth
[ 4] 0.00-1.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 1.00-2.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 2.00-3.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 3.00-4.00    sec     0.00 Bytes    0.00 bits/sec
[ 4] 4.00-5.00    sec     0.00 Bytes    0.00 bits/sec
[ 4] 5.00-6.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 6.00-7.00    sec    384 KBytes    3.15 Mbits/sec
[ 4] 7.00-8.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 8.00-9.00    sec    384 KBytes    3.14 Mbits/sec
[ 4] 9.00-10.00   sec    384 KBytes    3.14 Mbits/sec
-- -- -- -- --
[ ID] Interval      Transfer      Bandwidth
[ 4] 0.00-10.00   sec    2.38 MBytes    1.99 Mbits/sec
[ 4] 0.00-10.00   sec    2.29 MBytes    1.92 Mbits/sec
iperf Done.

Sakshi@Sakshi-PC MINGW64 /f
$ iperf3 -c iperf.he.net 5002
Connecting to host iperf.he.net, port 5201
[ 4] local 192.168.1.4 port 50963 connected to 216.218.207.42 port 5201
[ ID] Interval      Transfer      Bandwidth
[ 4] 0.00-1.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 1.00-2.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 2.00-3.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 3.00-4.00    sec     0.00 Bytes    0.00 bits/sec
[ 4] 4.00-5.00    sec     0.00 Bytes    0.00 bits/sec
[ 4] 5.00-6.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 6.00-7.00    sec    384 KBytes    3.15 Mbits/sec
[ 4] 7.00-8.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 8.00-9.00    sec    384 KBytes    3.14 Mbits/sec
[ 4] 9.00-10.00   sec    384 KBytes    3.14 Mbits/sec
-- -- -- -- --
[ ID] Interval      Transfer      Bandwidth
[ 4] 0.00-10.00   sec    2.38 MBytes    1.99 Mbits/sec
[ 4] 0.00-10.00   sec    2.29 MBytes    1.92 Mbits/sec
iperf Done.

Sakshi@Sakshi-PC MINGW64 /f
$ iperf3 -c iperf.he.net 5002
Connecting to host iperf.he.net, port 5201
[ 4] local 192.168.1.4 port 50963 connected to 216.218.207.42 port 5201
[ ID] Interval      Transfer      Bandwidth
[ 4] 0.00-1.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 1.00-2.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 2.00-3.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 3.00-4.00    sec     0.00 Bytes    0.00 bits/sec
[ 4] 4.00-5.00    sec     0.00 Bytes    0.00 bits/sec
[ 4] 5.00-6.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 6.00-7.00    sec    384 KBytes    3.15 Mbits/sec
[ 4] 7.00-8.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 8.00-9.00    sec    384 KBytes    3.14 Mbits/sec
[ 4] 9.00-10.00   sec    384 KBytes    3.14 Mbits/sec
-- -- -- -- --
[ ID] Interval      Transfer      Bandwidth
[ 4] 0.00-10.00   sec    2.38 MBytes    1.99 Mbits/sec
[ 4] 0.00-10.00   sec    2.29 MBytes    1.92 Mbits/sec
iperf Done.
```

b) bouygues.testdebit.info

```
Sakshi@Sakshi-PC MINGW64 /f/iperf-2.0.9-win64
$ iperf -c bouygues.testdebit.info
-----
Client connecting to bouygues.testdebit.info, TCP port 5001
TCP window size: 208 KByte (default)
-----
[ 3] local 192.168.1.4 port 50767 connected with 89.84.1.222 port 5001
write failed: Broken pipe
[ ID] Interval      Transfer      Bandwidth
[ 3] 0.0- 0.4 sec    256 KBytes    5.87 Mbits/sec
```

```

Sakshi@Sakshi-PC MINGW64 /f/iperf-2.0.9-win64
$ iperf -c bouygues.testdebit.info
-----
Client connecting to bouygues.testdebit.info, TCP port 5001
TCP window size: 208 KByte (default)
-----
[ 3] local 192.168.1.4 port 50765 connected with 89.84.1.222 port 5001
write failed: Broken pipe
[ ID] Interval      Transfer    Bandwidth
[ 3] 0.0- 0.4 sec   256 KBytes  5.02 Mbits/sec

Sakshi@Sakshi-PC MINGW64 /f/iperf-2.0.9-win64
$ iperf -c bouygues.testdebit.info
-----
Client connecting to bouygues.testdebit.info, TCP port 5001
TCP window size: 208 KByte (default)
-----
[ 3] local 192.168.1.4 port 50768 connected with 89.84.1.222 port 5001
write failed: Broken pipe
[ ID] Interval      Transfer    Bandwidth
[ 3] 0.0- 0.4 sec   256 KBytes  5.24 Mbits/sec

```

c) iperf.comneonext.de

```

Sakshi@Sakshi-PC MINGW64 /f
$ iperf -c iperf.comneonext.de -p 80
-----
Client connecting to iperf.comneonext.de, TCP port 80
TCP window size: 64.0 KByte (default)
-----
[584] local 192.168.1.4 port 60962 connected with 91.195.241.136 port 80
[ ID] Interval      Transfer    Bandwidth
[584] 0.0- 0.4 sec   256 KBytes  5.11 Mbits/sec
write failed: Connection reset by peer

Sakshi@Sakshi-PC MINGW64 /f
$ iperf -c iperf.comneonext.de -p 80
-----
Client connecting to iperf.comneonext.de, TCP port 80
TCP window size: 64.0 KByte (default)
-----
[584] local 192.168.1.4 port 60974 connected with 91.195.241.136 port 80
[ ID] Interval      Transfer    Bandwidth
[584] 0.0- 0.5 sec   256 KBytes  4.47 Mbits/sec
write failed: Connection reset by peer

Sakshi@Sakshi-PC MINGW64 /f
$ iperf -c iperf.comneonext.de -p 80
-----
Client connecting to iperf.comneonext.de, TCP port 80
TCP window size: 64.0 KByte (default)
-----
[592] local 192.168.1.4 port 60975 connected with 91.195.241.136 port 80
[ ID] Interval      Transfer    Bandwidth
[592] 0.0- 0.4 sec   256 KBytes  5.12 Mbits/sec

```

d) ikoula.testdebit.info

```
Sakshi@Sakshi-PC MINGW64 /f
$ iperf -c ikoula.testdebit.info
-----
Client connecting to ikoula.testdebit.info, TCP port 5001
TCP window size: 208 KByte (default)
-----
[ 3] local 192.168.1.4 port 50812 connected with 213.246.63.45 port 5001
write failed: Broken pipe
[ ID] Interval      Transfer      Bandwidth
[ 3] 0.0- 0.3 sec   256 KBytes   6.47 Mbits/sec
Sakshi@Sakshi-PC MINGW64 /f
$ iperf -c ikoula.testdebit.info
-----
Client connecting to ikoula.testdebit.info, TCP port 5001
TCP window size: 208 KByte (default)
-----
[ 3] local 192.168.1.4 port 50809 connected with 213.246.63.45 port 5001
write failed: Broken pipe
[ ID] Interval      Transfer      Bandwidth
[ 3] 0.0- 0.4 sec   256 KBytes   5.12 Mbits/sec
Sakshi@Sakshi-PC MINGW64 /f
$ iperf -c ikoula.testdebit.info
-----
Client connecting to ikoula.testdebit.info, TCP port 5001
TCP window size: 208 KByte (default)
-----
[ 3] local 192.168.1.4 port 50813 connected with 213.246.63.45 port 5001
write failed: Broken pipe
[ ID] Interval      Transfer      Bandwidth
[ 3] 0.0- 0.4 sec   256 KBytes   4.85 Mbits/sec
```

e) st2.nn.ertelecom.ru

```
Sakshi@Sakshi-PC MINGW64 /f
$ iperf -c st2.nn.ertelecom.ru
-----
Client connecting to st2.nn.ertelecom.ru, TCP port 5001
TCP window size: 208 KByte (default)
-----
[ 3] local 192.168.1.4 port 50818 connected with 91.144.184.232 port 5001
[ ID] Interval      Transfer      Bandwidth
[ 3] 0.0-10.1 sec   3.38 MBytes   2.80 Mbits/sec
Sakshi@Sakshi-PC MINGW64 /f
$ iperf -c st2.nn.ertelecom.ru
-----
Client connecting to st2.nn.ertelecom.ru, TCP port 5001
TCP window size: 208 KByte (default)
-----
[ 3] local 192.168.1.4 port 50815 connected with 91.144.184.232 port 5001
[ ID] Interval      Transfer      Bandwidth
[ 3] 0.0-10.2 sec   3.75 MBytes   3.10 Mbits/sec
Sakshi@Sakshi-PC MINGW64 /f
$ iperf -c st2.nn.ertelecom.ru
-----
Client connecting to st2.nn.ertelecom.ru, TCP port 5001
TCP window size: 208 KByte (default)
-----
[ 3] local 192.168.1.4 port 50826 connected with 91.144.184.232 port 5001
[ ID] Interval      Transfer      Bandwidth
[ 3] 0.0-10.3 sec   1.62 MBytes   1.33 Mbits/sec
```

f) iperf.biznetnetworks.com

```
Sakshi@Sakshi-PC MINGW64 /f
$ iperf3 -c iperf.biznetnetworks.com
Connecting to host iperf.biznetnetworks.com, port 5201
[ 4] local 192.168.1.4 port 50851 connected to 117.102.109.186 port 5201
[ ID] Interval      Transfer      Bandwidth
[ 4] 0.00-1.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 1.00-2.00    sec    256 KBytes    2.09 Mbits/sec
[ 4] 2.00-3.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 3.00-4.00    sec     0.00 Bytes    0.00 bits/sec
[ 4] 4.00-5.00    sec    128 KBytes    1.05 Mbits/sec
[ 4] 5.00-6.00    sec    128 KBytes    1.05 Mbits/sec
[ 4] 6.00-7.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 7.00-8.00    sec    128 KBytes    1.05 Mbits/sec
[ 4] 8.00-9.00    sec    256 KBytes    2.09 Mbits/sec
[ 4] 9.00-10.00   sec    256 KBytes    2.10 Mbits/sec
-- -- -- -- --
[ ID] Interval      Transfer      Bandwidth
[ 4] 0.00-10.00   sec    1.88 MBytes    1.57 Mbits/sec
[ 4] 0.00-10.00   sec    1.77 MBytes    1.48 Mbits/sec
sender
receiver
iperf Done.
```

```
Sakshi@Sakshi-PC MINGW64 /f
$ iperf3 -c iperf.biznetnetworks.com
Connecting to host iperf.biznetnetworks.com, port 5201
[ 4] local 192.168.1.4 port 50837 connected to 117.102.109.186 port 5201
[ ID] Interval      Transfer      Bandwidth
[ 4] 0.00-1.00    sec    256 KBytes    2.09 Mbits/sec
[ 4] 1.00-2.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 2.00-3.00    sec    384 KBytes    3.14 Mbits/sec
[ 4] 3.00-4.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 4.00-5.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 5.00-6.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 6.00-7.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 7.00-8.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 8.00-9.00    sec    384 KBytes    3.15 Mbits/sec
[ 4] 9.00-10.00   sec    256 KBytes    2.10 Mbits/sec
-- -- -- -- --
[ ID] Interval      Transfer      Bandwidth
[ 4] 0.00-10.00   sec    2.75 MBytes    2.31 Mbits/sec
[ 4] 0.00-10.00   sec    2.69 MBytes    2.25 Mbits/sec
sender
receiver
iperf Done.
```

```
Sakshi@Sakshi-PC MINGW64 /f
$ iperf3 -c iperf.biznetnetworks.com
Connecting to host iperf.biznetnetworks.com, port 5201
[ 4] local 192.168.1.4 port 50857 connected to 117.102.109.186 port 5201
[ ID] Interval      Transfer      Bandwidth
[ 4] 0.00-1.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 1.00-2.00    sec    128 KBytes    1.05 Mbits/sec
[ 4] 2.00-3.01    sec    128 KBytes    1.04 Mbits/sec
[ 4] 3.01-4.00    sec    256 KBytes    2.12 Mbits/sec
[ 4] 4.00-5.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 5.00-6.00    sec    256 KBytes    2.10 Mbits/sec
[ 4] 6.00-7.00    sec    384 KBytes    3.15 Mbits/sec
[ 4] 7.00-8.00    sec    384 KBytes    3.15 Mbits/sec
[ 4] 8.00-9.00    sec    384 KBytes    3.14 Mbits/sec
[ 4] 9.00-10.00   sec    384 KBytes    3.15 Mbits/sec
-- -- -- -- --
[ ID] Interval      Transfer      Bandwidth
[ 4] 0.00-10.00   sec    2.75 MBytes    2.31 Mbits/sec
[ 4] 0.00-10.00   sec    2.72 MBytes    2.28 Mbits/sec
sender
receiver
iperf Done.
```


g) iperf.scottlinux.com

```
Sakshi@Sakshi-PC MINGW64 /f
$ iperf -c iperf.scottlinux.com -p 80
-----
Client connecting to iperf.scottlinux.com, TCP port 80
TCP window size: 64.0 KByte (default)
-----
[584] local 192.168.1.4 port 60941 connected with 45.33.39.39 port 80
[ ID] Interval      Transfer      Bandwidth
[584] 0.0-12.1 sec  1.00 MBytes   694 Kbits/sec

Sakshi@Sakshi-PC MINGW64 /f
$ iperf -c iperf.scottlinux.com -p 80
-----
Client connecting to iperf.scottlinux.com, TCP port 80
TCP window size: 64.0 KByte (default)
-----
[588] local 192.168.1.4 port 60944 connected with 45.33.39.39 port 80
[ ID] Interval      Transfer      Bandwidth
[588] 0.0-10.3 sec  1.13 MBytes   920 Kbits/sec

Sakshi@Sakshi-PC MINGW64 /f
$ iperf -c iperf.scottlinux.com -p 80
-----
Client connecting to iperf.scottlinux.com, TCP port 80
TCP window size: 64.0 KByte (default)
-----
[584] local 192.168.1.4 port 60947 connected with 45.33.39.39 port 80
[ ID] Interval      Transfer      Bandwidth
[584] 0.0-10.2 sec  1.63 MBytes   1.33 Mbits/sec
```

h) speedtest.serverius.net

```
Sakshi@Sakshi-PC MINGW64 /f
$ iperf -c speedtest.serverius.net
-----
Client connecting to speedtest.serverius.net, TCP port 5001
TCP window size: 208 KByte (default)
-----
[ 3] local 192.168.1.4 port 50898 connected with 178.21.16.76 port 5001
write failed: Connection reset by peer
[ ID] Interval      Transfer      Bandwidth
[ 3] 0.0-27.9 sec   256 KBytes    75.1 Kbits/sec

Sakshi@Sakshi-PC MINGW64 /f
$ iperf -c speedtest.serverius.net
-----
Client connecting to speedtest.serverius.net, TCP port 5001
TCP window size: 208 KByte (default)
-----
[ 3] local 192.168.1.4 port 50879 connected with 178.21.16.76 port 5001
write failed: Connection reset by peer
[ ID] Interval      Transfer      Bandwidth
[ 3] 0.0-30.1 sec   256 KBytes    69.6 Kbits/sec

Sakshi@Sakshi-PC MINGW64 /f
$ iperf -c speedtest.serverius.net
-----
Client connecting to speedtest.serverius.net, TCP port 5001
TCP window size: 208 KByte (default)
-----
[ 3] local 192.168.1.4 port 50901 connected with 178.21.16.76 port 5001
write failed: Connection reset by peer
[ ID] Interval      Transfer      Bandwidth
[ 3] 0.0-31.6 sec   256 KBytes    66.3 Kbits/sec
```


i) iperf.volia.net

```
Sakshi@Sakshi-PC MINGW64 /f/iperf-2.0.9-win64
$ iperf -c iperf.volia.net
-----
Client connecting to iperf.volia.net, TCP port 5001
TCP window size: 208 KByte (default)
-----
[ 3] local 192.168.1.4 port 50729 connected with 77.120.3.236 port 5001
write failed: Connection reset by peer
[ ID] Interval      Transfer    Bandwidth
[ 3] 0.0-38.5 sec   256 KBytes  54.4 Kbits/sec

Sakshi@Sakshi-PC MINGW64 /f/iperf-2.0.9-win64
$ iperf -c iperf.volia.net
-----
Client connecting to iperf.volia.net, TCP port 5001
TCP window size: 208 KByte (default)
-----
[ 3] local 192.168.1.4 port 50717 connected with 77.120.3.236 port 5001
write failed: Connection reset by peer
[ ID] Interval      Transfer    Bandwidth
[ 3] 0.0-34.0 sec   256 KBytes  61.7 Kbits/sec

Sakshi@Sakshi-PC MINGW64 /f/iperf-2.0.9-win64
$ iperf -c iperf.volia.net
-----
Client connecting to iperf.volia.net, TCP port 5001
TCP window size: 208 KByte (default)
-----
[ 3] local 192.168.1.4 port 50730 connected with 77.120.3.236 port 5001
write failed: Connection reset by peer
[ ID] Interval      Transfer    Bandwidth
[ 3] 0.0-33.0 sec   256 KBytes  63.5 Kbits/sec
```

j) iperf.eenet.ee

```
Sakshi@Sakshi-PC MINGW64 /f
$ iperf -c iperf.eenet.ee -p 80
-----
Client connecting to iperf.eenet.ee, TCP port 80
TCP window size: 64.0 KByte (default)
-----
[488] local 192.168.1.4 port 52540 connected with 193.40.55.7 port 80
[ ID] Interval      Transfer    Bandwidth
[488] 0.0-10.1 sec   1.63 MBytes  1.35 Mbits/sec

Sakshi@Sakshi-PC MINGW64 /f
$ iperf -c iperf.eenet.ee -p 80
-----
Client connecting to iperf.eenet.ee, TCP port 80
TCP window size: 64.0 KByte (default)
-----
[588] local 192.168.1.4 port 52541 connected with 193.40.55.7 port 80
[ ID] Interval      Transfer    Bandwidth
[588] 0.0-10.2 sec   3.13 MBytes  2.57 Mbits/sec

Sakshi@Sakshi-PC MINGW64 /f
$ iperf -c iperf.eenet.ee -p 80
-----
Client connecting to iperf.eenet.ee, TCP port 80
TCP window size: 64.0 KByte (default)
-----
[592] local 192.168.1.4 port 52542 connected with 193.40.55.7 port 80
[ ID] Interval      Transfer    Bandwidth
[592] 0.0-10.3 sec   1.38 MBytes  1.12 Mbits/sec
```