1.

Traceroute from my machine to 103.120.178.71(Mumbai)

1st hour:

Text

Description automatically generated

|  |  |  |  |
| --- | --- | --- | --- |
| Network No | IP address of the routers | Average delay(ms) | Std. deviation(ms) |
| 1 | Local airtel fibre (my router private IP address)(192.169.1.1) | 7.204333 | 0.007134 |
| 2 | Router from Airtel(223.178.8.1) | 91.02667 | 0.006549 |
| 3 | Router from Airtel(122.187.95.57;122.187.95.61) | 7.984 | 0.491468 |
| 4 | Router from Airtel(182.79.208.128;116.119.50.142) | 51.166 | 1.452277 |
| 5 | Router from Airtel(125.19.53.94) | 57.13867 | 0.82567 |
| 6 | Router from Airtel(180.179.197.214;180.179.197.202;180.179.197.218) | 55.14033 | 5.936633 |
| 7 | Router from Airtel (180.179.220.68) | 60.743 | 0.024097 |

2nd hour:

Text

Description automatically generated

|  |  |  |  |
| --- | --- | --- | --- |
| Hop No | IP address of the routers | Average delay(ms) | Std. deviation(ms) |
| 1 | Local airtel fibre (my router private IP address)(192.169.1.1) | 6.993667 | 0.007587 |
| 2 | Router from Airtel(223.178.8.1) | 9.483000 | 0.010985 |
| 3 | Router from Airtel(122.187.95.57;122.187.95.61) | 9.463667 | 0.003682 |
| 4 | Router from Airtel(182.79.208.128;116.119.50.142) | 50.49867 | 2.161704 |
| 5 | Router from Airtel(125.19.53.94) | 57.25933 | 0.123532 |
| 6 | Router from Airtel(180.179.197.202;180.179.197.198;180.179.197.218) | 54.31667 | 4.437000 |
| 7 | Router from Airtel (180.179.220.68) | 56.13600 | 4.694979 |

3rd hour:

Text

Description automatically generated

|  |  |  |  |
| --- | --- | --- | --- |
| Hop No | IP address of the routers | Average delay(ms) | Std.deviation(ms) |
| 1 | Local airtel fibre (my router private IP address)(192.169.1.1) | 29.71833 | 0.023683 |
| 2 | Router from Airtel(223.178.8.1) | 34.20400 | 0.009798 |
| 3 | Router from Airtel (122.187.95.57;122.187.95.61) | 29.27967 | 0.061413 |
| 4 | Router from Airtel(182.79.208.128;116.119.50.142) | 61.59700 | 2.205799 |
| 5 | Router from Airtel (125.19.53.94) | 65.59533 | 2.576116 |
| 6 | Router from Airtel(180.179.197.214;180.179.197.198;180.179.197.218) | 57.84667 | 5.373004 |
| 7 | Router from Airtel(180.179.220.68) | 55.49900 | 5.291127 |

B. No. of routers: 11 and the paths changed during the hours

C. number of ISP: 1 that is Airtel

2.

Traceroute from My machine to mail.google.com(142.250.182.69)

1st hour:

A picture containing text

Description automatically generated

|  |  |  |  |
| --- | --- | --- | --- |
| Hop No. | IP address of the routers | Average delay(ms) | Std. deviation(ms) |
| 1 | Local airtel fibre (my router private IP address)(192.169.1.1) | 6.315000 | 0.023763 |
| 2 | Router from Airtel(223.178.8.1) | 8.588333 | 0.248068 |
| 3 | Router from Airtel (122.187.95.57;122.187.95.61) | 8.377000 | 0.004899 |
| 4 | Routers from Airtel (182.79.236.2;182.79.198.201;182.79.243.217) | 27.16767 | 8.499806 |
| 5 | Router from Google (72.14.216.192;72.14.208.234) | 21.60267 | 0.124719 |
| 7 | Router from Google (108.170.253.97;142.250.228.220) | 18.66833 | 0.931649 |
| 8 | Router from Google (108.170.253.120;108.170.253.122; 108.170.253.119) | 22.12567 | 1.814165 |
| 9 | Router from Google (142.250.182.69;74.125.242.145;74.125.242.129) | 19.76433 | 0.544795 |

2nd hour:

Text

Description automatically generated

|  |  |  |  |
| --- | --- | --- | --- |
| Hop No. | IP address of Routers | Average Delay(ms) | Std. deviation(ms) |
| 1 | Local airtel fibre (my router private IP address)(192.169.1.1) | 7.394667 | 0.030346 |
| 2 | Router from Airtel(223.178.8.1) | 7.853333 | 0.098473 |
| 3 | Router from Airtel (122.187.95.57;122.187.95.61) | 8.792667 | 0.999559 |
| 4 | Routers from Airtel (182.79.236.2;182.79.198.201;182.79.243.217) | 36.67167 | 16.84453 |
| 5 | Router from Google (72.14.216.192;72.14.208.234) | 22.15733 | 0.588629 |
| 7 | Router from Google (216.239.43.234;142.251.55.216;108.170.253.97) | 21.35067 | 1.024367 |
| 8 | Router from Google (142.251.55.247;142.251.55.245) | 20.84967 | 2.599162 |
| 9 | Router from Google (142.250.182.69;74.125.242.129;74.125.242.145) | 21.83233 | 0.957378 |

3rd hour:

Text

Description automatically generated

|  |  |  |  |
| --- | --- | --- | --- |
| Hop No. | IP address of the routers | Average delay(ms) | Std. deviation(ms) |
| 1 | Local airtel fibre (my router private IP address)(192.169.1.1) | 7.725667 | 0.059957 |
| 2 | Router from Airtel(223.178.8.1) | 8.010333 | 0.626748 |
| 3 | Router from Airtel (122.187.95.61;122.187.95.57) | 8.425 | 0.007348 |
| 4 | Routers from Airtel(116.119.57.102;182.79.198.22) | 22.78233 | 0.074374 |
| 5 | Router from Google (72.14.208.234) | 21.87433 | 0.686377 |
| 7 | Router from Google (108.170.253.97;142.250.236.156;142.251.55.88) | 20.06233 | 1.2348 |
| 8 | Router from Google (108.170.253.119;108.170.253.105; 108.170.253.103) | 21.85167 | 1.20809 |
| 9 | Router from Google (74.125.242.145; 142.250.182.69) | 21.02433 | 0.381901 |

B. No of Routers: 15 and the path changed during the hours.

C. Numbers of ISP: 2 that are (Airtel and Google) No there is no time delay.

In 2nd case, I took Google connection. As millions of people use google. The company should be fast, so it is showing much lesser values than the 1st case.

Here the transatlantic link in the traceroute result is where the change in ISPs{link 4-8}

3.

Tracerouting from my machine to 162.254.206.227:

1st hour:

Text

Description automatically generated

|  |  |  |  |
| --- | --- | --- | --- |
| Hop No. | IP address of the routers | Average delay(ms) | Std. deviation(ms) |
| 1 | Local airtel fibre (my router private IP address)(192.169.1.1) | 34.618 | 0.072861 |
| 2 | Router from Airtel(223.178.8.1) | 34.88233 | 0.006128 |
| 3 | Router from Airtel(122.187.95.61;122.187.95.57) | 34.71833 | 0.184283 |
| 4 | Routers from Airtel (116.119.57.102;182.79.198.22) | 136.638 | 0.937659 |
| 5 | Router from Telia(62.115.42.118) | 125.3265 | 8.7205 |
| 6 | Router from Telia(62.115.124.56;62.115.124.54) | 245.038 | 10.681 |
| 7 | Router from Telia(62.115.112.242;62.115.122.159) | 242.318 | 20.69631 |
| 8 | Router from Telia(62.115.125.7) | 251.8047 | 10.18493 |
| 9 | Router from Telia(62.115.125.7) | 255.5137 | 6.269516 |
| 10 | Router from Telia(62.115.11.154) | 254.651 | 8.980001 |
| 11 | Router from GoDaddy(148.72.37.3) | 250.083 | 6.557174 |

2nd hour:

Text

Description automatically generated

|  |  |  |  |
| --- | --- | --- | --- |
| Hop No. | IP address of the routers | Average delay(ms) | Std. deviation(ms) |
| 1 | Local airtel fibre (my router private IP address)(192.169.1.1) | 4.746333 | 0.396137 |
| 2 | Router from Airtel(223.178.8.1) | 49.753 | 0.078128 |
| 3 | Router from Airtel(122.187.95.61) | 11.3725 | 0.0055 |
| 4 | Routers from Airtel (182.79.134.148;116.119.61.204;182.79.154.147) | 138.08 | 11.94872 |
| 5 | Router from Telia(62.115.42.118) | 137.4455 | 0.0045 |
| 6 | Router from Telia(62.115.124.56;62.115.124.54) | 256.897 | 0 |
| 7 | Router from Telia(62.115.112.242;62.115.122.159) | 235.6423 | 18.39081 |
| 8 | Router from Telia(62.115.125.7) | 242.501 | 7.904043 |
| 9 | Router from Telia(62.115.125.7) | 248.2917 | 7.971976 |
| 10 | Router from Telia(62.115.11.154) | 280.5423 | 0.002867 |
| 11 | Router from GoDaddy(148.72.37.3) | 250.069 | 0.012832 |

3rd hour:

Text

Description automatically generated

|  |  |  |  |
| --- | --- | --- | --- |
| Hop No. | IP address of the routers | Average delay(ms) | Std. deviation(ms) |
| 1 | Local airtel fibre (my router private IP address)(192.169.1.1) | 10.43767 | 0.018732 |
| 2 | Router from Airtel(223.178.8.1) | 15.07933 | 0.298061 |
| 3 | Router from Airtel(122.187.95.61;122.187.95.57) | 16.78133 | 0.386302 |
| 4 | Routers from Airtel (182.79.198.112; 116.119.35.52;182.79.134.148 ) | 162.6517 | 37.23726 |
| 5 | Router from Telia(62.115.42.118) | 193.6637 | 30.05182 |
| 6 | Router from Telia(62.115.124.56;62.115.124.54) | 276.489 | 17.00733 |
| 7 | Router from Telia(62.115.112.242;62.115.122.159) | 254.4003 | 7.103375 |
| 8 | Router from Telia(62.115.125.7) | 257.457 | 7.453205 |
| 9 | Router from Telia(62.115.125.7) | 242.3447 | 4.888368 |
| 10 | Router from Telia(62.115.11.154) | 238.6773 | 0.751088 |
| 11 | Router from GoDaddy(148.72.37.3) | 246.467 | 3.474073 |

No. of common links between two traceroute results are 4.

Here, we can see that the difference in regular company routing delay and a multimillion users company routing delay(Google).

Comparing this case with the 1st case,

We can easily say the destination router of Miami is more far away from the router of Mumbai.

Here, transatlantic link in Miami case is between{link 4-10}