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# Group 1

It can be seen that Trace 1 to Trace 5 has 3 probes per TTL from 1 to 17. The intermediate node IPs are printed below. As can be shown,

from Router 13 to Router 16 (router 15 for Trace 5), the IPs vary. This occurs from load-balancing. It is also possible that a different path was taken to get to the destination.

## Trace 1

TTL 1 to 17 has 3 probes each

Seq:

Router 1 142.104.68.167

Router 2 142.104.68.1

Router 3 192.168.9.5

Router 4 192.168.10.1

Router 5 192.168.8.6

Router 6 142.104.252.37

Router 7 142.104.252.246

Router 8 207.23.244.242

Router 9 206.12.3.17

Router 10 199.212.24.64

Router 11 206.81.80.17

Router 12 74.125.37.91

Router 13 72.14.237.123

Router 14 209.85.249.155

Router 15 209.85.250.121

Router 16 209.85.249.153

## Trace 2

TTL 1 to 17 has 3 probes each

Router 1 142.104.68.167

Router 2 142.104.68.1

Router 3 192.168.9.5

Router 4 192.168.10.1

Router 5 192.168.8.6

Router 6 142.104.252.37

Router 7 142.104.252.246

Router 8 207.23.244.242

Router 9 206.12.3.17

Router 10 199.212.24.64

Router 11 206.81.80.17

Router 12 72.14.237.123

Router 13 74.125.37.91

Router 14 209.85.249.109

Router 15 209.85.250.57

Router 16 209.85.246.219

## Trace 3

TTL 1 to 17 has 3 probes each

Router 1 142.104.68.167

Router 2 142.104.68.1

Router 3 192.168.9.5

Router 4 192.168.10.1

Router 5 192.168.8.6

Router 6 142.104.252.37

Router 7 142.104.252.246

Router 8 207.23.244.242

Router 9 206.12.3.17

Router 10 199.212.24.64

Router 11 206.81.80.17

Router 12 74.125.37.91

Router 13 72.14.237.123

Router 14 209.85.247.63

Router 15 209.85.245.65

Router 16 209.85.249.155

## Trace 4

TTL 1 to 17 has 3 probes each

Router 1 142.104.68.167

Router 2 142.104.68.1

Router 3 192.168.9.5

Router 4 192.168.10.1

Router 5 192.168.8.6

Router 6 142.104.252.37

Router 7 142.104.252.246

Router 8 207.23.244.242

Router 9 206.12.3.17

Router 10 199.212.24.64

Router 11 206.81.80.17

Router 12 74.125.37.91

Router 13 72.14.237.123

Router 14 209.85.246.219

Router 15 209.85.250.123

Router 16 209.85.245.65

## Trace 5

TTL 1 to 17 has 3 probes each

Router 1 142.104.68.167

Router 2 142.104.68.1

Router 3 192.168.9.5

Router 4 192.168.10.1

Router 5 192.168.8.6

Router 6 142.104.252.37

Router 7 142.104.252.246

Router 8 207.23.244.242

Router 9 206.12.3.17

Router 10 199.212.24.64

Router 11 206.81.80.17

Router 12 72.14.237.123

Router 13 209.85.249.153

Router 14 209.85.250.59

Router 15 209.85.247.61

# Group 2

Trace Files 1 to 5 all have same intermediate nodal IPs.

Each file also has 3 probes each for TTL 1 to 9.

Router 1 192.168.0.1

Router 2 24.108.0.1

Router 3 64.59.161.197

Router 4 66.163.72.26

Router 5 66.163.68.18

Router 6 72.14.221.102

Router 7 108.170.245.113

Router 8 209.85.249.249

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Average RTT (ms)** | | | | |  |
|  | Trace 1 | Trace 2 | Trace 3 | Trace 4 | Trace 5 | Average per TTL (ms) |
| TTL 1 | 0.333 | 0.271 | 0.785 | 0.341 | 0.175 | 0.381 |
| TTL 2 | 1.58 | 1.71 | 1.18 | 1.33 | 1.62 | 1.484 |
| TTL 3 | 1.89 | 2.01 | 2.26 | 2.17 | 2.16 | 2.098 |
| TTL 4 | 2.28 | 1.94 | 1.95 | 1.98 | 1.86 | 2.002 |
| TTL 5 | 2.65 | 2.16 | 2.03 | 3.58 | 2.07 | 2.498 |
| TTL 6 | 2.43 | 2 | 2.18 | 2.27 | 4.35 | 2.646 |
| TTL 7 | 1.84 | 5.17 | 2.28 | 1.83 | 2.69 | 2.762 |
| TTL 8 | 2.3 | 10.87 | 2.06 | 2.46 | 2.56 | 4.05 |
| TTL 9 (dest) | 1.81 | 2.19 | 2.31 | 1.99 | 2.14 | 2.088 |

The hop at TTL 8 is going to have the biggest delay. The Average RTT obtained from Trace 2 is relatively higher than the other values, bumping up the Average of TTL 8 to 4.05 ms across all trace files. As a result, the hop at TTL 8 is most likely to incur the maximum delay.