

Group 1 traces

For both groups and all traces I will attached a folder of summaries of the outputs after running the packet analyzer written in python so all information is there but I will just me summarizing it here.

Part 1:

- All 5 traces in group 1 have 3 probes for each TTL from TTL 1 to TTL 17.
- Trace 1 also has TTL 18 , TTL 40, and TTL 64 which each have 1 probe.
- Trace 5 has a TTL 18 with one probe as well.

Part 2:

While the majority of the intermediary routers are the same there is slight differences between the trace file. These differences are:

- Trace 1's sequence includes 209.85.249.155, 209.85.250.121, 209.85.249.153.
- Trace 2 includes 209.85.249.109, 209.85.250.57, 209.85.246.219.
- Trace 3 includes 209.85.247.63, 209.85.245.65, 209.85.249.155.
- Trace 4 includes 209.85.246.219, 209.85.250.123, 209.85.245.65.
- Trace 5 includes 209.85.249.153, 209.85.250.59, 209.85.247.61.

Part 3:

The difference in intermediary routers could have occurred as a result of dynamic routing, load balancing or other network conditions. Such conditions may have caused some of the intermediary routers to forward packets through different paths based on traffic, policies, or other such issues. These things combined is likely what resulted in the variation of paths shown across the trace files.

Part 4:

This does not apply because we have different intermediary routers between the traces.

Group 2 traces

Part 1:

The numbers of probes and TTL's is consistent across all 5 traces in group 2.

- There are TTL's from 1 to 9 and each one has 3 probes.

Part 2:

The sequence of intermediary routers across all 5 traces in group 2 is exactly the same being:

- 192.168.0.1 → 24.108.0.1 → 64.59.161.197 → 66.163.72.26 → 66.163.68.18 → 72.14.221.102 → 108.170.245.113 → 209.85.249.249

Part 3:

There is no difference between the intermediary router of the traces in this group so is part doesn't apply.

Part 4:

Below is the table of values for RTTs for each TTL in each trace(AKA each intermediary router so values are grabbed from my output).

TTL	Average RTT in Trace 1	Average RTT in Trace 2	Average RTT in Trace 3	Average RTT in Trace 4	Average RTT in Trace 5
1	3.329667	2.710667	7.854	3.415333	1.745667
2	15.811667	17.118333	11.835333	13.245	16.153667
3	18.869333	20.096667	22.579333	21.672333	21.601667
4	22.843	19.42	19.460333	19.754667	18.558333
5	26.502	21.555333	20.321333	35.771333	20.717
6	24.263667	19.982333	21.849667	22.674667	43.472
7	18.408	51.658	22.763333	18.337333	26.921333
8	22.970667	108.737667	20.592	24.574333	25.623333
9	18.099667	21.911	23.14	19.942667	21.442

From the values seen in the table the hop to TTL 8 is likely to incur the maximum delay because it constantly seems to have values on the higher end in each trace. However, do note that the 108 ms value for trace 2 is the biggest difference between TTL 8 and rest. Some of the other TTLs also have some traces where the value is a lot bigger than the others like TTL 7 in trace 2 or TTL 6 in trace 5 or TTL5 in trace 4 but these are all still way smaller than the 108 ms that TTL 8 had. If TTL 8 had another value smaller than 108ms then it would be harder to decide but as is that value majorly influences the results.