R1:

run 'python3 trace.py <path to tracefile>'

R2: (consider using ‘python3 r2route.py <path to tracefile>’)

1. All traces in both groups send out 3 datagrams per ttl.

2.

a. Group 1 tracefiles are identical until router 12.

b. Group 2 tracefiles have identical routes.

3.

a. Group 1 tracefiles are identical until router 12.

Some observations:

i. trace 1, trace 3, and trace 4 share the same router 12

ii. trace 2 and trace 5 share the same router 12

iii. trace 1 and trace 5 may have passed through the same network at router 13

iv. router 13 in each trace is identical up to the third octet, where it is never less than 245.

- Due to (iv), suggests the same network but a different machine/router.

- May also be due to load balancing

b. Group 2 tracefiles have identical routes

4. using trace.py on each of the tracefiles from group 2:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **TTL** | **Trace 1** | **Trace 2** | **Trace 3** | **Trace 4** | **Trace 5** |
| **1** | 3 | 2 | 7 | 4 | 1 |
| **2** | 15 | 17 | 11 | 13 | 16 |
| **3** | 18 | 20 | 22 | 21 | 21 |
| **4** | 22 | 19 | 19 | 19 | 18 |
| **5** | 26 | 21 | 20 | 35 | 20 |
| **6** | 24 | 19 | 21 | 22 | 43 |
| **7** | 18 | 51 | 22 | 18 | 26 |
| **8** | 22 | 108 | 20 | 24 | 25 |

- Despite the obvious outliers at TTL = 7 & 8, it is reasonable to say TTL = 2 causes the most delays, considering the hop causes the average RTT to increase substantially across the row (TTL = 2).

- The outliers at TTL = 7 & 8 do not seem completely justified, the other traces are not nearly as slow as Trace 2 from TTL = 7 to TTL = 8.