

# 6.033 Handson Exercise 4

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1. Traceroute sends many short packets to the destination with progressively increasing time to live (TTL) values. Intermediate routers send ICMP “TTL Exceeded” messages back to the sender which include the gateway’s address. Traceroute correlates probes’ TTL values with the return addresses of the ICMP error messages to determine network paths.
2. (a) Traceroute from me to dragon

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 1 FENWAY-HOUSE-ETHER.MIT.EDU (18.209.0.1) 1.928 ms 2.671 ms 1.906 ms
 2 E19-RTR-1-FEN-T1.MIT.EDU (18.201.0.25) 31.886 ms 33.752 ms 14.130 ms
 3 EXTERNAL-RTR-BACKBONE.MIT.EDU (18.168.0.18) 9.375 ms 17.852 ms 8.398 ms
 4 p3-0.cambridge1-cr1.bbnplanet.net (4.1.80.9) 6.109 ms 11.058 ms 14.712 ms
 5 p4-2.cambridge1-nbr1.bbnplanet.net (4.1.80.6) 24.228 ms 10.839 ms 12.786 ms
 6 p3-0.cambridge1-nbr2.bbnplanet.net (4.0.5.18) 6.044 ms 12.245 ms 29.731 ms
 7 so-4-1-0.bstnma1-nbr2.bbnplanet.net (4.0.2.157) 39.536 ms 36.775 ms 14.131 ms
 8 p9-0.nycmny1-nbr2.bbnplanet.net (4.24.6.50) 24.402 ms 13.128 ms 16.715 ms
 9 p1-0.nycmny1-cr2.bbnplanet.net (4.24.7.6) 27.591 ms 13.752 ms 16.161 ms
10 p1-0.xnyc1-mci.bbnplanet.net (4.24.7.70) 13.174 ms 15.521 ms 43.872 ms
11 acr2-loopback.Phoenix.cw.net (208.172.226.62) 92.854 ms 125.997 ms 118.525 ms
12 bar2-loopback.Phoenix.cw.net (208.172.226.4) 108.303 ms 163.712 ms 131.331 ms
13 getnet.Phoenix.cw.net (208.172.232.114) 84.939 ms getnet.Phoenix.cw.net (208.172.232.118) 78.190 ms getnet.PH
14 dragon.getnet.net (63.137.32.5) 79.755 ms 155.558 ms 93.604 ms
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Traceroute from dragon back to me

Traceroute Output

FROM dragon.getnet.net TO 18.209.0.60.

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traceroute: Warning: Multiple interfaces found; using 63.137.32.5 @ hme0
traceroute to 18.209.0.60 (18.209.0.60), 30 hops max, 40 byte packets
 1 phnx-gw (63.137.32.1) 0.878 ms 0.717 ms 0.708 ms
 2 unused-36-250.getnet.net (63.137.36.250) 1.033 ms 1.417 ms 0.900 ms
 3 L3-phx-gig-p-i.cwie.net (64.38.194.1) 16.361 ms 1.848 ms 1.625 ms
 4 gige5-0-140.hsipaccess1.Phoenix1.Level3.net (63.214.160.129) 1.055 ms 1.139 ms 1.000 ms
 5 64.159.3.109 (64.159.3.109) 1.464 ms 3.812 ms 1.567 ms
 6 so-2-0-0.mp2.Washington1.Level3.net (64.159.1.2) 57.905 ms 56.169 ms 56.177 ms
 7 so-7-0-0.gar2.Washington1.Level3.net (64.159.1.194) 57.359 ms 56.379 ms 56.948 ms
 8 so-7-0-0.edge1.Washington1.Level3.net (209.244.11.14) 58.477 ms 57.643 ms 57.468 ms
 9 so-1-1-0.asbnva1-hcr1.bbnplanet.net (4.24.4.5) 65.847 ms 65.411 ms 66.690 ms
10 so-6-0-0.washdc3-nbr1.bbnplanet.net (4.24.11.249) 64.411 ms 64.233 ms 64.014 ms
11 so-7-0-0.washdc3-nbr2.bbnplanet.net (4.24.10.30) 63.998 ms 64.768 ms 64.409 ms
12 p9-0.phlapa1-br2.bbnplanet.net (4.24.10.186) 66.624 ms 69.314 ms 70.208 ms
13 p15-0.phlapa1-br1.bbnplanet.net (4.24.10.89) 67.164 ms 66.970 ms 66.302 ms
14 p13-0.nycmny1-nbr2.bbnplanet.net (4.24.10.178) 72.888 ms 66.069 ms 68.347 ms
15 so-4-0-0.bstnma1-nbr2.bbnplanet.net (4.24.6.49) 72.645 ms 72.206 ms 78.359 ms
16 p4-3.cambridge1-nbr2.bbnplanet.net (4.24.5.34) 72.426 ms 72.923 ms 75.325 ms
17 p3-0.cambridge1-nbr1.bbnplanet.net (4.0.5.17) 73.069 ms 72.488 ms 72.447 ms
18 p2-0.cambridge1-cr1.bbnplanet.net (4.1.80.5) 73.019 ms 73.130 ms 72.846 ms
19 p10-0-0.mit2.bbnplanet.net (4.1.80.10) 76.401 ms 79.081 ms 101.626 ms
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20 E19-RTR-1-BACKBONE.MIT.EDU (18.168.0.15) 99.286 ms 78.365 ms 133.588 ms
21 FEN-RTR-T1.MIT.EDU (18.201.0.26) 87.462 ms 80.982 ms 122.597 ms
22 BEG-FOR-MORE.MIT.EDU (18.209.0.60) 102.528 ms 113.421 ms 99.809 ms
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(b) See attached diagram.

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3. (a) 1 FENWAY-HOUSE-ETHER.MIT.EDU (18.209.0.1) 2.370 ms 1.859 ms 2.852 ms
      2 E19-RTR-1-FEN-T1.MIT.EDU (18.201.0.25) 19.362 ms 10.150 ms 21.350 ms
      3 B24-RTR-1-BACKBONE.MIT.EDU (18.168.0.14) 4.206 ms 5.174 ms 23.698 ms
      4 RADOLE.LCS.MIT.EDU (18.201.1.3) 4.082 ms 4.245 ms 9.005 ms
      5 anacreon.lcs.mit.edu (18.24.10.1) 5.634 ms 5.337 ms 6.391 ms
      6 * * *
      7 * * *
      8 * * *
      9 * *
```

(b) The output shows a series of intermediate hosts but then only “\* \* \*” lines. This happens because there is no host at the 18.31.0.200 address to respond to traceroute’s probes. Since traceroute gets no response, it continues sending probes with increasing TTL values until it reaches its default maximum.

4. I spent about one hour on this assignment.