

Lab Assignment-2

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1. Perform a traceroute to www.facebook.com. You can use the tool from the command line (within the Terminal application) on Linux/Mac OS X by simply running "traceroute www.facebook.com" and on Windows machines by issuing the following command from the command prompt: "tracert www.facebook.com". Answer the following questions. Add screenshots with highlights for all answers.

```
vaibhavb@vaibhavb:~$ traceroute www.facebook.com
traceroute to www.facebook.com (31.13.79.35), 30 hops max, 60 byte packets
 1  gateway (10.128.1.1)  0.786 ms  0.692 ms  0.606 ms
 2  14.139.174.49 (14.139.174.49)  1.786 ms  1.732 ms  1.682 ms
 3  * * *
 4  10.255.236.85 (10.255.236.85)  41.412 ms  41.311 ms  10.255.238.105 (10.255.238.105)  48.282 ms
 5  * * *
 6  10.152.7.38 (10.152.7.38)  47.791 ms  10.152.7.214 (10.152.7.214)  44.375 ms  10.152.7.38 (10.152.7.38)  47.992 ms
 7  10.152.7.233 (10.152.7.233)  46.721 ms  ae2.pr02.bom1.tfbnw.net (157.240.66.204)  42.906 ms  46.755 ms
 8  ae1.pr01.bom1.tfbnw.net (157.240.68.238)  45.391 ms  po102.psw03.bom1.tfbnw.net (157.240.44.27)  48.691 ms  ae1.pr01.bom1.tfbnw.net (157.240.68.238)  47.269 ms
 9  po101.psw01.bom1.tfbnw.net (31.13.29.205)  40.062 ms  157.240.36.23 (157.240.36.23)  39.982 ms  157.240.36.113 (157.240.36.113)  45.405 ms
10 edge-star-mnl-shv-02-bom1.facebook.com (31.13.79.35)  46.225 ms  46.146 ms  157.240.36.91 (157.240.36.91)  48.077 ms
```

a. What is the IP address associated with "www.facebook.com" (for example, "18.0.1.2")?

Ans.

31.13.79.35

b. What is the IP address and DNS name of the router that is just one hop before the destination?

Ans.

IP address: 31.13.29.205

DNS: po101.psw01.bom1.tfbnw.net

c. How many hops did it take for the traceroute to reach from your machine to the destination?

Ans.

it took 10 hops to reach the destination (www.facebook.com).

d. Which link incurs the longest latency (or delay) from the source to the destination?

Ans.

The link for hop between 9 to 10 has longest latency from source to destination.

2. Perform a traceroute to www.google.com. Also perform a traceroute to www.google.co.kr and www.google.co.in

```

vatbhavbnagrale@vatbhavbnagrale:~$ traceroute www.google.com
traceroute to www.google.com (142.250.196.36), 30 hops max, 60 byte packets
 1 _gateway (10.128.1.1) 0.420 ms 0.321 ms 0.269 ms
 2 14.139.174.49 (14.139.174.49) 2.417 ms 2.324 ms 2.265 ms
 3 * * *
 4 * * *
 5 * * *
 6 10.119.73.122 (10.119.73.122) 20.693 ms 19.934 ms 19.851 ms
 7 72.14.213.20 (72.14.213.20) 20.055 ms 72.14.195.128 (72.14.195.128) 20.817 ms 72.14.213.20 (72.14.213.20) 20.987 ms
 8 * * *
 9 74.125.242.129 (74.125.242.129) 20.925 ms 20.822 ms 20.259 ms
10 74.125.242.130 (74.125.242.130) 19.013 ms 74.125.242.146 (74.125.242.146) 31.893 ms 142.251.55.31 (142.251.55.31) 19.797 ms
11 108.170.253.97 (108.170.253.97) 20.688 ms maa03s45-lin-f4.1e100.net (142.250.196.36) 19.565 ms 108.170.253.97 (108.170.253.97) 22.923 ms
vatbhavbnagrale@vatbhavbnagrale:~$ traceroute www.google.co.kr
traceroute to www.google.co.kr (142.250.77.99), 30 hops max, 60 byte packets
 1 _gateway (10.128.1.1) 0.877 ms 0.796 ms 0.743 ms
 2 14.139.174.49 (14.139.174.49) 1.923 ms 1.839 ms 1.786 ms
 3 * * *
 4 * * *
 5 * * *
 6 10.119.73.122 (10.119.73.122) 19.319 ms 19.402 ms 19.319 ms
 7 72.14.213.20 (72.14.213.20) 22.098 ms 72.14.195.128 (72.14.195.128) 21.228 ms 72.14.213.20 (72.14.213.20) 21.136 ms
 8 * * *
 9 209.85.247.228 (209.85.247.228) 22.608 ms 142.251.55.234 (142.251.55.234) 22.401 ms 209.85.247.250 (209.85.247.250) 19.940 ms
10 108.170.253.106 (108.170.253.106) 20.107 ms 142.251.55.229 (142.251.55.229) 19.784 ms 108.170.253.106 (108.170.253.106) 19.560 ms
11 maa05s15-lin-f3.1e100.net (142.250.77.99) 18.430 ms 74.125.242.145 (74.125.242.145) 19.381 ms 74.125.242.129 (74.125.242.129) 21.546 ms
vatbhavbnagrale@vatbhavbnagrale:~$ traceroute www.google.co.in
traceroute to www.google.co.in (142.250.196.35), 30 hops max, 60 byte packets
 1 _gateway (10.128.1.1) 0.796 ms 0.714 ms 0.660 ms
 2 14.139.174.49 (14.139.174.49) 1.836 ms 1.783 ms 1.729 ms
 3 * * *
 4 * * *
 5 * * *
 6 10.119.73.122 (10.119.73.122) 21.546 ms 20.348 ms 20.243 ms
 7 72.14.213.20 (72.14.213.20) 20.168 ms 72.14.195.128 (72.14.195.128) 21.586 ms 21.509 ms
 8 * * *
 9 142.251.55.220 (142.251.55.220) 20.347 ms 108.170.231.130 (108.170.231.130) 20.296 ms 142.251.55.224 (142.251.55.224) 20.179 ms
10 74.125.242.146 (74.125.242.146) 20.097 ms 142.251.55.31 (142.251.55.31) 19.018 ms 74.125.242.138 (74.125.242.138) 20.192 ms
11 maa03s45-lin-f3.1e100.net (142.250.196.35) 19.571 ms 19.464 ms 108.170.253.113 (108.170.253.113) 20.502 ms

```

a. What is the IP address associated with "www.google.com"?

Ans.

142.250.196.36

b. Where do you think that "www.google.com", "www.google.co.kr", and "www.google.co.in" are physically located?

Ans.

Since in traceroute of each sites most of the ip of routers are same, so we can say they are at same location. The location is United States (US).

IP Location Finder

IP LOOKUP OR IP ADDRESS LOOKUP WITH DETAILED IP GEOLOCATION DATA

IP address or hostname

142.250.196.36

Find

LOCATION	
Country	United States (US)
Continent	North America (NA)
Coordinates	37.751 (lat) / -97.822 (long)
Time	2023-09-08 12:12:15 (America/Chicago)
NETWORK	
IP address	142.250.196.36
Hostname	maa03s45-lin-f4.1e100.net
Provider	GOOGLE
ASN	15169

IP Location Finder

IP LOOKUP OR IP ADDRESS LOOKUP WITH DETAILED IP GEOLOCATION DATA

IP address or hostname

142.250.196.35

Find

LOCATION	
Country	United States (US)
Continent	North America (NA)
Coordinates	37.751 (lat) / -97.822 (long)
Time	2023-09-08 12:14:54 (America/Chicago)
NETWORK	
IP address	142.250.196.35
Hostname	maa03s45-lin-f3.1e100.net
Provider	GOOGLE
ASN	15169

IP Location Finder

IP LOOKUP OR IP ADDRESS LOOKUP WITH DETAILED IP GEOLOCATION DATA

IP address or hostname

142.250.196.35

Find

LOCATION	
Country	United States (US)
Continent	North America (NA)
Coordinates	37.751 (lat) / -97.822 (long)
Time	2023-09-08 12:14:53 (America/Chicago)
NETWORK	
IP address	142.250.196.35
Hostname	maa03s45-lin-f3.1e100.net
Provider	GOOGLE
ASN	15169

c. Do you observe any unresponsive router hops (i.e., routers that don't send a diagnostic message when the packet is dropped)?

Ans.

Yes, they are represented by '*' (3, 4, 5 and 8th hop).

d. Are the round trip latencies observed to intermediate hops increasing uniformly or are there abrupt jumps? If there are abrupt jumps in measured latencies, can you explain why they occur?

Ans.

Yes, there are abrupt jumps in www.google.com in hop 9 to hop 10 (20.822ms to 31.893ms). There are abrupt jumps because the two routers are located far from each other.

3. www.traceroute.org provides a list of publicly available traceroute servers. Perform a traceroute to your computer from one of these servers. Also traceroute to that server from your computer. Are the same routers observed in both directions?

Ans.

Home / Traceroute						
Traceroute						
Hop	Hostname	IP Address	1	2	3	
1	g1-2.core1.troy2.waveform.net	(208.79.209.137)	0.596 ms	0.395 ms	0.253 ms	
2	192.111.55.214	(192.111.55.214)	0.315 ms	0.462 ms	0.274 ms	
3	core9.lynn2.managedway.com	(208.79.213.97)	0.310 ms	13.537 ms	0.925 ms	
4	38.142.133.97	(38.142.133.97)	1.003 ms	1.050 ms	0.986 ms	
5	be2123.rcr51.tol01.atlas.cogentco.com	(154.54.82.137)	2.868 ms	3.032 ms	2.847 ms	
6	be3745.ccr22.cle04.atlas.cogentco.com	(154.54.30.129)	4.772 ms	4.907 ms	4.894 ms	
7	be2890.ccr42.jfk02.atlas.cogentco.com	(154.54.82.246)	16.390 ms	16.515 ms	16.431 ms	
8	be3496.ccr31.jfk10.atlas.cogentco.com	(154.54.0.142)	16.614 ms	16.645 ms	33.160 ms	
9	38.122.229.102	(38.122.229.102)	18.867 ms	21.963 ms	18.475 ms	
10	103.198.140.212	(103.198.140.212)	209.670 ms	209.424 ms	209.008 ms	
11	103.198.140.38	(103.198.140.38)	211.394 ms	212.585 ms	211.246 ms	
12	103.198.140.212	(103.198.140.212)	208.977 ms	209.012 ms	365.988 ms	
13	-	-	*	*	*	
14	-	-	*	*	*	
15	115.247.69.86	(115.247.69.86)	209.292 ms	210.897 ms	209.488 ms	
16	-	-	*	*	*	
17	-	-	*	*	*	
18	-	-	*	*	*	
19	-	-	*	*	*	
20	14.139.174.50	(14.139.174.50)	280.238 ms	287.730 ms	279.904 ms	

```
vaibhavbnagale@vaibhavbnagale:~$ traceroute 208.79.209.137
traceroute to 208.79.209.137 (208.79.209.137), 30 hops max, 60 byte packets
 1  * * *
 2  14.139.174.49 (14.139.174.49) 1.825 ms 1.772 ms 1.723 ms
 3  10.162.69.161 (10.162.69.161) 59.311 ms 59.261 ms 59.212 ms
 4  10.255.238.105 (10.255.238.105) 76.620 ms 76.570 ms 10.255.236.85 (10.255.236.85) 61.691 ms
 5  10.255.238.241 (10.255.238.241) 86.595 ms 10.255.237.41 (10.255.237.41) 55.968 ms 10.255.238.237 (10.255.238.237) 65.110 ms
 6  10.255.239.158 (10.255.239.158) 69.073 ms 10.255.239.162 (10.255.239.162) 76.276 ms 10.255.239.30 (10.255.239.30) 62.222 ms
 7  10.255.221.229 (10.255.221.229) 62.004 ms 10.255.222.229 (10.255.222.229) 59.689 ms 59.642 ms
 8  10.255.221.1 (10.255.221.1) 53.240 ms 61.293 ms 10.255.222.1 (10.255.222.1) 65.353 ms
 9  115.244.136.21 (115.244.136.21) 64.017 ms 62.723 ms 61.235 ms
10  115.244.136.17 (115.244.136.17) 83.014 ms 67.388 ms 72.888 ms
11  * * *
12  * * *
13  * * *
14  * * *
15  * ae-21.a02.nycnny17.us.bb.gln.ntt.net (128.241.7.158) 272.957 ms 272.987 ms
16  ae-0.arelton.nycnny17.us.bb.gln.ntt.net (129.250.8.230) 289.618 ms ae-21.a02.nycnny17.us.bb.gln.ntt.net (128.241.7.158) 265.398 ms ae-0.arelton.nycnny17.us.bb.gln.ntt.net (129.250.8.230) 281.551 ms
17  ae-0.arelton.nycnny17.us.bb.gln.ntt.net (129.250.8.230) 287.081 ms 289.271 ms nyk-bb2-link.ip.twelve99.net (62.115.135.132) 283.562 ms
18  nyk-bb2-link.ip.twelve99.net (62.115.135.132) 277.624 ms 294.259 ms 299.888 ms
19  det-b4-link.ip.twelve99.net (62.115.137.167) 289.339 ms det-b2-link.ip.twelve99.net (62.115.113.35) 280.767 ms det-b4-link.ip.twelve99.net (62.115.137.167) 299.566 ms
20  easyonline-ic-369073.ip.twelve99-cust.net (213.248.93.11) 285.155 ms det-b4-link.ip.twelve99.net (62.115.137.167) 287.693 ms 285.114 ms
21  dtw-core9-v13660.managedway.com (192.111.55.146) 275.117 ms 284.371 ms 278.062 ms
22  dtw-core9-v13660.managedway.com (192.111.55.146) 277.034 ms dtw-edge1-v14000.msjohost.com (104.193.123.255) 269.478 ms 271.100 ms
23  agr4.managedway.com (208.79.213.97) 277.488 ms g1-2.core1.troy2.waveform.net (208.79.209.137) 279.887 ms 281.560 ms
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No, as per above trace route I don't see same routers in both directions but I observe that some routers are in same subnets (like 14.139.174.49 and 14.139.174.50).