IIT PALAKKAD

Indian Institute of Technology Palakkad
Department of Computer Science and Engineering
CS4010 Computer Networks
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Assignment – 2
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Question 1

(a)

The IP address associated with facebook is 163.70.139.35 as can be seen from the highlighted part in figure 1

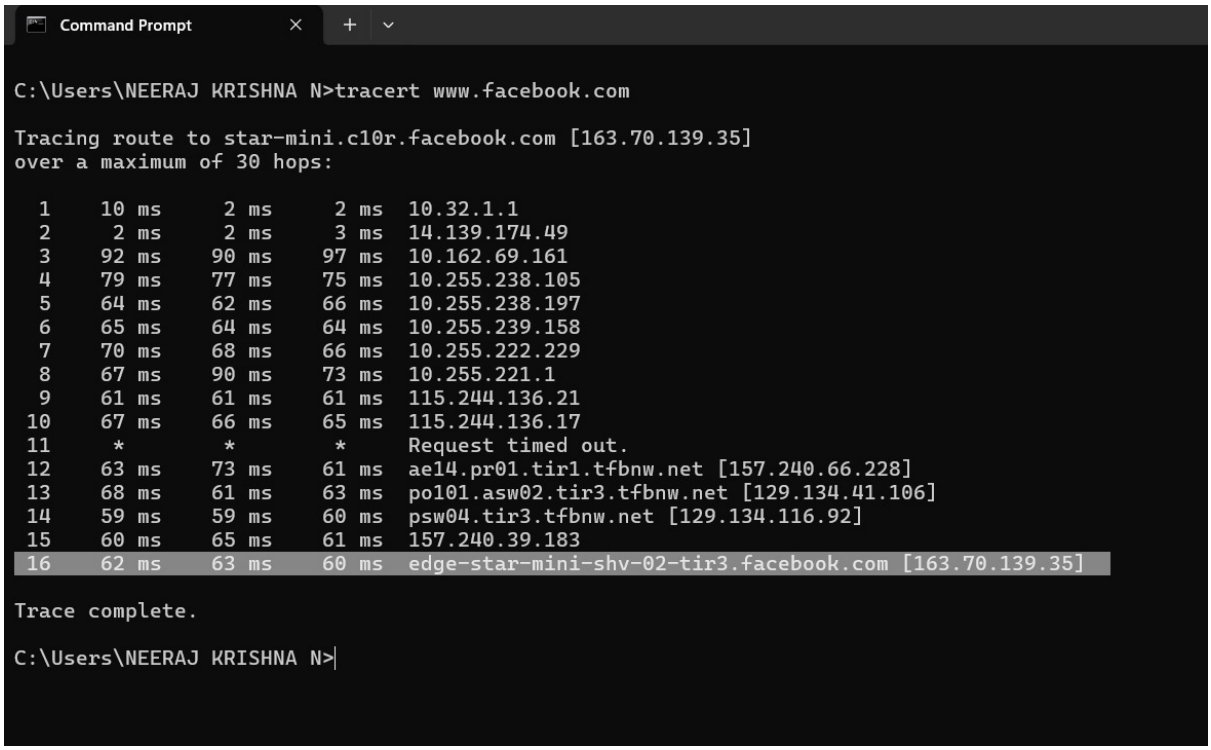

Figure 1: IP address of www.facebook.com

(b)

IP address of the router one hop before the destination is 157.240.39.183.
DNS name of the router one hop before the destination cannot be determined from the following traceroute since the router did not send its DNS name back to the local machine. This can be seen in figure 2
The possible reason can be that the router would have been configured to not reveal its DNS name

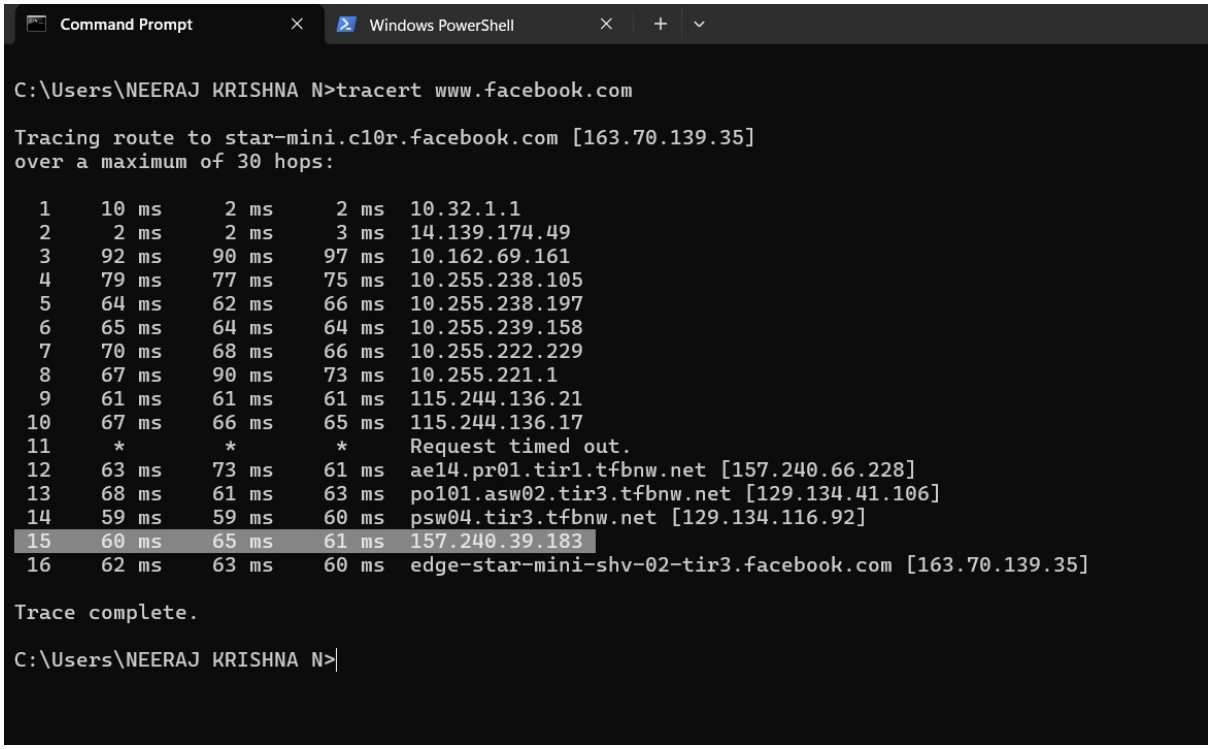

Figure 2: One Hop before destination

(c)

The number of hops it took for the traceroute to reach from my local machine to the destination is 16 as can be seen from the figure 3. The 16th entry in the traceroute is the destination.

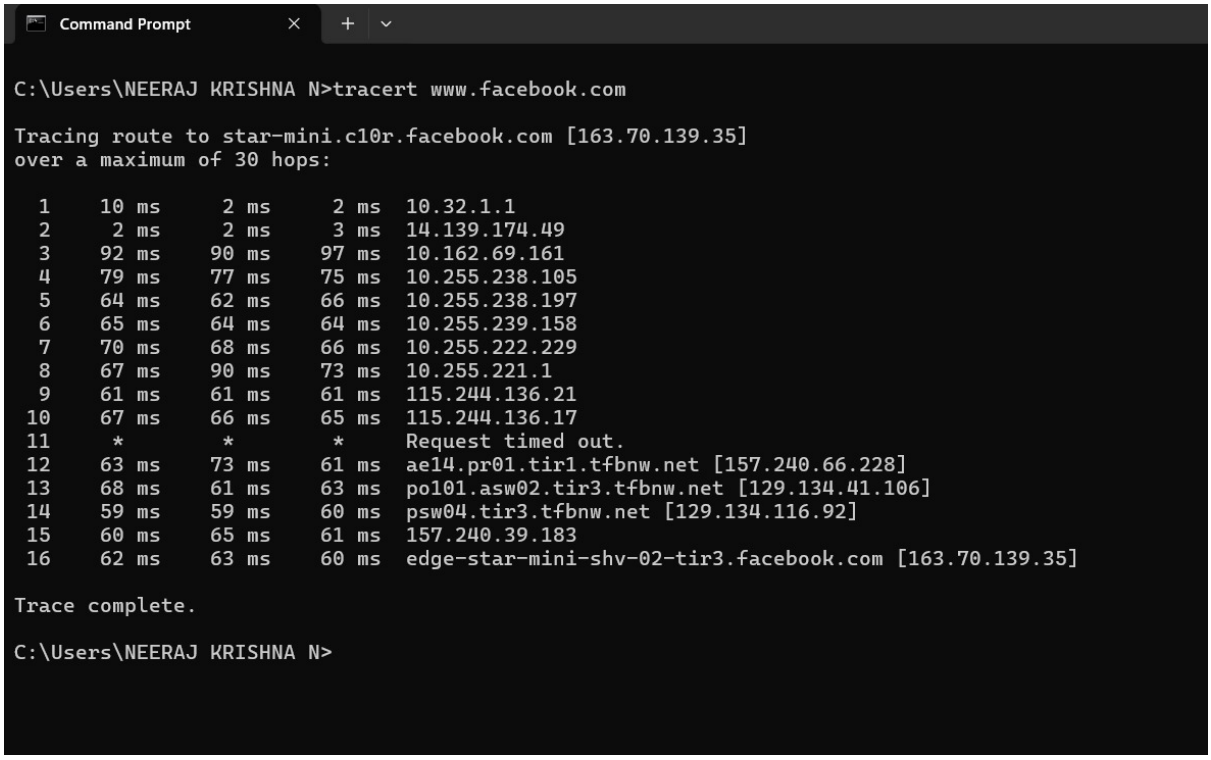

Figure 3: Number of Hops

(d)

The 3rd link faced the longest latency of 97ms as can be seen from figure 4

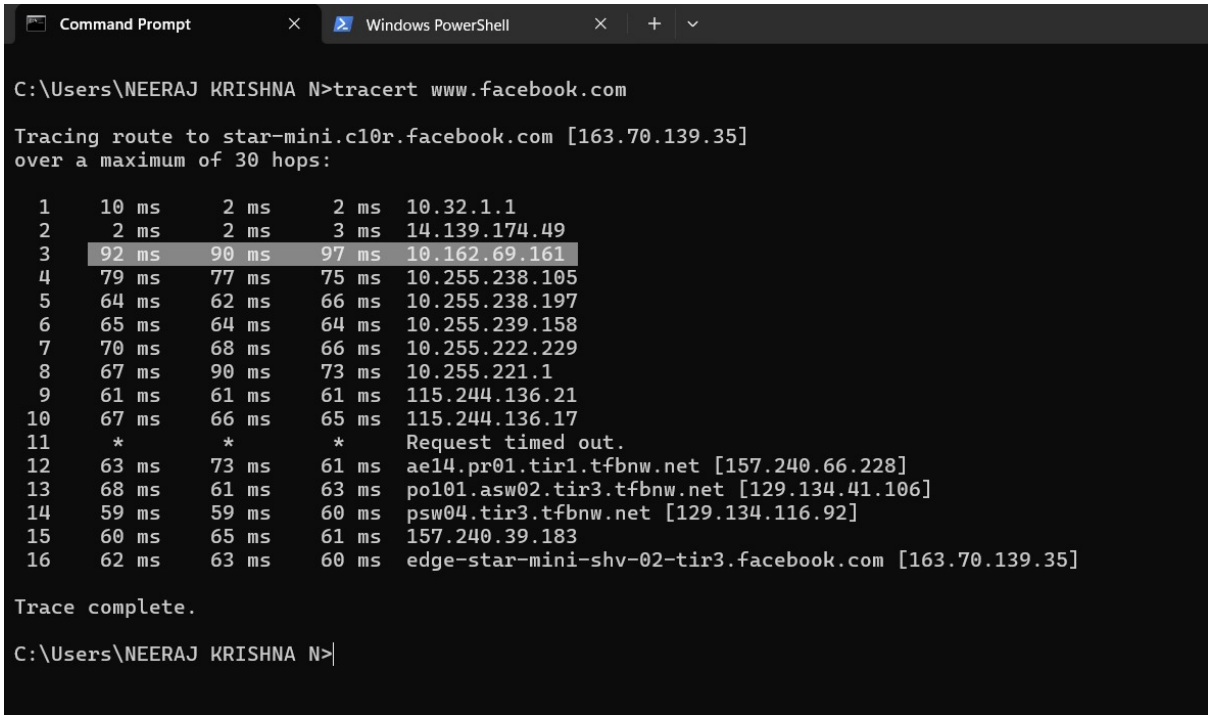

Figure 4: Longest Latency link

Question 2

(a)

IP address of www.google.com is 172.217.163.196 as can be seen from the highlighted part of the last response in the traceroute shown in the figure 5

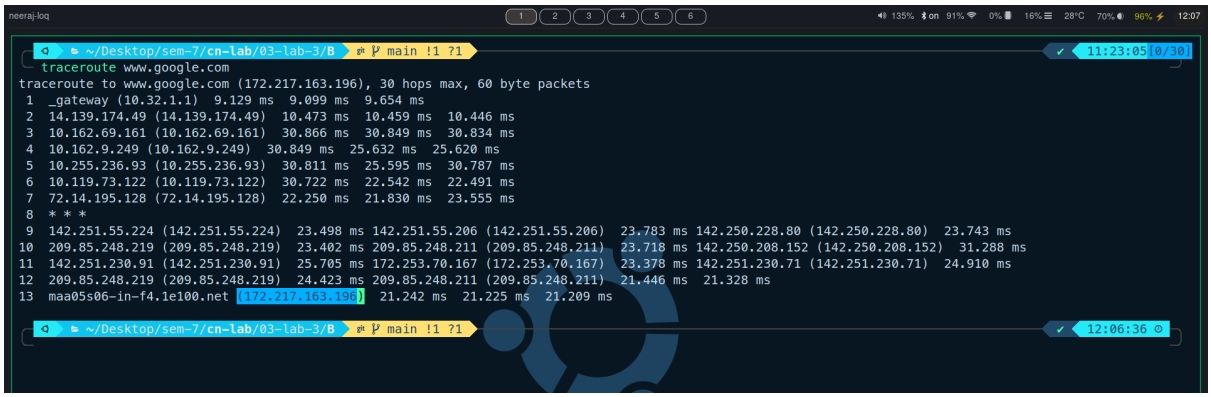

Figure 5: IP address of www.google.com

(b)

1. Servers of www.google.com are most likely located in major data centers like the US (.com represents "commercial")
2. Servers of www.google.co.kr are most likely located in South Korea since the domain (.co.kr) refers primarily to South Korea
3. Servers of www.google.co.in are most likely located in India since the domain (.co.in) refers primarily to India

(c)

Yes the 8th router was unresponsive as can be seen from the figure 6. The possible reason can be that the router is configured such that it does not reveal its IP address.

Figure 6: Unresponsive Router

(d)

There are abrupt jumps in the traceroute. One example is the latency difference between the 2nd and 3rd router (refer figure 7). Possible reason might be that the distance for the packet to travel from the machine to the 3rd router may be much higher than the distance from the machine to 2nd router.

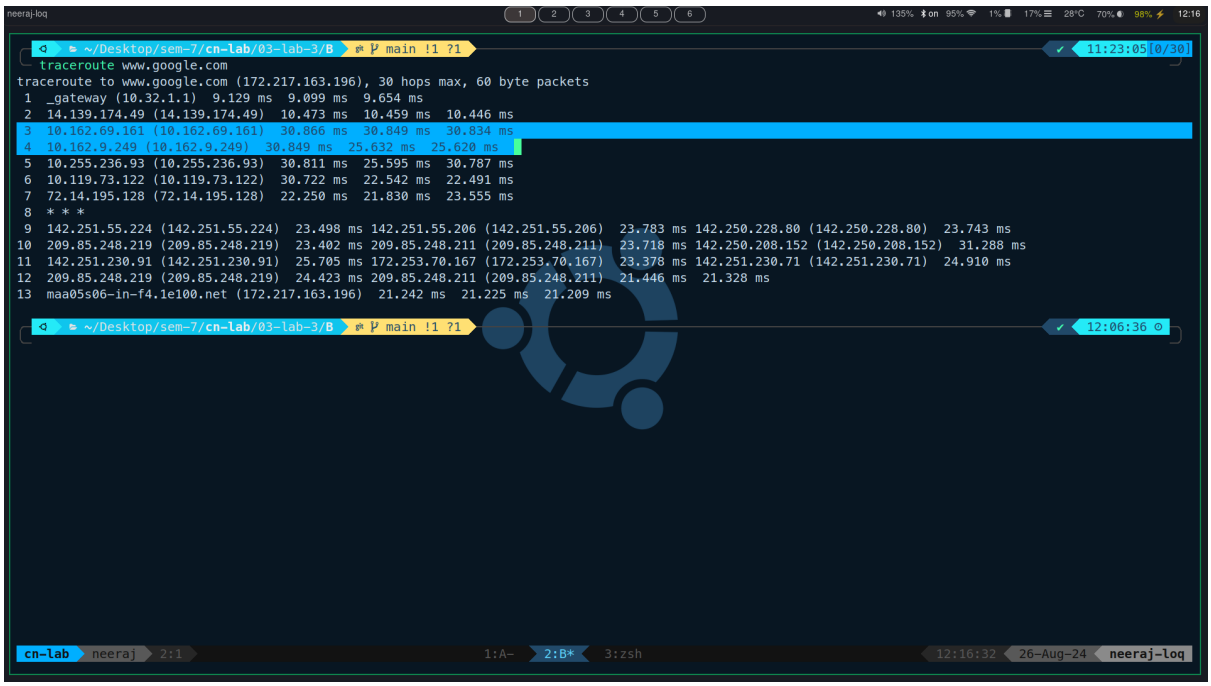

Figure 7: Latency Difference

Question 3

The publicly available traceroute server used in this question is https://dnschecker.org/online-traceroute.php. The public IP address of my local machine is 14.139.174.50. This can be found out in 2 ways, either using the website https://whatismyipaddress.com/ as shown in figure 8 or using the terminal command `curl ifconfig.me` as shown in figure 9

The traceroute was performed from the server to local machine shown in figure 10 and the output is shown in figure 11. Traceroute was performed from local machine to server using `traceroute` command and the output is shown in 12. As we can see, from the output in figures 11 and 12, the routers observed in both directions are not same. One possible reason might be Network Traffic and Congestion. The traffic might be re-routed dynamically based on the network traffic and congestion

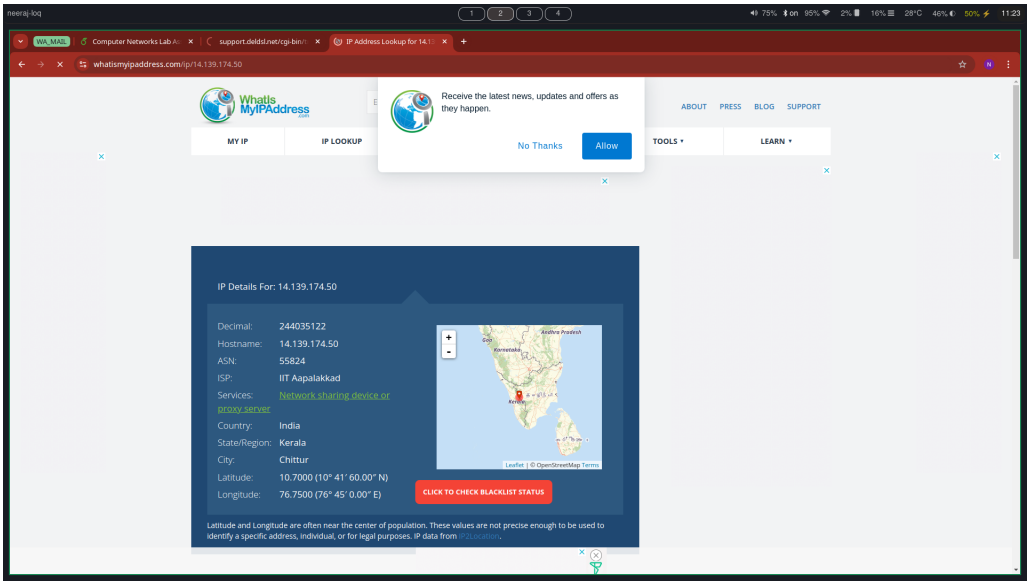

Figure 8: Finding public IP Address from whatismyipaddress.com

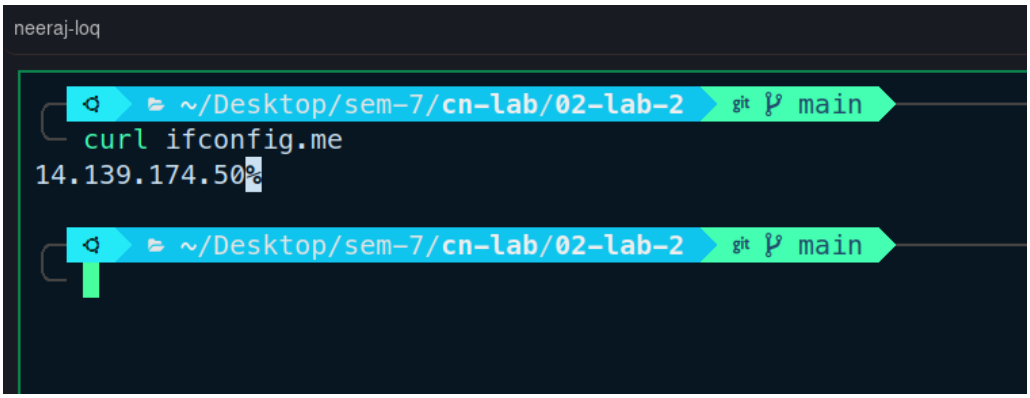

Figure 9: Finding public IP address from terminal

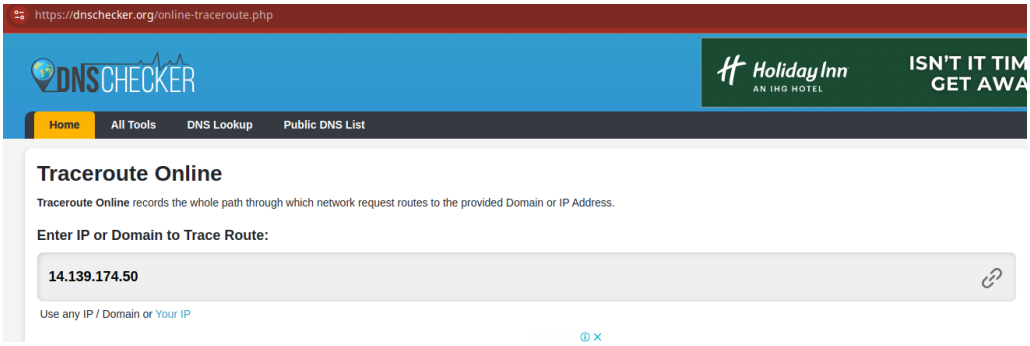

Figure 10: dnschecker-webpage

Converted IPv6 for: 14.139.174.50

```
Start: 2024-08-28T11:19:43+0500
HOST: DNSChecker.org                Loss%   Snt   Last   Avg  Best  Wrst StDev
  1.|-- ???                         100.0     3    0.0   0.0   0.0   0.0   0.0
  2.|-- 10.74.132.79                  0.0%     3    0.8   3.3   0.8   7.9   4.0
  3.|-- 138.197.248.246               0.0%     3   38.8  13.8   0.8  38.8  21.7
  4.|-- 143.244.192.162               0.0%     3    0.4   0.5   0.4   0.9   0.3
  5.|-- 143.244.225.94                0.0%     3    1.0   1.1   0.9   1.4   0.2
  6.|-- 143.244.225.23                0.0%     3    0.6   0.7   0.6   0.8   0.1
  7.|-- INFRA.JIO.COM (206.82.104.142)  0.0%     3    1.9   1.7   1.5   1.9   0.2
  8.|-- 103.198.140.26                0.0%     3  201.6 201.6 201.6 201.7   0.1
  9.|-- 103.198.140.203               0.0%     3  186.3 186.7 186.3 187.1   0.4
 10.|-- 103.198.140.42                0.0%     3  195.0 195.0 195.0 195.0   0.0
 11.|-- 103.198.140.26                0.0%     3  201.0 201.0 201.0 201.0   0.0
 12.|-- 49.44.220.242                 0.0%     3  196.1 196.4 196.1 196.9   0.4
 13.|-- ???                          100.0     3    0.0   0.0   0.0   0.0   0.0
 14.|-- 115.247.69.86                 0.0%     3  195.9 196.0 195.9 196.1   0.1
 15.|-- ???                          100.0     3    0.0   0.0   0.0   0.0   0.0
 16.|-- ???                          100.0     3    0.0   0.0   0.0   0.0   0.0
 17.|-- ???                          100.0     3    0.0   0.0   0.0   0.0   0.0
 18.|-- ???                          100.0     3    0.0   0.0   0.0   0.0   0.0
 19.|-- 14.139.174.50                 0.0%     3  300.2 297.8 296.1 300.2   2.1
```

Figure 11: Traceroute from server to local machine

```
~ 11:47:01
traceroute www.dnschecker.org
traceroute to www.dnschecker.org (104.26.7.89), 30 hops max, 60 byte packets
 1  _gateway (10.32.1.1)  7.565 ms  7.518 ms  7.499 ms
 2  14.139.174.49 (14.139.174.49)  5.402 ms  5.382 ms  5.363 ms
 3  10.162.69.161 (10.162.69.161)  102.945 ms  102.929 ms  103.791 ms
 4  10.255.236.85 (10.255.236.85)  86.918 ms  86.899 ms 10.255.238.105 (10.255.238.105)  90.475 ms
 5  10.255.237.41 (10.255.237.41)  90.456 ms  90.434 ms 10.255.238.197 (10.255.238.197)  80.605 ms
 6  10.255.239.30 (10.255.239.30)  90.772 ms 10.255.239.158 (10.255.239.158)  71.508 ms 10.255.239.162 (10.255.239.162)  71.436 ms
 7  10.255.222.229 (10.255.222.229)  92.202 ms  74.362 ms 10.255.221.229 (10.255.221.229)  100.460 ms
 8  10.255.222.1 (10.255.222.1)  69.372 ms 10.255.221.1 (10.255.221.1)  72.866 ms 10.255.222.1 (10.255.222.1)  69.540 ms
 9  115.244.136.21 (115.244.136.21)  72.471 ms  88.832 ms  75.428 ms
10  115.244.136.17 (115.244.136.17)  88.369 ms  70.994 ms  71.746 ms
11  * * *
12  * * *
13  49.44.220.133 (49.44.220.133)  68.852 ms  70.953 ms 104.26.7.89 (104.26.7.89)  71.850 ms
```

Figure 12: Traceroute from local machine to server