Assignment One

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Entry No: - 2021MCS2133

Computer Networks (COL334/672)

1. Networking Tools

a. Link-local IPv6 Address:-
fe80::2858:63aa:667b:b6ec%9
IPv4 Address: - **192.168.1.12**
Subnet Mask: - 255.255.255.0

While changing the service provider the IP address will not change it will remain the same because this IP address is private or local IP address which is assigned by the router to the PC.

b. IP Address using *nslookup*

www.google.com	142.250.194.100
www.facebook.com	157.240.16.35

After changing DNS Server(dns.opendns.com): -

www.google.com	142.250.194.132
www.facebook.com	157.240.239.35

Again changing DNS Server(dns.google): -

www.google.com	142.250.194.196
www.facebook.com	157.240.198.35

c. IP Address of www.iitd.ac.in is 103.27.9.24(got to know using nslookup.)

i.) **Changing the packet size** and using following command: -

ping www.iitd.ac.in -l x {It will send packet of x bytes}(range of x 0-65500)

by default the packet size is 32 bytes. And for is IP 103.27.9.24 we can send the packet of maximum size **only 1464 byte**.

for domain www.google.com and www.facebook.com the maximum packet I'm able to send is also **1464 bytes.**

ii.) **Changing the TTL value** and using following command: -

ping www.iitd.ac.in -i x (x is the TTL value whose range is 1 to 255)

The **minimum TTL values required for www.iitd.ac.in is 16.**

d. '*tracert*' with two different service provider is as follows: -

```
C:\Users\verma>tracert www.iitd.ac.in

Tracing route to www.iitd.ac.in [103.27.9.24]
over a maximum of 30 hops:

  1     1 ms    <1 ms    <1 ms  dsldevice.lan [192.168.1.1]
  2     5 ms     4 ms     4 ms  abts-mh-dynamic-001.33.169.122.airtelbroadband.in [122.169.33.1]
  3     4 ms     4 ms     4 ms  aes-static-249.51.22.125.airtel.in [125.22.51.249]
  4    13 ms    12 ms    13 ms  182.79.181.89
  5    92 ms    92 ms    92 ms  115.248.156.25
  6    94 ms    93 ms    93 ms  115.255.253.18
  7    13 ms    14 ms    14 ms  115.249.198.97
  8    14 ms    14 ms    15 ms  10.255.222.3
  9     *        *        *     Request timed out.
 10     *        *        *     Request timed out.
 11     *        *        *     Request timed out.
 12     *        *        *     Request timed out.
 13     *        *        *     Request timed out.
 14   100 ms    96 ms    96 ms  103.27.9.24
 15    96 ms    96 ms    99 ms  103.27.9.24
 16    96 ms    96 ms   103 ms  103.27.9.24

Trace complete.

C:\Users\verma>tracert www.iitd.ac.in

Tracing route to www.iitd.ac.in [103.27.9.24]
over a maximum of 30 hops:

  1     2 ms     2 ms     2 ms  192.168.125.29
  2    73 ms    47 ms    83 ms  10.153.222.61
  3    85 ms    66 ms    67 ms  10.166.122.178
  4    52 ms    58 ms    51 ms  100.64.0.149
  5   195 ms   192 ms   193 ms  14.143.254.241.static-delhi.vsnl.net.in [14.143.254.241]
  6   210 ms   194 ms   187 ms  172.31.169.86
  7   127 ms   125 ms   133 ms  219.65.112.66.static-delhi.vsnl.net.in [219.65.112.66]
  8   145 ms   133 ms   132 ms  115.249.198.97
  9     *        *        *     Request timed out.
 10     *        *        *     Request timed out.
 11     *        *        *     Request timed out.
 12     *        *        *     Request timed out.
 13     *        *        *     Request timed out.
 14     *        *        *     Request timed out.
 15   138 ms   167 ms   148 ms  103.27.9.24
 16   150 ms   136 ms   140 ms  103.27.9.24
 17   218 ms   131 ms   130 ms  103.27.9.24

Trace complete.
```

If some paths default to IPv6 then we can use property of *tracert -4* to force traceroute use IPv4.

And the hops which are not responding and sending “Request timed out” for those even the ping command is not working so I have no idea how to get

ip address of it.

2. Packet Analysis

(flushed the DNS by executing command *ipconfig /flushdns*)

a. After applying DNS filter on wireshark, we can clearly see the DNS request-response packet and it takes of approx. **0.016318 seconds.**

b. After applying http filter to count approximate number of HTTP requests that were generated we just need to look all http GET packet.
The **total count is 28.**

c. The **total time** taken by website to load is **3.438706 seconds.**

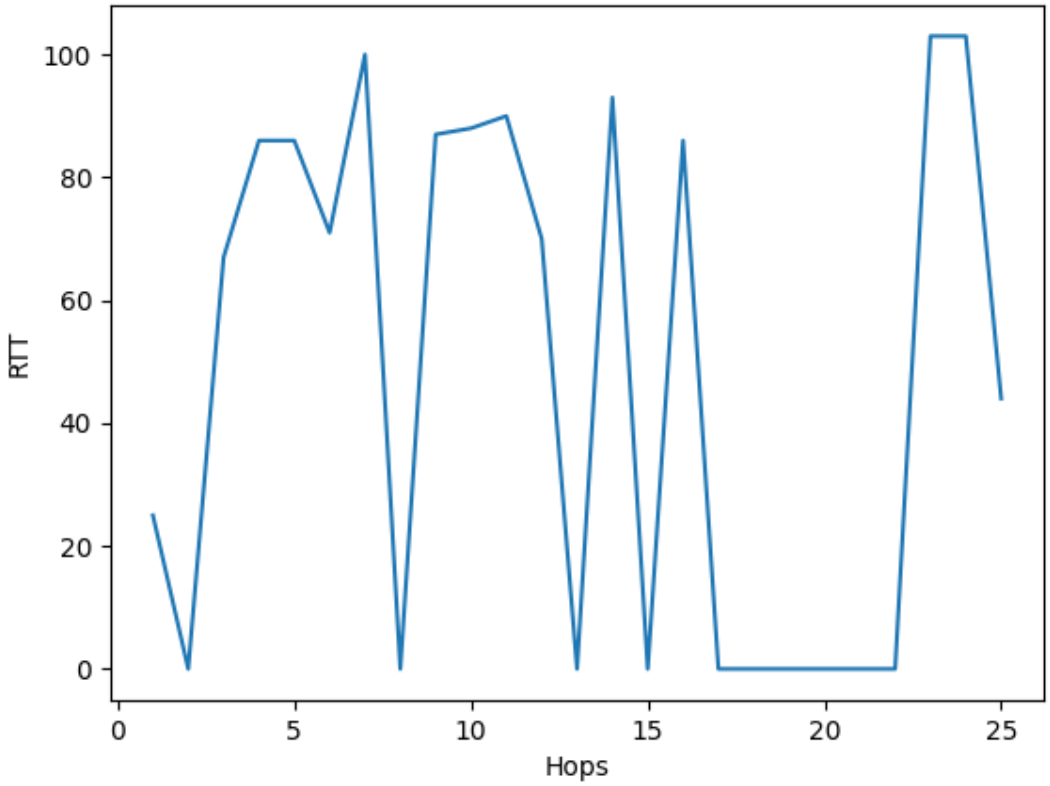
d. In http://www.cse.iitd.ac.in/ after filtering for http there is **only one http GET**. Hence almost no tracffic.

It may be because when we search for http://www.cse.iitd.ac.in/ it by default convert to https which is same as http but with security which then uses TLS as lower layer protocol so all data is secured.

3. The code for calculate RTT of each server on the way and then hop vs RTT graph is implemented and executed in python. (For plotting matplotlib module of python is used so make sure it is installed and use Windows platform as ping command is little different in UNIX)
   The output of the following is shown below: -

```
>>>
================ RESTART: C:\Users\verma\Desktop\CN\as 1\code.py ================
Enter Domain Name: www.iitd.ac.in
192.168.85.39
Request timed out.
56.8.211.201
192.168.118.52
192.168.118.47
172.26.108.198
172.26.108.210
192.168.112.132
192.168.112.131
172.25.115.26
172.25.115.26
172.16.18.33
172.25.115.25
115.249.187.169
Request timed out.
115.249.198.97
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
103.27.9.24
103.27.9.24
103.27.9.24
>>>
```

   All the server which doesn't response, I do not have IP address and hence for those ones "Request timed out." Is shown.
   The graph is also shown as follows: -



All the hops which don’t respond, RTT set for those ones is ZERO.