



INDIAN INSTITUTE OF TECHNOLOGY, DELHI

COL334 - ASSIGNMENT 1 REPORT

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1. Networking Tools

- a. *Ifconfig* - Run the *ifconfig* command by changing the service providers, Ip address changes (ipv4 - 192.168.43.170, 192.168.43.52)

```
anjali@anjali-HP-Pavilion-Laptop-15-cs1xxx:~$ ifconfig
eno1: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    ether c8:d9:d2:92:5c:80 txqueuelen 1000 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 53648 bytes 5559379 (5.5 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 53648 bytes 5559379 (5.5 MB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

wlo1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.43.170 netmask 255.255.255.0 broadcast 192.168.43.255
    inet6 2401:4900:463b:96e1:a25:75ba:cee4:ef2c prefixlen 64 scopeid 0x0<global>
    inet6 2401:4900:463b:96e1:998c:3608:8913:6a13 prefixlen 64 scopeid 0x0<global>
    inet6 fe80::d187:43f5:226a:2158 prefixlen 64 scopeid 0x20<link>
    ether c0:b6:f9:cb:3d:33 txqueuelen 1000 (Ethernet)
    RX packets 2030274 bytes 1665234304 (1.6 GB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 661327 bytes 179116513 (179.1 MB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

```

anjali@anjali-HP-Pavilion-Laptop-15-cs1xxx:~$ ifconfig
eno1: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    ether c8:d9:d2:92:5c:80 txqueuelen 1000 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 54424 bytes 5625969 (5.6 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 54424 bytes 5625969 (5.6 MB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

wlo1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.43.52 netmask 255.255.255.0 broadcast 192.168.43.255
    inet6 2401:4900:5246:d05:f7f8:fe00:bc93:e5d9 prefixlen 64 scopeid 0x0<global>
    inet6 fe80::1494:d359:84b3:20e7 prefixlen 64 scopeid 0x20<link>
    inet6 2401:4900:5246:d05:e5c9:5e5b:b4d8:6bf7 prefixlen 64 scopeid 0x0<global>
    ether c0:b6:f9:cb:3d:33 txqueuelen 1000 (Ethernet)
    RX packets 2031073 bytes 1665476503 (1.6 GB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 662265 bytes 179315811 (179.3 MB)

```

- b. Nslookup - Used nslookup for google and Facebook and changing the dns changed the respective Ip addresses

```
anjali@anjali-HP-Pavilion-Laptop-15-cs1xxx:~$ nslookup www.google.com
Server:          127.0.0.53
Address:         127.0.0.53#53
```

```
Non-authoritative answer:
Name:   www.google.com
Address: 142.250.182.100
Name:   www.google.com
Address: 2404:6800:4002:820::2004
```

```
anjali@anjali-HP-Pavilion-Laptop-15-cs1xxx:~$ nslookup www.facebook.com
Server:          127.0.0.53
Address:         127.0.0.53#53
```

```
Non-authoritative answer:
www.facebook.com      canonical name = star-mini.c10r.facebook.com.
Name:   star-mini.c10r.facebook.com
Address: 157.240.16.35
Name:   star-mini.c10r.facebook.com
Address: 2a03:2880:f12f:83:face:b00c:0:25de
```

```
anjali@anjali-HP-Pavilion-Laptop-15-cs1xxx:~$ nslookup www.facebook.com 1.1.1.1
Server:          1.1.1.1
Address:         1.1.1.1#53
```

```
Non-authoritative answer:
www.facebook.com      canonical name = star-mini.c10r.facebook.com.
Name:   star-mini.c10r.facebook.com
Address: 157.240.198.35
Name:   star-mini.c10r.facebook.com
Address: 2a03:2880:f144:82:face:b00c:0:25de
```

```
anjali@anjali-HP-Pavilion-Laptop-15-cs1xxx:~$ nslookup www.google.com 1.1.1.1
Server:          1.1.1.1
Address:         1.1.1.1#53
```

```
Non-authoritative answer:
Name:   www.google.com
Address: 142.250.194.36
Name:   www.google.com
Address: 2404:6800:4002:81f::2004
```

c. Ping- Ping www.iitd.ac.in, for various size packets, the limit is given as 65507. Although the limit to what i was able to send was somewhat less than this.

```
anjali@anjali-HP-Pavilion-Laptop-15-cs1xxx:~$ ping -c 5 www.iitd.ac.in
PING www.iitd.ac.in (103.27.9.24) 56(84) bytes of data.
64 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=1 ttl=51 time=86.1 ms
64 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=2 ttl=51 time=96.7 ms
64 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=3 ttl=51 time=226 ms
64 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=4 ttl=51 time=94.0 ms
64 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=5 ttl=51 time=168 ms

--- www.iitd.ac.in ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4541ms
rtt min/avg/max/mdev = 86.074/134.088/225.689/54.489 ms
anjali@anjali-HP-Pavilion-Laptop-15-cs1xxx:~$ ping -c 5 -s 100 www.iitd.ac.in
PING www.iitd.ac.in (103.27.9.24) 100(128) bytes of data.
108 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=1 ttl=51 time=94.5 ms
108 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=2 ttl=51 time=99.1 ms
108 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=3 ttl=51 time=163 ms
108 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=4 ttl=51 time=185 ms
108 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=5 ttl=51 time=98.9 ms

--- www.iitd.ac.in ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4006ms
rtt min/avg/max/mdev = 94.527/127.993/184.608/37.992 ms
anjali@anjali-HP-Pavilion-Laptop-15-cs1xxx:~$ ping -c 5 -s 10000 www.iitd.ac.in
PING www.iitd.ac.in (103.27.9.24) 10000(10028) bytes of data.
10008 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=1 ttl=51 time=213 ms
10008 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=2 ttl=51 time=239 ms
10008 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=3 ttl=51 time=157 ms
10008 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=4 ttl=51 time=179 ms
10008 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=5 ttl=51 time=202 ms

--- www.iitd.ac.in ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4005ms
rtt min/avg/max/mdev = 156.848/197.924/238.753/28.073 ms
anjali@anjali-HP-Pavilion-Laptop-15-cs1xxx:~$ ping -c 5 -s 100000 www.iitd.ac.in
ping: packet size 100000 is too large. Maximum is 65507
anjali@anjali-HP-Pavilion-Laptop-15-cs1xxx:~$ ping -c 5 -s 1000000 www.iitd.ac.in
ping: invalid argument: '1000000': out of range: 0 <= value <= 127992
```

For other websites as well, the limit is observed as 65507. I needed to use the -4 flag for other websites as my Isp chose ip6 address directly otherwise. Also, for different ttl values. The min ttl needed was 16.

```

anjali@anjali-HP-Pavilion-Laptop-15-cs1xxx:~$ ping -c 5 www.iitd.ac.in -t 20
PING www.iitd.ac.in (103.27.9.24) 56(84) bytes of data.
64 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=1 ttl=51 time=130 ms
64 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=2 ttl=51 time=153 ms
64 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=3 ttl=51 time=174 ms
64 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=4 ttl=51 time=197 ms
64 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=5 ttl=51 time=220 ms

--- www.iitd.ac.in ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4006ms
rtt min/avg/max/mdev = 129.883/174.736/219.972/31.715 ms
anjali@anjali-HP-Pavilion-Laptop-15-cs1xxx:~$ ping -c 5 www.iitd.ac.in -t 16
PING www.iitd.ac.in (103.27.9.24) 56(84) bytes of data.
64 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=1 ttl=51 time=204 ms
64 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=2 ttl=51 time=226 ms
64 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=3 ttl=51 time=146 ms
64 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=4 ttl=51 time=169 ms
64 bytes from 103.27.9.24 (103.27.9.24): icmp_seq=5 ttl=51 time=90.3 ms

--- www.iitd.ac.in ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4006ms
rtt min/avg/max/mdev = 90.328/167.066/226.356/47.323 ms
anjali@anjali-HP-Pavilion-Laptop-15-cs1xxx:~$ ping -c 5 www.iitd.ac.in -t 10
PING www.iitd.ac.in (103.27.9.24) 56(84) bytes of data.
From 14.140.210.22.static-Delhi-vsnl.net.in (14.140.210.22) icmp_seq=1 Time to live exceeded
From 14.140.210.22.static-Delhi-vsnl.net.in (14.140.210.22) icmp_seq=2 Time to live exceeded
From 14.140.210.22.static-Delhi-vsnl.net.in (14.140.210.22) icmp_seq=3 Time to live exceeded
From 14.140.210.22.static-Delhi-vsnl.net.in (14.140.210.22) icmp_seq=4 Time to live exceeded
From 14.140.210.22.static-Delhi-vsnl.net.in (14.140.210.22) icmp_seq=5 Time to live exceeded

--- www.iitd.ac.in ping statistics ---
5 packets transmitted, 0 received, +5 errors, 100% packet loss, time 4008ms

anjali@anjali-HP-Pavilion-Laptop-15-cs1xxx:~$ ping -c 5 www.iitd.ac.in -t 15
PING www.iitd.ac.in (103.27.9.24) 56(84) bytes of data.
From 103.27.9.24 (103.27.9.24) icmp_seq=1 Time to live exceeded
From 103.27.9.24 (103.27.9.24) icmp_seq=2 Time to live exceeded
From 103.27.9.24 (103.27.9.24) icmp_seq=3 Time to live exceeded
From 103.27.9.24 (103.27.9.24) icmp_seq=4 Time to live exceeded
From 103.27.9.24 (103.27.9.24) icmp_seq=5 Time to live exceeded

--- www.iitd.ac.in ping statistics ---
5 packets transmitted, 0 received, +5 errors, 100% packet loss, time 4003ms

anjali@anjali-HP-Pavilion-Laptop-15-cs1xxx:~$ ping -c 5 -s 100000 www.facebook.com -4
ping: packet size 100000 is too large. Maximum is 65507
anjali@anjali-HP-Pavilion-Laptop-15-cs1xxx:~$ ping -c 5 -s 100000 www.google.com -4
ping: packet size 100000 is too large. Maximum is 65507
anjali@anjali-HP-Pavilion-Laptop-15-cs1xxx:~$

```

d. Traceroute – running traceroute via different ISPs. Sometimes, direct command doesn't reach the destination but with `-I` it does.


```

anjali@anjali-HP-Pavilion-Laptop-15-cs1xxx:~$ traceroute www.iitd.ac.in -I
traceroute to www.iitd.ac.in (103.27.9.24), 30 hops max, 60 byte packets
 1 _gateway (192.168.43.202) 3.394 ms 3.424 ms 3.596 ms
 2 192.168.27.237 (192.168.27.237) 63.172 ms 63.161 ms 63.148 ms
 3 192.168.27.113 (192.168.27.113) 53.905 ms 53.895 ms 53.883 ms
 4 * * *
 5 192.168.31.217 (192.168.31.217) 54.814 ms 54.803 ms 54.791 ms
 6 182.78.210.9 (182.78.210.9) 55.100 ms 45.443 ms 45.375 ms
 7 182.79.181.79 (182.79.181.79) 87.081 ms 67.193 ms 71.095 ms
 8 115.110.232.173.static.Delhi.vsnl.net.in (115.110.232.173) 77.461 ms 76.556 ms 80.520 ms
 9 * * *
10 14.140.210.22.static-Delhi-vsnl.net.in (14.140.210.22) 79.050 ms 74.317 ms 77.194 ms
11 10.119.234.161 (10.119.234.161) 95.241 ms 95.409 ms 100.358 ms
12 10.119.233.65 (10.119.233.65) 100.459 ms 100.442 ms 100.427 ms
13 10.119.233.66 (10.119.233.66) 68.527 ms 68.511 ms 53.460 ms
14 103.27.9.24 (103.27.9.24) 90.584 ms 88.852 ms 86.991 ms
15 103.27.9.24 (103.27.9.24) 89.728 ms 94.616 ms 89.943 ms
16 103.27.9.24 (103.27.9.24) 93.308 ms 93.294 ms 94.689 ms
anjali@anjali-HP-Pavilion-Laptop-15-cs1xxx:~$ traceroute www.iitd.ac.in -I
traceroute to www.iitd.ac.in (103.27.9.24), 30 hops max, 60 byte packets
 1 *_gateway (192.168.43.1) 12.184 ms 12.269 ms
 2 10.50.98.16 (10.50.98.16) 154.752 ms 154.742 ms 154.732 ms
 3 * * *
 4 * * *
 5 125.17.141.241 (125.17.141.241) 153.060 ms * *
 6 182.79.181.253 (182.79.181.253) 164.049 ms * *
 7 115.110.232.173.static.Delhi.vsnl.net.in (115.110.232.173) 177.851 ms 184.771 ms *
 8 * * *
 9 * * *
10 * * *
11 * * *
12 10.119.233.66 (10.119.233.66) 86.740 ms * *
13 * 103.27.9.24 (103.27.9.24) 176.653 ms *
14 * * *
15 103.27.9.24 (103.27.9.24) 180.203 ms 183.187 ms 179.491 ms

```

To force traceroute to use Ipv4 '-4 'is used. For some private ip addresses, sometimes using -T or -I works.

```

anjali@anjali-HP-Pavilion-Laptop-15-cs1xxx:~$ sudo traceroute 10.50.5.5 -T
traceroute to 10.50.5.5 (10.50.5.5), 30 hops max, 60 byte packets
 0  _gateway (192.168.43.1)  7.442 ms  7.434 ms  8.642 ms
 1  10.50.98.16 (10.50.98.16)  139.267 ms  139.281 ms  139.266 ms
 2  10.206.28.111 (10.206.28.111)  47.185 ms  47.252 ms  47.229 ms
 3  * * *
 4  * * *
 5  125.17.141.241 (125.17.141.241)  47.088 ms  47.066 ms  125.18.52.85 (125.18.52.85)  47.108 ms
 6  182.79.222.233 (182.79.222.233)  285.240 ms  182.79.222.237 (182.79.222.237)  278.294 ms  182.79.245.6 (182.79.245.6)  278.294 ms
 7  * * *
 8  * * *
 9  * * *
10  * * *
11  * * *
12  * * *
13  * * *
14  * * *

```

2.Packet Analysis

- a. Dns response request took 88 ms for the first request response to the website. Considering first request and last response to dns, it was 5-6 seconds

The image shows a Wireshark network traffic capture. The top menu bar includes Edit, View, Go, Capture, Analyze, Statistics, Telephony, Wireless, Tools, and Help. Below the menu is a toolbar with various icons for packet capture and analysis. The main display area shows a list of captured packets. A green bar at the top of the packet list indicates the current filter is 'is'. The packet list table has columns for Time, Source, Destination, Protocol, Length, and Info.

Time	Source	Destination	Protocol	Length	Info
6 19:14:18.762	192.168.43.170	192.168.43.202	DNS	70	Standard query 0x39a1 A apache.org
7 19:14:18.762	192.168.43.170	192.168.43.202	DNS	70	Standard query 0x4c3e AAAA apache.org
11 19:14:18.840	192.168.43.202	192.168.43.170	DNS	223	Standard query response 0x39a1 A apache.org A 151
12 19:14:18.860	192.168.43.202	192.168.43.170	DNS	235	Standard query response 0x4c3e AAAA apache.org A/
41 19:14:19.077	192.168.43.170	192.168.43.202	DNS	80	Standard query 0xacea A fonts.googleapis.com
42 19:14:19.077	192.168.43.170	192.168.43.202	DNS	80	Standard query 0xae7b AAAA fonts.googleapis.com

- b. On applying http filter, we got approx. 60 packets. We can see that css files are loaded first then the associated images and text regarding the structure of webpages. Thus complex webpages are loaded in such a way.

Activities Wireshark Aug 21 19:18 *wlo1

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

http

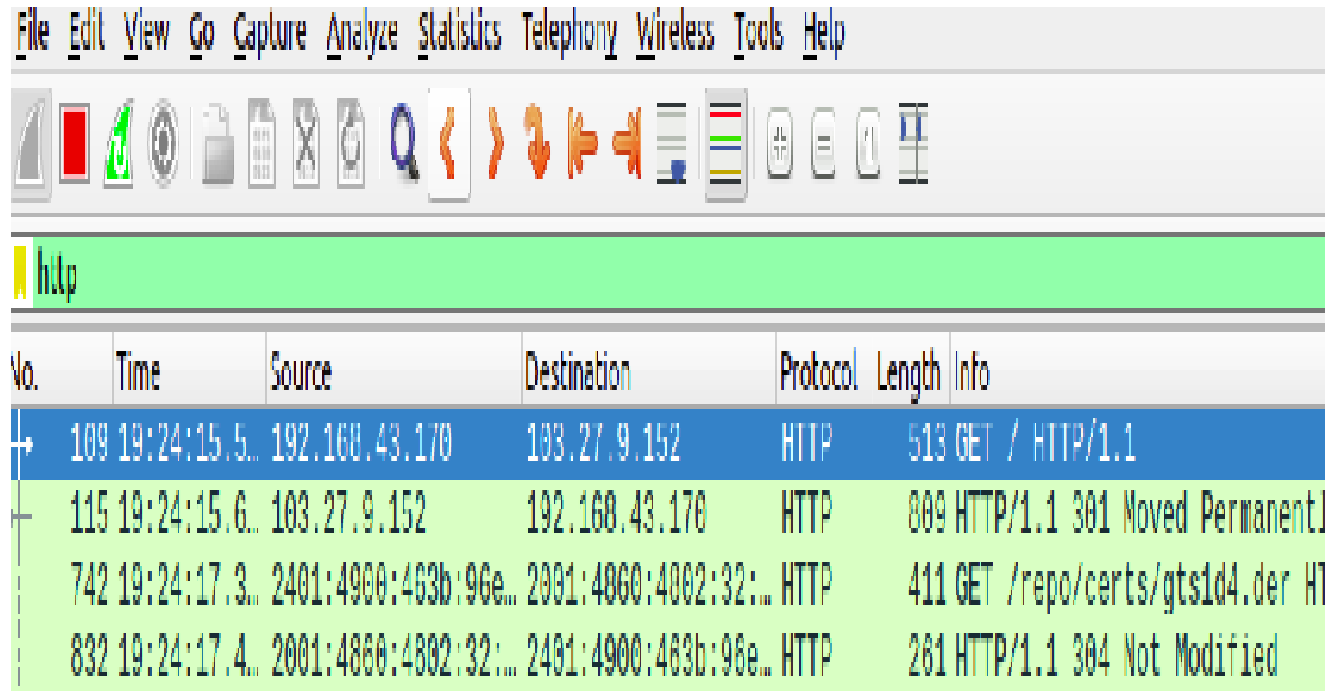
No.	Time	Source	Destination	Protocol	Length	Info
20	19:14:18.9...	2401:4900:463b:96e...	2a04:4e42::644	HTTP	525	GET / HTTP/1.1
37	19:14:19.0...	2a04:4e42::644	2401:4900:463b:96e...	HTTP	896	HTTP/1.1 200 OK (text/html)
43	19:14:19.0...	2401:4900:463b:96e...	2a04:4e42::644	HTTP	428	GET /css/min.bootstrap.css HTTP/1.1
51	19:14:19.0...	2401:4900:463b:96e...	2a04:4e42::644	HTTP	421	GET /css/styles.css HTTP/1.1
55	19:14:19.1...	2401:4900:463b:96e...	2a04:4e42::644	HTTP	479	GET /img/asf-estd-1999-Logo.jpg HTTP/1.1
58	19:14:19.1...	2401:4900:463b:96e...	2a04:4e42::644	HTTP	475	GET /img/support-apache.jpg HTTP/1.1
61	19:14:19.1...	2401:4900:463b:96e...	2a04:4e42::644	HTTP	504	GET /img/trillions-and-trillions/why-apache-thumbnail.jpg
72	19:14:19.1...	2401:4900:463b:96e...	2a04:4e42::644	HTTP	512	GET /img/trillions-and-trillions/apache-everywhere-thumbn...
81	19:14:19.1...	2a04:4e42::644	2401:4900:463b:96e...	HTTP	257	HTTP/1.1 200 OK (text/css)
92	19:14:19.1...	2401:4900:463b:96e...	2a04:4e42::644	HTTP	414	GET /js/jquery-2.1.1.min.js HTTP/1.1
102	19:14:19.1...	2a04:4e42::644	2401:4900:463b:96e...	HTTP	400	HTTP/1.1 200 OK (text/css)
104	19:14:19.1...	2401:4900:463b:96e...	2a04:4e42::644	HTTP	407	GET /js/bootstrap.js HTTP/1.1
221	19:14:19.3...	2a04:4e42::644	2401:4900:463b:96e...	HTTP	1620	HTTP/1.1 200 OK (JPEG JFIF image)
227	19:14:19.3...	2401:4900:463b:96e...	2a04:4e42::644	HTTP	407	GET /js/slideshow.js HTTP/1.1
240	19:14:19.3...	2a04:4e42::644	2401:4900:463b:96e...	HTTP	2374	HTTP/1.1 200 OK (JPEG JFIF image)
246	19:14:19.3...	2401:4900:463b:96e...	2a04:4e42::644	HTTP	518	GET /img/trillions-and-trillions/trillions-and-trillions--
271	19:14:19.3...	2a04:4e42::644	2401:4900:463b:96e...	HTTP	1186	HTTP/1.1 200 OK (JPEG JFIF image)
283	19:14:19.3...	2401:4900:463b:96e...	2a04:4e42::644	HTTP	512	GET /img/trillions-and-trillions/apache-innovation-thumbn...
289	19:14:19.3...	2a04:4e42::644	2401:4900:463b:96e...	HTTP	709	HTTP/1.1 200 OK (application/javascript)
297	19:14:19.3...	2401:4900:463b:96e...	2a04:4e42::644	HTTP	472	GET /img/2020-report.jpg HTTP/1.1
304	19:14:19.4...	2a04:4e42::644	2401:4900:463b:96e...	HTTP	988	HTTP/1.1 200 OK (application/javascript)
309	19:14:19.4...	2401:4900:463b:96e...	2a04:4e42::644	HTTP	470	GET /img/community.jpg HTTP/1.1
322	19:14:19.4...	2a04:4e42::644	2401:4900:463b:96e...	HTTP	953	HTTP/1.1 200 OK (JPEG JFIF image)
331	19:14:19.4...	2401:4900:463b:96e...	2a04:4e42::644	HTTP	475	GET /img/the-apache-way.jpg HTTP/1.1
346	19:14:19.4...	2a04:4e42::644	2401:4900:463b:96e...	HTTP	927	HTTP/1.1 200 OK (application/javascript)
374	19:14:19.4...	2401:4900:463b:96e...	2a04:4e42::644	HTTP	470	GET /img/ApacheCon.jpg HTTP/1.1
388	19:14:19.4...	2a04:4e42::644	2401:4900:463b:96e...	HTTP	263	HTTP/1.1 200 OK (JPEG JFIF image)
390	19:14:19.4...	2401:4900:463b:96e...	2a04:4e42::644	HTTP	482	GET /logos/res/echarts/default.png HTTP/1.1
467	19:14:19.5...	2a04:4e42::644	2401:4900:463b:96e...	HTTP	2439	HTTP/1.1 200 OK (JPEG JFIF image)
474	19:14:19.5...	2401:4900:463b:96e...	2a04:4e42::644	HTTP	400	GET /logos/res/nutch/default.png HTTP/1.1
530	19:14:19.5...	2a04:4e42::644	2401:4900:463b:96e...	HTTP	2358	HTTP/1.1 200 OK (JPEG JFIF image)
536	19:14:19.5...	2401:4900:463b:96e...	2a04:4e42::644	HTTP	401	GET /logos/res/bigtop/default.png HTTP/1.1
635	19:14:19.5...	2a04:4e42::644	2401:4900:463b:96e...	HTTP	621	HTTP/1.1 200 OK (JPEG JFIF image)
638	19:14:19.5...	2a04:4e42::644	2401:4900:463b:96e...	HTTP	1665	HTTP/1.1 200 OK (PNG)
642	19:14:19.5...	2401:4900:463b:96e...	2a04:4e42::644	HTTP	484	GET /logos/res/incubator/default.png HTTP/1.1
654	19:14:19.5...	2a04:4e42::644	2401:4900:463b:96e...	HTTP	944	HTTP/1.1 200 OK (JPEG JFIF image)
720	19:14:19.6...	2a04:4e42::644	2401:4900:463b:96e...	HTTP	1107	HTTP/1.1 200 OK (PNG)
762	19:14:19.6...	2401:4900:463b:96e...	2a04:4e42::644	HTTP	480	GET /fonts/glyphicons-halflings-regular.woff2 HTTP/1.1
806	19:14:19.6...	2a04:4e42::644	2401:4900:463b:96e...	HTTP	992	HTTP/1.1 200 OK (PNG)
835	19:14:19.6...	2a04:4e42::644	2401:4900:463b:96e...	HTTP	1297	HTTP/1.1 200 OK (JPEG JFIF image)
837	19:14:19.6...	2a04:4e42::644	2401:4900:463b:96e...	HTTP	1060	HTTP/1.1 200 OK (PNG)
842	19:14:19.6...	2401:4900:463b:96e...	2a04:6800:4002:80b...	HTTP	439	GET /cse.js?cx=005703438322411770421:5mgshgrgx2u HTTP/1.1
872	19:14:19.7...	2a04:4e42::644	2401:4900:463b:96e...	HTTP	1938	HTTP/1.1 200 OK (font/woff2)
1011	19:14:19.8...	2a04:6800:4002:80b...	2401:4900:463b:96e...	HTTP	694	HTTP/1.1 404 Not Found (text/html)

Frame 20: 525 bytes on wire (4200 bits), 525 bytes captured (4200 bits) on interface wlo1, id 0

Hypertext Transfer Protocol: Protocol Packets: 3572 - Displayed: 60 (1.7%) Profile: Default

c. the time to download entire webpage was from 18762 to 22129 ms

d. for www.cse.iitd.ac.in http requests were very few, this may be because of it using https(being secure) whereas Apache was http.



No.	Time	Source	Destination	Protocol	Length	Info
109	19:24:15.5...	192.168.43.170	103.27.9.152	HTTP	513	GET / HTTP/1.1
115	19:24:15.6...	103.27.9.152	192.168.43.170	HTTP	809	HTTP/1.1 301 Moved Permanentl
742	19:24:17.3...	2401:4900:463b:96e...	2001:4860:4802:32:...	HTTP	411	GET /repo/certs/gts1d4.der H1
832	19:24:17.4...	2001:4860:4802:32:...	2401:4900:463b:96e...	HTTP	261	HTTP/1.1 304 Not Modified

3.Implementing Traceroute

Program output showing IP addresses of each hop

```

anjali@anjali-HP-Pavilion-Laptop-15-cs1xxx:~/Desktop$ sudo python3 a.py www.iitd.ac.in
[sudo] password for anjali:
traceroute to www.iitd.ac.in (103.27.9.24), 30 hops max
1 192.168.43.202 7.502 ms, 192.168.43.202 2.257 ms, 192.168.43.202 1.739 ms
2 10.50.98.4 54.336 ms, 10.50.98.4 27.949 ms, 10.50.98.4 45.423 ms
3 10.50.98.227 39.915 ms, 10.50.98.227 37.764 ms, 10.50.98.227 42.013 ms
4 *, *, *
5 10.206.30.5 45.837 ms, *, 10.206.30.5 45.079 ms
6 125.18.52.85 31.864 ms, 125.18.52.85 26.464 ms, 125.18.52.85 26.852 ms
7 182.79.135.72 69.477 ms, 182.79.135.72 69.219 ms, 182.79.135.72 67.184 ms
8 115.110.232.173 85.053 ms, 115.110.232.173 91.177 ms, 115.110.232.173 85.651 ms
9 *, *, *
10 *, *, *
11 *, *, *
12 10.119.233.65 97.376 ms, 10.119.233.65 81.356 ms, 10.119.233.65 88.599 ms
13 10.119.233.66 97.392 ms, 10.119.233.66 93.376 ms, 10.119.233.66 86.511 ms
14 103.27.9.24 132.727 ms, 103.27.9.24 204.58 ms, 103.27.9.24 204.988 ms
anjali@anjali-HP-Pavilion-Laptop-15-cs1xxx:~/Desktop$

```

Plot for RTT vs Hops-

