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Computer Networks Lab

Assignment 5

The source code of the traceroute source code was taken from [sourceforge.com](https://sourceforge.com/projects/traceroute) with the version being traceroute-2.1.2

In order to run the file make changes in the traceroute.c file and then run the makefile.

For doing the above task,

Compile the code using make command in the root directory of the traceroute file.

The reports of checking various files are present in this pdf.

There is also txt attached about the checked ipaddresses.

In order to check for the original traceroute code, traceroute command was used.

Changes in the code are as follows.

```
795 // if (np == 0)
796 // printf("\n%2u ", ttl);
797
798 if (!pb->res.sa.sa_family)
799     // printf(" ");
800     print("");
801 else
802 {
803     if (np == 0)
804     {
805         // If you want to know particular hops then uncomment the below code
806         printf("\n%2u ", ttl);
807
808         // If you want counters as 1,2,...etc then uncomment the below one
809         // printf("\n%2u ", cnt);
810         cnt++;
811     }
812     int prn = !np; /* print if the first... */
813
814     if (np)
815     { /* ...and if differs with previous */
816         probe *p;
817
818         /* skip expired */
819         for (p = pb - 1; np && !p->res.sa.sa_family; p--, np--)
820             ;
821
822         if (!np ||
823             !equal_addr(&p->res, &pb->res) ||
824             (p->ext != pb->ext &&
825              !(p->ext && pb->ext && !strcmp(p->ext, pb->ext))) ||
826             (backward && p->recv_ttl != pb->recv_ttl))
827             ;
828     }
```

The following changes were made by checking the printf statements and modifying them as per the requirements.

The line when the hop didn't send their icmp packets is skipped that the '*' printf is replaced with no character.

For the public ip addresses:

```
> ./traceroute google.com
traceroute to google.com (142.251.42.110), 30 hops max, 60 byte packets
 2 192.168.1.5 (192.168.1.5) 1.556 ms 1.537 ms 1.534 ms
 3 14.139.204.209 (14.139.204.209) 2.868 ms 2.864 ms 2.860 ms
 6 10.119.73.122 (10.119.73.122) 25.209 ms 38.588 ms 38.579 ms
 7 72.14.213.20 (72.14.213.20) 81.048 ms 79.748 ms 72.14.195.128 (72.14.195.128) 79.726 ms
 9 108.170.253.97 (108.170.253.97) 51.579 ms 74.125.242.129 (74.125.242.129) 55.855 ms 142.251.55.236 (142.251.55.236) 45.448 ms
10 74.125.242.138 (74.125.242.138) 46.485 ms 108.170.253.120 (108.170.253.120) 49.176 ms 74.125.242.155 (74.125.242.155) 49.158 ms
11 172.253.72.136 (172.253.72.136) 63.880 ms 64.233.174.3 (64.233.174.3) 57.716 ms 142.250.238.182 (142.250.238.182) 54.148 ms
12 216.239.48.65 (216.239.48.65) 50.247 ms 108.170.248.193 (108.170.248.193) 60.225 ms 216.239.50.22 (216.239.50.22) 54.211 ms
13 108.170.248.193 (108.170.248.193) 52.185 ms 108.170.248.209 (108.170.248.209) 64.656 ms 63.519 ms
14 bom07s45-in-f14.1e100.net (142.251.42.110) 54.792 ms 47.803 ms 49.276 ms
```

ChangeLog
divers.sh
~/Code/networks/Assignments/asn5/traceroute-2.1.2/traceroute
CREDITS
default.rules
ipaddresses.txt
Make.defines

traceroute : zsh

```
> ./traceroute 1.1.1.1
traceroute to 1.1.1.1 (1.1.1.1), 30 hops max, 60 byte packets
 2 192.168.1.5 (192.168.1.5) 19.980 ms 19.975 ms 19.971 ms
 3 14.139.204.209 (14.139.204.209) 22.894 ms 22.890 ms 22.885 ms
 6 10.255.222.34 (10.255.222.34) 43.396 ms 10.255.221.33 (10.255.221.33) 23.347 ms 10.255.222.33 (10.255.222.33) 23.314 ms
 7 10.1.255.1 (10.1.255.1) 23.311 ms 115.247.100.29 (115.247.100.29) 47.600 ms 10.1.255.1 (10.1.255.1) 20.477 ms 115.247.100.29 (115.247.100.29) 56.009 ms
14 49.44.187.43 (49.44.187.43) 53.798 ms 51.253 ms 44.496 ms
15 one.one.one.one (1.1.1.1) 45.365 ms 45.942 ms 44.496 ms
```

~/Code/networks/Assignments/asn5/traceroute-2.1.2/traceroute
traceroute.h
workers
7 10.1.255.1 (10.1.255.1) 26.372 ms 115.247.100.29 (115.247.100.29) 42.262 ms 10.1.255.1 (10.1.255.1) 25.465 ms

Without any changes in the code, it should have worked in this way

```
> traceroute 1.1.1.1
traceroute to 1.1.1.1 (1.1.1.1), 30 hops max, 60 byte packets
 1 *** Edit View Insert Format Tools Extensions Help
 2 192.168.1.5 (192.168.1.5) 1.970 ms 1.946 ms 1.924 ms
 3 14.139.204.209 (14.139.204.209) 22.325 ms 22.305 ms 22.284 ms
 4 ***
 5 ***
 6 10.255.221.33 (10.255.221.33) 22.117 ms 10.255.222.34 (10.255.222.34) 20.273 ms 10.255.221.33 (10.255.221.33) 20.195 ms
 7 10.1.255.1 (10.1.255.1) 20.216 ms 18.675 ms 115.247.100.29 (115.247.100.29) 45.536 ms
 8 ***
 9 ***
10 ***
11 ***
12 ***
13 ***
14 49.44.187.43 (49.44.187.43) 58.051 ms * *
15 49.44.187.43 (49.44.187.43) 71.393 ms one.one.one.one (1.1.1.1) 48.911 ms
```

After changes in the code:

For the public ipaddresses:

1) Google.com

~/Code/networks/Assignments/asn5/traceroute-2.1.2/traceroute
traceroute : zsh
traceroute to google.com (142.251.42.110), 30 hops max, 60 byte packets
 1 ***
 2 192.168.1.5 (192.168.1.5) 2.704 ms 2.700 ms 2.695 ms
 3 14.139.204.209 (14.139.204.209) 10.561 ms 10.556 ms 10.552 ms
 4 ***
 5 ***
 6 10.119.73.122 (10.119.73.122) 28.346 ms 31.545 ms 31.536 ms
 7 72.14.213.20 (72.14.213.20) 75.602 ms 67.735 ms *
 8 ***
 9 108.170.253.97 (108.170.253.97) 54.760 ms 142.251.55.40 (142.251.55.40) 54.943 ms 74.125.242.129 (74.125.242.129) 62.749 ms
10 108.170.253.120 (108.170.253.120) 54.106 ms 74.125.242.139 (74.125.242.139) 48.311 ms 74.125.242.146 (74.125.242.146) 64.574 ms
11 142.250.212.4 (142.250.212.4) 55.310 ms 142.250.238.182 (142.250.238.182) 63.088 ms 142.250.238.206 (142.250.238.206) 58.163 ms
12 72.14.232.50 (72.14.232.50) 96.289 ms 108.170.248.209 (108.170.248.209) 57.939 ms 59.404 ms
13 108.170.248.209 (108.170.248.209) 61.458 ms 55.388 ms 142.251.77.97 (142.251.77.97) 54.176 ms
14 142.251.77.95 (142.251.77.95) 63.007 ms bom07s45-in-f14.1e100.net (142.251.42.110) 50.028 ms 142.251.77.95 (142.251.77.95) 63.669 ms

For the campus addresses:

```
tracert: zsh
> ./traceroute 172.20.233.150
traceroute to 172.20.233.150 (172.20.233.150), 30 hops max, 60 byte packets
 2  192.168.1.5 (192.168.1.5)  1.794 ms  1.565 ms  1.544 ms
 3  14.139.204.209 (14.139.204.209)  6.898 ms  6.877 ms  6.856 ms
 6  10.255.222.33 (10.255.222.33)  22.419 ms  10.255.221.34 (10.255.221.34)  20.928 ms  20.878 ms  10.1.255.1 (10.1.255.1)  19.403 ms  19.354 ms

^C ~/Code/networks/Assignments/asgn5/traceroute-2.1.2/traceroute

mod.udp.o
module.c
module.o
poll.c
poll.o

Cloudflare: 1.1.1.1
Google.com : 142.251.42.110

tracert: zsh
> ./traceroute iitbbs.ac.in
traceroute to iitbbs.ac.in (10.10.0.26), 30 hops max, 60 byte packets
 2  10.10.0.26 (10.10.0.26)  2.606 ms  2.602 ms

^C ~/Code/networks/Assignments/asgn5/traceroute-2.1.2/traceroute

traceroute: zsh
> ./traceroute 10.10.151.109
traceroute to 10.10.151.109 (10.10.151.109), 30 hops max, 60 byte packets
 1  10.10.151.109 (10.10.151.109)  53.757 ms  53.720 ms  53.717 ms

^C ~/Code/networks/Assignments/asgn5/traceroute-2.1.2/traceroute
```

The below ipaddress had disabled input ICMP Packets so didnt give the result.

```
tracert: zsh
> ./traceroute 172.20.233.150
traceroute to 172.20.233.150 (172.20.233.150), 30 hops max, 60 byte packets
 1  * * *
 2  192.168.1.5 (192.168.1.5)  4.419 ms  4.415 ms  4.409 ms
 3  14.139.204.209 (14.139.204.209)  4.406 ms  4.402 ms  4.397 ms
 4  * * *
 5  * * *
 6  10.255.221.33 (10.255.221.33)  30.841 ms  26.372 ms  10.255.222.33 (10.255.222.33)  26.356 ms
 7  10.1.255.1 (10.1.255.1)  26.351 ms  26.346 ms *
 8  * * *
 9  * * *
10  * * *
11  * * *
12  * * *
13  * * *
14  * * *
15  * * *
16  * * *
17  * * *
18  * * *
19  * * *
20  * * *
21  * * *
22  * * *
23  * * *
24  * * *
25  * * *
26  * * *
27  * * *
28  * * *
29  * * *
30  * * *
```

Traceroute for above two ip addresses that were not included in the prev output