Networks Laboratory - Assignment 1

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CSE-B

1. ping

```
Muhammed_B190703CS:~$ ping google.com
PING google.com (142.250.185.46) 56(84) bytes of data.
64 bytes from mct01s19-in-f14.1e100.net (142.250.185.46): icmp_seq=1 ttl=116 time=75.1 ms
64 bytes from mct01s19-in-f14.1e100.net (142.250.185.46): icmp_seq=2 ttl=116 time=19.7 ms
64 bytes from mct01s19-in-f14.1e100.net (142.250.185.46): icmp_seq=3 ttl=116 time=20.4 ms
64 bytes from mct01s19-in-f14.1e100.net (142.250.185.46): icmp_seq=4 ttl=116 time=24.1 ms
64 bytes from mct01s19-in-f14.1e100.net (142.250.185.46): icmp_seq=5 ttl=116 time=19.1 ms
64 bytes from mct01s19-in-f14.1e100.net (142.250.185.46): icmp_seq=6 ttl=116 time=23.6 ms
^C
--- google.com ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 5037ms
rtt min/avg/max/mdev = 19.084/30.320/75.138/20.131 ms
Muhammed_B190703CS:~$ ping -c 3 google.com
PING google.com (142.250.185.46) 56(84) bytes of data.
64 bytes from mct01s19-in-f14.1e100.net (142.250.185.46): icmp_seq=1 ttl=116 time=19.3 ms
64 bytes from mct01s19-in-f14.1e100.net (142.250.185.46): icmp_seq=2 ttl=116 time=24.8 ms
64 bytes from mct01s19-in-f14.1e100.net (142.250.185.46): icmp_seq=3 ttl=116 time=21.3 ms

--- google.com ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2010ms
rtt min/avg/max/mdev = 19.347/21.805/24.791/2.253 ms
Muhammed_B190703CS:~$
```

2. tracert / traceroute

```
Muhammed_B190703CS:~$ traceroute -I google.com
traceroute to google.com (172.217.18.142), 30 hops max, 60 byte packets
 1  _gateway (10.0.2.2)  0.446 ms  0.409 ms  0.400 ms
 2  192.168.1.1 (192.168.1.1)  5.931 ms  6.078 ms  6.071 ms
 3  10.64.0.3 (10.64.0.3)  6.063 ms  6.270 ms  6.261 ms
 4  10.200.204.99 (10.200.204.99)  6.252 ms  6.294 ms  7.021 ms
 5  10.200.204.100 (10.200.204.100)  7.136 ms  7.411 ms  7.583 ms
 6  10.200.204.90 (10.200.204.90)  7.571 ms  5.197 ms  5.227 ms
 7  * * *
 8  212.70.97.144 (212.70.97.144)  20.672 ms  20.667 ms  21.024 ms
 9  216.239.41.109 (216.239.41.109)  20.385 ms  20.652 ms  20.648 ms
10  172.253.51.137 (172.253.51.137)  22.686 ms  22.783 ms  22.778 ms
11  mct01s09-in-f14.1e100.net (172.217.18.142)  21.799 ms  21.967 ms  22.407 ms
Muhammed_B190703CS:~$
```

3. ip / ifconfig / ipconfig

```
Muhammed_B190703CS: ~

Muhammed_B190703CS:~$ ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen
 1000
    link/ether 08:00:27:f6:08:a2 brd ff:ff:ff:ff:ff:ff
    inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic noprefixroute enp0s3
       valid_lft 81793sec preferred_lft 81793sec
    inet6 fe80::cc24:a833:eb68:69b3/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
Muhammed_B190703CS:~$ ip -4 a show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen
 1000
    inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic noprefixroute enp0s3
       valid_lft 81784sec preferred_lft 81784sec
Muhammed_B190703CS:~$ ip -6 a show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 state UNKNOWN qlen 1000
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 state UP qlen 1000
    inet6 fe80::cc24:a833:eb68:69b3/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
Muhammed_B190703CS:~$ ip a show dev lo
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
Muhammed_B190703CS:~$
```

4. dig / nslookup / host

```
Muhammed_B190703CS: ~

Muhammed_B190703CS:~$ dig google.com

; <<>> DiG 9.16.1-Ubuntu <<>> google.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 20443
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 65494
;; QUESTION SECTION:
;google.com.                    IN      A

;; ANSWER SECTION:
google.com.            300      IN      A       172.217.18.142

;; Query time: 7 msec
;; SERVER: 127.0.0.53#53(127.0.0.53)
;; WHEN: 2022 03+ 18:34:39 16 لى ح
;; MSG SIZE  rcvd: 55
```

```
Muhammed_B190703CS:~$ dig google.com ANY

; <<>> DiG 9.16.1-Ubuntu <<>> google.com ANY
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 31642
;; flags: qr rd ra; QUERY: 1, ANSWER: 12, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 65494
;; QUESTION SECTION:
;google.com.                    IN      ANY

;; ANSWER SECTION:
google.com.             291     IN      A       172.217.18.142
google.com.             152     IN      AAAA    2a00:1450:4018:809::200e
google.com.             536     IN      MX      50 alt4.aspmx.l.google.com.
google.com.             536     IN      MX      20 alt1.aspmx.l.google.com.
google.com.             536     IN      MX      10 aspmx.l.google.com.
google.com.             536     IN      MX      40 alt3.aspmx.l.google.com.
google.com.             536     IN      MX      30 alt2.aspmx.l.google.com.
google.com.             49      IN      SOA     ns1.google.com. dns-admin.google.com. 422014924
900 900 1800 60
google.com.             295009  IN      NS      ns2.google.com.
google.com.             295009  IN      NS      ns4.google.com.
google.com.             295009  IN      NS      ns1.google.com.
google.com.             295009  IN      NS      ns3.google.com.

;; Query time: 7 msec
;; SERVER: 127.0.0.53#53(127.0.0.53)
;; WHEN: 2022 03+ 18:34:48 16 ليز ح
;; MSG SIZE  rcvd: 309

Muhammed_B190703CS:~$
```

5. whois

```
Muhammed_B190703CS: ~
Muhammed_B190703CS:~$ whois google.com
   Domain Name: GOOGLE.COM
   Registry Domain ID: 2138514_DOMAIN_COM-VRSN
   Registrar WHOIS Server: whois.markmonitor.com
   Registrar URL: http://www.markmonitor.com
   Updated Date: 2019-09-09T15:39:04Z
   Creation Date: 1997-09-15T04:00:00Z
   Registry Expiry Date: 2028-09-14T04:00:00Z
   Registrar: MarkMonitor Inc.
   Registrar IANA ID: 292
   Registrar Abuse Contact Email: abusecomplaints@markmonitor.com
   Registrar Abuse Contact Phone: +1.2083895740
   Domain Status: clientDeleteProhibited https://icann.org/epp#clientDeleteProhibited
   Domain Status: clientTransferProhibited https://icann.org/epp#clientTransferProhibited
   Domain Status: clientUpdateProhibited https://icann.org/epp#clientUpdateProhibited
   Domain Status: serverDeleteProhibited https://icann.org/epp#serverDeleteProhibited
   Domain Status: serverTransferProhibited https://icann.org/epp#serverTransferProhibited
   Domain Status: serverUpdateProhibited https://icann.org/epp#serverUpdateProhibited
   Name Server: NS1.GOOGLE.COM
   Name Server: NS2.GOOGLE.COM
   Name Server: NS3.GOOGLE.COM
   Name Server: NS4.GOOGLE.COM
   DNSSEC: unsigned
   URL of the ICANN Whois Inaccuracy Complaint Form: https://www.icann.org/wicf/
>>> Last update of whois database: 2022-01-16T07:25:26Z <<<

For more information on Whois status codes, please visit https://icann.org/epp

NOTICE: The expiration date displayed in this record is the date the
registrar's sponsorship of the domain name registration in the registry is
currently set to expire. This date does not necessarily reflect the expiration
date of the domain name registrant's agreement with the sponsoring
registrar.  Users may consult the sponsoring registrar's Whois database to
view the registrar's reported date of expiration for this registration.
```

The Registry database contains ONLY .COM, .NET, .EDU domains and
Registrars.
Domain Name: google.com
Registry Domain ID: 2138514_DOMAIN_COM-VRSN
Registrar WHOIS Server: whois.markmonitor.com
Registrar URL: http://www.markmonitor.com
Updated Date: 2019-09-09T15:39:04+0000
Creation Date: 1997-09-15T07:00:00+0000
Registrar Registration Expiration Date: 2028-09-13T07:00:00+0000
Registrar: MarkMonitor, Inc.
Registrar IANA ID: 292
Registrar Abuse Contact Email: abusecomplaints@markmonitor.com
Registrar Abuse Contact Phone: +1.2083895770
Domain Status: clientUpdateProhibited (https://www.icann.org/epp#clientUpdateProhibited)
Domain Status: clientTransferProhibited (https://www.icann.org/epp#clientTransferProhibited)
Domain Status: clientDeleteProhibited (https://www.icann.org/epp#clientDeleteProhibited)
Domain Status: serverUpdateProhibited (https://www.icann.org/epp#serverUpdateProhibited)
Domain Status: serverTransferProhibited (https://www.icann.org/epp#serverTransferProhibited)
Domain Status: serverDeleteProhibited (https://www.icann.org/epp#serverDeleteProhibited)
Registrant Organization: Google LLC
Registrant State/Province: CA
Registrant Country: US
Registrant Email: Select Request Email Form at https://domains.markmonitor.com/whois/google.com
Admin Organization: Google LLC
Admin State/Province: CA
Admin Country: US
Admin Email: Select Request Email Form at https://domains.markmonitor.com/whois/google.com
Tech Organization: Google LLC
Tech State/Province: CA
Tech Country: US
Tech Email: Select Request Email Form at https://domains.markmonitor.com/whois/google.com
Name Server: ns2.google.com
Name Server: ns1.google.com
Name Server: ns4.google.com
Name Server: ns3.google.com
DNSSEC: unsigned
URL of the ICANN WHOIS Data Problem Reporting System: http://wdprs.internic.net/
>>> Last update of WHOIS database: 2022-01-16T10:11:08+0000 <<<

For more information on WHOIS status codes, please visit:
  https://www.icann.org/resources/pages/epp-status-codes

If you wish to contact this domain's Registrant, Administrative, or Technical
contact, and such email address is not visible above, you may do so via our web
form, pursuant to ICANN's Temporary Specification. To verify that you are not a
robot, please enter your email address to receive a link to a page that
facilitates email communication with the relevant contact(s).

Web-based WHOIS:
  https://domains.markmonitor.com/whois

If you have a legitimate interest in viewing the non-public WHOIS details, send
your request and the reasons for your request to whoisrequest@markmonitor.com
and specify the domain name in the subject line. We will review that request and
may ask for supporting documentation and explanation.

6. route

```
Muhammed_B190703CS:~$ route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
default         _gateway        0.0.0.0         UG    100    0        0 enp0s3
link-local      0.0.0.0         255.255.0.0     U     1000   0        0 enp0s3
192.168.1.0     0.0.0.0         255.255.255.0   U     100    0        0 enp0s3
Muhammed_B190703CS:~$
```

7. tcpdump

```
Muhammed_B190703CS:~$ sudo tcpdump -c 10 -i enp0s3
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp0s3, link-type EN10MB (Ethernet), capture size 262144 bytes
13:48:02.191393 IP MuhammedB190703CS.46840 > arn09s05-in-f14.1e100.net.https: Flags [.], ack 794
95243, win 62780, length 0
13:48:02.191432 IP MuhammedB190703CS.46842 > arn09s05-in-f14.1e100.net.https: Flags [.], ack 796
23243, win 62780, length 0
13:48:02.191440 IP MuhammedB190703CS.32792 > server-13-227-9-55.bah53.r.cloudfront.net.https: Fl
ags [.], ack 78406571, win 62780, length 0
13:48:02.191446 IP MuhammedB190703CS.38494 > mct01s19-in-f1.1e100.net.https: Flags [.], ack 7924
0102, win 62780, length 0
13:48:02.191802 IP arn09s05-in-f14.1e100.net.https > MuhammedB190703CS.46840: Flags [.], ack 1,
win 65535, length 0
13:48:02.191814 IP arn09s05-in-f14.1e100.net.https > MuhammedB190703CS.46842: Flags [.], ack 1,
win 65535, length 0
13:48:02.191817 IP server-13-227-9-55.bah53.r.cloudfront.net.https > MuhammedB190703CS.32792: Fl
ags [.], ack 1, win 65535, length 0
13:48:02.191820 IP mct01s19-in-f1.1e100.net.https > MuhammedB190703CS.38494: Flags [.], ack 1, w
in 65535, length 0
13:48:02.192302 IP MuhammedB190703CS.41383 > 192.168.1.1.domain: 41847+ PTR? 142.209.58.216.in-a
ddr.arpa. (45)
13:48:02.201833 IP 192.168.1.1.domain > MuhammedB190703CS.41383: 41847 3/0/0 PTR arn09s05-in-f14
.1e100.net., PTR arn09s05-in-f142.1e100.net., PTR mct01s13-in-f14.1e100.net. (145)
10 packets captured
14 packets received by filter
0 packets dropped by kernel
Muhammed_B190703CS:~$
```

8. netstat / ss

```
Muhammed_B190703CS:~$ ss -u
Recv-Q      Send-Q            Local Address:Port              Peer Address:Port        Process
0           0                 10.0.2.15%enp0s3:bootpc              10.0.2.2:bootps
Muhammed_B190703CS:~$ ss -l
Netid State  Recv-Q Send-Q                                   Local Address:Port
                              Peer Address:Port                   Process
nl     UNCONN 0      0                                              rtnl:systemd-resolve/586
                                        *
nl     UNCONN 0      0                                              rtnl:evolution-calen/1434
                                        *
nl     UNCONN 0      0                                              rtnl:evolution-sourc/1419
                                        *
nl     UNCONN 0      0                                              rtnl:xdg-desktop-por/1798
                                        *
nl     UNCONN 0      0                                              rtnl:evolution-addre/1448
                                        *
nl     UNCONN 0      0                                              rtnl:NetworkManager/641
                                        *
nl     UNCONN 0      0                                              rtnl:kernel
                                        *
nl     UNCONN 0      0                                              rtnl:whoopsie/817
                                        *
nl     UNCONN 0      0                                              rtnl:avahi-daemon/634
                                        *
nl     UNCONN 0      0                                              rtnl:goa-daemon/1093
                                        *
nl     UNCONN 0      0                                              rtnl:chrome/2886
                                        *
nl     UNCONN 0      0                                              rtnl:chrome/2839
                                        *
nl     UNCONN 0      0                                              rtnl:chrome/2886
                                        *
nl     UNCONN 0      0                                              rtnl:chrome/2839
                                      * 0
u_dgr  UNCONN 0      0                                            * 35908
                                      * 0
u_dgr  UNCONN 0      0                                            * 21816
                                      * 21815
u_dgr  UNCONN 0      0                                            * 32277
                                      * 17687
u_dgr  UNCONN 0      0                                            * 21818
                                      * 21817
icmp6  UNCONN 0      0                                            *:ipv6-icmp
                                      *:*
udp    UNCONN 0      0                                         0.0.0.0:631
                              0.0.0.0:*
udp    UNCONN 0      0                                         0.0.0.0:mdns
                              0.0.0.0:*
udp    UNCONN 0      0                                         0.0.0.0:55014
                              0.0.0.0:*
udp    UNCONN 0      0                                    127.0.0.53%lo:domain
                              0.0.0.0:*
udp    UNCONN 0      0                                            [::]:mdns
                                 [::]:*
udp    UNCONN 0      0                                            [::]:40760
                                 [::]:*
udp    UNCONN 0      0           [fe80::cc24:a833:eb68:69b3]%enp0s3:dhcpv6-client
                                 [::]:*
tcp    LISTEN 0      4096                                   127.0.0.53%lo:domain
                              0.0.0.0:*
tcp    LISTEN 0      5                                        127.0.0.1:ipp
                              0.0.0.0:*
tcp    LISTEN 0      5                                            [::1]:ipp
                                 [::]:*
Muhammed_B190703CS:~$^C
```

9. dstat

```
Muhammed_B190703CS:~$ dstat
You did not select any stats, using -cdngy by default.
--total-cpu-usage-- -dsk/total- -net/total- ---paging-- ---system--
usr sys idl wai stl| read  writ| recv  send|  in   out | int   csw
  0   0  99   0   0| 224k   66k|   0     0 |   0     0 | 184   309
  0   0 100   0   0|   0     0 |   0     0 |   0     0 | 214   321
  2   1  96   0   0|   0     0 |   0     0 |   0     0 | 918  2123
  1   1  98   0   0|   0    56k|   0     0 |   0     0 | 477   841
  1   0  99   0   0|   0    64k|   0     0 |   0     0 | 339   652
  1   0  99   0   0|   0     0 |   0     0 |   0     0 | 677  1301
  1   0  99   0   0|   0     0 |   0     0 |   0     0 | 455   920
  0   0  99   0   0|   0    76k|   0     0 |   0     0 | 222   411 ^C
Muhammed_B190703CS:~$ dstat -c --top-cpu
/usr/bin/dstat:2619: DeprecationWarning: the imp module is deprecated in favour of importlib; se
e the module's documentation for alternative uses
  import imp
--total-cpu-usage-- -most-expensive-
usr sys idl wai stl|  cpu process
  0   0  99   0   0|gnome-shell  0.1
  0   0 100   0   0|
  1   1  99   0   0|gnome-shell  0.5
  0   0 100   0   0|Xorg         0.2
  0   0  99   0   0|Xorg         0.2
  1   0  99   0   0|VBoxClient   0.5
  0   0  99   0   0|gnome-shell  0.2
  0   0 100   0   0|gnome-shell  0.2
  1   0  99   0   0|gnome-shell  0.2^C
Muhammed_B190703CS:~$ dstat -c --top-mem
/usr/bin/dstat:2619: DeprecationWarning: the imp module is deprecated in favour of importlib; se
e the module's documentation for alternative uses
  import imp
--total-cpu-usage-- --most-expensive-
usr sys idl wai stl|  memory process
  0   0  99   0   0|gnome-shell  393M
  1   0  99   0   0|gnome-shell  393M
  1   0  99   0   0|gnome-shell  393M
  1   0  99   0   0|gnome-shell  393M
  0   0 100   0   0|gnome-shell  393M
  0   0 100   0   0|gnome-shell  393M
  0   0  99   0   0|gnome-shell  393M
  1   0  99   0   0|gnome-shell  393M
  1   0  99   0   0|gnome-shell  393M^C
Muhammed_B190703CS:~$
```

10. ifstat

```
Muhammed_B190703CS:~$ ifstat
      enp0s3
 KB/s in  KB/s out
   0.00      0.00
  19.81      1.18
 118.00     11.88
  47.40      5.51
 451.71     37.42
2193.16     91.24
 337.66     43.66
1030.98     10.15
   0.00      0.00
^C
Muhammed_B190703CS:~$
```

11. wget


```
Muhammed_B190703CS:~$ wget -O task-tracker.zip --limit-rate=1m https://github.com/jasseeeem/Task
-Tracker/archive/refs/heads/master.zip
--2022-01-16 14:02:14--  https://github.com/jasseeeem/Task-Tracker/archive/refs/heads/master.zip
Resolving github.com (github.com)... 13.234.176.102
Connecting to github.com (github.com)|13.234.176.102|:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: https://codeload.github.com/jasseeeem/Task-Tracker/zip/refs/heads/master [following]
--2022-01-16 14:02:14--  https://codeload.github.com/jasseeeem/Task-Tracker/zip/refs/heads/maste
r
Resolving codeload.github.com (codeload.github.com)... 13.127.152.42
Connecting to codeload.github.com (codeload.github.com)|13.127.152.42|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: unspecified [application/zip]
Saving to: 'task-tracker.zip'

task-tracker.zip          [     <=>                         ] 393.98K   398KB/s    in 1.0s

2022-01-16 14:02:17 (398 KB/s) - 'task-tracker.zip' saved [403438]

Muhammed_B190703CS:~$
```

12. tracepath


```
Muhammed_B190703CS:~$ tracepath google.com
 1?: [LOCALHOST]                      pmtu 1492
 1:  _gateway                                      24.108ms
 1:  _gateway                                       2.784ms
 2:  10.64.0.3                                      4.842ms
 3:  10.200.204.98                                  8.294ms
 4:  10.200.204.100                                 6.538ms
 5:  10.200.204.90                                  5.299ms
 6:  212.70.97.145                                  4.376ms
 7:  212.70.97.146                                 22.811ms asymm 11
 8:  no reply
 9:  no reply
10:  no reply
11:  no reply
^C
```