

Assignment 1

Network Programming(IS F462)

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Some of the ways to obtain the port numbers used by TCP and UDP:

- `netstat --ntue --program`: The command returns all active tcp and udp connections and their current states and processes along with process owners. Here User 0 refers to root and 1000 refers to the first user ever created on my system. Running the command `cat /etc/passwd|grep 1000` gives me the identity of the user i.e. shreyas

```

hrravasshryes-CE62-200-1 netstat -ntue -n --program
(Not all processes could be identified, non-owned process info
will not be shown, you would have to be root to see it all.)
Active Internet connections (W/o servers)
Proto Recv-Q Send-Q Local Address          Foreign Address         State       User          Inode         PID/Program name
tcp        0    0 0.0.0.0:3.25:33380     172.217.166.174:443    TIME_WAIT  0             0             -
tcp        0    0 0.0.0.0:3.25:57802     172.217.166.101:443    TIME_WAIT  0             0             -
tcp        0    0 0.0.0.0:3.25:43446     13.35.8.227:443       TIME_WAIT  0             0             -
tcp        0    0 0.0.0.0:3.25:33372     172.217.166.174:443    TIME_WAIT  0             0             -
tcp        0    0 127.0.0.1:53338        127.0.0.1:36582        ESTABLISHED 1000          18869692     12247/java
tcp        0    0 0.0.0.0:3.25:59766     216.58.197.74:443     TIME_WAIT  0             0             -
tcp        0    0 0.0.0.0:3.25:54864     216.58.197.35:443     TIME_WAIT  0             0             -
tcp        0    0 0.0.0.0:3.25:38730     216.58.206.195:443    TIME_WAIT  0             0             -
tcp        0    0 0.0.0.0:3.25:57844     104.16.29.34:443      TIME_WAIT  0             0             -
tcp        0    0 0.0.0.0:3.25:39122     157.140.16.52:443     TIME_WAIT  0             0             -
tcp        0    0 0.0.0.0:3.25:33376     172.217.166.174:443    TIME_WAIT  0             0             -
tcp        0    0 0.0.0.0:3.25:38726     216.58.206.195:443    TIME_WAIT  0             0             -
tcp        0    0 0.0.0.0:3.25:42271     10.3.3.111:500         ESTABLISHED 1000          10810092     9406/elksaltcdqpp-
tcp        0    0 0.0.0.0:3.25:46718     172.217.166.103:443    TIME_WAIT  0             0             -
tcp        0    0 0.0.0.0:3.25:44814     172.217.160.142:443    ESTABLISHED 1000          18864988     8699/firefox
tcp        0    0 0.0.0.0:3.25:57244     172.217.163.196:443    TIME_WAIT  0             0             -
tcp        0    0 0.0.0.0:3.25:57906     74.125.60.108:443     ESTABLISHED 1000          18829556     8699/firefox
tcp        0    0 0.0.0.0:3.25:59782     172.217.27.286:443     ESTABLISHED 1000          18949658     8699/firefox
tcp        0    0 0.0.0.0:3.25:57786     172.217.166.161:443    TIME_WAIT  0             0             -
tcp        0    0 0.0.0.0:3.25:59648     198.252.206.25:443     ESTABLISHED 1000          18865625     8699/firefox
tcp        0    0 0.0.0.0:3.25:57542     192.6.72.32:443       TIME_WAIT  0             0             -
tcp        0    0 0.0.0.0:3.25:57544     151.101.1.69:443      TIME_WAIT  0             0             -
tcp        0    0 0.0.0.0:3.25:46078     172.217.163.194:443    TIME_WAIT  0             0             -
tcp        0    0 0.0.0.0:3.25:49736     104.18.35.249:443     TIME_WAIT  0             0             -
tcp        0    0 0.0.0.0:3.25:37038     172.217.163.90:443     TIME_WAIT  0             0             -
tcp6       0    0 0.0.0.0:3.25:33402     172.217.166.174:443    ESTABLISHED 1000          18860846     12439/java
tcp6       0    0 0.0.0.0:3.25:33398     172.217.166.174:443    ESTABLISHED 1000          18895925     12439/java
tcp6       0    0 0.0.0.0:3.25:33600     172.217.166.174:443    ESTABLISHED 1000          18774014     12439/java
tcp6       0    0 0.0.0.0:3.25:35720     75.126.118.188:443     ESTABLISHED 1000          18872247     12439/java
tcp6       0    0 0.0.0.0:3.25:35718     75.126.118.188:443     ESTABLISHED 1000          18872246     12439/java
tcp6       0    0 0.0.0.0:3.25:35716     75.126.118.188:443     ESTABLISHED 1000          18872245     12439/java
tcp6       0    0 0.0.0.0:3.25:35712     75.126.118.188:443     ESTABLISHED 1000          18869666     12439/java
tcp6       0    0 0.0.0.0:3.25:35714     75.126.118.188:443     ESTABLISHED 1000          18872244     12439/java
tcp6       0    0 0.0.0.0:3.25:33394     172.217.166.174:443    ESTABLISHED 1000          18895924     12439/java
tcp6       0    0 0.0.0.0:3.25:33388     172.217.166.174:443    ESTABLISHED 1000          18872462     12439/java
tcp6       0    0 127.0.0.1:36582        127.0.0.1:53338        ESTABLISHED 1000          18868945     12439/java
tcp6       0    0 0.0.0.0:3.25:33390     172.217.166.174:443    ESTABLISHED 1000          18872241     12439/java
tcp6       0    0 0.0.0.0:3.25:35722     75.126.118.188:443     ESTABLISHED 1000          18872248     12439/java
tcp6       0    0 0.0.0.0:3.25:33592     172.217.166.174:443    ESTABLISHED 1000          18874013     12439/java
tcp6       0    0 0.0.0.0:3.25:35709     75.126.118.188:443     ESTABLISHED 1000          18872243     12439/java
tcp6       0    0 0.0.0.0:3.25:33396     172.217.166.174:443    ESTABLISHED 1000          18873978     12439/java
tcp6       0    0 0.0.0.0:3.25:35768     75.126.118.188:443     ESTABLISHED 1000          18869697     12439/java
tcp        0    0 127.0.0.1:39136        127.0.0.1:1353        ESTABLISHED 1000          18791900     1863/python3
hrravasshryes-GE62-200-1 netstat -nt -n --program |

```

- `ss -ntupe`: The command does the same as `netstat`. The ports being are similar to the previous result.

[illegible]

- **lsof -i TCP** and **lsof -i UDP** : The command does the same as the above. It tells us about the list of open files and processes.

```

shreyas@shreyas-GE62-2Q0:~$ lsof -i TCP
COMMAND  PID  USER  FD  TYPE  DEVICE  SIZE/OFF  NODE NAME
firefox  8699  shreyas  92u  IPv4  18910068  0t0  TCP shreyas-GE62-2Q0:59588->stackoverflow.com:https (ESTABLISHED)
firefox  8699  shreyas  94u  IPv4  18872480  0t0  TCP shreyas-GE62-2Q0:45308->maa05s06-in-f14.1e100.net:https (ESTABLISHED)
firefox  8699  shreyas  113u  IPv4  18909736  0t0  TCP shreyas-GE62-2Q0:36546->text-lb.eqsin.wikimedia.org:https (ESTABLISHED)
firefox  8699  shreyas  124u  IPv4  18895687  0t0  TCP shreyas-GE62-2Q0:48144->maa03s29-in-f4.1e100.net:https (ESTABLISHED)
firefox  8699  shreyas  131u  IPv4  18910978  0t0  TCP shreyas-GE62-2Q0:50326->upload-lb.eqsin.wikimedia.org:https (ESTABLISHED)
firefox  8699  shreyas  182u  IPv4  18829556  0t0  TCP shreyas-GE62-2Q0:57906->sc-in-f189.1e100.net:https (ESTABLISHED)
eiskaltdc 9406  shreyas  22u  IPv4  18810981  0t0  TCP *:3000 (LISTEN)
eiskaltdc 9406  shreyas  23u  IPv4  18810982  0t0  TCP *:3001 (LISTEN)
eiskaltdc 9406  shreyas  27u  IPv4  18810092  0t0  TCP shreyas-GE62-2Q0:42271->10.3.3.111:isakmp (ESTABLISHED)
java      12247  shreyas  238u  IPv4  18865641  0t0  TCP localhost:6942 (LISTEN)
java      12247  shreyas  445u  IPv4  18868664  0t0  TCP localhost:63342 (LISTEN)
java      12439  shreyas  175u  IPv6  18872442  0t0  TCP *:36582 (LISTEN)
java      12439  shreyas  223u  IPv6  18875648  0t0  TCP shreyas-GE62-2Q0:33442->bom07s20-in-f14.1e100.net:https (CLOSE_WAIT)
java      12439  shreyas  224u  IPv6  18876082  0t0  TCP shreyas-GE62-2Q0:60678->ec2-35-160-90-8.us-west-2.compute.amazonaws.com:https (CLOSE_WAIT)
java      12439  shreyas  225u  IPv6  18876099  0t0  TCP shreyas-GE62-2Q0:51064->server-52-85-69-69.lhr5.r.cloudfront.net:https (CLOSE_WAIT)
java      12770  shreyas  191u  IPv6  18889925  0t0  TCP *:36384 (LISTEN)
shreyas@shreyas-GE62-2Q0:~$ lsof -i UDP
COMMAND  PID  USER  FD  TYPE  DEVICE  SIZE/OFF  NODE NAME
chrome-gn 8863  shreyas  100u  IPv4  18799100  0t0  UDP localhost:38136->shreyas-GE62-2Q0:domain
eiskaltdc 9406  shreyas  24u  IPv4  18810983  0t0  UDP *:3000
eiskaltdc 9406  shreyas  28u  IPv4  18811593  0t0  UDP *:44470
java      12247  shreyas  25u  IPv4  18866728  0t0  UDP *:57235
java      12247  shreyas  48u  IPv4  18889237  0t0  UDP *:56364
java      12439  shreyas  178u  IPv6  18872455  0t0  UDP *:33961
java      12770  shreyas  194u  IPv6  18889938  0t0  UDP *:35774
shreyas@shreyas-GE62-2Q0:~$

```

The port numbers being used by TCP are :

1. **59588** is used by PID **8699** which is **firefox** which is owned by **shreyas**. (TCP State: ESTABLISHED)
2. **42271** is used by PID **9406** which is **eiskaltdc** which is owned by **shreyas**. (TCP State: ESTABLISHED)
3. **48144** is used by PID **8699** which is **firefox** which is owned by **shreyas**. (TCP State: ESTABLISHED)

The port number used by UDP is **38136** which is being used by **PID 8863** which is **chrome-gnome-sh** which is owned by **shreyas**.

All the above answers have been obtained from the above images.