

Project on Linux

Week - 1

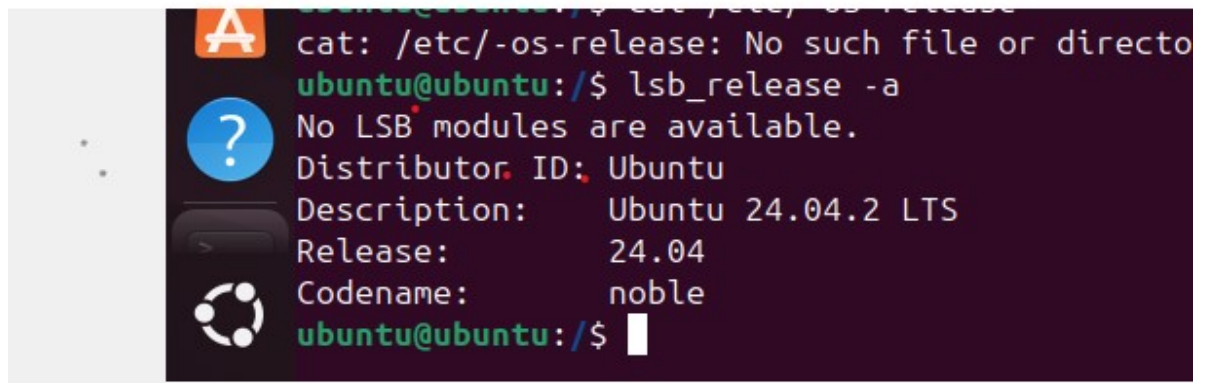
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Date:06/07/2025

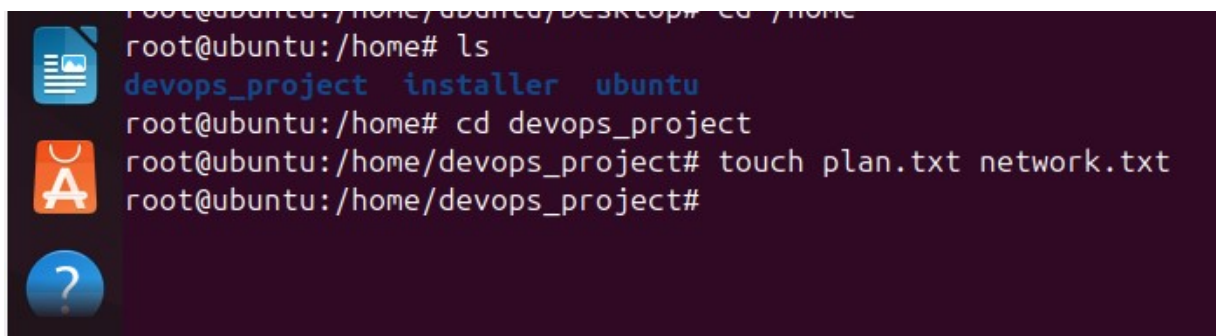
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1. Check OS Version

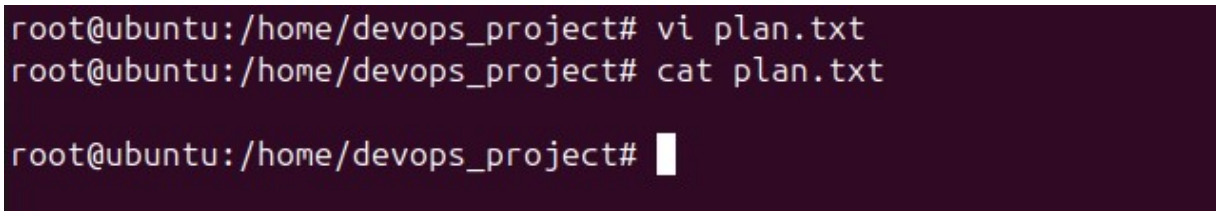
A terminal window with a dark purple background. On the left side, there is a vertical sidebar with four icons: an orange 'A' (Applications), a blue circle with a white question mark (Help), a dark grey terminal icon, and a circular logo with three white dots (Ubuntu). The terminal text shows a failed attempt to run 'cat /etc/-os-release', followed by a successful 'lsb_release -a' command that outputs system information for Ubuntu 24.04.2 LTS (noble).

```
ubuntu@ubuntu:/$ cat /etc/-os-release
cat: /etc/-os-release: No such file or directory
ubuntu@ubuntu:/$ lsb_release -a
No LSB modules are available.
Distributor ID: Ubuntu
Description:    Ubuntu 24.04.2 LTS
Release:        24.04
Codename:       noble
ubuntu@ubuntu:/$
```

2. Files & Directories

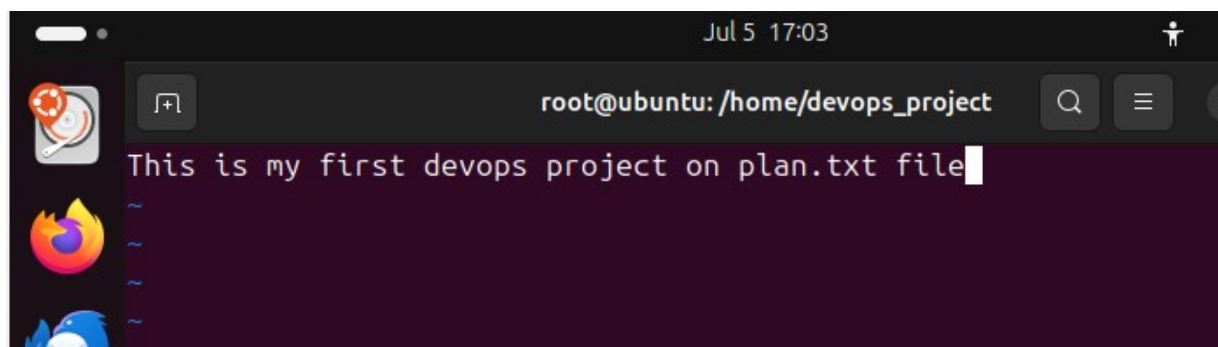
A terminal window with a dark purple background. On the left side, there is a vertical sidebar with three icons: a blue document icon (Files), an orange 'A' (Applications), and a blue circle with a white question mark (Help). The terminal text shows the user navigating to the home directory, listing files, creating a subdirectory 'devops_project', and creating two files 'plan.txt' and 'network.txt' within that directory.

```
root@ubuntu:/home/ubuntu/desktop# cd /home
root@ubuntu:/home# ls
devops_project  installer  ubuntu
root@ubuntu:/home# cd devops_project
root@ubuntu:/home/devops_project# touch plan.txt network.txt
root@ubuntu:/home/devops_project#
```

A terminal window with a dark purple background. The terminal text shows the user opening 'plan.txt' in a text editor (vi) and then displaying its contents with the 'cat' command.

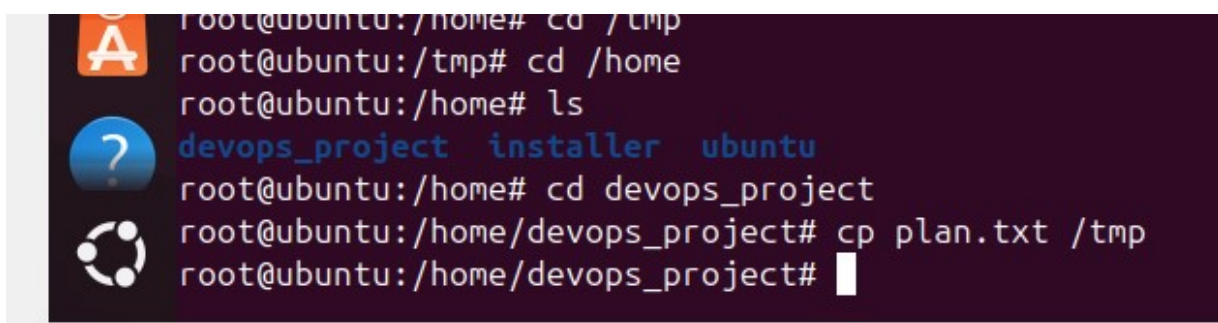
```
root@ubuntu:/home/devops_project# vi plan.txt
root@ubuntu:/home/devops_project# cat plan.txt

root@ubuntu:/home/devops_project#
```



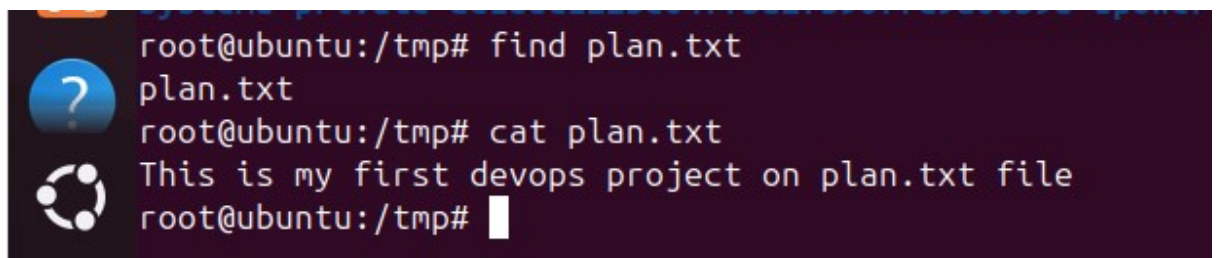
A terminal window titled 'root@ubuntu: /home/devops_project' with a search icon and a menu icon. The terminal shows the command 'cat plan.txt' and its output: 'This is my first devops project on plan.txt file'.

```
root@ubuntu: /home/devops_project
cat plan.txt
This is my first devops project on plan.txt file
```



A terminal window showing a sequence of commands: 'cd /tmp', 'cd /home', 'ls', 'cd devops_project', and 'cp plan.txt /tmp'. The output of 'ls' is 'devops_project installer ubuntu'. The prompt returns to the root@ubuntu: /home/devops_project directory.

```
root@ubuntu:/home# cd /tmp
root@ubuntu:/tmp# cd /home
root@ubuntu:/home# ls
devops_project  installer  ubuntu
root@ubuntu:/home# cd devops_project
root@ubuntu:/home/devops_project# cp plan.txt /tmp
root@ubuntu:/home/devops_project#
```



A terminal window showing the commands 'find plan.txt' and 'cat plan.txt'. The output of 'find' is 'plan.txt' and the output of 'cat' is 'This is my first devops project on plan.txt file'.

```
root@ubuntu:/tmp# find plan.txt
plan.txt
root@ubuntu:/tmp# cat plan.txt
This is my first devops project on plan.txt file
root@ubuntu:/tmp#
```

3. Users & Permissions

```
.. devops_project installer ubuntu
root@ubuntu:/home# sudo adduser devstudent
info: Adding user `devstudent' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group `devstudent' (1002) ...
info: Adding new user `devstudent' (1002) with group `devstudent (1002)'
...
info: Creating home directory `/home/devstudent' ...
info: Copying files from `/etc/skel' ...
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: password updated successfully
Changing the user information for devstudent
Enter the new value, or press ENTER for the default
  Full Name []:
  Room Number []:
  Work Phone []:
  Home Phone []:
  Other []:
Is the information correct? [Y/n] Y
info: Adding new user `devstudent' to supplemental / extra groups `users'
```

```
info: Adding user `devstudent' to group `users' ...
root@ubuntu:/home# sudo groupadd devops_team
root@ubuntu:/home# sudo usermod devops_team devstudent
Usage: usermod [options] LOGIN

Options:
  -a, --append                append the user to the supplemental groups
  -s, --shell SHELL           change the user's shell to SHELL
  -u, --uid UID               change the user's UID to UID
  -g, --group GROUP            change the user's group to GROUP
  -G, --groups GROUPS         change the user's supplemental groups to GROUPS
  -c, --comment COMMENT       change the user's comment to COMMENT
  -e, --expiredate EXPIRE     change the user's expiration date to EXPIRE
  -f, --frequency FREQ        change the user's password frequency to FREQ
  -F, --force                  force the user to change the password
  -I, --inactive INACTIVE     change the user's password inactivity period to INACTIVE
  -l, --lock                   lock the user's account
  -L, --local                   use local authentication
  -m, --movehome              move the user's home directory to the new location
  -M, --nohome                do not create the user's home directory
  -o, --noolog                 do not create the user's login directory
  -O, --noosgroups             do not create the user's OS groups
  -p, --password PASSWD       change the user's password to PASSWD
  -P, --passexp                force the password to expire at the end of PASSWD
  -r, --radius                 use radius authentication
  -R, --radiususeip            use the IP address of the host to set the radius
  -t, --timebase TIMEBASE     change the user's timebase to TIMEBASE
  -T, --timeunit TIMEUNIT     change the user's timeunit to TIMEUNIT
  -U, --unlock                 unlock the user's account
  -x, --xauth                  use X authentication
  -X, --xauthfile XAUTHFILE   use the XAUTHFILE for X authentication
  -Z, --zfs                     use ZFS authentication
  -z, --zsh                    use ZSH authentication
  --help                      display this help message
  --version                   display the usermod version
```

```
command 'getent' from deb libc-bin (2.39-0ubuntu8.3)
Try: apt install <deb name>
root@ubuntu:/home# touch secret.txt
root@ubuntu:/home# vi secret.txt
```

```
root@ubuntu:/home# touch secret.txt
root@ubuntu:/home# vi secret.txt
root@ubuntu:/home# cat secret.txt
This is Secret.txt file
root@ubuntu:/home#
```

```
try: apt install <deb name>
root@ubuntu:/home# touch secret.txt
root@ubuntu:/home# vi secret.txt
root@ubuntu:/home# cat secret.txt
This is Secret.txt file
root@ubuntu:/home# sudo chmod devstudent secret.txt
chmod: invalid mode: 'devstudent'
Try 'chmod --help' for more information.
root@ubuntu:/home# sudo chown devstudent secret.txt
root@ubuntu:/home# ls -l secret.txt
-rw-r--r-- 1 devstudent root 24 Jul  5 17:29 secret.txt
root@ubuntu:/home#
```

4. File Compression

```
ubuntu@ubuntu:/home$ sudo su
root@ubuntu:/home# touch sample.log
root@ubuntu:/home# vi sample.log
root@ubuntu:/home# cat sample.log
This is dummy file
root@ubuntu:/home#
```

```
This is dummy file
This is dummyroot@ubuntu:/home# echo -n "This is dummy" > sample.log
root@ubuntu:/home# cat sample.log
This is dummyroot@ubuntu:/home#
```



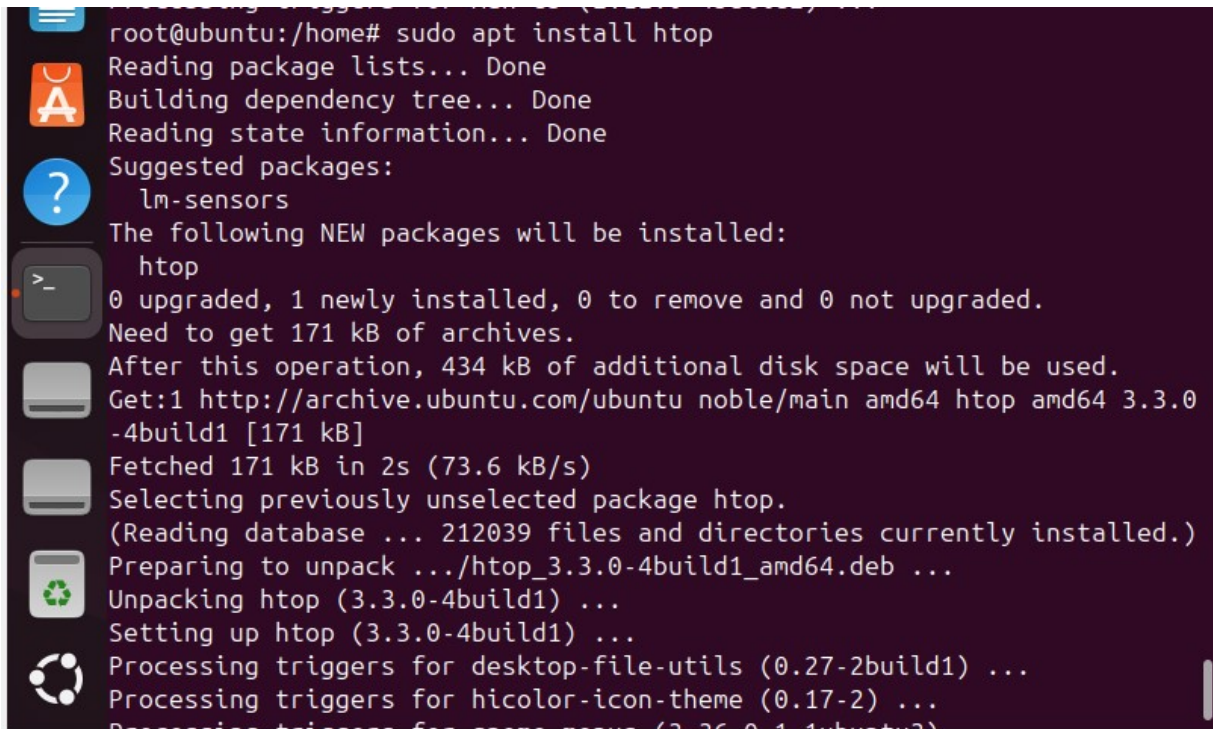
```
root@ubuntu:/home# cat sample.log
This is dummyroot@ubuntu:/home# ls -lstr sample.log
4 -rw-r--r-- 1 root root 13 Jul  6 04:34 sample.log
root@ubuntu:/home#
```

```
root@ubuntu:/home# gzip sample.log
gzip: sample.log.gz already exists; do you wish to overwrite (y or n)?
```

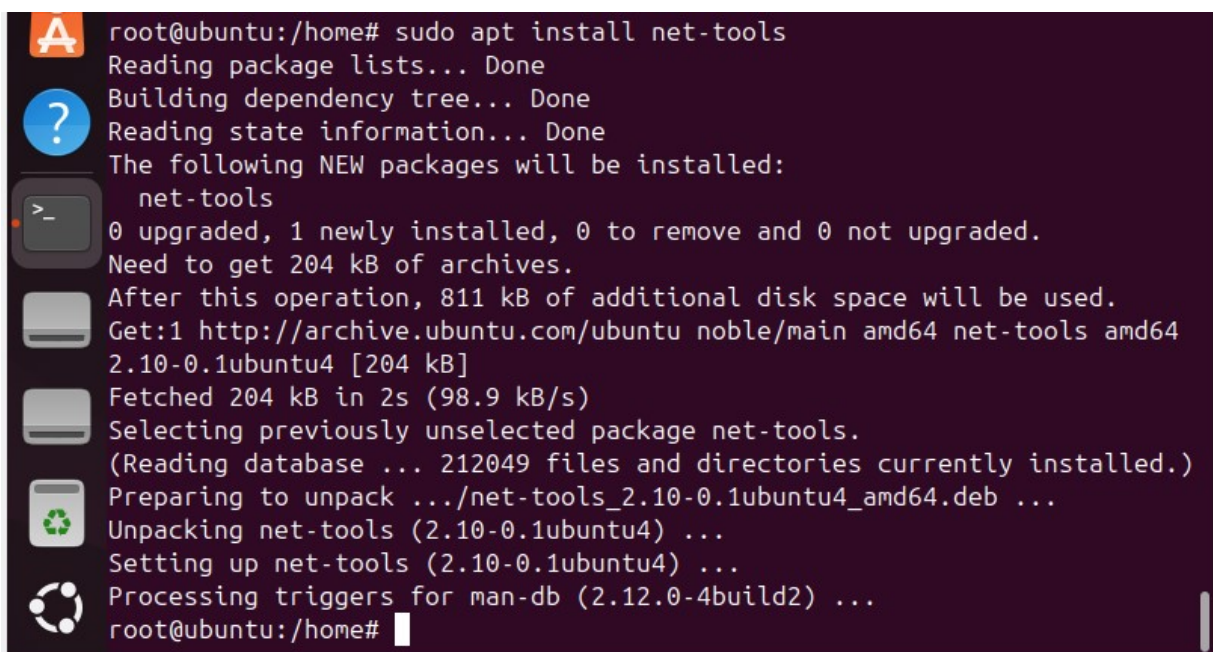
```
tar: Cowardly refusing to create an empty archive
Try 'tar --help' or 'tar --usage' for more information.
root@ubuntu:/home# tar -cvf app_logs.tar sample.log
sample.log
root@ubuntu:/home#
```

5. Package Management.

```
root@ubuntu:/home# sudo apt install curl
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
  curl
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded
Need to get 226 kB of archives.
After this operation, 534 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 curl 8.5.0-2ubuntu10.6 [226 kB]
Fetched 226 kB in 2s (92.7 kB/s)
Selecting previously unselected package curl.
(Reading database ... 212032 files and directories currently installed.)
Preparing to unpack .../curl_8.5.0-2ubuntu10.6_amd64.deb ...
Unpacking curl (8.5.0-2ubuntu10.6) ...
Setting up curl (8.5.0-2ubuntu10.6) ...
Processing triggers for man-db (2.12.0-4build2) ...
root@ubuntu:/home#
```

A terminal window with a dark purple background. On the left side, there is a vertical toolbar with icons: a hamburger menu, an orange 'A' icon, a blue question mark, a terminal icon, a laptop icon, a recycling icon, and a circular refresh icon. The terminal text shows the command 'sudo apt install htop' being executed. It displays the progress of installing the htop package, including reading package lists, building the dependency tree, and fetching the package from the archive. The installation is successful, and the prompt returns to 'root@ubuntu:/home#'.

```
root@ubuntu:/home# sudo apt install htop
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Suggested packages:
  lm-sensors
The following NEW packages will be installed:
  htop
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 171 kB of archives.
After this operation, 434 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu noble/main amd64 htop amd64 3.3.0-4build1 [171 kB]
Fetched 171 kB in 2s (73.6 kB/s)
Selecting previously unselected package htop.
(Reading database ... 212039 files and directories currently installed.)
Preparing to unpack ../htop_3.3.0-4build1_amd64.deb ...
Unpacking htop (3.3.0-4build1) ...
Setting up htop (3.3.0-4build1) ...
Processing triggers for desktop-file-utils (0.27-2build1) ...
Processing triggers for hicolor-icon-theme (0.17-2) ...
Processing triggers for gnome-menus (3.36.0-11ubuntu2) ...
root@ubuntu:/home#
```

A terminal window with a dark purple background. On the left side, there is a vertical toolbar with icons: an orange 'A' icon, a blue question mark, a terminal icon, a laptop icon, a recycling icon, and a circular refresh icon. The terminal text shows the command 'sudo apt install net-tools' being executed. It displays the progress of installing the net-tools package, including reading package lists, building the dependency tree, and fetching the package from the archive. The installation is successful, and the prompt returns to 'root@ubuntu:/home#'.

```
root@ubuntu:/home# sudo apt install net-tools
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
  net-tools
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 204 kB of archives.
After this operation, 811 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu noble/main amd64 net-tools amd64 2.10-0.1ubuntu4 [204 kB]
Fetched 204 kB in 2s (98.9 kB/s)
Selecting previously unselected package net-tools.
(Reading database ... 212049 files and directories currently installed.)
Preparing to unpack ../net-tools_2.10-0.1ubuntu4_amd64.deb ...
Unpacking net-tools (2.10-0.1ubuntu4) ...
Setting up net-tools (2.10-0.1ubuntu4) ...
Processing triggers for man-db (2.12.0-4build2) ...
root@ubuntu:/home#
```

6. Network Commands – Run & Explain.

IFconfig: it views all interfaces.


```
Processing triggers for libc-bin (2.14-0ubuntu2) ...
root@ubuntu:/home# ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255
    inet6 fe80::a00:27ff:fe4f:41e4 prefixlen 64 scopeid 0x20<link>
    inet6 fd17:625c:f037:2:a00:27ff:fe4f:41e4 prefixlen 64 scopeid
0x0<global>
    inet6 fd17:625c:f037:2:f9e9:b653:8814:8827 prefixlen 64 scopei
d 0x0<global>
    ether 08:00:27:4f:41:e4 txqueuelen 1000 (Ethernet)
    RX packets 1376 bytes 1305762 (1.3 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 925 bytes 126853 (126.8 KB)
    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>
```

Ping IP google.com -c4: Sent ICMP echo request to google.com, -c4 limit to 4 packets.

```
root@ubuntu:/home# ping google.com -c4
PING google.com (142.251.223.14) 56(84) bytes of data:
64 bytes from lcmaaa-ao-in-f14.1e100.net (142.251.223.14): icmp_seq=1 tt
l=255 time=112 ms
64 bytes from lcmaaa-ao-in-f14.1e100.net (142.251.223.14): icmp_seq=2 tt
l=255 time=16.9 ms
64 bytes from lcmaaa-ao-in-f14.1e100.net (142.251.223.14): icmp_seq=3 tt
l=255 time=16.6 ms
64 bytes from lcmaaa-ao-in-f14.1e100.net (142.251.223.14): icmp_seq=4 tt
l=255 time=17.3 ms

--- google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3005ms
rtt min/avg/max/mdev = 16.626/40.689/111.879/41.101 ms
root@ubuntu:/home#
```

Traceroute google.com: shows path data takes from my machine to google.com

```
root@ubuntu:/home# traceroute google.com
traceroute to google.com (142.251.223.14), 30 hops max, 60 byte packets
 1 _gateway (10.0.2.2) 0.686 ms 0.566 ms 0.529 ms
 2 * * *
 3 * * *
 4 * * *
 5 * * *
 6 * * *
 7 * * *
```


Nslookup google.com: To find IP Address of domain.

```
root@ubuntu:/home# nslookup google.com
Server:          127.0.0.53
Address:         127.0.0.53#53

Non-authoritative answer:
Name:   google.com
Address: 142.251.223.14
Name:   google.com
Address: 2404:6800:4007:838::200e

root@ubuntu:/home#
```

Netstat -tuln: To display all listening ports.

```
root@ubuntu:/home# netstat -tuln
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         Stat
tcp        0      0 127.0.0.1:631           0.0.0.0:*               LISTEN
tcp        0      0 127.0.0.54:53           0.0.0.0:*               LISTEN
tcp        0      0 127.0.0.53:53           0.0.0.0:*               LISTEN
tcp6       0      0 :::1:631                :::*                    LISTEN
udp        0      0 0.0.0.0:45603           0.0.0.0:*               LISTEN
udp        0      0 127.0.0.54:53           0.0.0.0:*               LISTEN
udp        0      0 127.0.0.53:53           0.0.0.0:*               LISTEN
udp        0      0 0.0.0.0:5353            0.0.0.0:*               LISTEN
```

Ifconfig me: To view my IP address

```
root@ubuntu:/home# curl ifconfig.me
157.20.251.11root@ubuntu:/home#
```