PS (process status)

pid – unique process id

tty – terminal type

time – total time of process

cmd – runned commands

```
sathish@dark:~$ ps
    PID TTY          TIME CMD
   2016 pts/0    00:00:00 bash
   5307 pts/0    00:00:00 ps
```

ps a (list all process in terminal)

```
sathish@dark:~$ ps a
    PID TTY      STAT   TIME COMMAND
   1396 tty2     Ssl+   0:00 /usr/libexec/gdm-wayland-session env GNOME_SHELL_SE
   1410 tty2     Sl+    0:00 /usr/libexec/gnome-session-binary --session=ubuntu
   3935 pts/0    Ss     0:00 bash
   5466 pts/0    R+     0:00 ps
```

sathish@dark:~$ ps -a (except leaders STAT s)

```
    PID TTY          TIME CMD
   1410 tty2     00:00:00 gnome-session-b
   5427 pts/0    00:00:00 ps
```

ps -A or ps -e (list all process on linux)

```
sathish@dark:~$ ps -A
                                                    1 ?        00:00:02 systemd
      2 ?        00:00:00 kthreadd
      3 ?        00:00:00 rcu_gp
      4 ?        00:00:00 rcu_par_gp
      5 ?        00:00:00 netns
      7 ?        00:00:00 kworker/0:0H-events_highpri
```

```
     10 ?        00:00:00 mm_percpu_wq
```

ps x (list all process of current user)

```
    sathish@dark:~$ ps x
    PID TTY      STAT   TIME COMMAND
   1348 ?        Ss     0:01 /lib/systemd/systemd --user
   1349 ?        S      0:00 (sd-pam)
   1355 ?        S<sl   0:00 /usr/bin/pipewire
   1356 ?        Ssl    0:00 /usr/bin/pipewire-media-session
   1357 ?        S<sl   0:00 /usr/bin/pulseaudio --daemonize=no --log-target=
   1358 ?        Ss     0:00 /snap/snapd-desktop-integration/49/usr/bin/snapd
   1366 ?        Ss     0:01 /usr/bin/dbus-daemon --session --address=systemd
   1372 ?        Ssl    0:00 /usr/libexec/gvfsd
```

ps ax (list all process in BSD format)

```
sathish@dark:~$ ps ax
    PID TTY      STAT   TIME COMMAND
      1 ?        Ss     0:02 /sbin/init splash
      2 ?        S      0:00 [kthreadd]
      3 ?        I<     0:00 [rcu_gp]
      4 ?        I<     0:00 [rcu_par_gp]
      5 ?        I<     0:00 [netns]
      7 ?        I<     0:00 [kworker/0:0H-events_highpri]
     10 ?        I<     0:00 [mm_percpu_wq]
     11 ?        S      0:00 [rcu_tasks_rude_]
....
```

ps -f (list process in full format)

ps -F (list process in extra full format)

```
sathish@dark:~$ ps -f
UID          PID    PPID  C STIME TTY          TIME CMD
sathish     3935    3913  0 21:43 pts/0    00:00:00 bash
```

```
sathish     6008    3935  0 22:55 pts/0    00:00:00 ps -f

sathish@dark:~$ ps -F
UID          PID    PPID  C    SZ   RSS PSR STIME TTY          TIME CMD
sathish     3935    3913  0  4947  2496   0 21:43 pts/0    00:00:00 bash
sathish     6009    3935  0  5331  1580   0 22:55 pts/0    00:00:00 ps -F
```

ps u (show process with username)

```
sathish@dark:~$ ps u
USER         PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
sathish     1378  0.0  0.2 171036  4896 tty2     Ssl+ 08:55   0:00 /usr/libexec/
sathish     1382  0.0  0.5 231688 11024 tty2     Sl+  08:55   0:00 /usr/libexec/
sathish     1975  0.0  0.1  19660  3544 pts/0    Ss   08:56   0:00 bash
sathish     3866  0.0  0.1  21324  3384 pts/0    R+   08:59   0:00 ps u
sathish@dark:~$
```

ps v (show process with virtual memory format)

```
sathish@dark:~$ ps v
    PID TTY      STAT   TIME  MAJFL   TRS   DRS   RSS %MEM COMMAND
   1378 tty2     Ssl+   0:00      0    17 171018 2624  0.1 /usr/libexec/gdm-wayl
   1382 tty2     Sl+    0:00      2   139 231548 5972  0.2 /usr/libexec/gnome-se
   1975 pts/0    Ss     0:00     25   891 18768  3132  0.1 bash
   4311 pts/0    R+     0:00      0    50 21273  1512  0.0 ps v
sathish@dark:~$
```

ps -u or ps –user (show process of given username)

```
sathish@dark:~$ ps -u root
    PID TTY          TIME CMD
      1 ?        00:00:01 systemd
      2 ?        00:00:00 kthreadd
      3 ?        00:00:00 rcu_gp
      4 ?        00:00:00 rcu_par_gp
```

```
      5 ?        00:00:00 netns
      6 ?        00:00:00 kworker/0:0-events
......
```

ps p pid or ps -pid or ps –-pid pid (list process of given process id)

```
sathish@dark:~$ ps p 1,2
    PID TTY      STAT   TIME COMMAND
      1 ?        Ss     0:01 /sbin/init splash
      2 ?        S      0:00 [kthreadd]
sathish@dark:~$ ps -p 1,2
    PID TTY          TIME CMD
      1 ?        00:00:01 systemd
      2 ?        00:00:00 kthreadd
sathish@dark:~$ ps --pid 1,2
    PID TTY          TIME CMD
      1 ?        00:00:01 systemd
      2 ?        00:00:00 kthreadd
```

ps e (show environment after command)

```
sathish@dark:~$ ps e
    PID TTY      STAT   TIME COMMAND
   1378 tty2     Ssl+   0:00 /usr/libexec/gdm-wayland-session env GNOME_SHELL_SE
   1382 tty2     Sl+    0:00 /usr/libexec/gnome-session-binary --session=ubuntu
   1975 pts/0    Ss     0:00 bash SYSTEMD_EXEC_PID=1462 SSH_AUTH_SOCK=/run/user/
   4566 pts/0    R+     0:00 ps e SHELL=/bin/bash SESSION_MANAGER=local/dark:@/t
sathish@dark:~$
```

ps h (hide header of top row)sathish@dark:~$ ps h

```
   1378 tty2     Ssl+   0:00 /usr/libexec/gdm-wayland-session env GNOME_SHELL_SE
   1382 tty2     Sl+    0:00 /usr/libexec/gnome-session-binary --session=ubuntu
   1975 pts/0    Ss     0:00 bash
   4581 pts/0    R+     0:00 ps h
```

ps f or ps –-forest (diplay tree fromat)

```
sathish@dark:~$ ps f
    PID TTY      STAT   TIME COMMAND
   1975 pts/0    Ss     0:00 bash
   4612 pts/0    R+     0:00  \_ ps f
   1378 tty2     Ssl+   0:00 /usr/libexec/gdm-wayland-session env GNOME_SHELL_SE
   1382 tty2     Sl+    0:00  \_ /usr/libexec/gnome-session-binary --session=ubu
sathish@dark:~$
```

ps H (show threads)

```
sathish@dark:~$ ps H
    PID TTY      STAT   TIME COMMAND
   1378 tty2     Ssl+   0:00 /usr/libexec/gdm-wayland-session env GNOME_SHELL_SE
   1378 tty2     Ssl+   0:00 /usr/libexec/gdm-wayland-session env GNOME_SHELL_SE
   1378 tty2     Ssl+   0:00 /usr/libexec/gdm-wayland-session env GNOME_SHELL_SE
   1382 tty2     Sl+    0:00 /usr/libexec/gnome-session-binary --session=ubuntu
   1382 tty2     Sl+    0:00 /usr/libexec/gnome-session-binary --session=ubuntu
   1382 tty2     Sl+    0:00 /usr/libexec/gnome-session-binary --session=ubuntu
   1975 pts/0    Ss     0:00 bash
   4670 pts/0    R+     0:00 ps H
```

ps L (show all format specifiers)

```
sathish@dark:~$ ps L
%cpu         %CPU
%mem         %MEM
_left        LLLLLLLL
_left2       L2L2L2L2
_right       RRRRRRRR
_right2      R2R2R2R2
_unlimited   U
_unlimited2  U2
alarm        ALARM
```

```
args         COMMAND
atime        TIME
blocked      BLOCKED
bsdstart     START
```

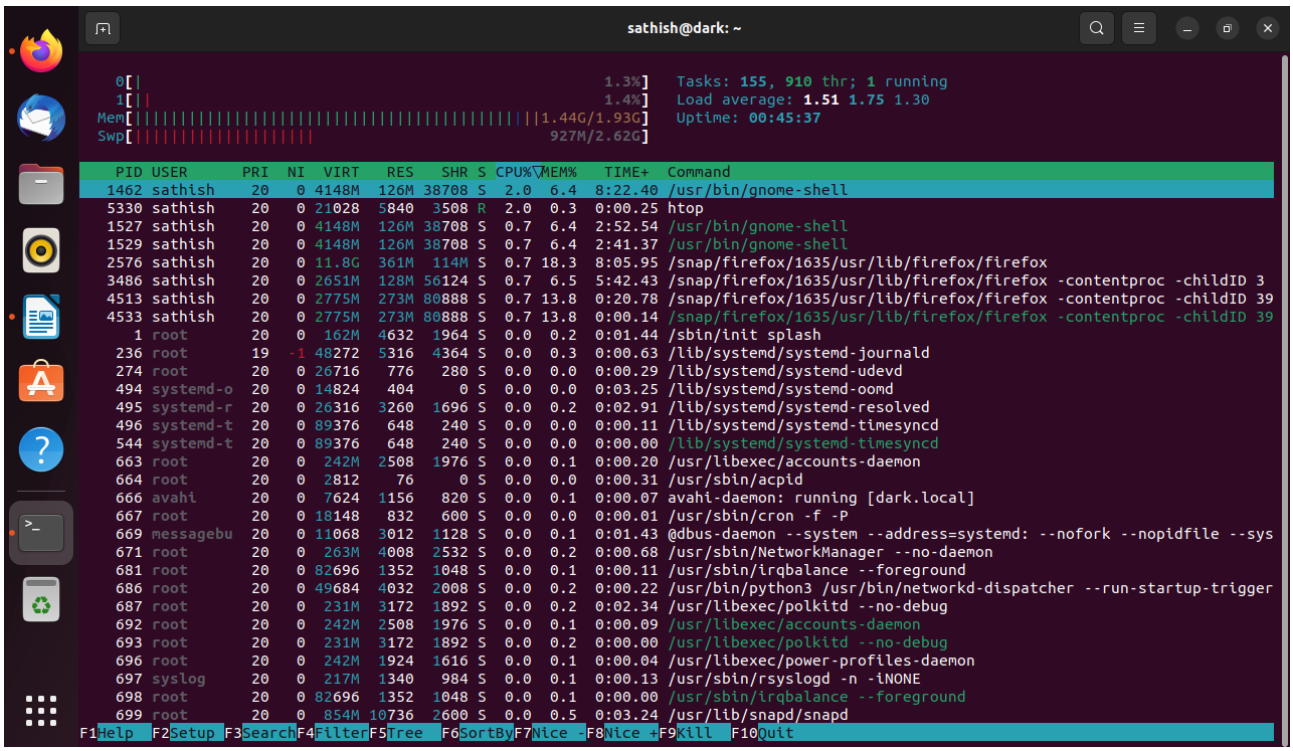
ps s (display process in signal format)

```
  sathish@dark:~$ ps s
  UID     PID   PENDING   BLOCKED   IGNORED    CAUGHT STAT TTY        TIME
COMMAND
 1000    1378  00000000  00000000  00001000 <00014000 Ssl+ tty2       0:00 /usr/
 1000    1382  00000000  00000000  00001000 <00004002 Sl+  tty2       0:00 /usr/
 1000    1975  00000000  00010000  00384004  4b813efb Ss   pts/0      0:00 bash
 1000    4734  00000000  00000000  00000000  73d1fef9 R+   pts/0      0:00 ps s
sathish@dark:~$
```

ps -M (Display security info)

```
sathish@dark:~$ ps -M
LABEL                               PID TTY          TIME CMD
unconfined                         1975 pts/0    00:00:00 bash
unconfined                         4763 pts/0    00:00:00 ps
sathish@dark:~$
```

htop



nmon (ngel’s monitor)

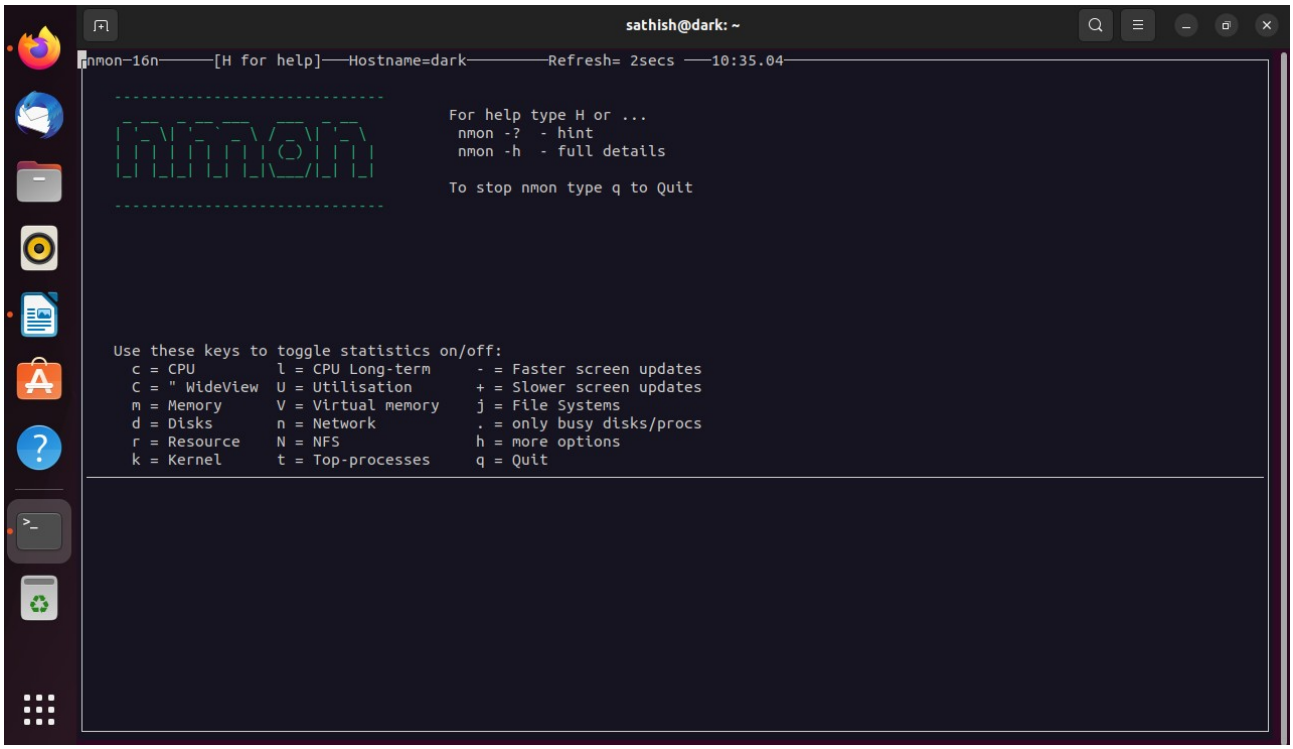
nmon is an mointtor linux system and network performace

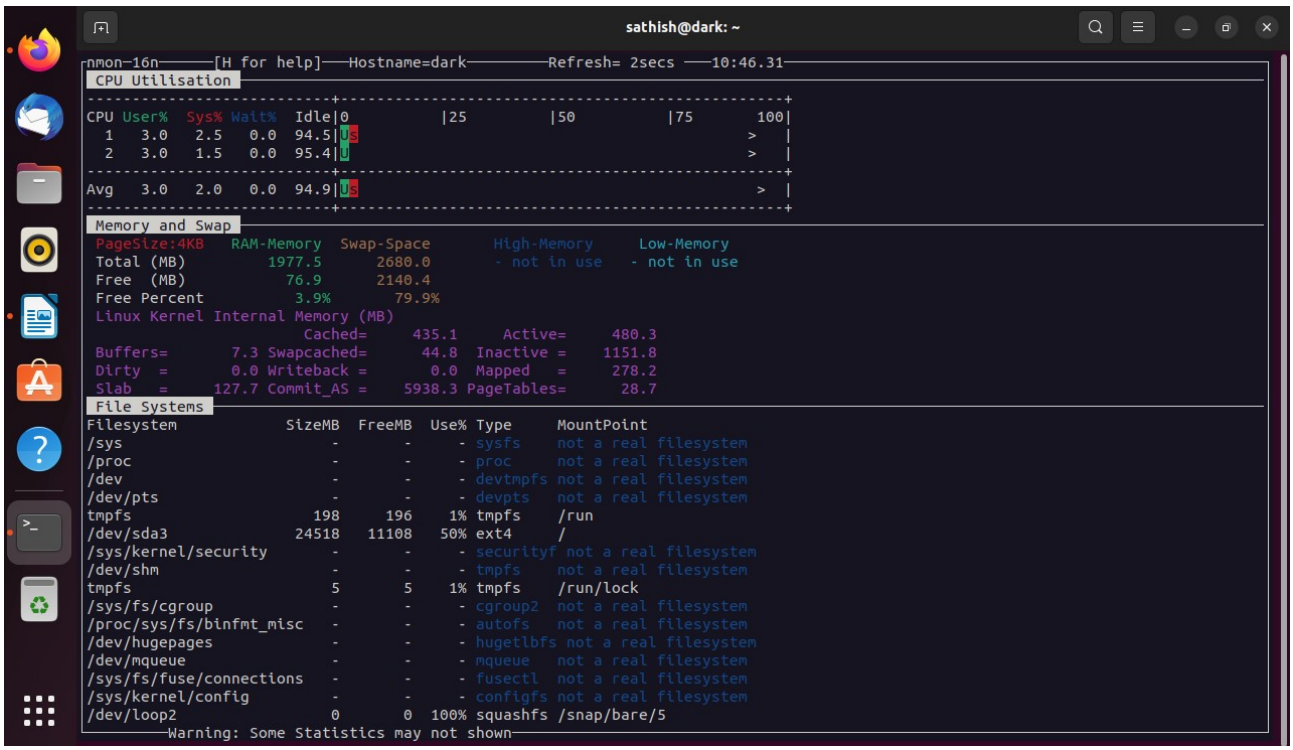
```
sathish@dark:~$ sudo apt-get install nmon
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
  nmon
0 upgraded, 1 newly installed, 0 to remove and 264 not upgraded.
Need to get 69.3 kB of archives.
After this operation, 177 kB of additional disk space will be used.
Get:1 http://in.archive.ubuntu.com/ubuntu jammy/universe amd64 nmon amd64
16n+debian-1 [69.3 kB]
Fetched 69.3 kB in 1s (50.9 kB/s)
Selecting previously unselected package nmon.
(Reading database ... 160089 files and directories currently installed.)
Preparing to unpack .../nmon_16n+debian-1_amd64.deb ...
Unpacking nmon (16n+debian-1) ...
```

```
Setting up nmon (16n+debian-1) ...
Processing triggers for man-db (2.10.2-1) ...
```

start nmon

```
sathish@dark:~$ nmon
```





df (disk filesystem)

find total disk space and available space

```
sathish@dark:~$ df
Filesystem     1K-blocks     Used Available Use% Mounted on
tmpfs             202496     1540    200956   1% /run
/dev/sda3       25106692 12446740  11359268  53% /
tmpfs            1012472        0   1012472   0% /dev/shm
tmpfs               5120        4      5116   1% /run/lock
/dev/sda2         524252     5364    518888   2% /boot/efi
tmpfs             202492     2416    200076   2% /run/user/1000
```

human readable

```
sathish@dark:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
tmpfs           198M  1.6M  197M   1% /run
/dev/sda3        24G   12G   11G  53% /
tmpfs           989M     0  989M   0% /dev/shm
```

```
tmpfs           5.0M  4.0K  5.0M   1% /run/lock
/dev/sda2       512M  5.3M  507M   2% /boot/efi
tmpfs           198M  2.4M  196M   2% /run/user/1000
```

df -k (kilobytes)

```
sathish@dark:~$ df -k
Filesystem     1K-blocks     Used Available Use% Mounted on
tmpfs             202496     1540    200956   1% /run
/dev/sda3       25106692 12446740  11359268  53% /
tmpfs            1012472        0   1012472   0% /dev/shm
tmpfs               5120        4      5116   1% /run/lock
/dev/sda2         524252     5364    518888   2% /boot/efi
tmpfs             202492     2416    200076   2% /run/user/1000
```

df -m (megabytes)

```
sathish@dark:~$ df -m
Filesystem     1M-blocks  Used Available Use% Mounted on
tmpfs                198     2       197   1% /run
/dev/sda3          24519 12156     11094  53% /
tmpfs                989     0       989   0% /dev/shm
tmpfs                  5     1         5   1% /run/lock
/dev/sda2            512     6       507   2% /boot/efi
tmpfs                198     3       196   2% /run/user/1000
sathish@dark:~$
```

df -t filesystem (specified givfilesystem)

```
sathish@dark:~$ df -t tmpfs
Filesystem     1K-blocks  Used Available Use% Mounted on
tmpfs             202496  1540    200956   1% /run
tmpfs            1012472     0   1012472   0% /dev/shm
tmpfs               5120     4      5116   1% /run/lock
tmpfs             202492  2420    200072   2% /run/user/1000
```

df -x filesystem (except given filesystem)

```
sathish@dark:~/demo$ df -x tmpfs
Filesystem     1K-blocks     Used Available Use% Mounted on
/dev/sda3       25106692 12434052  11371956  53% /
/dev/sda2         524252     5364    518888   2% /boot/efi

sathish@dark:~$ sudo df -a
Filesystem     1K-blocks     Used Available Use% Mounted on
sysfs                  0        0         0    - /sys
proc                   0        0         0    - /proc
udev              977792        0    977792   0% /dev
devpts                 0        0         0    - /dev/pts
tmpfs             202496     1548    200948   1% /run
/dev/sda3       25106692 12450392  11355616  53% /
securityfs             0        0         0    - /sys/kernel/security
tmpfs            1012472        0   1012472   0% /dev/shm
```

df -T (print filesystem type)

```
sathish@dark:~$ df -T
Filesystem     Type  1K-blocks     Used Available Use% Mounted on
tmpfs          tmpfs    202496     1540    200956   1% /run
/dev/sda3      ext4   25106692 12449468  11356540  53% /
tmpfs          tmpfs   1012472        0   1012472   0% /dev/shm
tmpfs          tmpfs      5120        4      5116   1% /run/lock
/dev/sda2      vfat     524252     5364    518888   2% /boot/efi
tmpfs          tmpfs    202492     2412    200080   2% /run/user/1000
.....
```

Free (view free disk space)

```
sathish@dark:~$ free
               total        used        free      shared  buff/cache   available
Mem:         2024948     1476104      108856       36928      439988      349548
```

```
Swap:        2744316      449872     2294444
sathish@dark:~$
```

free -h (human readable)

```
sathish@dark:~$ free -h
               total        used        free      shared  buff/cache   available
Mem:           1.9Gi       1.4Gi        96Mi        35Mi       435Mi       337Mi
Swap:          2.6Gi       438Mi       2.2Gi
sathish@dark:~$
```

free -s2 (set delay of seconds to print)

```
sathish@dark:~$ free -s2
               total        used        free      shared  buff/cache   available
Mem:         2024948     1485496       65392       43516      474060      334308
Swap:        2744316      547052     2197264

               total        used        free      shared  buff/cache   available
Mem:         2024948     1485476       65392       43516      474080      334328
Swap:        2744316      547052     2197264

               total        used        free      shared  buff/cache   available
Mem:         2024948     1482648       65392       46344      476908      334328
Swap:        2744316      547052     2197264

               total        used        free      shared  buff/cache   available
Mem:         2024948     1482640       65392       46344      476916      334336
Swap:        2744316      547052     2197264
```

free -t (view total)

```
sathish@dark:~$ free -h -t
               total        used        free      shared  buff/cache   available
Mem:           1.9Gi       1.4Gi       155Mi        39Mi       436Mi       393Mi
```

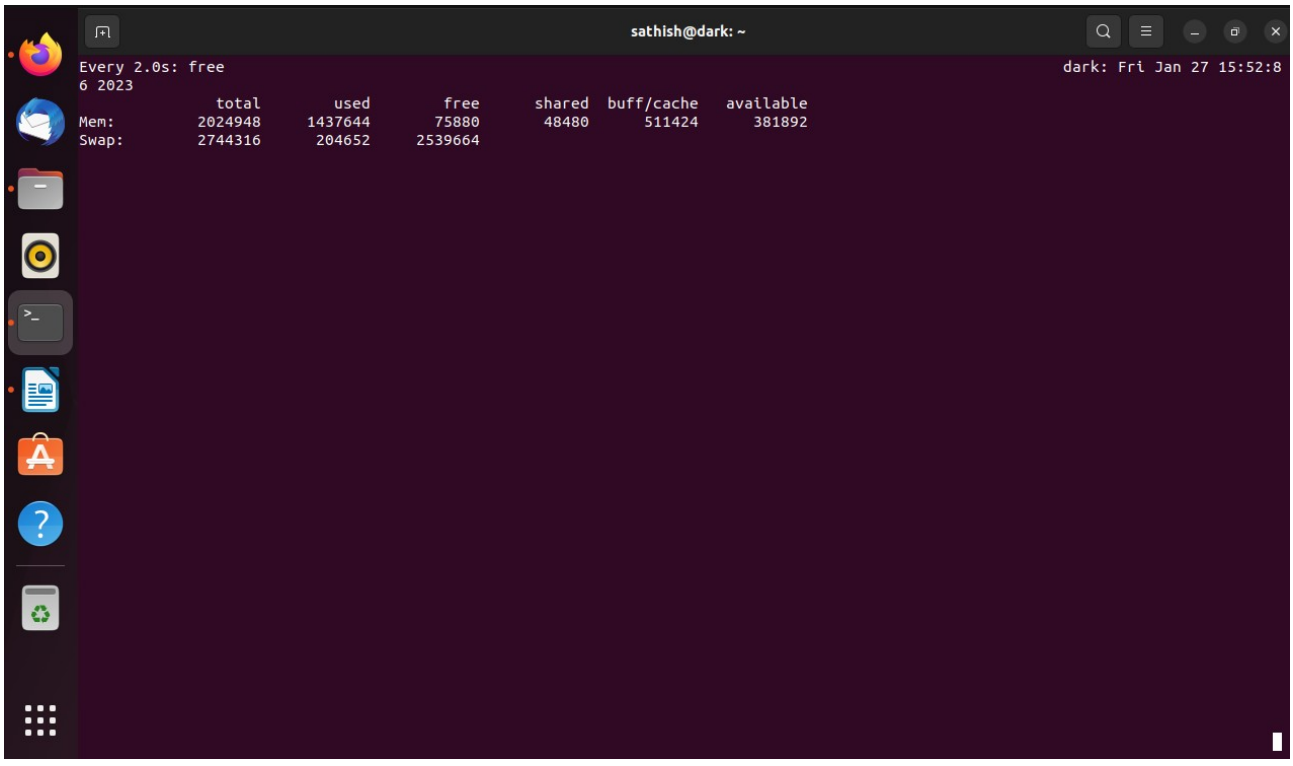
```
Swap:          2.6Gi       556Mi       2.1Gi
Total:         4.5Gi       1.9Gi       2.2Gi
```

free -w (seperate buffer / cache)

```
sathish@dark:~$ free -w
               total        used        free      shared     buffers       cache
available
Mem:         2024948     1403200      144400       42416       12524      464824
417532
Swap:        2744316      559964     2184352
```

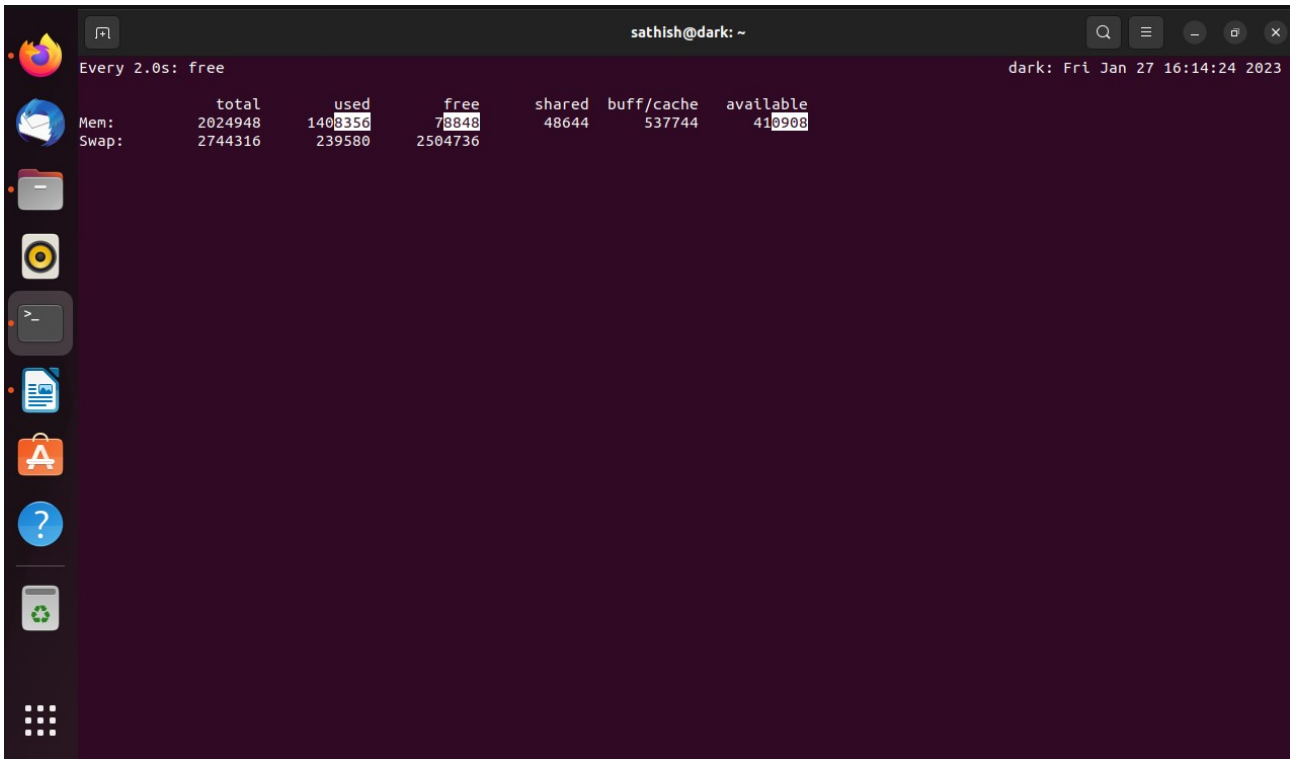
watch (update every 2 seconds display on new window)

```
sathish@dark:~$ watch free
```



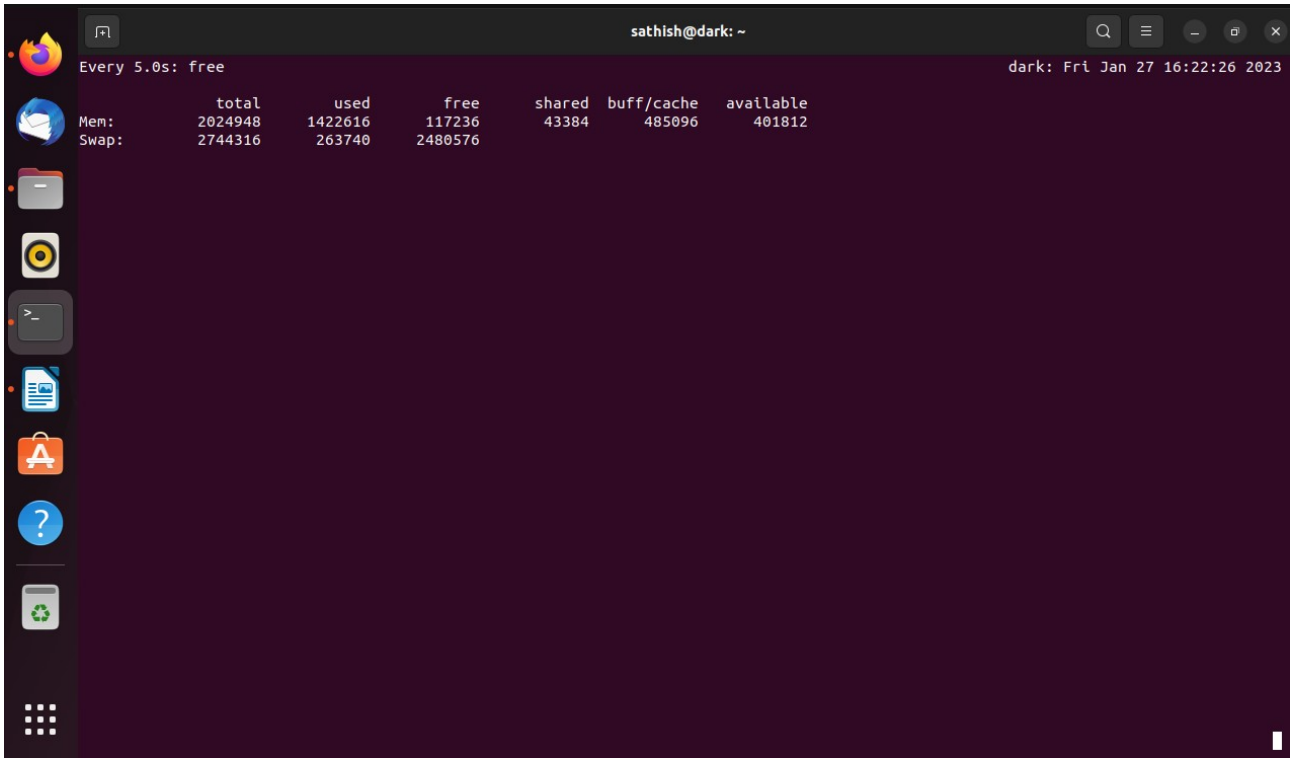
show highlights update time

```
sathish@dark:~$ watch -d  free
```



set number of seconds to update

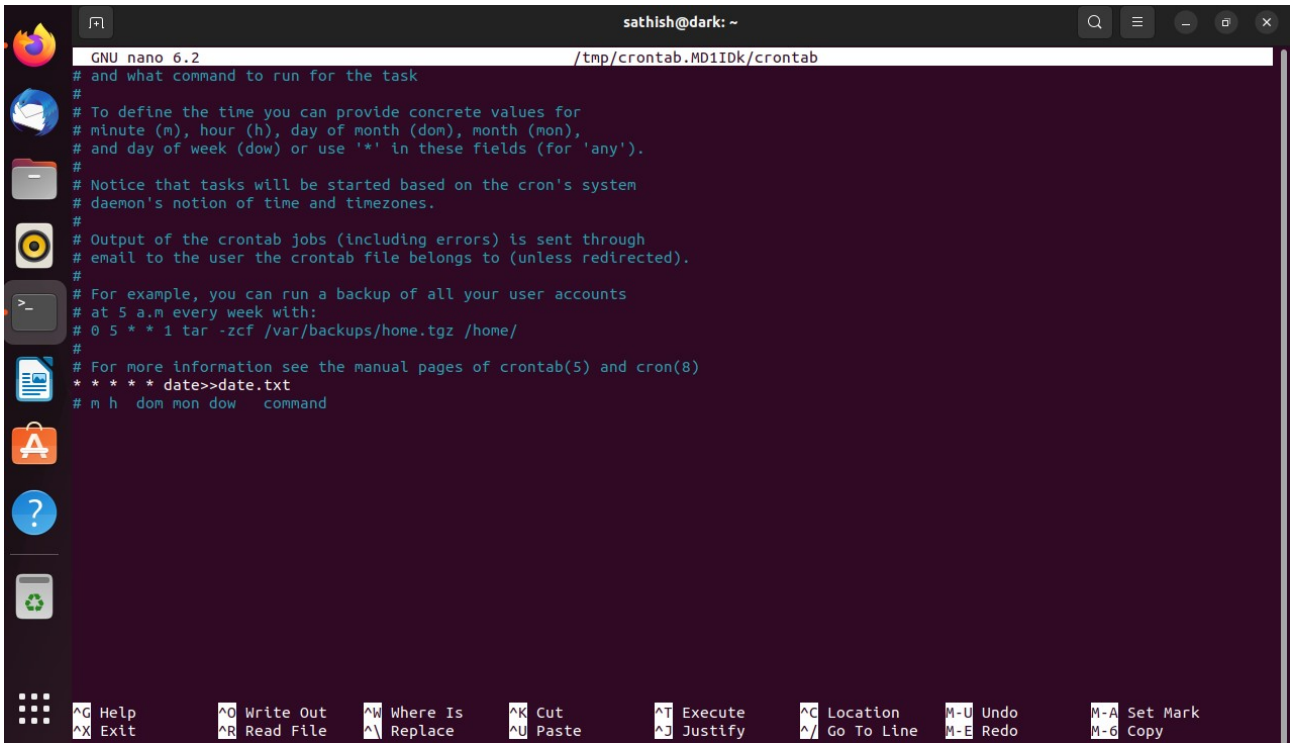
```
sathish@dark:~$ watch -n 5 free
```



crontab (schedule execution command at specific time)

crontab -e (set schedule command for execution)

```
sathish@dark:~$ crontab -e
```



view auto exceuted output

```
sathish@dark:~$ cat date.txt
Friday 27 January 2023 09:48:01 PM IST
Friday 27 January 2023 09:49:01 PM IST
Friday 27 January 2023 09:50:01 PM IST
```

how to set up job on crontab

```
sathish@dark:~$ sudo cat /etc/crontab
[sudo] password for sathish:
# /etc/crontab: system-wide crontab
# Unlike any other crontab you don't have to run the `crontab'
# command to install the new version when you edit this file
# and files in /etc/cron.d. These files also have username fields,
# that none of the other crontabs do.
```

```
SHELL=/bin/sh
# You can also override PATH, but by default, newer versions inherit it from the
environment
#PATH=/usr/local/sbin:/usr/local/bin:/sbin:/bin:/usr/sbin:/usr/bin

# Example of job definition:
# .---------------- minute (0 - 59)
# |  .------------- hour (0 - 23)
# |  |  .---------- day of month (1 - 31)
# |  |  |  .------- month (1 - 12) OR jan,feb,mar,apr ...
# |  |  |  |  .---- day of week (0 - 6) (Sunday=0 or 7) OR
sun,mon,tue,wed,thu,fri,sat
# |  |  |  |  |
# *  *  *  *  * user-name command to be executed
17 *  * * * root    cd / && run-parts --report /etc/cron.hourly
25 6  * * * root  test -x /usr/sbin/anacron || ( cd / && run-parts --report
/etc/cron.daily )
47 6  * * 7 root  test -x /usr/sbin/anacron || ( cd / && run-parts --report
/etc/cron.weekly )
52 6  1 * * root  test -x /usr/sbin/anacron || ( cd / && run-parts --report
/etc/cron.monthly )
#
```