

Process and Memory Management Commands

PROCESS MANAGEMENT :

Ps:

displays information about the processes associated with the current terminal session.

Ps -a:

List all processes except session leaders (instances where the process ID is the same as the session ID) and processes not associated with a terminal.

Ps -e:

Lists all processes on the entire system, offering a complete overview of running tasks and programs.

Ps -d:

Lists all processes except session leaders, providing a filtered view of processes running on the system.

```
File Edit View Search Terminal Help
For more details see ps(1).
lab1003@lab1003-HP-280-G2-MT:~$ clear

lab1003@lab1003-HP-280-G2-MT:~$ ps -a
  PID TTY          TIME CMD
  902 tty1      00:00:00 gnome-session-b
  917 tty1      00:00:02 gnome-shell
  988 tty1      00:00:00 Xwayland
 1153 tty1      00:00:00 ibus-daemon
 1156 tty1      00:00:00 ibus-dconf
 1159 tty1      00:00:00 ibus-x11
 1283 tty1      00:00:00 gsd-xsettings
 1287 tty1      00:00:00 gsd-a11y-settin
 1290 tty1      00:00:00 gsd-clipboard
 1291 tty1      00:00:00 gsd-color
 1297 tty1      00:00:00 gsd-datetime
 1298 tty1      00:00:00 gsd-housekeepin
 1299 tty1      00:00:00 gsd-keyboard
 1307 tty1      00:00:00 gsd-media-keys
 1309 tty1      00:00:00 gsd-mouse
 1315 tty1      00:00:00 gsd-power
 1319 tty1      00:00:00 gsd-print-notif
 1323 tty1      00:00:00 gsd-rfkill
 1328 tty1      00:00:00 gsd-screensaver
 1331 tty1      00:00:00 gsd-sharing
 1337 tty1      00:00:00 gsd-smartcard
 1342 tty1      00:00:00 gsd-sound
 1347 tty1      00:00:00 gsd-wacom
 1475 tty1      00:00:00 ibus-engine-sin
 1633 tty2      00:01:27 Xorg
 1648 tty2      00:00:00 gnome-session-b
 1777 tty2      00:01:26 gnome-shell
 1816 tty2      00:00:00 ibus-daemon
 1824 tty2      00:00:00 ibus-dconf
 1830 tty2      00:00:00 ibus-x11
 1939 tty2      00:00:00 gsd-power
 1941 tty2      00:00:00 gsd-print-notif
 1942 tty2      00:00:00 gsd-rfkill
```

```
File Edit View Search Terminal Help
lab1003@lab1003-HP-280-G2-MT:~$ ps -e
  PID TTY          TIME CMD
    1 ?        00:00:08 systemd
    2 ?        00:00:00 kthreadd
    3 ?        00:00:00 rcu_gp
    4 ?        00:00:00 rcu_par_gp
    5 ?        00:00:00 kworker/0:0-eve
    6 ?        00:00:00 kworker/0:0H-kb
    8 ?        00:00:00 mm_percpu_wq
    9 ?        00:00:00 ksoftirqd/0
   10 ?        00:00:01 rcu_sched
   11 ?        00:00:00 migration/0
   12 ?        00:00:00 idle_inject/0
   14 ?        00:00:00 cpuhp/0
   15 ?        00:00:00 cpuhp/1
   16 ?        00:00:00 idle_inject/1
   17 ?        00:00:00 migration/1
   18 ?        00:00:00 ksoftirqd/1
   20 ?        00:00:00 kworker/1:0H-kb
   21 ?        00:00:00 cpuhp/2
   22 ?        00:00:00 idle_inject/2
   23 ?        00:00:00 migration/2
   24 ?        00:00:00 ksoftirqd/2
   26 ?        00:00:00 kworker/2:0H-kb
   27 ?        00:00:00 cpuhp/3
   28 ?        00:00:00 idle_inject/3
   29 ?        00:00:00 migration/3
   30 ?        00:00:00 ksoftirqd/3
   32 ?        00:00:00 kworker/3:0H-kb
   33 ?        00:00:00 kdevtmpfs
   34 ?        00:00:00 netns
   35 ?        00:00:00 rcu_tasks_kthre
   36 ?        00:00:00 kauditd
   37 ?        00:00:00 khungtaskd
   38 ?        00:00:00 oom_reaper
   39 ?        00:00:00 writeback
   40 ?        00:00:00 kcompactd0
   41 ?        00:00:00 ksm
```

```
File Edit View Search Terminal Help
lab1003@lab1003-HP-280-G2-MT:~$ ps -d
  PID TTY          TIME CMD
    2 ?        00:00:00 kthreadd
    3 ?        00:00:00 rcu_gp
    4 ?        00:00:00 rcu_par_gp
    5 ?        00:00:00 kworker/0:0-eve
    6 ?        00:00:00 kworker/0:0H-kb
    8 ?        00:00:00 mm_percpu_wq
    9 ?        00:00:00 ksoftirqd/0
   10 ?        00:00:01 rcu_sched
   11 ?        00:00:00 migration/0
   12 ?        00:00:00 idle_inject/0
   14 ?        00:00:00 cpuhp/0
   15 ?        00:00:00 cpuhp/1
   16 ?        00:00:00 idle_inject/1
   17 ?        00:00:00 migration/1
   18 ?        00:00:00 ksoftirqd/1
   20 ?        00:00:00 kworker/1:0H-kb
   21 ?        00:00:00 cpuhp/2
   22 ?        00:00:00 idle_inject/2
   23 ?        00:00:00 migration/2
   24 ?        00:00:00 ksoftirqd/2
   26 ?        00:00:00 kworker/2:0H-kb
   27 ?        00:00:00 cpuhp/3
   28 ?        00:00:00 idle_inject/3
   29 ?        00:00:00 migration/3
   30 ?        00:00:00 ksoftirqd/3
   32 ?        00:00:00 kworker/3:0H-kb
   33 ?        00:00:00 kdevtmpfs
   34 ?        00:00:00 netns
   35 ?        00:00:00 rcu_tasks_kthre
   36 ?        00:00:00 kauditd
   37 ?        00:00:00 khungtaskd
   38 ?        00:00:00 oom_reaper
   39 ?        00:00:00 writeback
   40 ?        00:00:00 kcompactd0
```

Pstree:

Pstree command in Unix that shows the running processes as a tree which is a more convenient way to display the processes hierarchy and makes the output more visually appealing.

```
File Edit View Search Terminal Help
lab1003@lab1003-HP-280-G2-MT:~$ pstree
systemd
├── ModemManager─2*[{ModemManager}]
│   └── NetworkManager─dhcpcd
│       └── 2*[{NetworkManager}]
├── accounts-daemon─2*[{accounts-daemon}]
├── acpid
├── avahi-daemon─avahi-daemon
├── boltd─2*[{boltd}]
├── colord─2*[{colord}]
├── cron
├── cups-browsed─2*[{cups-browsed}]
├── cupsd
├── dbus-daemon
├── firefox─4*[{Isolated Web Co─19*[{Isolated Web Co}]]
│   ├── 7*[{Isolated Web Co─18*[{Isolated Web Co}]]
│   ├── Isolated Web Co─23*[{Isolated Web Co}]
│   ├── Isolated Web Co─24*[{Isolated Web Co}]
│   ├── Privileged Cont─18*[{Privileged Cont}]
│   ├── RDD Process─3*[{RDD Process}]
│   ├── Socket Process─4*[{Socket Process}]
│   ├── Utility Process─3*[{Utility Process}]
│   ├── 2*[{Web Content─16*[{Web Content}]]
│   ├── WebExtensions─18*[{WebExtensions}]
│   └── 130*[{firefox}]
├── fwupd─4*[{fwupd}]
├── gdm3
│   ├── gdm-session-wor
│   ├── gdm-wayland-ses
│   ├── gnome-session-b
│   ├── gnome-shell
│   │   ├── Xwayland─12*[{Xwayland}]
│   │   ├── ibus-daemon
│   │   │   ├── ibus-dconf─3*[{ibus-dconf}]
│   │   │   ├── ibus-engine-sin─2*[{ibus-engine-sin}]
│   │   │   └── 2*[{ibus-daemon}]
│   │   └── 20*[{gnome-shell}]
│   ├── gsd-a11y-settin─3*[{gsd-a11y-settin}]
│   ├── gsd-clipboard─6*[{gsd-clipboard}]
│   ├── gsd-color─7*[{gsd-color}]
│   ├── gsd-datetime─2*[{gsd-datetime}]
│   ├── gsd-housekeepin─2*[{gsd-housekeepin}]
│   ├── gsd-keyboard─7*[{gsd-keyboard}]
│   ├── gsd-media-keys─7*[{gsd-media-keys}]
│   └── gsd-mouse─2*[{gsd-mouse}]
```

Pstree -a:

This command now displays command line options for some processes.

```

lab1003@lab1003-HP-280-G2-MT:~$ pstree -a
systemd splash
├── ModemManager --filter-policy=strict
│   └── 2*[{ModemManager}]
├── NetworkManager --no-daemon
│   ├── dhclient -d -q -sf /usr/lib/NetworkManager/nm-dhcp-helper -pf /run/dhclient-ens5s0.pid -lf...
│   └── 2*[{NetworkManager}]
├── accounts-daemon
│   └── 2*[{accounts-daemon}]
├── acpid
├── avahi-daemon
│   └── avahi-daemon
├── boltd
│   └── 2*[{boltd}]
├── colord
│   └── 2*[{colord}]
├── cron -f
├── cups-browsed
│   └── 2*[{cups-browsed}]
├── cupsd -l
├── dbus-daemon --system --address=systemd: --nofork --nopidfile --systemd-activation --syslog-only
└── firefox -new-window
    ├── Isolated Web Co -contentproc -childID 4 -isForBrowser -prefsLen 30158 -prefMapSize 234088 -jsInitLen 238780 -parentBuildID2023052213
    │   └── 19*[{Isolated Web Co}]
    ├── Isolated Web Co -contentproc -childID 5 -isForBrowser -prefsLen 30158 -prefMapSize 234088 -jsInitLen 238780 -parentBuildID2023052213
    │   └── 18*[{Isolated Web Co}]
    ├── Isolated Web Co -contentproc -childID 6 -isForBrowser -prefsLen 30353 -prefMapSize 234088 -jsInitLen 238780 -parentBuildID2023052213
    │   └── 18*[{Isolated Web Co}]
    ├── Isolated Web Co -contentproc -childID 7 -isForBrowser -prefsLen 30353 -prefMapSize 234088 -jsInitLen 238780 -parentBuildID2023052213
    │   └── 26*[{Isolated Web Co}]
    ├── Isolated Web Co -contentproc -childID 8 -isForBrowser -prefsLen 30353 -prefMapSize 234088 -jsInitLen 238780 -parentBuildID2023052213
    │   └── 18*[{Isolated Web Co}]
    ├── Isolated Web Co -contentproc -childID 9 -isForBrowser -prefsLen 30353 -prefMapSize 234088 -jsInitLen 238780 -parentBuildID2023052213
    │   └── 18*[{Isolated Web Co}]
    ├── Isolated Web Co -contentproc -childID 10 -isForBrowser -prefsLen 30353 -prefMapSize 234088 -jsInitLen 238780 -parentBuildID202305221
    │   └── 18*[{Isolated Web Co}]
    └── Isolated Web Co -contentproc -childID 11 -isForBrowser -prefsLen 30353 -prefMapSize 234088 -jsInitLen 238780 -parentBuildID202305221
        └── 18*[{Isolated Web Co}]
  
```

Pstree -p:

To display PIDs for each process name, we use “-p” option.

```

lab1003@lab1003-HP-280-G2-MT:~$ ps aux
systemd(1) -- /usr/lib/systemd/systemd -- /usr/lib/systemd/systemd
--NetworkManager(752) -- /usr/libexec/networkd-dispatcher -- /usr/libexec/networkd-dispatcher
--accounts-daemon(717) -- /usr/libexec/AccountsService -- /usr/libexec/AccountsService
--acpid(640) -- /usr/libexec/acpid -- /usr/libexec/acpid
--avahi-daemon(716) -- /usr/libexec/avahi-daemon -- /usr/libexec/avahi-daemon
--boltd(1252) -- /usr/libexec/boltd -- /usr/libexec/boltd
--colord(1540) -- /usr/libexec/colord -- /usr/libexec/colord
--cron(645) -- /usr/libexec/cron -- /usr/libexec/cron
--cups-browsed(3006) -- /usr/libexec/cups-browsed -- /usr/libexec/cups-browsed
--cupsd(3005) -- /usr/libexec/cupsd -- /usr/libexec/cupsd
--dbus-daemon(472) -- /usr/libexec/dbus-daemon -- /usr/libexec/dbus-daemon
--Firefox(2382) -- /usr/lib/firefox/firefox -- /usr/lib/firefox/firefox
--Isolated Web Co(2554) -- /usr/libexec/Isolated Web Co -- /usr/libexec/Isolated Web Co
--Isolated Web Co(2559) -- /usr/libexec/Isolated Web Co -- /usr/libexec/Isolated Web Co
--Isolated Web Co(2630) -- /usr/libexec/Isolated Web Co -- /usr/libexec/Isolated Web Co

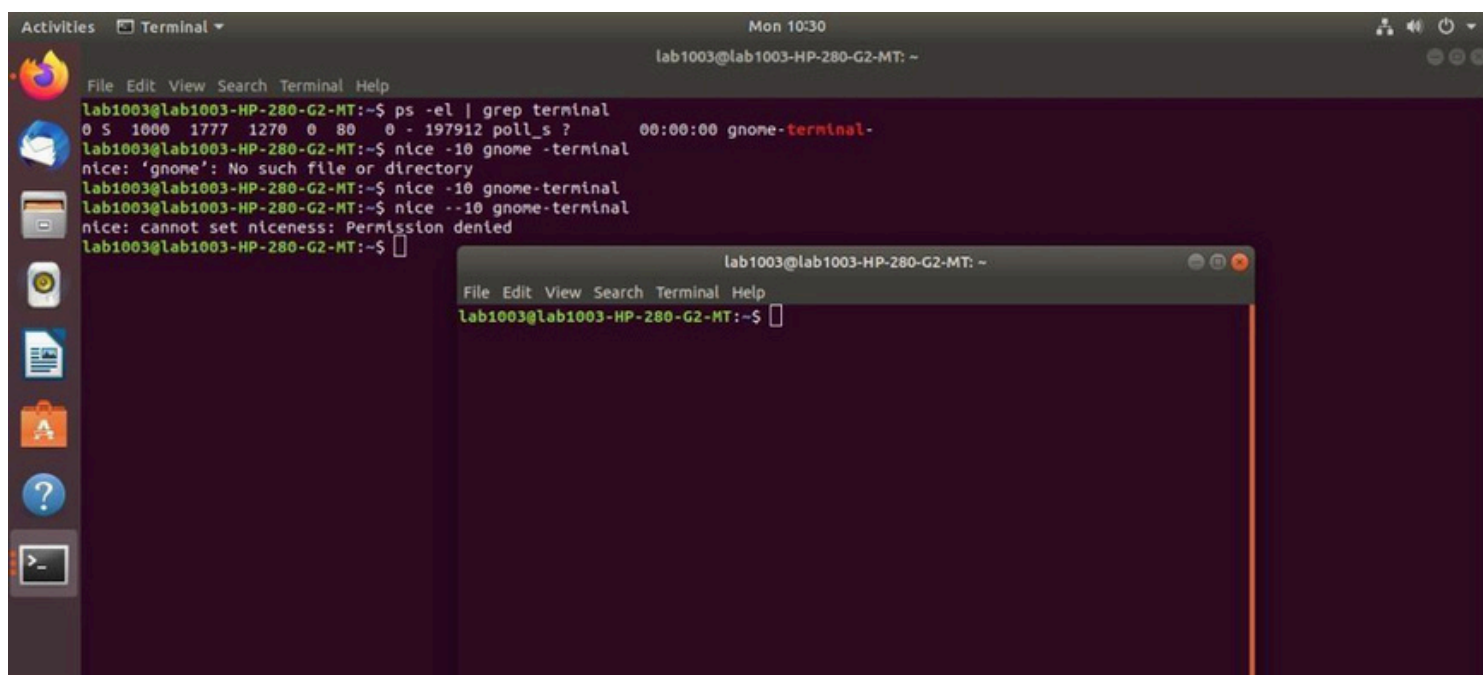
```

Nice:

nice command in Unix helps in execution of a program/process with modified scheduling priority

nice -10 gnome-terminal: To set the priority of a process

nice --10 gnome-terminal: To set the negative priority for a process



```
lab1003@lab1003-HP-280-G2-MT:~$ ps -el | grep terminal
0 S 1000 1777 1270 0 80 0 - 197912 poll_s ? 00:00:00 gnome-terminal-
lab1003@lab1003-HP-280-G2-MT:~$ nice -10 gnome-terminal
nice: 'gnome': No such file or directory
lab1003@lab1003-HP-280-G2-MT:~$ nice -10 gnome-terminal
lab1003@lab1003-HP-280-G2-MT:~$ nice --10 gnome-terminal
nice: cannot set niceness: Permission denied
lab1003@lab1003-HP-280-G2-MT:~$
```

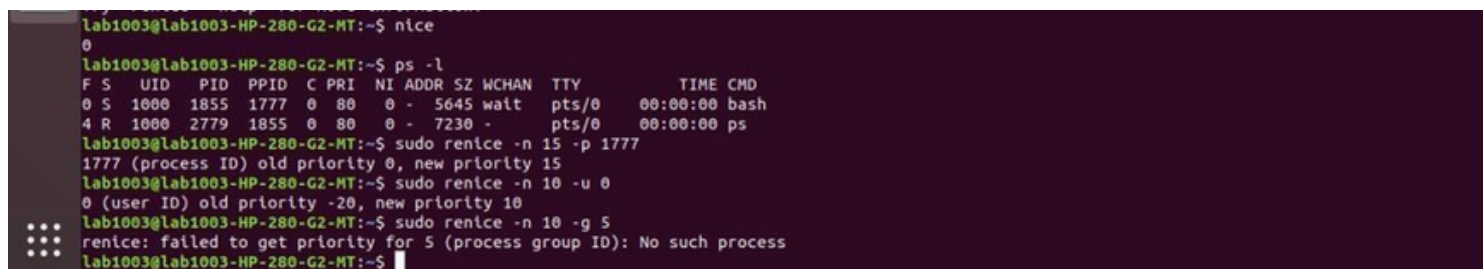
Renice:

the renice command allows you to change and modify the scheduling priority of an already running process.

sudo renice -n 15 -p 1777: changing priority of the running process.

renice -n 10 -g 4: To change the priority of all programs of a specific group. sudo renice -n 10 -u 2:

To change the priority of all programs of a specific user.



```
lab1003@lab1003-HP-280-G2-MT:~$ nice
0
lab1003@lab1003-HP-280-G2-MT:~$ ps -l
F S UID PID PPID C PRI NI ADDR SZ WCHAN TTY TIME CMD
0 S 1000 1855 1777 0 80 0 - 5645 wait pts/0 00:00:00 bash
4 R 1000 2779 1855 0 80 0 - 7230 - pts/0 00:00:00 ps
lab1003@lab1003-HP-280-G2-MT:~$ sudo renice -n 15 -p 1777
1777 (process ID) old priority 0, new priority 15
lab1003@lab1003-HP-280-G2-MT:~$ sudo renice -n 10 -u 0
0 (user ID) old priority -20, new priority 10
lab1003@lab1003-HP-280-G2-MT:~$ sudo renice -n 10 -g 5
renice: failed to get priority for 5 (process group ID): No such process
lab1003@lab1003-HP-280-G2-MT:~$
```


Kill:

Kill is a built-in command which is used to terminate processes manually. kill command sends a signal to a process that terminates the process.

kill number PID: We can specify a signal using a number. For example, we have a PID `1212` and want to send a `SIGKILL` signal to kill this PID.

kill -SIGTERM PID:

We can also specify signal using SIG prefix.

```
File Edit View Search Terminal Help
1596 tty2 00:00:00 gsd-datetime
1601 tty2 00:00:00 gsd-color
1604 tty2 00:00:00 gsd-keyboard
1606 tty2 00:00:00 gsd-housekeepin
1608 tty2 00:00:00 gsd-mouse
1612 tty2 00:00:00 gsd-media-keys
1633 tty2 00:00:00 gsd-printer
1651 tty2 00:00:00 nautilus-deskto
1654 tty2 00:00:00 gsd-disk-utilit
1678 tty2 00:00:00 ibus-engine-sim
1920 tty2 00:06:13 firefox
2016 tty2 00:00:00 Socket Process
2037 tty2 00:00:02 Privileged Cont
2081 tty2 00:00:00 WebExtensions
2265 tty2 00:00:00 sd_espeak-ng
2311 tty2 00:00:00 sd_dummy
2314 tty2 00:00:00 sd_generic
2452 tty2 00:00:00 update-notifier
2495 tty2 00:00:00 deja-dup-monito
2672 tty2 00:00:00 RDD Process
2674 tty2 00:00:00 Utility Process
3166 tty2 00:00:15 Isolated Web Co
3225 tty2 00:00:00 Isolated Web Co
3255 tty2 00:00:02 Isolated Web Co
3285 tty2 00:00:00 Isolated Web Co
3309 tty2 00:00:00 Isolated Web Co
3338 tty2 00:00:00 Isolated Web Co
3341 tty2 00:00:00 Isolated Web Co
3390 tty2 00:00:00 Isolated Web Co
3414 tty2 00:00:00 Isolated Web Co
3439 tty2 00:00:00 Web Content
3442 tty2 00:00:00 Web Content
3445 tty2 00:00:00 Web Content
3509 tty2 00:00:00 gnome-mines
3531 tty2 00:00:00 oosplash
3571 tty2 00:00:02 soffice.bin
3644 pts/0 00:00:00 ps
Lab1003@Lab1003-HP-280-G2-MT:~$ kill -10 3571
```

```
File Edit View Search Terminal Help
1594 tty2 00:00:00 gsd-clipboard
1595 tty2 00:00:00 gsd-a11y-settin
1596 tty2 00:00:00 gsd-datetime
1601 tty2 00:00:00 gsd-color
1604 tty2 00:00:00 gsd-keyboard
1606 tty2 00:00:00 gsd-housekeepin
1608 tty2 00:00:00 gsd-mouse
1612 tty2 00:00:00 gsd-media-keys
1633 tty2 00:00:00 gsd-printer
1651 tty2 00:00:00 nautilus-deskto
1654 tty2 00:00:00 gsd-disk-utilit
1678 tty2 00:00:00 ibus-engine-sim
1920 tty2 00:06:18 firefox
2016 tty2 00:00:00 Socket Process
2037 tty2 00:00:02 Privileged Cont
2081 tty2 00:00:00 WebExtensions
2265 tty2 00:00:00 sd_espeak-ng
2311 tty2 00:00:00 sd_dummy
2314 tty2 00:00:00 sd_generic
2452 tty2 00:00:00 update-notifier
2495 tty2 00:00:00 deja-dup-monito
2672 tty2 00:00:00 RDD Process
2674 tty2 00:00:00 Utility Process
3166 tty2 00:00:21 Isolated Web Co
3225 tty2 00:00:00 Isolated Web Co
3255 tty2 00:00:02 Isolated Web Co
3285 tty2 00:00:00 Isolated Web Co
3309 tty2 00:00:00 Isolated Web Co
3338 tty2 00:00:00 Isolated Web Co
3341 tty2 00:00:00 Isolated Web Co
3390 tty2 00:00:00 Isolated Web Co
3414 tty2 00:00:00 Isolated Web Co
3439 tty2 00:00:00 Web Content
3442 tty2 00:00:00 Web Content
3445 tty2 00:00:00 Web Content
3509 tty2 00:00:00 gnome-mines
3653 pts/0 00:00:00 ps
Lab1003@Lab1003-HP-280-G2-MT:~$
```

```
File Edit View Search Terminal Help
1594 tty2 00:00:00 gsd-clipboard
1595 tty2 00:00:00 gsd-a11y-settin
1596 tty2 00:00:00 gsd-datetime
1601 tty2 00:00:00 gsd-color
1604 tty2 00:00:00 gsd-keyboard
1606 tty2 00:00:00 gsd-housekeepin
1608 tty2 00:00:00 gsd-mouse
1612 tty2 00:00:00 gsd-media-keys
1633 tty2 00:00:00 gsd-printer
1651 tty2 00:00:00 nautilus-deskto
1654 tty2 00:00:00 gsd-disk-utilit
1678 tty2 00:00:00 ibus-engine-sim
1920 tty2 00:06:18 firefox
2016 tty2 00:00:00 Socket Process
2037 tty2 00:00:02 Privileged Cont
2081 tty2 00:00:00 WebExtensions
2265 tty2 00:00:00 sd_espeak-ng
2311 tty2 00:00:00 sd_dummy
2314 tty2 00:00:00 sd_generic
2452 tty2 00:00:00 update-notifier
2495 tty2 00:00:00 deja-dup-monito
2672 tty2 00:00:00 RDD Process
2674 tty2 00:00:00 Utility Process
3166 tty2 00:00:21 Isolated Web Co
3225 tty2 00:00:00 Isolated Web Co
3255 tty2 00:00:02 Isolated Web Co
3285 tty2 00:00:00 Isolated Web Co
3309 tty2 00:00:00 Isolated Web Co
3338 tty2 00:00:00 Isolated Web Co
3341 tty2 00:00:00 Isolated Web Co
3390 tty2 00:00:00 Isolated Web Co
3414 tty2 00:00:00 Isolated Web Co
3439 tty2 00:00:00 Web Content
3442 tty2 00:00:00 Web Content
3445 tty2 00:00:00 Web Content
3509 tty2 00:00:00 gnome-mines
3653 pts/0 00:00:00 ps
Lab1003@Lab1003-HP-280-G2-MT:~$ kill -SIGTERM 3442
```

```
File Edit View Search Terminal Help
1587 tty2 00:00:00 gsd-wacom
1594 tty2 00:00:00 gsd-clipboard
1595 tty2 00:00:00 gsd-a11y-settin
1596 tty2 00:00:00 gsd-datetime
1601 tty2 00:00:00 gsd-color
1604 tty2 00:00:00 gsd-keyboard
1606 tty2 00:00:00 gsd-housekeepin
1608 tty2 00:00:00 gsd-mouse
1612 tty2 00:00:00 gsd-media-keys
1633 tty2 00:00:00 gsd-printer
1651 tty2 00:00:00 nautilus-deskto
1654 tty2 00:00:00 gsd-disk-utilit
1678 tty2 00:00:00 ibus-engine-sim
1920 tty2 00:06:23 firefox
2016 tty2 00:00:00 Socket Process
2037 tty2 00:00:02 Privileged Cont
2081 tty2 00:00:00 WebExtensions
2265 tty2 00:00:00 sd_espeak-ng
2311 tty2 00:00:00 sd_dummy
2314 tty2 00:00:00 sd_generic
2452 tty2 00:00:00 update-notifier
2495 tty2 00:00:00 deja-dup-monito
2672 tty2 00:00:00 RDD Process
2674 tty2 00:00:00 Utility Process
3166 tty2 00:00:26 Isolated Web Co
3225 tty2 00:00:00 Isolated Web Co
3255 tty2 00:00:02 Isolated Web Co
3285 tty2 00:00:00 Isolated Web Co
3309 tty2 00:00:00 Isolated Web Co
3338 tty2 00:00:00 Isolated Web Co
3341 tty2 00:00:00 Isolated Web Co
3390 tty2 00:00:00 Isolated Web Co
3414 tty2 00:00:00 Isolated Web Co
3439 tty2 00:00:00 Web Content
3445 tty2 00:00:00 Web Content
3509 tty2 00:00:00 gnome-mines
3673 pts/0 00:00:00 ps
Lab1003@Lab1003-HP-280-G2-MT:~$
```

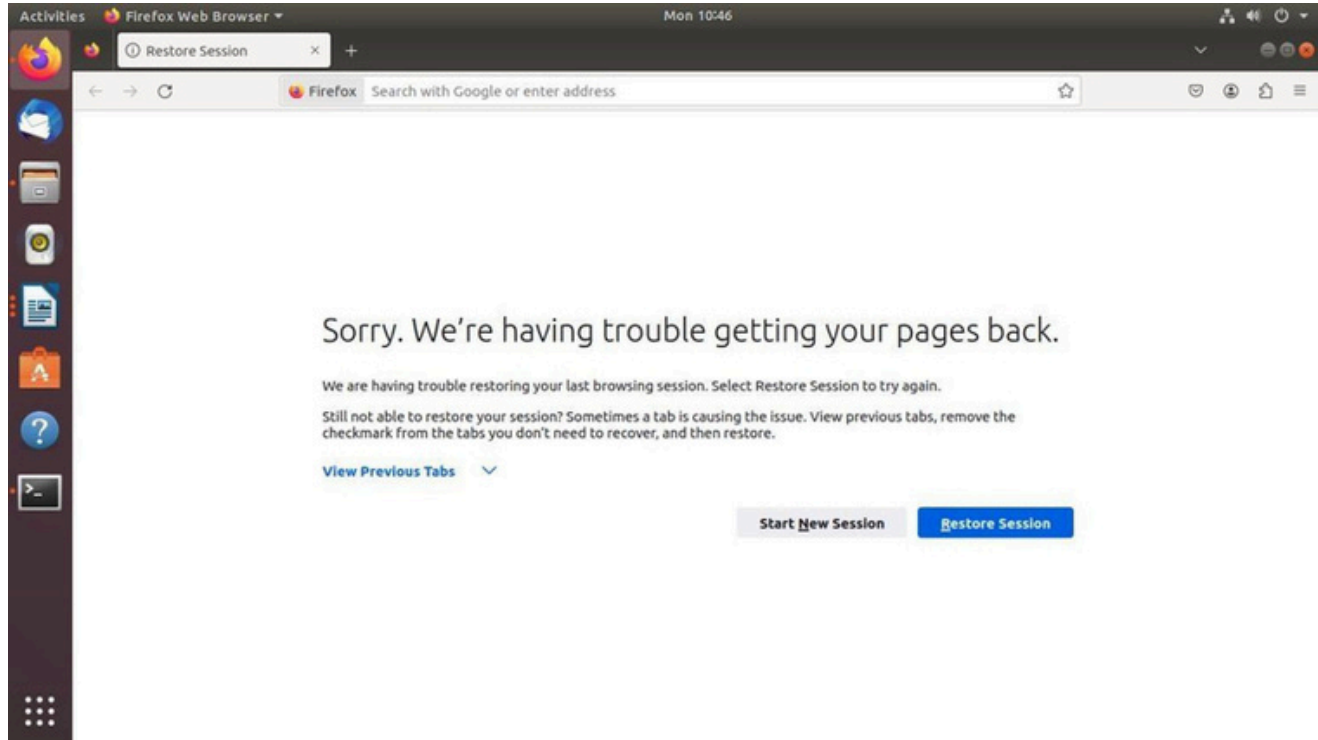
Pkill:

The pkill command uses name of the process instead of PID number. Signal can be send to a process either by typing full name or partial name.

Pkill -n name:

Kills the process name mentioned

```
lab1003@lab1003-HP-280-G2-MT:~$ pkill -15 firefox
lab1003@lab1003-HP-280-G2-MT:~$
```



Xlsclients:

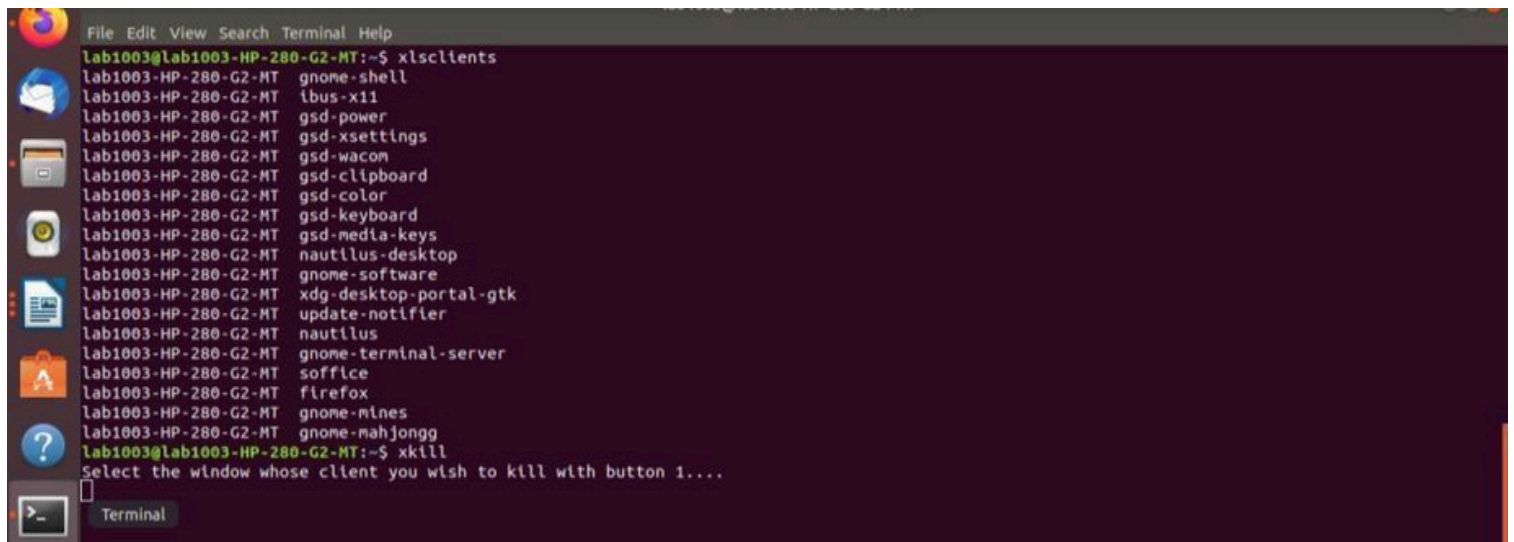
This command will show the list of all open windows with the hostname.

Xkill:

xkill is a command-line utility that can kill the undesired windows on the user's screen. Basically, xkill force the X server to close the connection to the client. This utility kills the programs without providing PID with a command.

For using xkill to kill the open window, just run the xkill command. Then your cursor will turn into an X sign.

Then right-click on the windows which you have to kill.



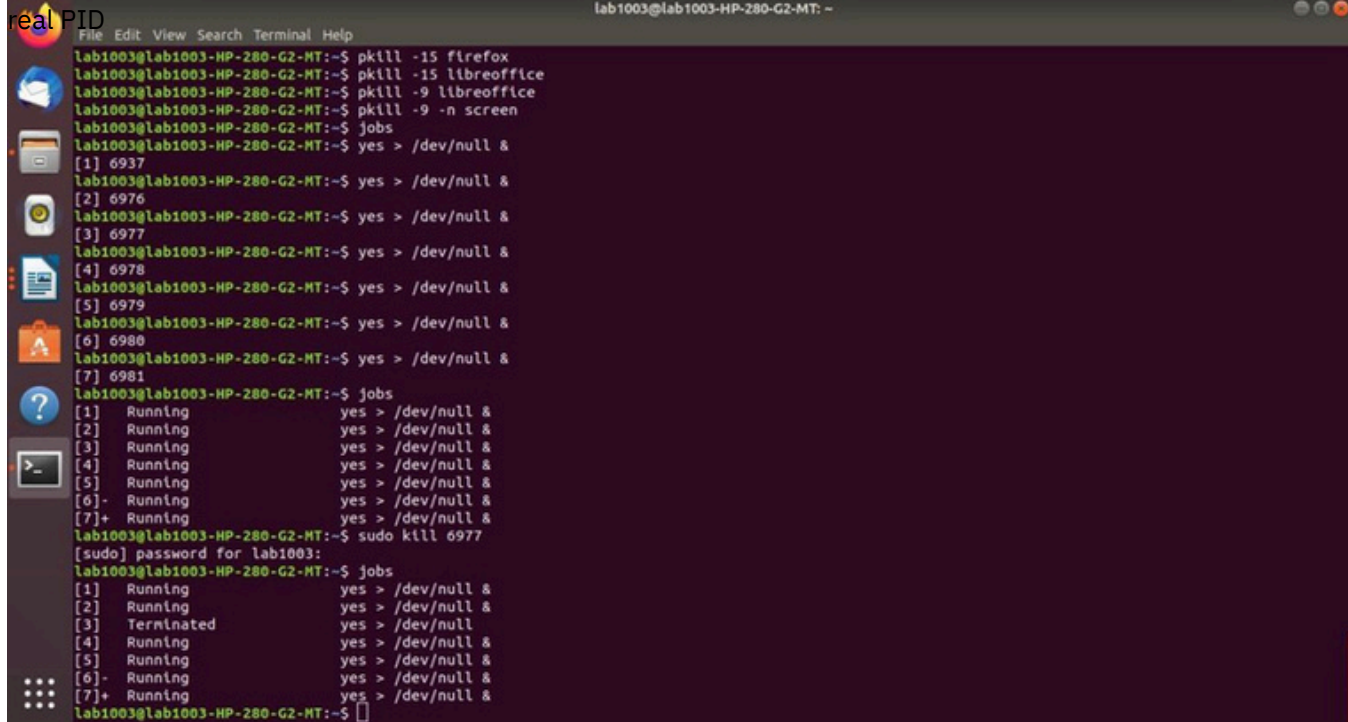
Jobs:

To list all your measures forked from the current shell use “jobs” command

yes > /dev/null & :

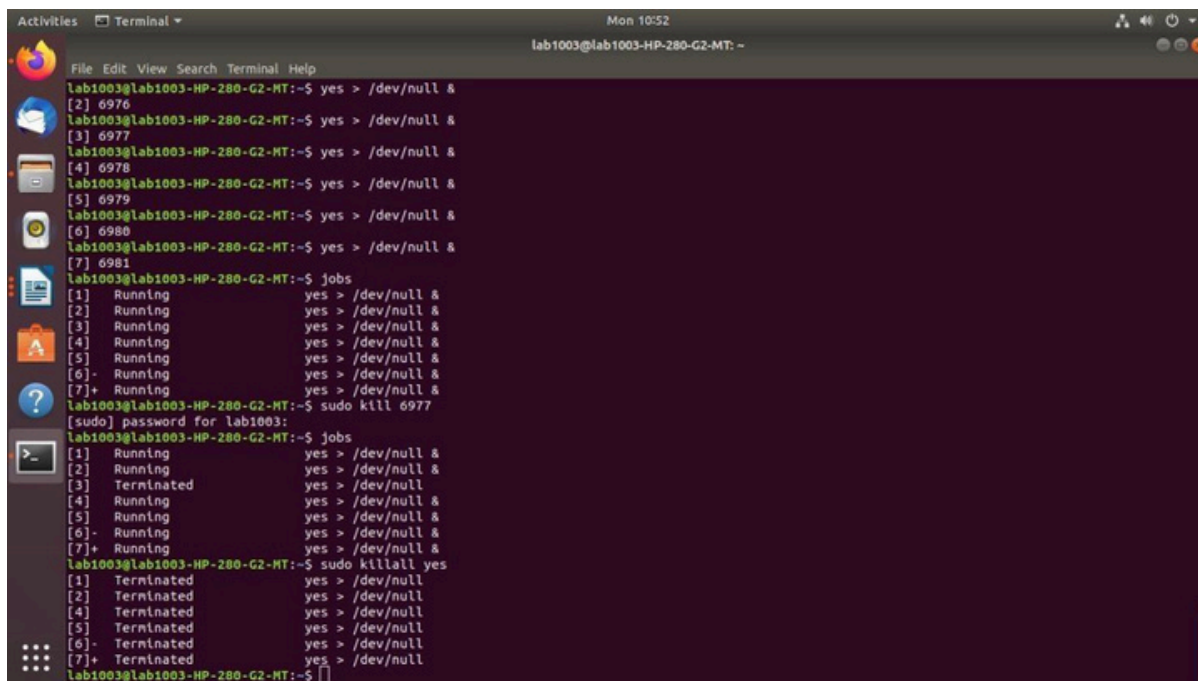
The command will begin the process yes and yield its standard output to/dev/null.

The second line contains the accompanying data “[1]” (work ID) and “16017” the



```
lab1003@lab1003-HP-280-G2-MT:~$ pkill -15 firefox
lab1003@lab1003-HP-280-G2-MT:~$ pkill -15 libreoffice
lab1003@lab1003-HP-280-G2-MT:~$ pkill -9 libreoffice
lab1003@lab1003-HP-280-G2-MT:~$ pkill -9 -n screen
lab1003@lab1003-HP-280-G2-MT:~$ jobs
lab1003@lab1003-HP-280-G2-MT:~$ yes > /dev/null &
[1] 6937
lab1003@lab1003-HP-280-G2-MT:~$ yes > /dev/null &
[2] 6976
lab1003@lab1003-HP-280-G2-MT:~$ yes > /dev/null &
[3] 6977
lab1003@lab1003-HP-280-G2-MT:~$ yes > /dev/null &
[4] 6978
lab1003@lab1003-HP-280-G2-MT:~$ yes > /dev/null &
[5] 6979
lab1003@lab1003-HP-280-G2-MT:~$ yes > /dev/null &
[6] 6980
lab1003@lab1003-HP-280-G2-MT:~$ yes > /dev/null &
[7] 6981
lab1003@lab1003-HP-280-G2-MT:~$ jobs
[1] Running yes > /dev/null &
[2] Running yes > /dev/null &
[3] Running yes > /dev/null &
[4] Running yes > /dev/null &
[5] Running yes > /dev/null &
[6]- Running yes > /dev/null &
[7]+ Running yes > /dev/null &
lab1003@lab1003-HP-280-G2-MT:~$ sudo kill 6977
[sudo] password for lab1003:
lab1003@lab1003-HP-280-G2-MT:~$ jobs
[1] Running yes > /dev/null &
[2] Running yes > /dev/null &
[3] Terminated yes > /dev/null &
[4] Running yes > /dev/null &
[5] Running yes > /dev/null &
[6]- Running yes > /dev/null &
[7]+ Running yes > /dev/null &
```

killall name : Ending each cycle individually can end up being hard and repetitive work. We should see Whether we can get some assistance by utilizing killall order and process cycle name



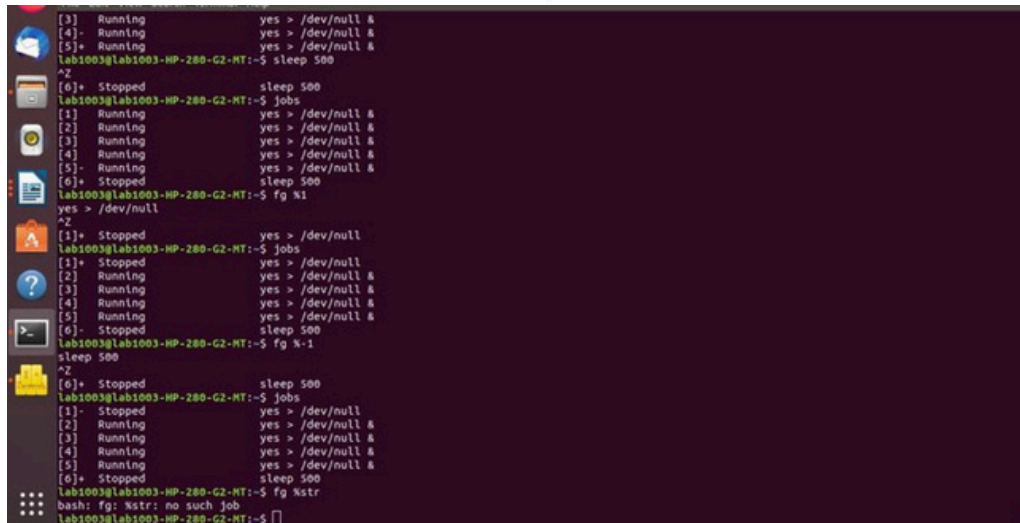
```
lab1003@lab1003-HP-280-G2-MT:~$ yes > /dev/null &
[2] 6976
lab1003@lab1003-HP-280-G2-MT:~$ yes > /dev/null &
[3] 6977
lab1003@lab1003-HP-280-G2-MT:~$ yes > /dev/null &
[4] 6978
lab1003@lab1003-HP-280-G2-MT:~$ yes > /dev/null &
[5] 6979
lab1003@lab1003-HP-280-G2-MT:~$ yes > /dev/null &
[6] 6980
lab1003@lab1003-HP-280-G2-MT:~$ yes > /dev/null &
[7] 6981
lab1003@lab1003-HP-280-G2-MT:~$ jobs
[1] Running yes > /dev/null &
[2] Running yes > /dev/null &
[3] Running yes > /dev/null &
[4] Running yes > /dev/null &
[5] Running yes > /dev/null &
[6]- Running yes > /dev/null &
[7]+ Running yes > /dev/null &
lab1003@lab1003-HP-280-G2-MT:~$ sudo kill 6977
[sudo] password for lab1003:
lab1003@lab1003-HP-280-G2-MT:~$ jobs
[1] Running yes > /dev/null &
[2] Running yes > /dev/null &
[3] Terminated yes > /dev/null &
[4] Running yes > /dev/null &
[5] Running yes > /dev/null &
[6]- Running yes > /dev/null &
[7]+ Running yes > /dev/null &
lab1003@lab1003-HP-280-G2-MT:~$ sudo killall yes
[1] Terminated yes > /dev/null &
[2] Terminated yes > /dev/null &
[3] Terminated yes > /dev/null &
[4] Terminated yes > /dev/null &
[5] Terminated yes > /dev/null &
[6]- Terminated yes > /dev/null &
[7]+ Terminated yes > /dev/null &
```

Fg: fg command in unix used to put a background job in foreground.

%n : Refer to job number n.

%str : Refer to a job which was started by a command beginning with str.

`fg -help` : It displays help information



```
[3] Running          yes > /dev/null &
[4] Running          yes > /dev/null &
[5] Running          yes > /dev/null &
lab1003@lab1003-HP-280-G2-MT:~$ sleep 500
^Z
[6]+ Stopped         sleep 500
lab1003@lab1003-HP-280-G2-MT:~$ jobs
[1] Running          yes > /dev/null &
[2] Running          yes > /dev/null &
[3] Running          yes > /dev/null &
[4] Running          yes > /dev/null &
[5] Running          yes > /dev/null &
[6]+ Stopped         sleep 500
lab1003@lab1003-HP-280-G2-MT:~$ fg %1
yes > /dev/null
^Z
[1]+ Stopped         yes > /dev/null
lab1003@lab1003-HP-280-G2-MT:~$ jobs
[1]+ Stopped         yes > /dev/null
[2] Running          yes > /dev/null &
[3] Running          yes > /dev/null &
[4] Running          yes > /dev/null &
[5] Running          yes > /dev/null &
[6]+ Stopped         sleep 500
lab1003@lab1003-HP-280-G2-MT:~$ fg %1
sleep 500
^Z
[6]+ Stopped         sleep 500
lab1003@lab1003-HP-280-G2-MT:~$ jobs
[1]+ Stopped         yes > /dev/null
[2] Running          yes > /dev/null &
[3] Running          yes > /dev/null &
[4] Running          yes > /dev/null &
[5] Running          yes > /dev/null &
[6]+ Stopped         sleep 500
lab1003@lab1003-HP-280-G2-MT:~$ fg %str
bash: fg: %str: no such job
lab1003@lab1003-HP-280-G2-MT:~$
```

Bg: The 'bg' command is primarily used when you wish to run a job/process in the background after it has been stopped or paused.

%n : Refer to job number n.

%str : Refer to a job which was started by a command beginning with str.

Pgrep: The pgrep command is a tool that searches for processes based on their name and other attributes, and returns their PIDs.

Pgrep ssh: If there are running processes with names matching "ssh", their PIDs will be displayed on the screen. If no matches are found, the output is empty. `pgrep ssh -d '` : The option allows you to specify a different delimiter.

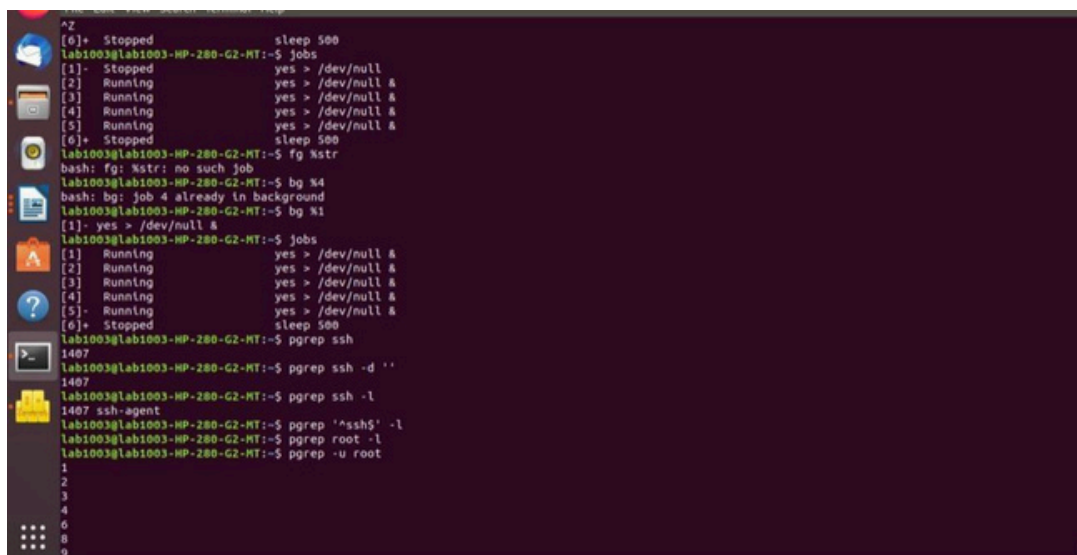
- pgrep

`pgrep ssh -l`: The option tells to show the process name along with its ID

`pgrep '^ssh$' -l`: If you want to match only the processes which names are exactly as the search pattern, you would use this command.

-u pgrep

`pgrep -u root`: the option to tell to display processes being run by a given user



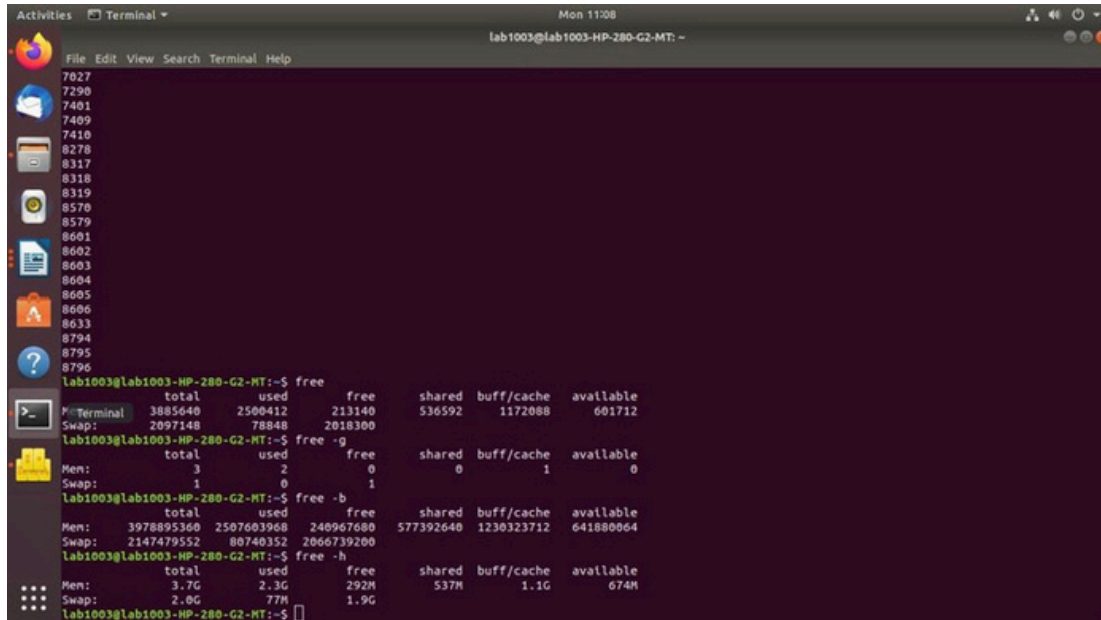
```
lab1003@lab1003-HP-280-G2-MT:~$ jobs
[1]+ Stopped         sleep 500
lab1003@lab1003-HP-280-G2-MT:~$ jobs
[1]+ Stopped         yes > /dev/null
[2] Running          yes > /dev/null &
[3] Running          yes > /dev/null &
[4] Running          yes > /dev/null &
[5] Running          yes > /dev/null &
[6]+ Stopped         sleep 500
lab1003@lab1003-HP-280-G2-MT:~$ fg %str
bash: fg: %str: no such job
lab1003@lab1003-HP-280-G2-MT:~$ fg %4
bash: fg: job 4 already in background
lab1003@lab1003-HP-280-G2-MT:~$ fg %1
[1]+ yes > /dev/null &
lab1003@lab1003-HP-280-G2-MT:~$ jobs
[1] Running          yes > /dev/null &
[2] Running          yes > /dev/null &
[3] Running          yes > /dev/null &
[4] Running          yes > /dev/null &
[5] Running          yes > /dev/null &
[6]+ Stopped         sleep 500
lab1003@lab1003-HP-280-G2-MT:~$ pgrep ssh
1407
lab1003@lab1003-HP-280-G2-MT:~$ pgrep ssh -d ''
1407
lab1003@lab1003-HP-280-G2-MT:~$ pgrep ssh -l
1407 ssh-agent
lab1003@lab1003-HP-280-G2-MT:~$ pgrep '^ssh$' -l
lab1003@lab1003-HP-280-G2-MT:~$ pgrep root -l
lab1003@lab1003-HP-280-G2-MT:~$ pgrep -u root
1
2
3
4
6
8
9
```


MEMORY MANAGEMENT :

Free: The free command is a Unix command that allows you to check for memory RAM on your system or to check the memory statics of the Unix operating system.

Free -g: It displays the amount of memory in gigabytes. Free -b: It displays the memory in bytes.

Free -h: It shows all output columns automatically scaled to shortest three digit unit and display the units also of print out.



```
lab1003@lab1003-HP-280-G2-MT: ~$ free
              total        used        free      shared  buff/cache   available
Mem:           3885640      2500412      2131140         536592      1172088      601712
Swap:          2097148           78848       2018300

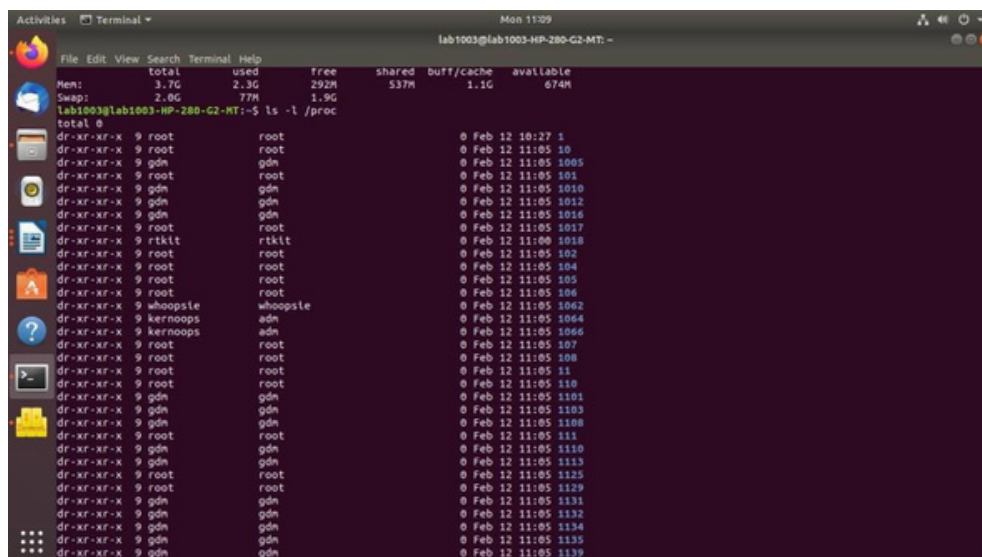
lab1003@lab1003-HP-280-G2-MT: ~$ free -g
              total        used        free      shared  buff/cache   available
Mem:              3           2           0           0           1           0
Swap:             1           0           1

lab1003@lab1003-HP-280-G2-MT: ~$ free -b
              total        used        free      shared  buff/cache   available
Mem:    3978895360    2507603968    240967680    577392640    1230323712    641880064
Swap:   2147479552     80740352    2066739200

lab1003@lab1003-HP-280-G2-MT: ~$ free -h
              total        used        free      shared  buff/cache   available
Mem:           3.7G         2.3G         292M         537M         1.1G         674M
Swap:          2.0G          77M         1.9G
```

Proc: Proc file system (procfs) is a virtual file system created on the fly when the system boots and is dissolved at the time of system shutdown.

ls -l /proc : This command will list all the files and directories under the `/proc` directory with detailed information like permissions, ownership, size, and time of modifications. ls -ltr /proc/6311: gives information about the process with PID 6311.



```
lab1003@lab1003-HP-280-G2-MT: ~$ ls -l /proc
total 0
dr-xr-xr-x  9 root      root           0 Feb 12 10:27 1
dr-xr-xr-x  9 root      root           0 Feb 12 11:05 10
dr-xr-xr-x  9 gdm      gdm           0 Feb 12 11:05 1005
dr-xr-xr-x  9 root      root           0 Feb 12 11:05 101
dr-xr-xr-x  9 gdm      gdm           0 Feb 12 11:05 1010
dr-xr-xr-x  9 gdm      gdm           0 Feb 12 11:05 1012
dr-xr-xr-x  9 gdm      gdm           0 Feb 12 11:05 1016
dr-xr-xr-x  9 root      root           0 Feb 12 11:05 1017
dr-xr-xr-x  9 rtkit     rtkit         0 Feb 12 11:00 1018
dr-xr-xr-x  9 root      root           0 Feb 12 11:05 102
dr-xr-xr-x  9 root      root           0 Feb 12 11:05 104
dr-xr-xr-x  9 root      root           0 Feb 12 11:05 105
dr-xr-xr-x  9 root      root           0 Feb 12 11:05 106
dr-xr-xr-x  9 whoopsie whoopsie      0 Feb 12 11:05 1062
dr-xr-xr-x  9 kernoops  adm           0 Feb 12 11:05 1064
dr-xr-xr-x  9 kernoops  adm           0 Feb 12 11:05 1066
dr-xr-xr-x  9 root      root           0 Feb 12 11:05 107
dr-xr-xr-x  9 root      root           0 Feb 12 11:05 108
dr-xr-xr-x  9 root      root           0 Feb 12 11:05 11
dr-xr-xr-x  9 root      root           0 Feb 12 11:05 110
dr-xr-xr-x  9 gdm      gdm           0 Feb 12 11:05 1101
dr-xr-xr-x  9 gdm      gdm           0 Feb 12 11:05 1103
dr-xr-xr-x  9 gdm      gdm           0 Feb 12 11:05 1108
dr-xr-xr-x  9 root      root           0 Feb 12 11:05 111
dr-xr-xr-x  9 gdm      gdm           0 Feb 12 11:05 1110
dr-xr-xr-x  9 gdm      gdm           0 Feb 12 11:05 1113
dr-xr-xr-x  9 root      root           0 Feb 12 11:05 1125
dr-xr-xr-x  9 root      root           0 Feb 12 11:05 1129
dr-xr-xr-x  9 gdm      gdm           0 Feb 12 11:05 1131
dr-xr-xr-x  9 gdm      gdm           0 Feb 12 11:05 1132
dr-xr-xr-x  9 gdm      gdm           0 Feb 12 11:05 1134
dr-xr-xr-x  9 gdm      gdm           0 Feb 12 11:05 1135
dr-xr-xr-x  9 gdm      gdm           0 Feb 12 11:05 1139
```

```

les Terminal
File Edit View Search Terminal Help
lab1003@lab1003-HP-280-G2-MT:~$ ls -ltr /proc/6311
total 0
-rw-r--r-- 1 lab1003 lab1003 0 Feb 12 11:00 oom_score_adj
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:05 status
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:05 cmdline
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 stat
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 wchan
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 uid_map
-rw-rw-rw- 1 lab1003 lab1003 0 Feb 12 11:10 timerslack_ns
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 timers
dr-xr-xr-x 21 lab1003 lab1003 0 Feb 12 11:10 task
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 sysctl
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 statm
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 staps
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 snaps_rollup
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 snaps
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 setgroups
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 sessionid
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 schedstat
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 sched
lrwxrwxrwx 1 lab1003 lab1003 0 Feb 12 11:10 root -> /proc/6312/fdinfo
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 projid_map
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 personality
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 patch_state
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 pagemap
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 oom_score
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 oom_adj
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 numa_maps
dr-xr-xr-x 2 lab1003 lab1003 0 Feb 12 11:10 ns
dr-xr-xr-x 53 lab1003 lab1003 0 Feb 12 11:10 net
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 mountstats
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 mounts
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 mountinfo
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 mem
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 map_files
dr-xr-xr-x 2 lab1003 lab1003 0 Feb 12 11:10 loginuid
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 limits
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 io
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 gid_map
dr-xr-xr-x 2 lab1003 lab1003 0 Feb 12 11:10 fdinfo
lrwxrwxrwx 1 lab1003 lab1003 0 Feb 12 11:10 exe -> /usr/lib/firefox/firefox
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 environ
lrwxrwxrwx 1 lab1003 lab1003 0 Feb 12 11:10 cwd -> /proc/6312/fdinfo
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 cpuset
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 coredump_filter
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 comm
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 clear_refs
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 cgroup
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 auxv
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 autogroup
dr-xr-xr-x 2 lab1003 lab1003 0 Feb 12 11:10 attr
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 arch_status
lab1003@lab1003-HP-280-G2-MT:~$ ls -ltr /proc/4011/status
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:05 /proc/4011/status
lab1003@lab1003-HP-280-G2-MT:~$ ls -ltr /proc/4011/statm
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:11 /proc/4011/statm
lab1003@lab1003-HP-280-G2-MT:~$ cat /proc/meminfo
MemTotal: 3885640 kB
MemFree: 299988 kB
MemAvailable: 781836 kB
Buffers: 41392 kB
Cached: 1089664 kB
SwapCached: 1832 kB
Active: 2377780 kB
Inactive: 834928 kB
Active(anon): 2071836 kB
Inactive(anon): 570736 kB
Active(file): 305944 kB
Inactive(file): 264192 kB
Unevictable: 79484 kB
Mlocked: 16 kB
SwapTotal: 2097148 kB
SwapFree: 2018300 kB
Dirty: 176 kB
Writeback: 0 kB
AnonPages: 2160564 kB
Mapped: 378184 kB
Shmem: 561120 kB
KReclaimable: 76828 kB
Slab: 160576 kB
SReclaimable: 76828 kB
SUnreclaim: 83748 kB
KernelStacks: 18680 kB
PageTables: 63572 kB
NFS_Unstable: 0 kB
Bounce: 0 kB
WritebackTmp: 0 kB
CommitLimit: 4019968 kB
Committed_AS: 8270132 kB
VmallocTotal: 34359738367 kB
VmallocUsed: 33668 kB
VmallocChunk: 0 kB
Percpu: 1872 kB
HardwareCorrupted: 0 kB
AnonHugePages: 0 kB
ShmemHugePages: 0 kB
ShmemHugePss: 0 kB

```

/status: To View The status of the process
 /statm: To View The memory usage of the process

Meminfo: Displays the memory information.
 cat/proc/meminfo: to determine how much memory the computer has.

```

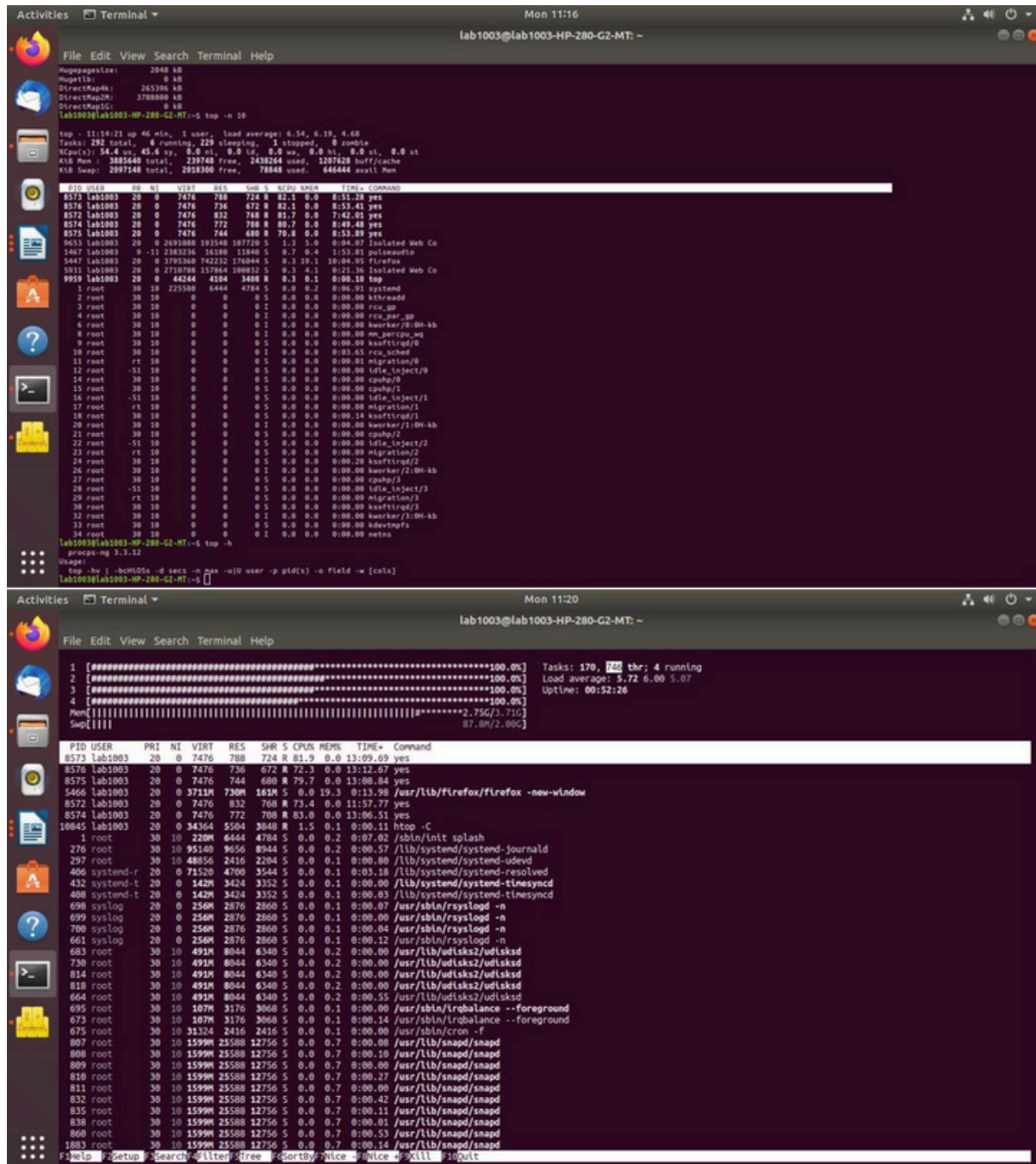
es Terminal
File Edit View Search Terminal Help
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 arch_status
lab1003@lab1003-HP-280-G2-MT:~$ ls -ltr /proc/4011/status
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:05 /proc/4011/status
lab1003@lab1003-HP-280-G2-MT:~$ ls -ltr /proc/4011/statm
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:11 /proc/4011/statm
lab1003@lab1003-HP-280-G2-MT:~$ cat /proc/meminfo
MemTotal: 3885640 kB
MemFree: 299988 kB
MemAvailable: 781836 kB
Buffers: 41392 kB
Cached: 1089664 kB
SwapCached: 1832 kB
Active: 2377780 kB
Inactive: 834928 kB
Active(anon): 2071836 kB
Inactive(anon): 570736 kB
Active(file): 305944 kB
Inactive(file): 264192 kB
Unevictable: 79484 kB
Mlocked: 16 kB
SwapTotal: 2097148 kB
SwapFree: 2018300 kB
Dirty: 176 kB
Writeback: 0 kB
AnonPages: 2160564 kB
Mapped: 378184 kB
Shmem: 561120 kB
KReclaimable: 76828 kB
Slab: 160576 kB
SReclaimable: 76828 kB
SUnreclaim: 83748 kB
KernelStacks: 18680 kB
PageTables: 63572 kB
NFS_Unstable: 0 kB
Bounce: 0 kB
WritebackTmp: 0 kB
CommitLimit: 4019968 kB
Committed_AS: 8270132 kB
VmallocTotal: 34359738367 kB
VmallocUsed: 33668 kB
VmallocChunk: 0 kB
Percpu: 1872 kB
HardwareCorrupted: 0 kB
AnonHugePages: 0 kB
ShmemHugePages: 0 kB
ShmemHugePss: 0 kB

```

Top: The top command is used to show the active Unix processes. It provides a dynamic real-time view of the running system.

Top -n 10: Top output keep refreshing until you press 'q'. Top command will automatically exit after 10 number of repetition.

Top -h: Shows top command syntax



```
Mon 11:16
lab1003@lab1003-HP-280-G2-MT: ~
File Edit View Search Terminal Help
Hugoboss@lab1003: 2048 kb
Hugoboss@lab1003: 0 kb
DirectMapK: 265396 kb
DirectMapM: 378880 kb
DirectMapS: 0 kb
lab1003@lab1003-HP-280-G2-MT: ~$ top -n 10

top - 11:14:21 up 46 min, 1 user, load average: 6.54, 6.19, 4.48
Tasks: 292 total, 0 running, 229 sleeping, 1 stopped, 0 zombie
Cmefr: 34.4 ms, 45.4 ms, 0.0 ms, 0.0 ms, 0.0 ms, 0.0 ms, 0.0 ms, 0.0 ms
Kib Mem: 3885640 total, 239748 free, 2438264 used, 1207628 buff/cache
Kib Swap: 2097148 total, 2083300 free, 78848 used, 646444 avail Mem

  PID USER      PRI  NI  VIRT   RES   SHR  S  CPU% MEM%   TIME+  COMMAND
 5573 lab1003    20   0  7476   788   724  R   82.1  0.0   0:51.28 yes
 8576 lab1003    20   0  7476   736   672  R   82.1  0.0   0:53.41 yes
 8572 lab1003    20   0  7476   832   768  R   81.7  0.0   7:42.01 yes
 8574 lab1003    20   0  7476   772   708  R   80.7  0.0   8:49.48 yes
 8575 lab1003    20   0  7476   744   680  R   79.8  0.0   1:53.89 yes
 9453 lab1003    20   0 2691088 193548 187720  S   1.3  5.0   0:04.07 Isolated Web Co
1467 lab1003    9-11 2383236 16380 13840  S   0.7  0.4   1:53.81 pulseaudio
5467 lab1003    20   0 3795368 742232 176844  S   0.3 10.1  20:04.05 Firefox
10045 lab1003    20   0 2710708 157864 100832  S   0.3 4.1   0:21.36 Isolated Web Co
 9959 lab1003    20   0  44244   4184  3408  R   0.3  0.1   0:00.10 top
   1 root        30  10 235088 6444 4784  S   0.0  0.2   0:06.91 systemd
   2 root        30  10 0 0 0  S   0.0  0.0   0:00.00 kthreadd
   3 root        30  10 0 0 0  S   0.0  0.0   0:00.00 rcu_gp
   4 root        30  10 0 0 0  S   0.0  0.0   0:00.00 rcu_gpd
   5 root        30  10 0 0 0  S   0.0  0.0   0:00.00 kworker/0:0H-kb
   6 root        30  10 0 0 0  S   0.0  0.0   0:00.00 mm_percpu_wq
   7 root        30  10 0 0 0  S   0.0  0.0   0:00.00 ksoftirqd/0
   8 root        30  10 0 0 0  S   0.0  0.0   0:00.00 kworker/0:0H-kb
   9 root        30  10 0 0 0  S   0.0  0.0   0:03.65 rcu_sched
  10 root        30  10 0 0 0  S   0.0  0.0   0:00.01 migration/0
  11 root        30  10 0 0 0  S   0.0  0.0   0:00.00 ksoftirqd/1
  12 root        30  10 0 0 0  S   0.0  0.0   0:00.00 idle_inject/0
  13 root        30  10 0 0 0  S   0.0  0.0   0:00.00 cpupd/0
  14 root        30  10 0 0 0  S   0.0  0.0   0:00.00 cpupd/1
  15 root        30  10 0 0 0  S   0.0  0.0   0:00.00 idle_inject/1
  16 root        30  10 0 0 0  S   0.0  0.0   0:00.00 migration/1
  17 root        30  10 0 0 0  S   0.0  0.0   0:00.14 ksoftirqd/1
  18 root        30  10 0 0 0  S   0.0  0.0   0:00.00 kworker/1:0H-kb
  19 root        30  10 0 0 0  S   0.0  0.0   0:00.00 cpupd/2
  20 root        30  10 0 0 0  S   0.0  0.0   0:00.00 idle_inject/2
  21 root        30  10 0 0 0  S   0.0  0.0   0:00.00 migration/2
  22 root        30  10 0 0 0  S   0.0  0.0   0:00.20 ksoftirqd/2
  23 root        30  10 0 0 0  S   0.0  0.0   0:00.00 kworker/2:0H-kb
  24 root        30  10 0 0 0  S   0.0  0.0   0:00.00 cpupd/3
  25 root        30  10 0 0 0  S   0.0  0.0   0:00.00 idle_inject/3
  26 root        30  10 0 0 0  S   0.0  0.0   0:00.00 migration/3
  27 root        30  10 0 0 0  S   0.0  0.0   0:00.00 ksoftirqd/3
  28 root        30  10 0 0 0  S   0.0  0.0   0:00.00 kworker/3:0H-kb
  29 root        30  10 0 0 0  S   0.0  0.0   0:00.00 ksoftirqd/4
  30 root        30  10 0 0 0  S   0.0  0.0   0:00.00 kworker/4:0H-kb
  31 root        30  10 0 0 0  S   0.0  0.0   0:00.00 ksoftirqd/5
  32 root        30  10 0 0 0  S   0.0  0.0   0:00.00 kworker/5:0H-kb
  33 root        30  10 0 0 0  S   0.0  0.0   0:00.00 ksoftirqd/6
  34 root        30  10 0 0 0  S   0.0  0.0   0:00.00 kworker/6:0H-kb
lab1003@lab1003-HP-280-G2-MT: ~$ top -h
Usage:
  top -b [-b] [-d secs] [-n max] [-u user] [-p pid(s)] [-o field] [-w [cols]]
lab1003@lab1003-HP-280-G2-MT: ~$

Mon 11:20
lab1003@lab1003-HP-280-G2-MT: ~
File Edit View Search Terminal Help
1 [*****100.0%] Tasks: 170, 74 thr; 4 running
2 [*****100.0%] Load average: 5.72 6.00 5.07
3 [*****100.0%] Uptime: 00:52:26
4 [*****100.0%]
Mem[*****]
Swap[*****]

  PID USER      PRI  NI  VIRT   RES   SHR  S  CPU% MEM%   TIME+  COMMAND
 8573 lab1003    20   0  7476   788   724  R   81.9  0.0  13:09.69 yes
 8576 lab1003    20   0  7476   736   672  R   82.3  0.0  13:12.07 yes
 8575 lab1003    20   0  7476   744   680  R   79.7  0.0  13:08.84 yes
 5466 lab1003    20   0 37111M  730M  163M  S   0.0 19.3  0:13.98 /usr/lib/firefox/firefox -new-window
 8572 lab1003    20   0  7476   832   768  R   73.4  0.0 11:57.77 yes
 8574 lab1003    20   0  7476   772   708  R   83.0  0.0 13:06.51 yes
10045 lab1003    20   0 34364 5504 3648  R   1.5  0.1  0:00.11 http -C
   1 root        30  10 220M 6444 4784  S   0.0  0.2  0:07.02 /sbin/init splash
 276 root        30  10 95140 9656 8944  S   0.0  0.2  0:00.57 /lib/systemd/systemd-journald
 297 root        30  10 48856 2416 2204  S   0.0  0.1  0:00.80 /lib/systemd/systemd-udev
 406 systemd-r  20   0 71520 4700 3544  S   0.0  0.1  0:03.18 /lib/systemd/systemd-resolved
 432 systemd-t  20   0 142M 3424 3352  S   0.0  0.1  0:00.00 /lib/systemd/systemd-timesyncd
 408 systemd-t  20   0 142M 3424 3352  S   0.0  0.1  0:00.03 /lib/systemd/systemd-timesyncd
 698 syslog     20   0 256M 2876 2868  S   0.0  0.1  0:00.07 /usr/sbin/rsyslogd -n
 699 syslog     20   0 256M 2876 2868  S   0.0  0.1  0:00.00 /usr/sbin/rsyslogd -n
 700 syslog     20   0 256M 2876 2868  S   0.0  0.1  0:00.04 /usr/sbin/rsyslogd -n
 661 syslog     20   0 256M 2876 2868  S   0.0  0.1  0:00.12 /usr/sbin/rsyslogd -n
 603 root        30  10 491M 8044 6340  S   0.0  0.2  0:00.00 /usr/lib/udisks2/udisksd
 730 root        30  10 491M 8044 6340  S   0.0  0.2  0:00.00 /usr/lib/udisks2/udisksd
 814 root        30  10 491M 8044 6340  S   0.0  0.2  0:00.00 /usr/lib/udisks2/udisksd
 818 root        30  10 491M 8044 6340  S   0.0  0.2  0:00.00 /usr/lib/udisks2/udisksd
 664 root        30  10 491M 8044 6340  S   0.0  0.2  0:00.55 /usr/lib/udisks2/udisksd
 695 root        30  10 107M 3176 3068  S   0.0  0.1  0:00.00 /usr/sbin/lrqlbalance --foreground
 673 root        30  10 107M 3176 3068  S   0.0  0.1  0:00.14 /usr/sbin/lrqlbalance --foreground
 675 root        30  10 31324 2416 2416  S   0.0  0.1  0:00.00 /usr/sbin/cron -f
 807 root        30  10 1599M 25588 12756 S   0.0  0.7  0:00.08 /usr/lib/swapd/swapd
 808 root        30  10 1599M 25588 12756 S   0.0  0.7  0:00.10 /usr/lib/swapd/swapd
 809 root        30  10 1599M 25588 12756 S   0.0  0.7  0:00.00 /usr/lib/swapd/swapd
 810 root        30  10 1599M 25588 12756 S   0.0  0.7  0:00.27 /usr/lib/swapd/swapd
 811 root        30  10 1599M 25588 12756 S   0.0  0.7  0:00.00 /usr/lib/swapd/swapd
 832 root        30  10 1599M 25588 12756 S   0.0  0.7  0:00.42 /usr/lib/swapd/swapd
 835 root        30  10 1599M 25588 12756 S   0.0  0.7  0:00.11 /usr/lib/swapd/swapd
 838 root        30  10 1599M 25588 12756 S   0.0  0.7  0:00.01 /usr/lib/swapd/swapd
 808 root        30  10 1599M 25588 12756 S   0.0  0.7  0:00.53 /usr/lib/swapd/swapd
1803 root        30  10 1599M 25588 12756 S   0.0  0.7  0:00.14 /usr/lib/swapd/swapd
```


Htop: htop is a useful command-line tool in the Unix environment to determine the cause of load by each process.

Htop -h: Used to display the help message and exit. Htop -c: Start htop in monochrome mode.

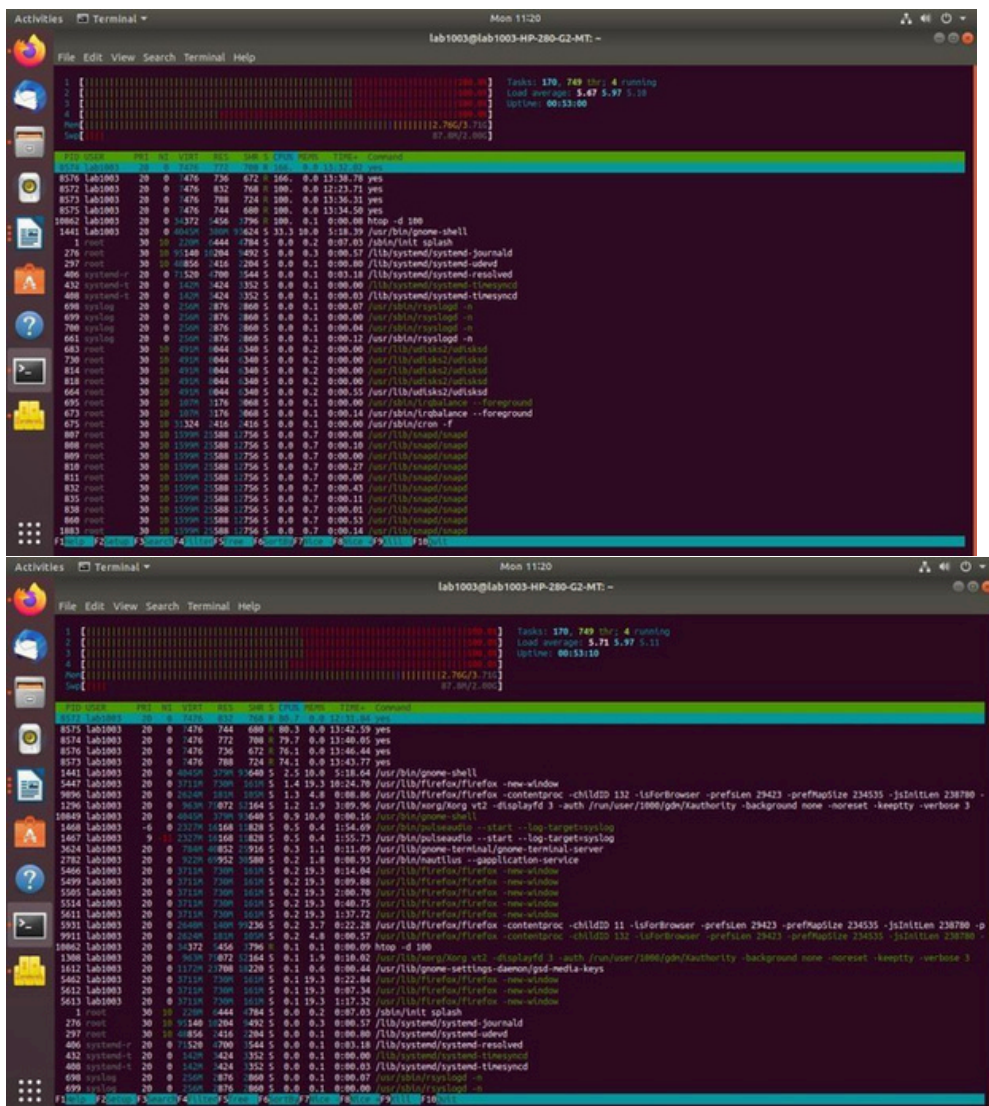
```
Lab1003@lab1003-HP-280-G2-MT:~$ sudo apt install htop
Reading package lists... Done
Building dependency tree
Reading state information... Done
htop is already the newest version (2.1.0-3).
0 upgraded, 0 newly installed, 0 to remove and 55 not upgraded.
Lab1003@lab1003-HP-280-G2-MT:~$ htop -v
htop 2.1.0 - (C) 2004-2018 Hisham Muhammad
Released under the GNU GPL.

Lab1003@lab1003-HP-280-G2-MT:~$ htop -d
htop: option requires an argument -- 'd'
Lab1003@lab1003-HP-280-G2-MT:~$ htop -h
htop 2.1.0 - (C) 2004-2018 Hisham Muhammad
Released under the GNU GPL.

-C --no-color          Use a monochrome color scheme
-d --delay=DELAY       Set the delay between updates, in tenths of seconds
-h --help              Print this help screen
-s --sort=KEYCOLUMN    Sort by COLUMN (try --sort-key=help for a list)
-u --user=USERNAME     Show only processes of a given user
-p --pid=PID[,PID,PID...] Show only the given PIDs
-v --version           Print version info

Long options may be passed with a single dash.

Press F1 inside htop for online help.
See 'man htop' for more information.
Lab1003@lab1003-HP-280-G2-MT:~$ htop -C
Lab1003@lab1003-HP-280-G2-MT:~$
```



Df: The df command displays information about total space and available space on a file system. Df -h: Prints sizes in a human-readable format using power of 1024. Filesystem: The name of the mounted storage device (e.g., /dev/sda4). Size: The total size of the filesystem in bytes.

Used: The amount of space currently occupied by data in bytes. Avail: The amount of free space available in bytes.

Use%: The percentage of the filesystem used.

Mounted on: The directory where the filesystem is mounted (e.g., /, /home)

```

lab1003@lab1003-HP-280-G2-MT:~$ df
Filesystem            1K-blocks      used Available Use% Mounted on
udev                  1916756            0  1916756   0% /dev
tmpfs                 388564         1832    386732   1% /run
/dev/sda5             227627468 18664220 205327648   5% /
tmpfs                1942820            0   1942820   0% /dev/shm
tmpfs                 5120             4     5116   1% /run/lock
tmpfs                1942820            0   1942820   0% /sys/fs/cgroup
/dev/loop2            640             640     100% /snap/gnome-logs/186
/dev/loop3            1664            1664     100% /snap/gnome-system-monitor/186
/dev/loop1            512             512     100% /snap/gnome-characters/795
/dev/loop5            588928          588928     100% /snap/gnome-42-2204/141
/dev/loop7            6688            6688     100% /snap/gtk-common-themes/1515
/dev/loop6            224256          224256     100% /snap/gnome-3-34-1804/72
/dev/loop4            65536           65536     100% /snap/core20/2105
/dev/loop6            41472           41472     100% /snap/snapd/20671
/dev/loop8            768             768     100% /snap/gnome-characters/726
/dev/loop9            2560            2560     100% /snap/gnome-calculator/884
/dev/loop12           2304            2304     100% /snap/gnome-calculator/955
/dev/loop10           358144          358144     100% /snap/gnome-3-38-2004/143
/dev/loop13           223744          223744     100% /snap/gnome-3-34-1804/93
/dev/loop15           75904           75904     100% /snap/core22/1033
/dev/loop14           57088           57088     100% /snap/core18/2012
/dev/loop11           93952           93952     100% /snap/gtk-common-themes/1535
/dev/loop17           2560            2560     100% /snap/gnome-system-monitor/163
/dev/loop16           247168          247168     100% /snap/gnome-3-38-2004/76
/dev/loop18           128             128     100% /snap/bare/5
/dev/loop20           896             896     100% /snap/gnome-logs/121
/dev/loop19           56832           56832     100% /snap/core18/2128
/dev/loop21           63360           63360     100% /snap/core20/1861
tmpfs                 388564         16    388548   1% /run/user/1000
lab1003@lab1003-HP-280-G2-MT:~$ df -h database.txt
Filesystem            1K-blocks      used Available Use% Mounted on
/dev/sda5             227627468 18664276 205327584   5% /
lab1003@lab1003-HP-280-G2-MT:~$ df -h
Filesystem            1K-blocks      used Available Use% Mounted on
/dev/sda5             218G  11G  196G   5% /

```

Du: The 'du' command in Unix is used to estimate file and directory space usage. Du -h: If we want to print sizes in human readable format(K, M, G), use -h option

Du -a: Displays disk usage information for all files and directories, including hidden ones.

```

Mon 11:25
lab1003@lab1003-HP-280-G2-MT: ~
lab1003@lab1003-HP-280-G2-MT:~$ du /home/Lab1003/Videos
4
lab1003@lab1003-HP-280-G2-MT:~$ du /home/Lab1003/VedDir/Ved
796
/home/Lab1003/VedDir/Ved
lab1003@lab1003-HP-280-G2-MT:~$ du -h /home/Lab1003/VedDir/Ved
796K /home/Lab1003/VedDir/Ved
lab1003@lab1003-HP-280-G2-MT:~$ du -a /home/Lab1003/VedDir/Ved
204 /home/Lab1003/VedDir/Ved/chnod.png
208 /home/Lab1003/VedDir/Ved/chnod1.png
172 /home/Lab1003/VedDir/Ved/plpe.png
208 /home/Lab1003/VedDir/Ved/chnod2.png
796 /home/Lab1003/VedDir/Ved
lab1003@lab1003-HP-280-G2-MT:~$

```

Vmstat: vmstat command in Unix is a performance monitoring command of the system as it gives the information about processes, memory, paging, block IO, disk, and CPU scheduling.

Vmstat -f: It displays the number of forks since boot. Each process is represented by one or more task, depending on thread usage.

Vmstat -a: It displays active and inactive memory of the system running. Vmstat -m: It displays the number of forks since boot. Each process is represented by one or more task, depending on thread usage.

Vmstat -s: This command is used to display a table of various event counters and memory statistics.

```
Lab1003@lab1003-HP-280-G2-MT-i5-$ vmstat -a
procs-----memory-----swap-----io-----system-----cpu-----
r  b   swpd   free   inact   actio   si   so    bi   bo   in   cs   us   sy   id   wa   st
12  0  119040 236084 696220 2542168   0   0  132   71  749 1776 37 26 96 1  0
Lab1003@lab1003-HP-280-G2-MT-i5-$ vmstat -f
22332 forks
Lab1003@lab1003-HP-280-G2-MT-i5-$ vmstat -m
vmstat: your kernel does not support slabinfo or your permissions are insufficient
Lab1003@lab1003-HP-280-G2-MT-i5-$ vmstat -s
3885648 K total memory
2467612 K used memory
2440088 K active memory
782416 K inactive memory
313812 K free memory
56880 K buffer memory
1028168 K swap cache
2097148 K total swap
119040 K used swap
1377088 K free swap
518667 non-nice user cpu ticks
745 nice user cpu ticks
366742 system cpu ticks
519787 idle cpu ticks
20779 id-wait cpu ticks
0 iowait cpu ticks
18218 softirq cpu ticks
0 stolen cpu ticks
1926133 pages paged in
1048732 pages paged out
943 pages swapped in
36235 pages swapped out
10987869 interrupts
2683238 CPU context switches
1707713852 boot time
12545 forks
Lab1003@lab1003-HP-280-G2-MT-i5-$
```

Pagesize: The pagesize command prints the size, in bytes, of a page of memory, as returned by the getpagesize subroutine

Pagesize -a: Prints all of the page size values (in bytes) supported on the system.

Pagesize -H:Shows only huge page size.

```
Lab1003@lab1003-OptiPlex-3020:~$ pagesize -a
4096
2097152
1073741824
Lab1003@lab1003-OptiPlex-3020:~$ pagesize -H
2097152
1073741824
Lab1003@lab1003-OptiPlex-3020:~$
```

Sar: sar (System Activity Report) It can be used to monitor Unix system's resources like CPU usage,

Memory utilization, I/O devices consumption etc. sar -V: Displays The current version.

sar -u 2 5: To report CPU details a total of 5 times with the interval of 2 seconds.

sar -r 1 3 :To report about the amount of memory used, amount of memory free, available cache, available buffers total 3 times with the interval of 1 second. sar -F 2 5: To report about file systems mounted on the device total 5 times with the interval of 2 seconds.
 sar -q 2 5:To report run queue length, number of processes and load average

```

lab1003@lab1003-OptiPlex-3020: ~
File Edit View Search Terminal Help
~w Task creation and system switching statistics
~y TTY devices statistics
lab1003@lab1003-OptiPlex-3020:~$ sar -V
sysstat version 11.6.1
(C) Sebastien Godard (sysstat <at> orange.fr)
lab1003@lab1003-OptiPlex-3020:~$ sar -u 2 5
Linux 5.4.0-150-generic (lab1003-OptiPlex-3020)      Monday 12 Febr
uary 2024      _x86_64_      (4 CPU)

11:22:38 IST      CPU      %user      %nice      %system      %iowait      %stea
l      %idle
11:22:40 IST      all      1.87      0.00      1.75      0.00      0.0
0      96.38
0      96.38
11:22:42 IST      all      3.77      0.00      1.38      1.01      0.0
0      93.84
0      93.84
11:22:44 IST      all      1.25      0.00      0.88      0.13      0.0
0      97.74
0      97.74
11:22:46 IST      all      0.75      0.00      0.50      0.50      0.0
0      98.24
0      98.24
11:22:48 IST      all      1.13      0.00      0.38      0.00      0.0
0      98.49
0      98.49
Average:      all      1.76      0.00      0.98      0.33      0.00
96.94
lab1003@lab1003-OptiPlex-3020:~$ sar -r 1 3
Linux 5.4.0-150-generic (lab1003-OptiPlex-3020)      Monday 12 Febr
uary 2024      _x86_64_      (4 CPU)

11:22:59 IST      kbmemfree      kbavall      kbmemused      %memused      kbbuffers      kbcac
hed      kbcommit      %commit      kbactive      kbinactive      kbdirt
y
072      8567536      141.84      2424208      898636      348      71968      1168
11:23:01 IST      292104      887780      3650872      92.59      71968      1166
180      8567536      141.84      2424240      898636      348
11:23:02 IST      292104      887780      3650872      92.59      71968      1166
140      8567536      141.84      2424248      898636      348
Average:      291475      887149      3651501      92.61      71968      116679
7      8567536      141.84      2424232      898636      348
lab1003@lab1003-OptiPlex-3020:~$ sar -F 2 5

```

```

lab1003@lab1003-OptiPlex-3020: ~
File Edit View Search Terminal Help
7      8567536      141.84      2424232      898636      348
lab1003@lab1003-OptiPlex-3020:~$ sar -F 2 5
Linux 5.4.0-150-generic (lab1003-OptiPlex-3020)      Monday 12 Febr
uary 2024      _x86_64_      (4 CPU)

11:23:30 IST      MBfsfree      MBfsused      %fsused      %ufsused      Ifree      Iu
sed      %Iused      FILESYSTEM
11:23:32 IST      462225      10056      2.13      7.22      30585641      199
895      0.65      /dev/sda5
11:23:32 IST      0      1      100.00      100.00      0
450      100.00      /dev/loop0
11:23:32 IST      0      1      100.00      100.00      0
401      100.00      /dev/loop2
11:23:32 IST      0      2      100.00      100.00      0      1
388      100.00      /dev/loop4
11:23:32 IST      0      62      100.00      100.00      0      11
720      100.00      /dev/loop1
11:23:32 IST      0      2      100.00      100.00      0
907      100.00      /dev/loop3
11:23:32 IST      0      56      100.00      100.00      0      10
803      100.00      /dev/loop5
11:23:32 IST      0      64      100.00      100.00      0      12
041      100.00      /dev/loop6
11:23:32 IST      0      219      100.00      100.00      0      18
500      100.00      /dev/loop7
11:23:32 IST      0      2      100.00      100.00      0      1
032      100.00      /dev/loop8
11:23:32 IST      0      218      100.00      100.00      0      18
503      100.00      /dev/loop9
11:23:32 IST      0      0      100.00      100.00      0
241      100.00      /dev/loop10
11:23:32 IST      0      65      100.00      100.00      0      64
986      100.00      /dev/loop11
11:23:32 IST      0      0      100.00      100.00      0
29      100.00      /dev/loop12
11:23:32 IST      0      92      100.00      100.00      0      76
208      100.00      /dev/loop13
11:23:32 IST      0      56      100.00      100.00      0      10

```

```

lab1003@lab1003-OptiPlex-3020: ~
File Edit View Search Terminal Help
Summary:      0      40      100.00      100.00      0      65
0      100.00      /dev/loop21
lab1003@lab1003-OptiPlex-3020:~$ sar -d 1 3
Linux 5.4.0-150-generic (lab1003-OptiPlex-3020)      Monday 12 Febr
uary 2024      _x86_64_      (4 CPU)

11:23:56 IST      DEV      tps      rkb/s      wkb/s      areq-sz      aqu
-sz      await      svctm      %util
11:23:57 IST      dev7-0      0.00      0.00      0.00      0.00      0
0.00      0.00      0.00      0.00
11:23:57 IST      dev7-1      0.00      0.00      0.00      0.00      0
0.00      0.00      0.00      0.00
11:23:57 IST      dev7-2      0.00      0.00      0.00      0.00      0
0.00      0.00      0.00      0.00
11:23:57 IST      dev7-3      0.00      0.00      0.00      0.00      0
0.00      0.00      0.00      0.00
11:23:57 IST      dev7-4      0.00      0.00      0.00      0.00      0
0.00      0.00      0.00      0.00
11:23:57 IST      dev7-5      0.00      0.00      0.00      0.00      0
0.00      0.00      0.00      0.00
11:23:57 IST      dev7-6      0.00      0.00      0.00      0.00      0
0.00      0.00      0.00      0.00
11:23:57 IST      dev7-7      0.00      0.00      0.00      0.00      0
0.00      0.00      0.00      0.00
11:23:57 IST      dev8-0      0.00      0.00      0.00      0.00      0
0.00      0.00      0.00      0.00
11:23:57 IST      dev7-8      0.00      0.00      0.00      0.00      0
0.00      0.00      0.00      0.00
11:23:57 IST      dev7-9      0.00      0.00      0.00      0.00      0
0.00      0.00      0.00      0.00
11:23:57 IST      dev7-10      0.00      0.00      0.00      0.00      0
0.00      0.00      0.00      0.00
11:23:57 IST      dev7-11      0.00      0.00      0.00      0.00      0
0.00      0.00      0.00      0.00
11:23:57 IST      dev7-12      0.00      0.00      0.00      0.00      0
0.00      0.00      0.00      0.00
11:23:57 IST      dev7-13      0.00      0.00      0.00      0.00      0
0.00      0.00      0.00      0.00

```

```

lab1003@lab1003-OptiPlex-3020: ~
File Edit View Search Terminal Help
0      0.00      0.00      0.00
lab1003@lab1003-OptiPlex-3020:~$ sar -q 2 5
Linux 5.4.0-150-generic (lab1003-OptiPlex-3020)      Monday 12 Febr
uary 2024      _x86_64_      (4 CPU)

11:24:12 IST      runq-sz      plist-sz      ldavg-1      ldavg-5      ldavg-15      bloc
ked
11:24:14 IST      0      1118      0.14      0.42      0.55
0
11:24:16 IST      0      1118      0.14      0.42      0.55
0
11:24:18 IST      1      1118      0.13      0.41      0.54
0
11:24:20 IST      0      1118      0.13      0.41      0.54
0
11:24:22 IST      0      1118      0.12      0.40      0.54
0
Average:      0      1118      0.13      0.41      0.54
lab1003@lab1003-OptiPlex-3020:~$ sar -P 1 1 3
Linux 5.4.0-150-generic (lab1003-OptiPlex-3020)      Monday 12 Febr
uary 2024      _x86_64_      (4 CPU)

11:24:40 IST      CPU      %user      %nice      %system      %iowait      %stea
l      %idle
11:24:41 IST      1      0.00      0.00      0.00      0.00      0.0
0      99.00
0      100.00
11:24:42 IST      1      3.00      0.00      1.00      0.00      0.0
0      96.00
0      96.00
11:24:43 IST      1      7.00      0.00      2.00      0.00      0.0
0      91.00
0      91.00
Average:      1      3.34      0.00      1.00      0.00      0.00
95.65
lab1003@lab1003-OptiPlex-3020:~$ ^C
lab1003@lab1003-OptiPlex-3020:~$ ^C
lab1003@lab1003-OptiPlex-3020:~$ ^C
lab1003@lab1003-OptiPlex-3020:~$ ^C
lab1003@lab1003-OptiPlex-3020:~$ 

```

Dmicodec: dmidecode also referred as Desktop Management Interface table decoder, record data from DMI table and produce it in human readable format.

Sudo dmicodec | more: Running a simple dmidecode command to get hardware information.

Sudo dmicodec -t processor: To get information about Processor. Sudo dmicodec -t bios: To get BIOS information.

```
es Terminal ▾ lab1003@lab1003-OptiPlex-3020: ~
File Edit View Search Terminal Help
lab1003@lab1003-OptiPlex-3020:~$ sudo dmidecode | more
[sudo] password for lab1003:
# dmidecode 3.1
Getting SMBIOS data from sysfs.
SMBIOS 2.7 present.
80 structures occupying 3575 bytes.
Table at 0x000EA390.

Handle 0xDA00, DMI type 218, 251 bytes
OEM-specific Type
Header and Data:
DA FB 00 DA B2 00 37 4F 1E 36 00 05 00 05 00 03
00 06 00 06 00 05 00 0F 00 0F 00 00 00 11 00 11
00 02 00 12 00 12 00 04 00 22 00 22 00 01 00 23
00 23 00 00 00 28 00 28 00 00 00 29 00 29 00 01
00 2A 00 2A 00 02 00 28 00 28 00 FF FF 2C 00 2C
00 FF FF 2D 00 2D 00 02 00 2E 00 2E 00 00 00 40
00 40 00 01 00 41 00 41 00 00 00 42 00 42 00 01
00 43 00 43 00 00 00 55 00 55 00 00 00 5C 00 5C
00 01 00 5D 00 5D 00 00 00 60 00 60 00 05 00 6E
00 6E 00 01 00 90 00 90 00 01 00 91 00 91 00 00
00 92 00 92 00 02 00 93 00 93 00 01 00 94 00 94
00 00 00 98 00 98 00 01 00 9D 00 9D 00 01 00 9E
00 9E 00 00 00 9F 00 9F 00 00 00 A0 00 A0 00 01
00 A1 00 A1 00 00 00 A2 00 A2 00 02 00 A3 00 A3
00 01 00 D1 00 D1 00 01 00 D2 00 D2 00 00 00 ED
00 ED 00 00 FF FF FF FF 00 00

Handle 0xDA01, DMI type 218, 251 bytes
OEM-specific Type
Header and Data:
DA FB 01 DA B2 00 37 4F 1E 36 00 F0 00 F0 00 01
00 F5 00 F5 00 04 00 F6 00 F6 00 00 00 09 01 09
01 00 00 17 01 17 01 00 00 18 01 18 01 01 00 19
01 19 01 00 00 1A 01 1A 01 01 00 1B 01 1B 01 00
00 1C 01 1C 01 01 00 28 01 28 01 01 00 2C 01 2C
01 00 00 2D 01 2D 01 01 00 2E 01 2E 01 00 00 35
01 35 01 FF 00 37 01 37 01 00 00 38 01 38 01 01

es Terminal ▾ lab1003@lab1003-OptiPlex-3020: ~
File Edit View Search Terminal Help
lab1003@lab1003-OptiPlex-3020:~$ sudo dmidecode -t processor
# dmidecode 3.1
Getting SMBIOS data from sysfs.
SMBIOS 2.7 present.

Handle 0x0033, DMI type 4, 42 bytes
Processor Information
Socket Designation: SOCKET 0
Type: Central Processor
Family: Core i5
Manufacturer: Intel
ID: C3 06 03 00 FF FB EB BF
Signature: Type 0, Family 6, Model 60, Stepping 3
Flags:
FPU (Floating-point unit on-chip)
VME (Virtual mode extension)
DE (Debugging extension)
PSE (Page size extension)
TSC (Time stamp counter)
MSR (Model specific registers)
PAE (Physical address extension)
MCE (Machine check exception)
CX8 (CMPXCHGB instruction supported)
APIC (On-chip APIC hardware supported)
SEP (Fast system call)
MTRR (Memory type range registers)
PGE (Page global enable)
MCA (Machine check architecture)
CMOV (Conditional move instruction supported)
PAT (Page attribute table)
PSE-36 (36-bit page size extension)
CLFSH (CLFLUSH instruction supported)
DS (Debug store)
ACPI (ACPI supported)

es Terminal ▾ lab1003@lab1003-OptiPlex-3020: ~
File Edit View Search Terminal Help
lab1003@lab1003-OptiPlex-3020:~$ sudo dmidecode -t bios
# dmidecode 3.1
Getting SMBIOS data from sysfs.
SMBIOS 2.7 present.

Handle 0x0000, DMI type 0, 24 bytes
BIOS Information
Vendor: Dell Inc.
Version: A02
Release Date: 01/07/2014
Address: 0xF0000
Runtime Size: 64 kB
ROM Size: 8192 kB
Characteristics:
PCI is supported
PNP is supported
BIOS is upgradeable
BIOS shadowing is allowed
Boot from CD is supported
Selectable boot is supported
BIOS ROM is socketed
EDD is supported
5.25"/1.2 MB floppy services are supported (Int 13h)
3.5"/720 kB floppy services are supported (Int 13h)
3.5"/2.88 MB floppy services are supported (Int 13h)
Print screen service is supported (Int 5h)
8042 keyboard services are supported (Int 9h)
Serial services are supported (Int 14h)
Printer services are supported (Int 17h)
ACPI is supported
USB legacy is supported
BIOS boot specification is supported
Function key-initiated network boot is supported
Targeted content distribution is supported
UEFI is supported
BIOS Revision: 4.6

lab1003@lab1003-OptiPlex-3020:~$
```