

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      00:00:06 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 ?        00:00:00 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 kaudtd
   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 ksmd
```

```
File Edit View Search Terminal Help
lab1003@lab1003-HP-280-G2-MT:~$ ps -d
  PID TTY          TIME CMD
 3961 tty2      00:00:00 Web Content
 3991 pts/0      00:00:00 ps
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 kaudtd
   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--dhclient
--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-enp5s0.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.

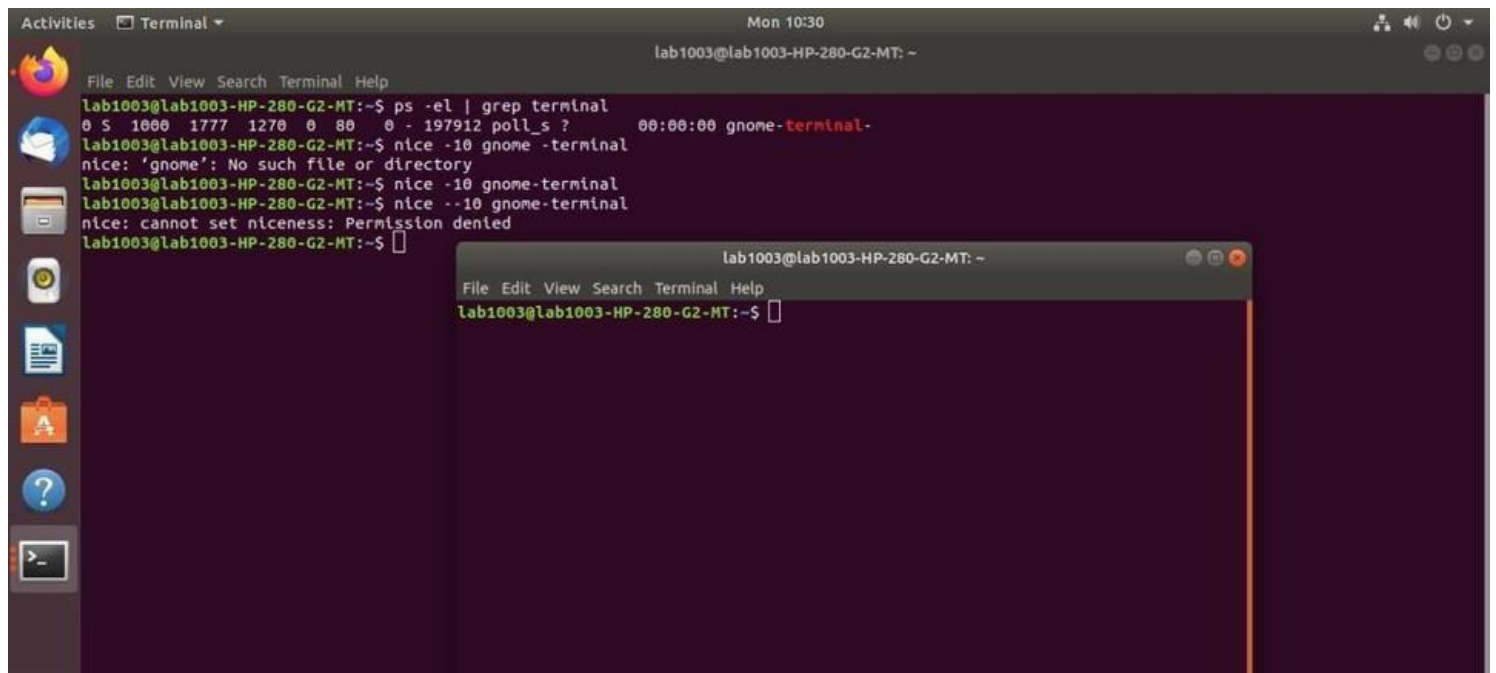
```
lab1003@lab1003-HP-280-G2-MT:~$ pstree -p
systemd(1)─ModemManager(670)─ModemManager(708)
├──NetworkManager(732)─NetworkManager(711)
│   ├──NetworkManager(810)
│   └──NetworkManager(814)
├──accounts-daemon(717)─accounts-daemon(743)
│   └──accounts-daemon(745)
├──acpid(649)
├──avahi-daemon(716)─avahi-daemon(746)
├──boltd(1232)─boltd(1266)
│   └──boltd(1268)
├──colord(1548)─colord(1560)
│   └──colord(1571)
├──cron(665)
├──cups-browsed(3006)─cups-browsed(3008)
│   └──cups-browsed(3009)
├──cupsd(3005)
├──dbus-daemon(672)
└──Firefox(2382)─Isolated Web Co(2554)─Isolated Web Co(2567)
    │   ├──Isolated Web Co(2579)
    │   ├──Isolated Web Co(2576)
    │   ├──Isolated Web Co(2578)
    │   ├──Isolated Web Co(2581)
    │   ├──Isolated Web Co(2582)
    │   ├──Isolated Web Co(2598)
    │   ├──Isolated Web Co(2605)
    │   ├──Isolated Web Co(2606)
    │   ├──Isolated Web Co(2607)
    │   ├──Isolated Web Co(2608)
    │   ├──Isolated Web Co(2610)
    │   ├──Isolated Web Co(2611)
    │   ├──Isolated Web Co(2612)
    │   ├──Isolated Web Co(2615)
    │   ├──Isolated Web Co(2612)
    │   ├──Isolated Web Co(2613)
    │   ├──Isolated Web Co(2614)
    │   ├──Isolated Web Co(2615)
    │   ├──Isolated Web Co(2616)
    │   ├──Isolated Web Co(2617)
    │   ├──Isolated Web Co(2618)
    │   ├──Isolated Web Co(2619)
    │   ├──Isolated Web Co(2620)
    │   ├──Isolated Web Co(2621)
    │   ├──Isolated Web Co(2622)
    │   ├──Isolated Web Co(2623)
    │   ├──Isolated Web Co(2624)
    │   ├──Isolated Web Co(2625)
    │   ├──Isolated Web Co(2626)
    │   ├──Isolated Web Co(2627)
    │   ├──Isolated Web Co(2628)
    │   ├──Isolated Web Co(2629)
    │   ├──Isolated Web Co(2630)
    │   ├──Isolated Web Co(2631)
    │   ├──Isolated Web Co(2632)
    │   ├──Isolated Web Co(2633)
    │   ├──Isolated Web Co(2634)
    │   ├──Isolated Web Co(2635)
    │   ├──Isolated Web Co(2636)
    │   ├──Isolated Web Co(2637)
    │   └──Isolated Web Co(2639)
    ├──Isolated Web Co(2559)─Isolated Web Co(2575)
    │   ├──Isolated Web Co(2577)
    │   ├──Isolated Web Co(2580)
    │   ├──Isolated Web Co(2583)
    │   ├──Isolated Web Co(2585)
    │   ├──Isolated Web Co(2586)
    │   ├──Isolated Web Co(2592)
    │   ├──Isolated Web Co(2593)
    │   ├──Isolated Web Co(2594)
    │   ├──Isolated Web Co(2595)
    │   ├──Isolated Web Co(2596)
    │   ├──Isolated Web Co(2597)
    │   ├──Isolated Web Co(2600)
    │   ├──Isolated Web Co(2603)
    │   ├──Isolated Web Co(2678)
    │   ├──Isolated Web Co(2679)
    │   ├──Isolated Web Co(2680)
    │   ├──Isolated Web Co(2681)
    │   ├──Isolated Web Co(2684)
    │   ├──Isolated Web Co(2615)
    │   ├──Isolated Web Co(2636)
    │   ├──Isolated Web Co(2637)
    │   └──Isolated Web Co(2639)
    └──Isolated Web Co(2630)─Isolated Web Co(2634)
        ├──Isolated Web Co(2615)
        ├──Isolated Web Co(2636)
        ├──Isolated Web Co(2637)
        └──Isolated Web Co(2639)
```

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



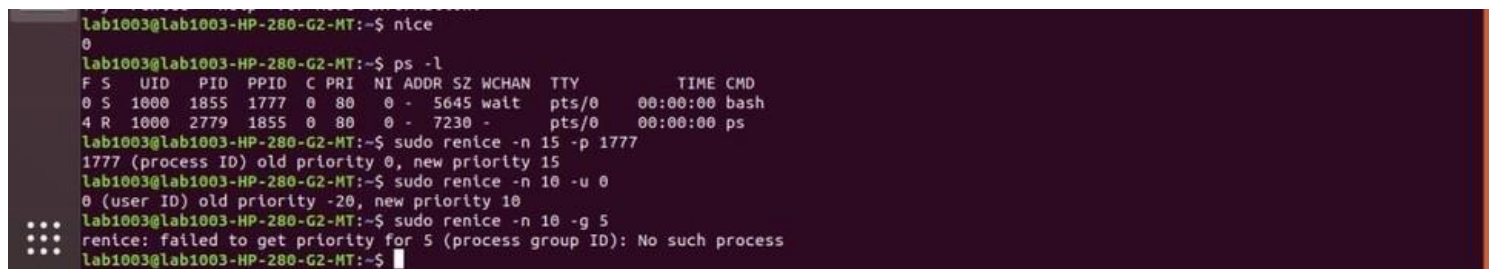
```
lab1003@lab1003-HP-280-G2-MT:~$ ps -el | grep terminal
0 S 1000 1777 1270 0 80 0 - 197912 poll_s ? 00:00:00 gnome-terminal-
lab1003@lab1003-HP-280-G2-MT:~$ nice -10 gnome-terminal
nice: 'gnome': No such file or directory
lab1003@lab1003-HP-280-G2-MT:~$ nice -10 gnome-terminal
lab1003@lab1003-HP-280-G2-MT:~$ 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:~$ niced
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:~$
```

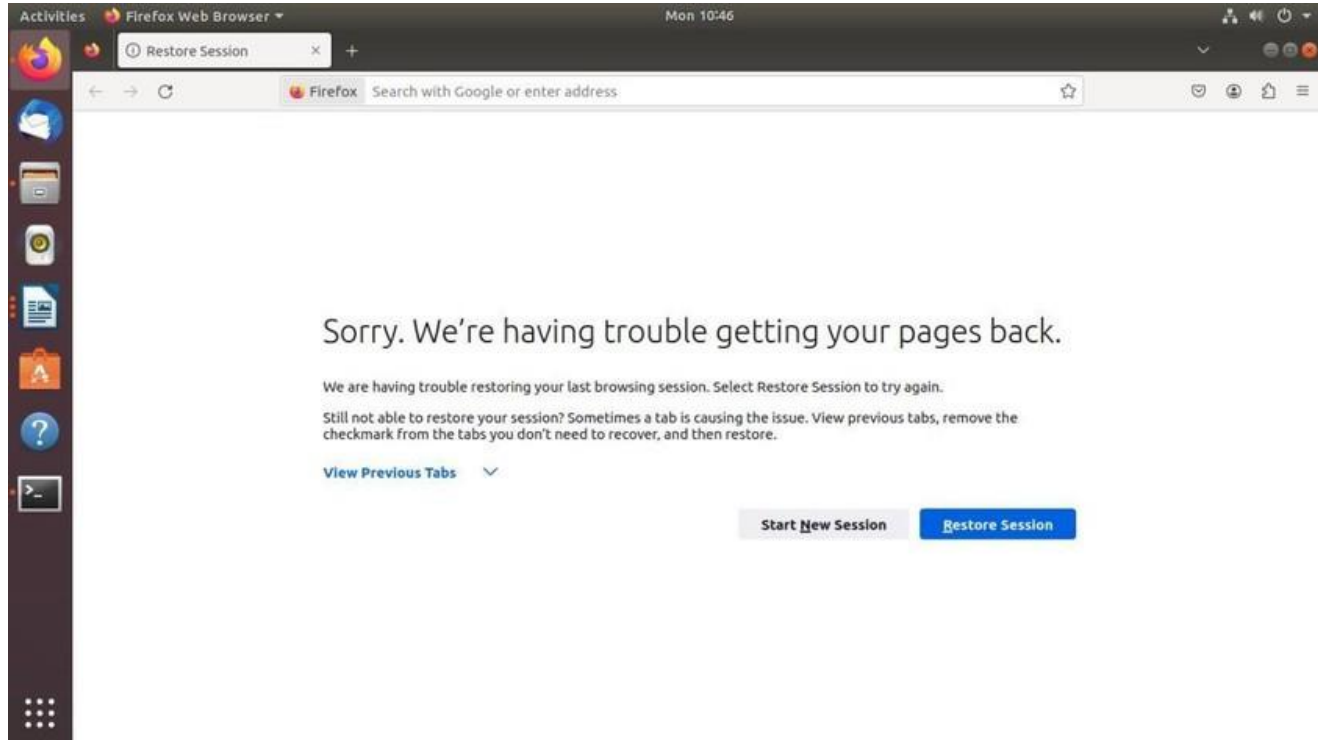
Pkill:

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:

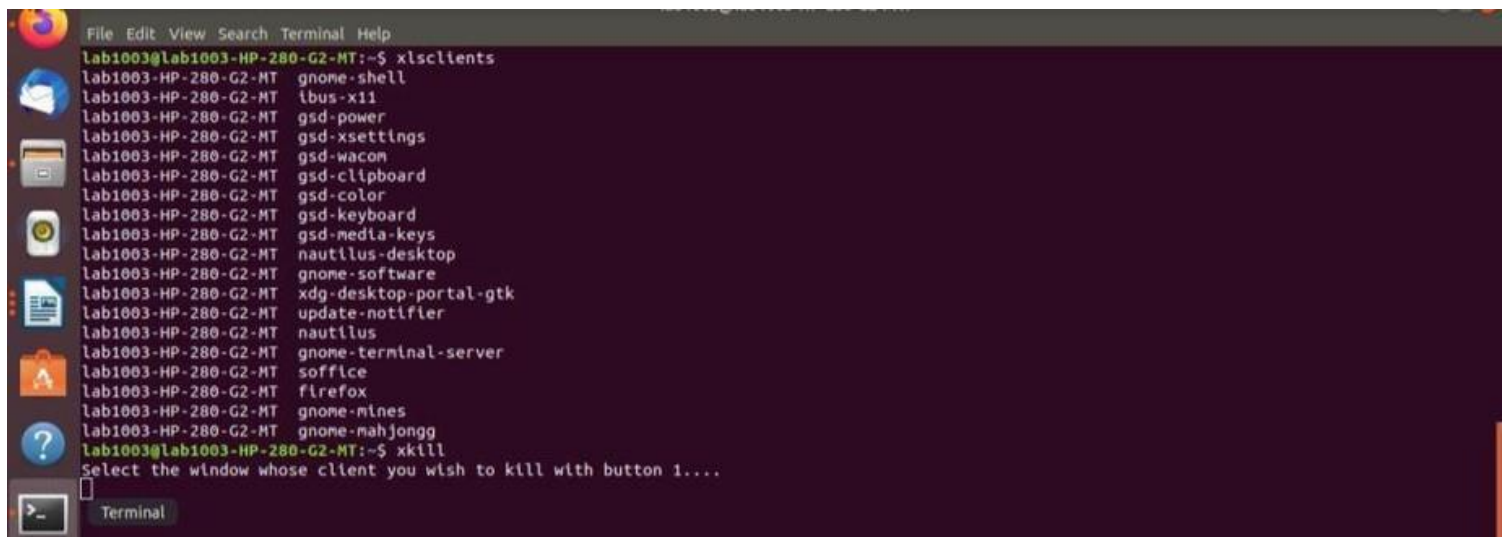
This command will show the list of all open windows with the hostname.

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.

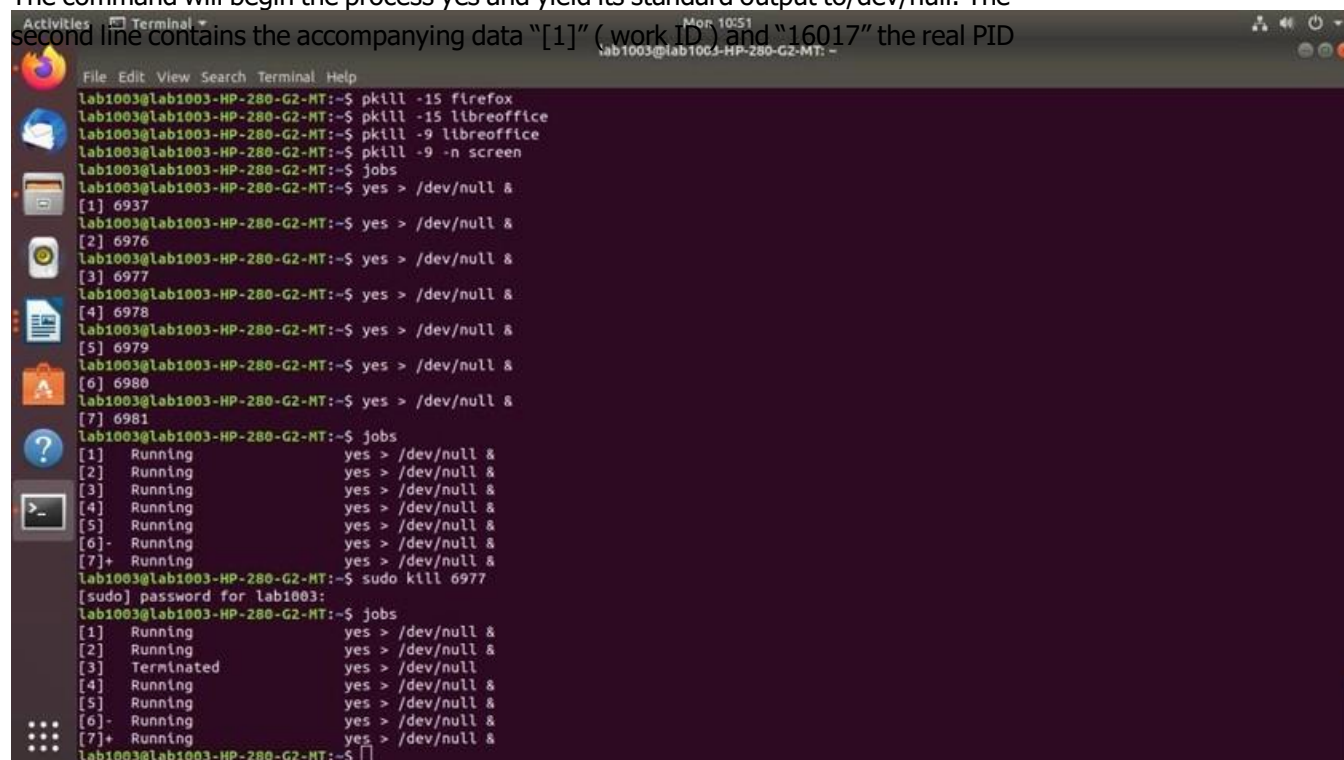


Jobs:

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

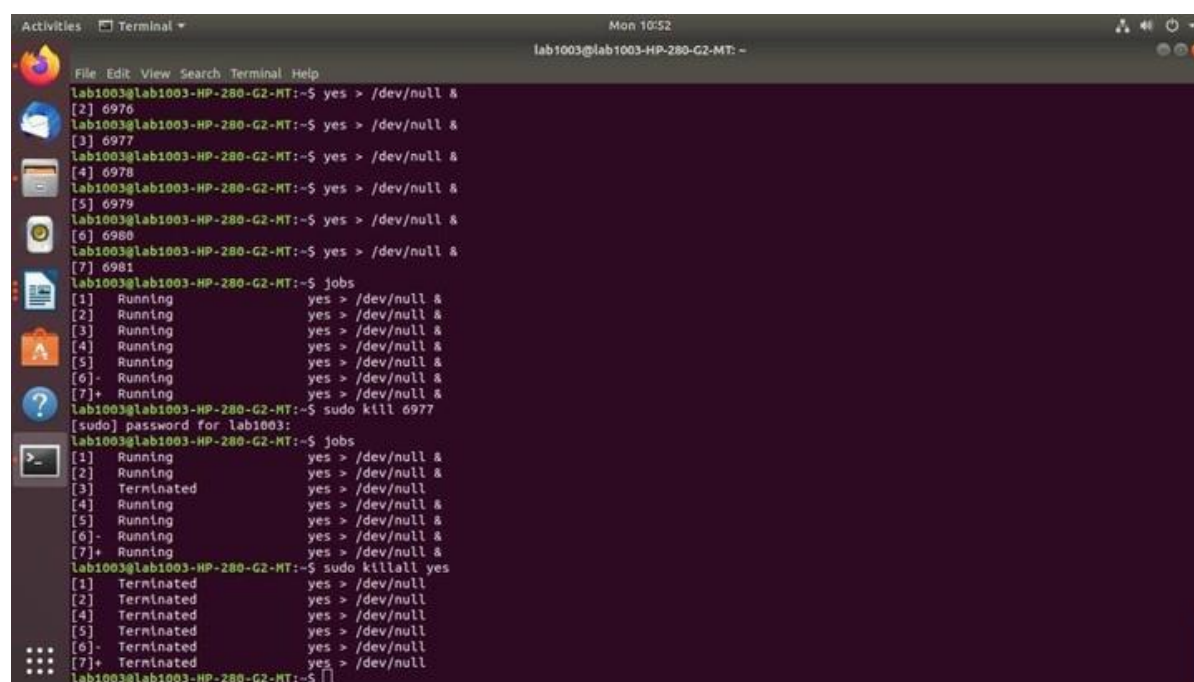
yes > /dev/null & :

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 real PID



```
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 killall yes
[sudo] password for lab1003:
lab1003@lab1003-HP-280-G2-MT:~$ jobs
[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.

- pgre

`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 pgre

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

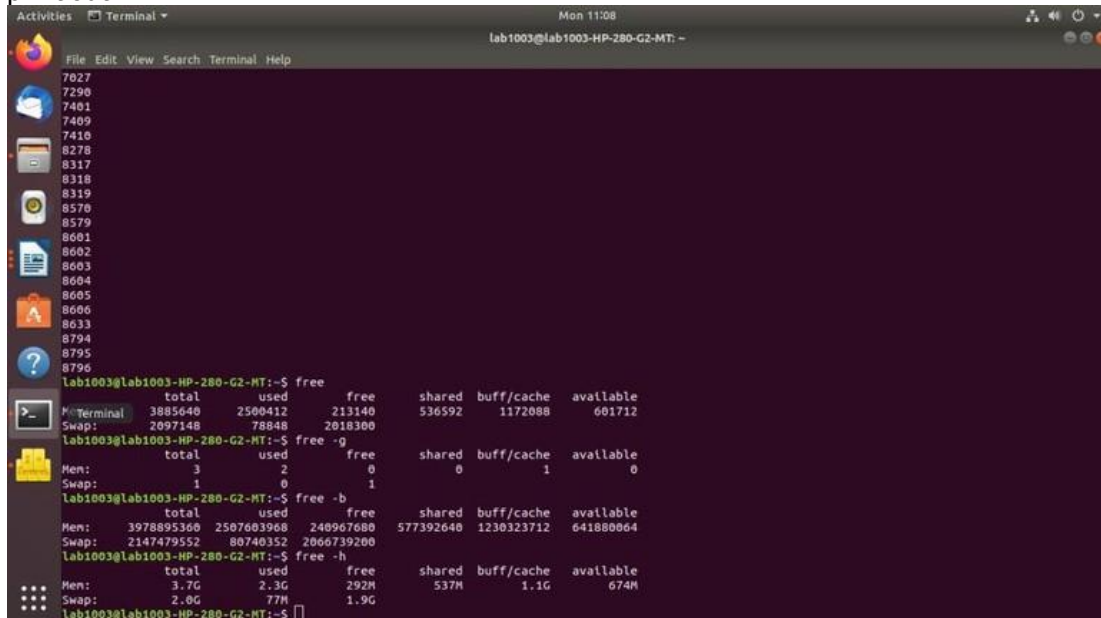
```
^Z
[6]+ Stopped sleep 500
lab1003@lab1003-HP-280-G2-MT:~$ jobs
[1]+ Stopped yes > /dev/null
[2] Running yes > /dev/null &
[3] Running yes > /dev/null &
[4] Running yes > /dev/null &
[5] Running yes > /dev/null &
[6]+ Stopped sleep 500
lab1003@lab1003-HP-280-G2-MT:~$ fg %str
bash: fg: %str: no such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

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

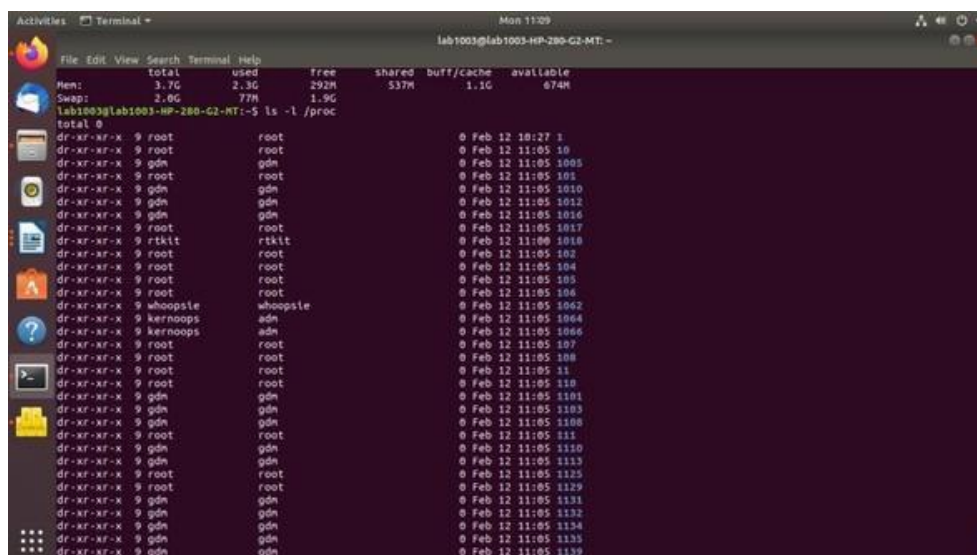
Free -h: It shows all output columns automatically scaled to shortest three digit unit and display the units also of print out.



```
lab1003@lab1003-HP-280-G2-MT: ~  
$ free  
              total        used        free      shared  buff/cache   available  
Mem:           3885640      2500412      2131140         536592      1172088      601712  
Swap:          2097148       78048         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 11:06 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 online
-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 stack
-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
-rw-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 exe -> /proc/6311/exe
-rw-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 numa_maps
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 ns
dr-xr-xr-x 2 lab1003 lab1003 0 Feb 12 11:10 net
dr-xr-xr-x 53 lab1003 lab1003 0 Feb 12 11:10 fd
-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 maps
dr-xr-xr-x 2 lab1003 lab1003 0 Feb 12 11:10 map_files
-rw-r--r-- 1 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
-rw-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
-r--r--r-- 1 lab1003 lab1003 0 Feb 12 11:10 fd
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
-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
-rw-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/4011/meminfo
MemTotal: 3885640 kB
MemFree: 299980 kB
MemAvailable: 781036 kB
Buffers: 41392 kB
Cached: 1089864 kB
SwapCached: 1032 kB
Active: 237780 kB
Inactive: 844928 kB
Active(anon): 2071836 kB
Inactive(anon): 570736 kB
Active(file): 385944 kB
Inactive(file): 264192 kB
Unevictable: 79488 kB
Mlocked: 10 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: 168576 kB
SReclaimable: 76828 kB
ShmemSlabs: 83748 kB
KernelStack: 18608 kB
PageTables: 43572 kB
NFS_Unstable: 0 kB
Bounce: 0 kB
WritebackTmp: 0 kB
CommitLimit: 4639968 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
ShmemPssMlocked: 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/4011/meminfo
MemTotal: 3885640 kB
MemFree: 299980 kB
MemAvailable: 781036 kB
Buffers: 41392 kB
Cached: 1089864 kB
SwapCached: 1032 kB
Active: 237780 kB
Inactive: 844928 kB
Active(anon): 2071836 kB
Inactive(anon): 570736 kB
Active(file): 385944 kB
Inactive(file): 264192 kB
Unevictable: 79488 kB
Mlocked: 10 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: 168576 kB
SReclaimable: 76828 kB
ShmemSlabs: 83748 kB
KernelStack: 18608 kB
PageTables: 43572 kB
NFS_Unstable: 0 kB
Bounce: 0 kB
WritebackTmp: 0 kB
CommitLimit: 4639968 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
ShmemPssMlocked: 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
lab1003@lab1003-HP-280-G2-MT: ~$ top -n 10
top - 11:14:21 up 46 min, 1 user, load average: 0.54, 0.19, 0.48
Tasks: 292 total, 0 running, 229 sleeping, 1 stopped, 0 zombie
Cpu(s): 0.4% sv, 0.0% sy, 0.0% id, 0.0% wa, 0.0% hi, 0.0% si, 0.0% st
Mem: 3885648 total, 239748 free, 2438264 used, 1287628 buff/cache
Mem Swap: 2097548 total, 2083300 free, 78848 used, 646444 avail Mem

  PID USER      PR  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   0:47.48 yes
 8575 lab1003   20   0  7476   744   680  R   79.8  0.0   0:53.80 yes
 9653 lab1003   20   0 2691088 103548 187720  S   1.3  5.9   0:04.07 Isolated Web Co
 1467 lab1003   9  -11 2383236 16380 11840  S   0.7  0.4   1:51.81 polinaudio
 1467 lab1003   20   0 3795248 742232 150644  S   0.2 38.5   3:04.90 Firefox
 1031 lab1003   20   0 2710708 157864 108832  S   0.3  4.1   0:21.56 Isolated Web Co
 9958 lab1003   20   0  46244   4164   3408  R   0.3  0.1   0:00.10 top
   1 root      30  10 225308 6444  4784  S   0.0  0.2   0:00.01 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_par_gp
   6 root      30  10 0 0 0  S   0.0  0.0 0:00.00 kworker/0:0H-ah
   8 root      30  10 0 0 0  S   0.0  0.0 0:00.00 mw_perop_wq
   9 root      30  10 0 0 0  S   0.0  0.0 0:00.00 ksoftirqd/0
  10 root      30  10 0 0 0  S   0.0  0.0 0:00.00 rcu_sched
  11 root      30  10 0 0 0  S   0.0  0.0 0:00.00 migration/0
  12 root      30  10 0 0 0  S   0.0  0.0 0:00.00 ksoftirqd/0
  13 root      30  10 0 0 0  S   0.0  0.0 0:00.00 cpuphp/0
  14 root      30  10 0 0 0  S   0.0  0.0 0:00.00 cpuphp/1
  15 root      30  10 0 0 0  S   0.0  0.0 0:00.00 ksoftirqd/1
  16 root      30  10 0 0 0  S   0.0  0.0 0:00.00 ksoftirqd/1
  17 root      30  10 0 0 0  S   0.0  0.0 0:00.00 ksoftirqd/1
  18 root      30  10 0 0 0  S   0.0  0.0 0:00.00 kworker/1:0H-ah
  20 root      30  10 0 0 0  S   0.0  0.0 0:00.00 kworker/1:0H-ah
  21 root      30  10 0 0 0  S   0.0  0.0 0:00.00 cpuphp/2
  22 root      30  10 0 0 0  S   0.0  0.0 0:00.00 ksoftirqd/2
  23 root      30  10 0 0 0  S   0.0  0.0 0:00.00 migration/2
  24 root      30  10 0 0 0  S   0.0  0.0 0:00.20 ksoftirqd/2
  26 root      30  10 0 0 0  S   0.0  0.0 0:00.00 kworker/2:0H-ah
  27 root      30  10 0 0 0  S   0.0  0.0 0:00.00 cpuphp/3
  28 root      30  10 0 0 0  S   0.0  0.0 0:00.00 ksoftirqd/3
  29 root      30  10 0 0 0  S   0.0  0.0 0:00.00 migration/3
  30 root      30  10 0 0 0  S   0.0  0.0 0:00.00 ksoftirqd/3
  32 root      30  10 0 0 0  S   0.0  0.0 0:00.00 kworker/3:0H-ah
  33 root      30  10 0 0 0  S   0.0  0.0 0:00.00 ksoftirqd/3
  34 root      30  10 0 0 0  S   0.0  0.0 0:00.00 netns

lab1003@lab1003-HP-280-G2-MT: ~$ top -h


```

top -n 10
Usage:
top -n <N> [-d <delay>] [-s <sort>] [-u <user>] [-p <pid(s)>] [-n <field>] [-c <cols>]
lab1003@lab1003-HP-280-G2-MT: ~$

```



```

Mon 11:20
lab1003@lab1003-HP-280-G2-MT: ~
File Edit View Search Terminal Help
lab1003@lab1003-HP-280-G2-MT: ~$ top -n 10
Tasks: 170, 170 thr; 4 running
Load average: 5.72 0.00 3.07
Uptime: 00:52:26

Mem[|||||]*****2.75G/3.71G
Swap[|||||]07.0M/2.00G

 PID USER PR 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 13:12.67 yes
 8575 lab1003 20 0 7476 744 680 R 79.7 0.0 13:08.84 yes
 5466 lab1003 20 0 37111M 738M 161M S 0.0 19.3 0:13.98 /usr/lib/firefox/firefox -new-window
 8572 lab1003 20 0 7476 832 768 R 83.4 0.0 11:57.77 yes
 8574 lab1003 20 0 7476 772 708 R 83.0 0.0 13:06.51 yes
 10845 lab1003 20 0 34364 5504 3848 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 0:00.88 /lib/systemd/systemd-udev
 406 systemd-r 20 0 71520 4780 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 2860 S 0.0 0.1 0:00.07 /usr/sbin/rsyslogd -n
 699 syslog 20 0 256M 2876 2860 S 0.0 0.1 0:00.00 /usr/sbin/rsyslogd -n
 700 syslog 20 0 256M 2876 2860 S 0.0 0.1 0:00.04 /usr/sbin/rsyslogd -n
 661 syslog 20 0 256M 2876 2860 S 0.0 0.1 0:00.12 /usr/sbin/rsyslogd -n
 683 root 30 10 491M 8044 6340 S 0.0 0.2 0:00.00 /usr/lib/odisks2/odisksd
 730 root 30 10 491M 8044 6340 S 0.0 0.2 0:00.00 /usr/lib/odisks2/odisksd
 814 root 30 10 491M 8044 6340 S 0.0 0.2 0:00.00 /usr/lib/odisks2/odisksd
 818 root 30 10 491M 8044 6340 S 0.0 0.2 0:00.00 /usr/lib/odisks2/odisksd
 664 root 30 10 491M 8044 6340 S 0.0 0.2 0:00.55 /usr/lib/odisks2/odisksd
 695 root 30 10 107M 3176 3068 S 0.0 0.1 0:00.00 /usr/sbin/lrbalance --foreground
 673 root 30 10 107M 3176 3068 S 0.0 0.1 0:00.14 /usr/sbin/lrbalance --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/napd/napd
 808 root 30 10 1599M 25588 12756 S 0.0 0.7 0:00.19 /usr/lib/napd/napd
 809 root 30 10 1599M 25588 12756 S 0.0 0.7 0:00.00 /usr/lib/napd/napd
 810 root 30 10 1599M 25588 12756 S 0.0 0.7 0:00.27 /usr/lib/napd/napd
 811 root 30 10 1599M 25588 12756 S 0.0 0.7 0:00.00 /usr/lib/napd/napd
 832 root 30 10 1599M 25588 12756 S 0.0 0.7 0:00.42 /usr/lib/napd/napd
 835 root 30 10 1599M 25588 12756 S 0.0 0.7 0:00.11 /usr/lib/napd/napd
 838 root 30 10 1599M 25588 12756 S 0.0 0.7 0:00.01 /usr/lib/napd/napd
 860 root 30 10 1599M 25588 12756 S 0.0 0.7 0:00.53 /usr/lib/napd/napd
 1883 root 30 10 1599M 25588 12756 S 0.0 0.7 0:00.14 /usr/lib/napd/napd

F1:help F2:Setup F3:Search F4:filter F5:tree F6:sortby F7:pipe F8:pipe F9:kill F10:quit

```


```

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.

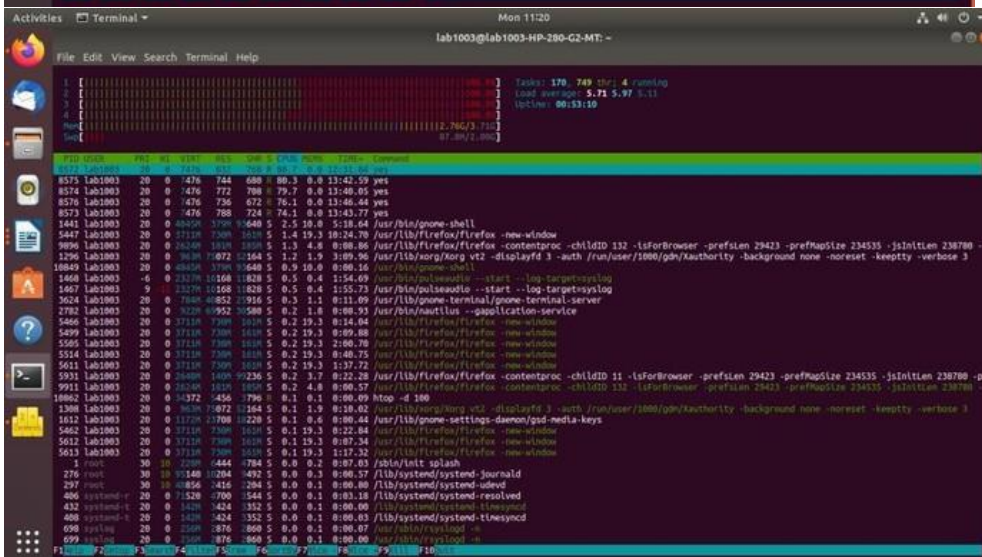
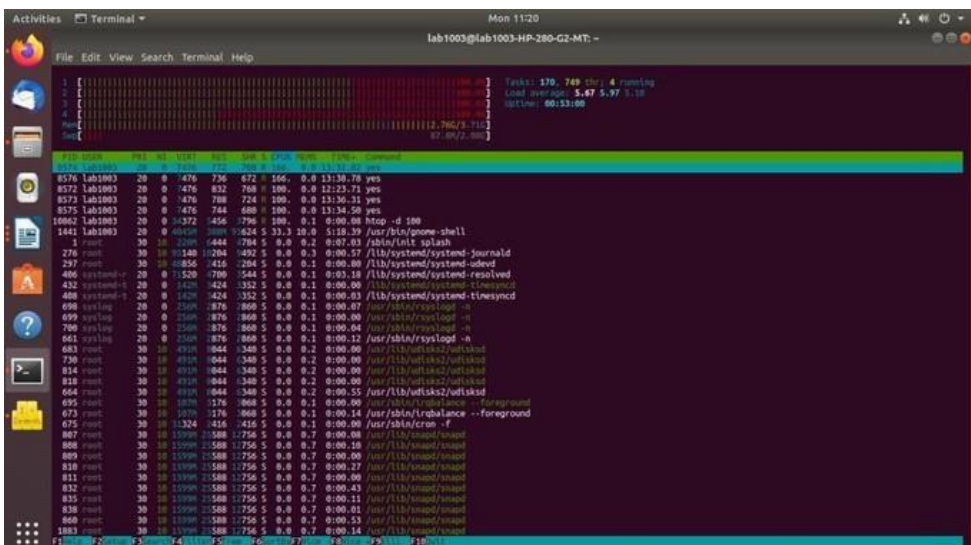
```
lab1003@lab1003-HP-280-G2-MT:~$ sudo apt install htop
Reading package lists... Done
Building dependency tree
Reading state information... Done
htop is already the newest version (2.1.0-3).
0 upgraded, 0 newly installed, 0 to remove and 55 not upgraded.
lab1003@lab1003-HP-280-G2-MT:~$ htop -v
htop 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,...] 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             22762768 18664228  20532768    1% /
tmpfs                1942828            0   1942828    0% /dev/shm
tmpfs                 5128            4     5116    1% /run/lock
tmpfs                1942828            0   1942828    0% /sys/fs/cgroup
/dev/loop7            640            0    100% /snap/gnome-logs/186
/dev/loop3            1664           1664    100% /snap/gnome-system-monitor/186
/dev/loop1            512            0    100% /snap/gnome-characters/795
/dev/loop5            588928      588928    100% /snap/gnome-42-2204/141
/dev/loop6            66688         66688    100% /snap/gtk-common-themes/1515
/dev/loop8            224256      224256    100% /snap/gnome-3-34-1804/72
/dev/loop4            65536         65536    100% /snap/core20/2185
/dev/loop6            41472         41472    100% /snap/snapd/20671
/dev/loop7            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           73904         73904    100% /snap/core22/1833
/dev/loop14           57888         57888    100% /snap/core18/2812
/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/core20/1881
tmpfs                 388564      16    388548    1% /run/user/1000
Lab1003@lab1003-HP-280-G2-MT:~$ df /etc/passwd
Filesystem            1K-blocks      Used Available Use% Mounted on
/dev/sda5             22762768 18664228  20532768    1% /
Lab1003@lab1003-HP-280-G2-MT:~$ df -h database.txt
Filesystem            Size  Used Avail 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: ~
File Edit View Search Terminal Help
Lab1003@lab1003-HP-280-G2-MT:~$ du /home/Lab1003/Videos
4 /home/Lab1003/Videos
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-OptiPlex-3020-G2-M7i:~$ vmstat -a
procs .....:memory.....:---swap-----:io-----:system:-----cpu-----
 r  b   swpd   free   inact   active   si   so    bi   bo   sr   so    us   sy   cs   us   sy   id   wa   st
 12  0  119040 236444 698228 2342168      0  0  132   71  749 1776 17 26 36 1 0

Lab1003@Lab1003-OptiPlex-3020-G2-M7i:~$ vmstat -f
12332 forks

Lab1003@Lab1003-OptiPlex-3020-G2-M7i:~$ vmstat -m
vmstat: your kernel does not support slabinfo or your permissions are insufficient
Lab1003@Lab1003-OptiPlex-3020-G2-M7i:~$ vmstat -s
3885648 k total memory
2467612 k used memory
2446088 k active memory
782416 k inactive memory
333812 k free memory
56088 k buffer memory
1628188 k swap cache
2097148 k total swap
122968 k used swap
1578188 k free swap
558867 non-nice user cpu ticks
742 nice user cpu ticks
366742 system cpu ticks
5129747 idle cpu ticks
28779 id-wait cpu ticks
0 iowait cpu ticks
18218 softirq cpu ticks
0 stolen cpu ticks
1326133 pages swapped in
1648732 pages swapped out
943 pages swapped in
16535 pages swapped out
18947869 interrupts
20832324 CPU context switches
170773852 hours time
12345 forks
Lab1003@Lab1003-OptiPlex-3020-G2-M7i:~$
```

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

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

Pagsize -H:Shows only huge page size.

```
Lab1003@Lab1003-OptiPlex-3020:~$ pagsize -a
4096
2097152
1073741824
Lab1003@Lab1003-OptiPlex-3020:~$ pagsize -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 February 2024 _x86_64_ (4 CPU)

11:22:38 IST CPU %user %nice %system %iowait %steal
l %idle
11:22:40 IST all 1.87 0.00 1.75 0.00 0.0
0 96.38
11:22:42 IST all 3.77 0.00 1.38 1.01 0.0
0 93.84
11:22:44 IST all 1.25 0.00 0.88 0.13 0.0
0 97.74
11:22:46 IST all 0.75 0.00 0.50 0.50 0.0
0 98.24
11:22:48 IST all 1.13 0.00 0.38 0.00 0.0
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 February 2024 _x86_64_ (4 CPU)

11:22:59 IST kbmemfree kbavail kbmemused %memused kbbuffers kbcac
hed kbcommit %commit kbactive kbinactive kbdirty
11:23:00 IST 290216 885888 3652760 92.64 71968 1168
072 8567536 141.84 2424208 898636 348
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 February 2024 _x86_64_ (4 CPU)

11:23:30 IST MBfsfree MBfsused %fsused %ufsused Ifree Iu
sed %Used FILESYSTEM
11:23:32 IST 402225 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 February 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
.00 0.00 0.00 0.00
11:23:57 IST dev7-1 0.00 0.00 0.00 0.00 0
.00 0.00 0.00 0.00
11:23:57 IST dev7-2 0.00 0.00 0.00 0.00 0
.00 0.00 0.00 0.00
11:23:57 IST dev7-3 0.00 0.00 0.00 0.00 0
.00 0.00 0.00 0.00
11:23:57 IST dev7-4 0.00 0.00 0.00 0.00 0
.00 0.00 0.00 0.00
11:23:57 IST dev7-5 0.00 0.00 0.00 0.00 0
.00 0.00 0.00 0.00
11:23:57 IST dev7-6 0.00 0.00 0.00 0.00 0
.00 0.00 0.00 0.00
11:23:57 IST dev7-7 0.00 0.00 0.00 0.00 0
.00 0.00 0.00 0.00
11:23:57 IST dev8-0 0.00 0.00 0.00 0.00 0
.00 0.00 0.00 0.00
11:23:57 IST dev7-8 0.00 0.00 0.00 0.00 0
.00 0.00 0.00 0.00
11:23:57 IST dev7-9 0.00 0.00 0.00 0.00 0
.00 0.00 0.00 0.00
11:23:57 IST dev7-10 0.00 0.00 0.00 0.00 0
.00 0.00 0.00 0.00
11:23:57 IST dev7-11 0.00 0.00 0.00 0.00 0
.00 0.00 0.00 0.00
11:23:57 IST dev7-12 0.00 0.00 0.00 0.00 0
.00 0.00 0.00 0.00
11:23:57 IST dev7-13 0.00 0.00 0.00 0.00 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 February 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 February 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 96.00
11:24:42 IST 1 3.00 0.00 1.00 0.00 0.0
0 96.00
11:24:43 IST 1 7.00 0.00 2.00 0.00 0.0
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 6D 00 6D 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 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
00 1C 01 1C 01 01 00 2B 01 2B 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
00 39 01 39 01 02 00 40 01 40 01 00 00 41 01 41
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 (CMPXCHG8 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
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)
MMX (MMX technology supported)
FXSR (FXSAVE and FXSTOR instructions supported)
SSE (Streaming SIMD extensions)
SSE2 (Streaming SIMD extensions 2)
SS (Self-snoop)
HTT (Multi-threading)
TM (Thermal monitor supported)
PBE (Pending break enabled)
Version: Intel(R) Core(TM) i5-4570 CPU @ 3.20GHz
Voltage: 1.2 V
External Clock: 100 MHz
Max Speed: 3800 MHz
Current Speed: 3200 MHz
Status: Populated, Enabled
Upgrade: Socket BGA1155
L1 Cache Handle: 0x0034
L2 Cache Handle: 0x0035
L3 Cache Handle: 0x0036
Serial Number: Not Specified
Asset Tag: Fill By OEM
Part Number: Fill By OEM
Core Count: 4
Core Enabled: 4
Thread Count: 4
Characteristics:
64-bit capable
lab1003@lab1003-OptiPlex-3020:~$

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
```

