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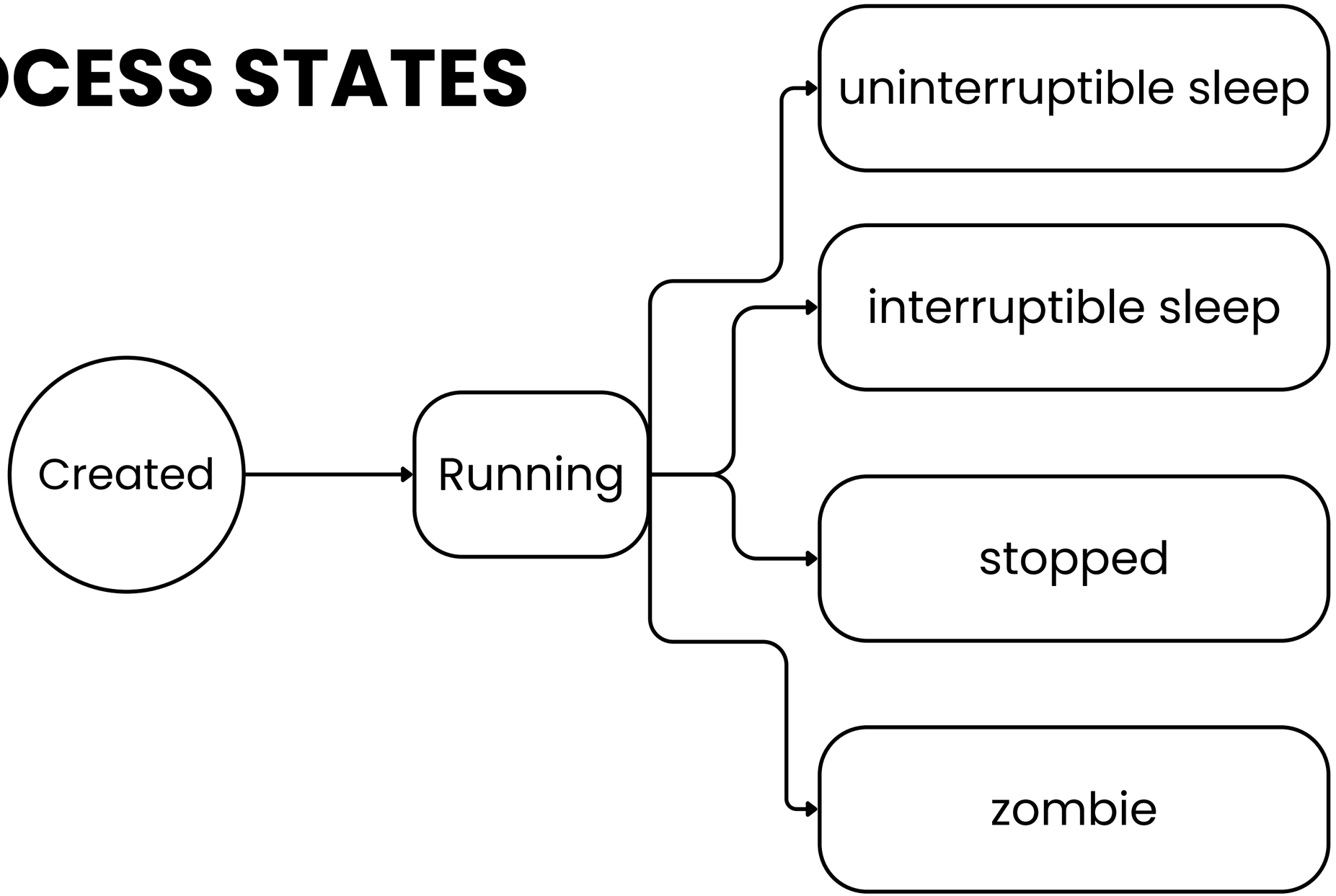
DISCLAIMER

MANAGING SYSTEM PROCESSES

PROCESS

- A **running instance** of a program.
- Types of Processes:
  - Foreground - E.g: Libre Programs
  - Background - E.g: Antivirus

PROCESS STATES



FOREGROUND TO BACKGROUND PROCESS

Start the program
$ ping google.com

Press Ctrl + Z
[1]+ Stopped ping google.com

List all the jobs running in the background
$ jobs
[1]+ Stopped ping google.com

Convert the foreground into a background program
$ bg <job_id>

CONVERT TO A FOREGROUND PROCESS

Execute a foreground into a background program in **one** line
$ ping google.com &

List all the jobs running in the background
$ jobs

[1]+ Running ping google.com &

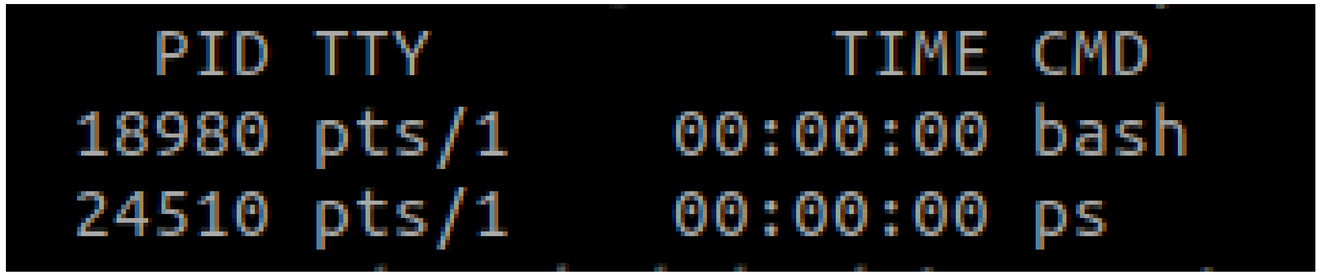
Make the background into a foreground program
$ fg <job_id>

PS

PROCESS STATUS

To show running processes on the current terminal

$ ps



PS

To show running processes for the current user

$ ps -u

```
USER         PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
dereck      2136  0.0  0.0 170776  6104 tty2     Ssl+ 15:10   0:00 /usr/libexec/gdm-wayland-session env GNOME_SHELL_SESSION_MODE=ubuntu /usr/bin/gnome-session --session=ubuntu
dereck      2140  0.0  0.1 232464 14764 tty2     Sl+  15:10   0:00 /usr/libexec/gnome-session-binary --session=ubuntu
dereck      8730  0.0  0.1  26912 12512 pts/0    Ss+  15:36   0:00 /bin/bash
dereck      9664  0.0  0.1  26912 12540 pts/1    Ss   15:41   0:00 /bin/bash
dereck     10649  0.0  0.0  21436  3652 pts/1    R+   15:57   0:00 ps -u
```

To show all processes for the current user

$ ps -aux

To show a specific running process for the current user

$ ps -u | grep <program_name>

PGREP

PS -U | GREP

To obtain the PID of a specific running process for the current user

$ pgrep <program_name>

TOP

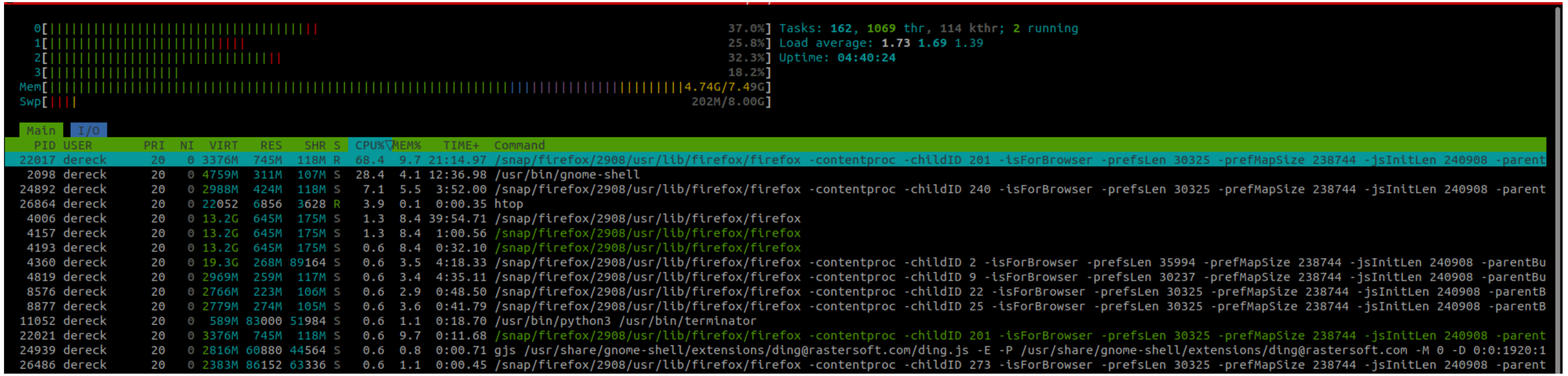
However, unlike **ps** command, output generated is realtime and sorted by its CPU usage by default .

```
top - 14:46:48 up  3:58,  1 user,  load average: 0.96, 1.20, 1.22
Tasks: 276 total,   1 running, 275 sleeping,   0 stopped,   0 zombie
%Cpu(s):  4.1 us,  1.6 sy,  0.0 ni, 93.9 id,  0.0 wa,  0.0 hi,  0.4 si,  0.0 st
MiB Mem :   7673.7 total,    463.9 free,   4475.0 used,   2734.7 buff/cache
MiB Swap:   8192.0 total,   7933.2 free,    258.8 used.   1960.2 avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
   4819 dereck    20   0 3049196 301532 121400 S   7.0   3.8   4:01.02 Isolated Web Co
    214 root     -51   0       0      0      0 S   3.0   0.0   1:51.32 irq/143-DELL0AB0:00
   2098 dereck    20   0 4878844 322696 122272 S   2.7   4.1  10:31.55 gnome-shell
   4006 dereck    20   0   12.9g 675520 186248 S   2.3   8.6  33:14.56 firefox
    704 root     -51   0       0      0      0 S   2.0   0.0   2:17.96 irq/153-rtw88_pci
```

HTOP

BEAUTIFUL TOP



KILL

- To stop a running process
- **kill** command needs the process ID as an argument.
- Sends a kill signal to the process.

To list all the kill signals

```
02:48:30 dereck@dodoadmin-Inspiron-15-3511 html →kill -L
 1) SIGHUP       2) SIGINT       3) SIGQUIT      4) SIGILL       5) SIGTRAP
 6) SIGABRT      7) SIGBUS       8) SIGFPE       9) SIGKILL     10) SIGUSR1
11) SIGSEGV     12) SIGUSR2     13) SIGPIPE     14) SIGALRM     15) SIGTERM
16) SIGSTKFLT   17) SIGCHLD     18) SIGCONT     19) SIGSTOP     20) SIGTSTP
21) SIGTTIN     22) SIGTTOU     23) SIGURG      24) SIGXCPU     25) SIGXFSZ
26) SIGVTALRM   27) SIGPROF     28) SIGWINCH    29) SIGIO       30) SIGPWR
31) SIGSYS      34) SIGRTMIN    35) SIGRTMIN+1  36) SIGRTMIN+2  37) SIGRTMIN+3
38) SIGRTMIN+4  39) SIGRTMIN+5  40) SIGRTMIN+6  41) SIGRTMIN+7  42) SIGRTMIN+8
43) SIGRTMIN+9  44) SIGRTMIN+10 45) SIGRTMIN+11 46) SIGRTMIN+12 47) SIGRTMIN+13
48) SIGRTMIN+14 49) SIGRTMIN+15 50) SIGRTMAX-14 51) SIGRTMAX-13 52) SIGRTMAX-12
53) SIGRTMAX-11 54) SIGRTMAX-10 55) SIGRTMAX-9  56) SIGRTMAX-8  57) SIGRTMAX-7
58) SIGRTMAX-6  59) SIGRTMAX-5  60) SIGRTMAX-4  61) SIGRTMAX-3  62) SIGRTMAX-2
63) SIGRTMAX-1  64) SIGRTMAX
```

KILL

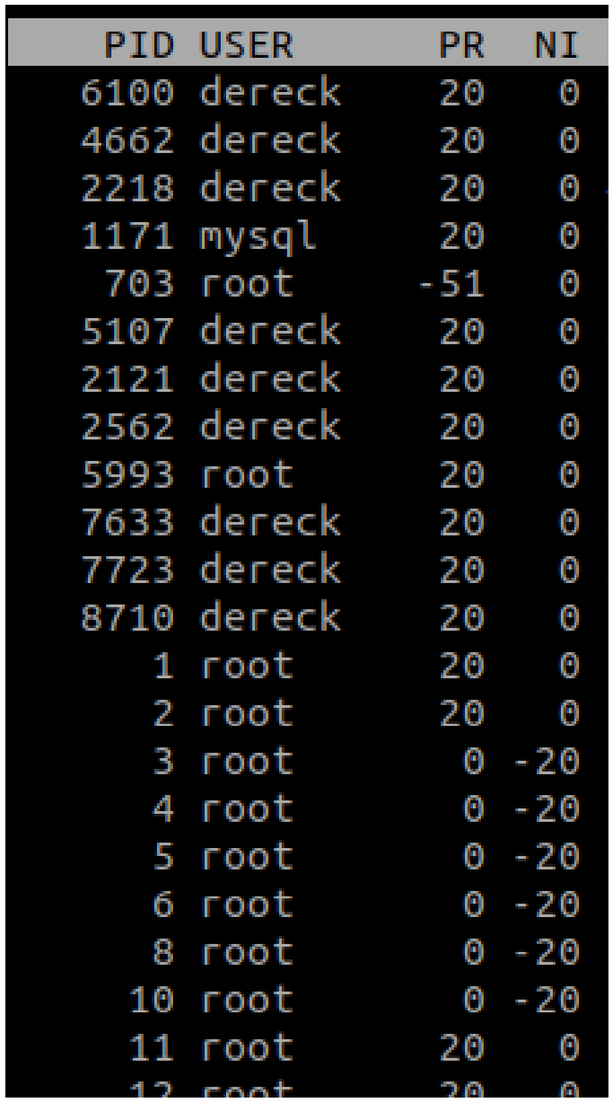
- The default kill signal is **15 (SIGTERM)** if the user doesn't specify.
- **9) SIGKILL** is the most common one used.
- Ctrl+Z and Ctrl+C are shortcuts to the kill command.

To kill one running program
$ kill -<signal_id> <program_id>

To kill all instances of a running program
$ pkill -<signal_id> <program_name>

NICE

- To tell your machine to prioritise processes.
- The priority value is called **Niceness**.
- It has a value between -20 to 19.
- Default value of all processes is 0.



PID	USER	PR	NI
6100	dereck	20	0
4662	dereck	20	0
2218	dereck	20	0
1171	mysql	20	0
703	root	-51	0
5107	dereck	20	0
2121	dereck	20	0
2562	dereck	20	0
5993	root	20	0
7633	dereck	20	0
7723	dereck	20	0
8710	dereck	20	0
1	root	20	0
2	root	20	0
3	root	0	-20
4	root	0	-20
5	root	0	-20
6	root	0	-20
8	root	0	-20
10	root	0	-20
11	root	20	0
12	root	20	0

NICE

To start a process and give it a nice value other than the default
$ nice -n <niceness_index> <process_name>

To change nice value of a running process
$ renice <niceness_index> -p <pid>