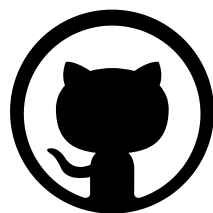


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DISCLAIMER

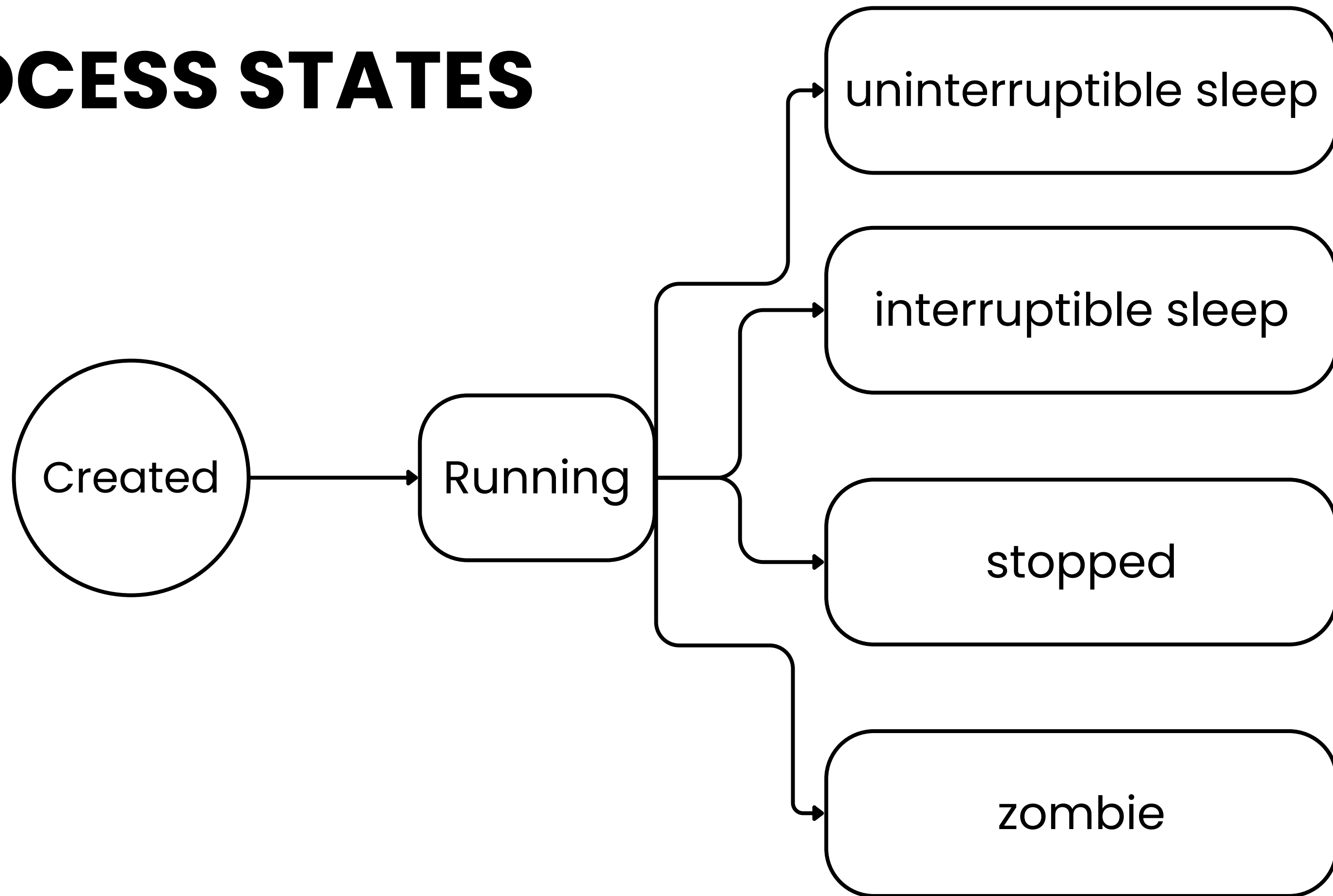


MANAGING SYSTEM PROCESSES

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

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 &

Make the background into a foreground program

\$ fg <job_id>

PS

PROCESS STATUS

To show running processes on the current terminal

\$ ps

```
PID  TTY          TIME CMD
18980 pts/1        00:00:00 bash
24510 pts/1        00:00:00 ps
```


PS

To show running processes for the current user

\$ ps -u

To show a specific running process for the current user

\$ ps -u | grep <program_name>

To show all processes for the current user

\$ ps -aux

PGREP

PS -U | GREP

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

\$ pgrep <program_name>

TOP

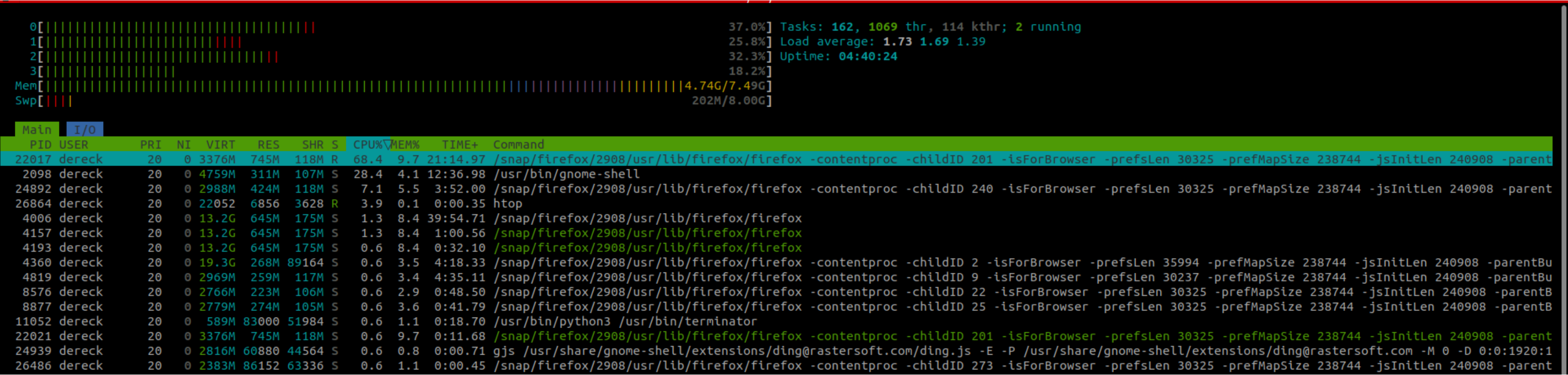
However, unlike **ps** command, output generated is realtime and sorted by its CPU usage by default .

```
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** if the user doesn't specify.
- **Ctrl+Z** and **Ctrl+C** are shortcuts for the kill command.
- **9) SIGKILL** is the most common one used.

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. The **lower the Niceness index**, the **higher the priority** given to the process.
- Default value of all processes is 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>