

Assignment — Process Management

1) List out highest priority process in the system

htop

Press f6

Sort by priority

```
CPU||||| 3.2% Tasks: 32, 34 thr, 74 kthr: 1 running
Mem| 174M/957M Load average: 0.00 0.00 0.00
Swp| 0K/0K Uptime: 03:08:30
```

Main	170
Sort by	PID USER PRI NI VIRT RES SHR S CPU% MEM% TIME+ Command
PID	184 root RT 0 282M 27136 8704 S 0.0 2.8 0:00.11 /sbin/multipathd -d -s
USER	192 root RT 0 282M 27136 8704 S 0.0 2.8 0:00.00 /sbin/multipathd -d -s
PRIORITY	193 root RT 0 282M 27136 8704 S 0.0 2.8 0:00.00 /sbin/multipathd -d -s
NICE	194 root RT 0 282M 27136 8704 S 0.0 2.8 0:00.00 /sbin/multipathd -d -s
M_VIRT	195 root RT 0 282M 27136 8704 S 0.0 2.8 0:00.64 /sbin/multipathd -d -s
M_RESIDENT	196 root RT 0 282M 27136 8704 S 0.0 2.8 0:00.00 /sbin/multipathd -d -s
M_SHARE	125 root 19 -1 66812 14912 13760 S 0.0 1.5 0:00.27 /usr/lib/systemd/systemd-journald
STATE	1 root 20 0 22172 13276 9436 S 0.0 1.4 0:01.41 /sbin/init
PERCENT_CPU	189 root 20 0 26472 8188 5116 S 0.0 0.8 0:00.14 /usr/lib/systemd/systemd-udev
PERCENT_MEM	191 root 20 0 282M 27136 8704 S 0.0 2.8 0:00.00 /sbin/multipathd -d -s
TIME	323 systemd-re 20 0 21584 12928 10624 S 0.0 1.3 0:00.12 /usr/lib/systemd/systemd-resolved
Command	464 systemd-ne 20 0 22396 9728 8576 S 0.0 1.0 0:00.05 /usr/lib/systemd/systemd-networkd
	506 root 20 0 2720 1920 1792 S 0.0 0.2 0:00.00 /usr/sbin/acpid
	510 root 20 0 7224 2688 2432 S 0.0 0.3 0:00.01 /usr/sbin/cron -f -P
	511 messagebus 20 0 9800 5504 4608 S 0.0 0.6 0:00.10 @dbus-daemon --system --address=systemd: --nofork --nopidfile --system-acti
	518 root 20 0 32512 20736 10496 S 0.0 2.1 0:00.07 /usr/bin/python3 /usr/bin/networkd-dispatcher --run-startup-triggers
	519 polkitd 20 0 374M 9352 7296 S 0.0 1.0 0:00.06 /usr/lib/polkit-1/polkitd --no-debug
	521 root 20 0 1645M 19112 10880 S 0.0 1.9 0:00.35 /snap/amazon-ssm-agent/9881/amazon-ssm-agent
	524 root 20 0 1728M 31028 20608 S 0.0 3.2 0:00.02 /usr/lib/snapd/snapd
	532 root 20 0 18156 8704 7680 S 0.0 0.9 0:00.07 /usr/lib/systemd/systemd-logind
	543 root 20 0 1728M 31028 20608 S 0.0 3.2 0:00.03 /usr/lib/snapd/snapd
	547 root 20 0 457M 13440 11392 S 0.0 1.4 0:00.03 /usr/libexec/udisks2/udisksd
	548 root 20 0 1728M 31028 20608 S 0.0 3.2 0:00.00 /usr/lib/snapd/snapd
	549 root 20 0 1728M 31028 20608 S 0.0 3.2 0:00.00 /usr/lib/snapd/snapd
	577 root 20 0 457M 13440 11392 S 0.0 1.4 0:00.18 /usr/libexec/udisks2/udisksd
	579 root 20 0 457M 13440 11392 S 0.0 1.4 0:00.00 /usr/libexec/udisks2/udisksd
	585 root 20 0 457M 13440 11392 S 0.0 1.4 0:00.00 /usr/libexec/udisks2/udisksd
	595 root 20 0 1728M 31028 20608 S 0.0 3.2 0:00.03 /usr/lib/snapd/snapd
	596 root 20 0 1728M 31028 20608 S 0.0 3.2 0:00.02 /usr/lib/snapd/snapd
	644 root 20 0 6148 2048 1920 S 0.0 0.2 0:00.00 /sbin/agetty -o -p -- \u --keep-baud 115200,57600,38400,9600 - vt220
	660 _chrony 20 0 19388 3728 3072 S 0.0 0.4 0:00.31 /usr/sbin/chronyd -F 1
	669 _chrony 20 0 11060 2204 1664 S 0.0 0.2 0:00.00 /usr/sbin/chronyd -F 1
	684 root 20 0 107M 23040 13696 S 0.0 2.4 0:00.06 /usr/bin/python3 /usr/share/unattended-upgrades/unattended-upgrade-shutdown
	686 polkitd 20 0 374M 9352 7296 S 0.0 1.0 0:00.00 /usr/lib/polkit-1/polkitd --no-debug
	687 polkitd 20 0 374M 9352 7296 S 0.0 1.0 0:00.00 /usr/lib/polkit-1/polkitd --no-debug
	690 polkitd 20 0 374M 9352 7296 S 0.0 1.0 0:00.00 /usr/lib/polkit-1/polkitd --no-debug
	702 root 20 0 457M 13440 11392 S 0.0 1.4 0:00.00 /usr/libexec/udisks2/udisksd
	703 syslog 20 0 217M 6272 4608 S 0.0 0.6 0:00.03 /usr/sbin/rsyslogd -n -iNONE
	728 root 20 0 457M 13440 11392 S 0.0 1.4 0:00.00 /usr/libexec/udisks2/udisksd

EnterSort EscCancel

Then the highest priority will be display at the top

In this case RT means real time highest priority

```
CPU[ ] 0.7% Tasks: 32, 34 thr, 74 kthr; 1 running
Mem[ ] 174M/957M Load average: 0.00 0.00 0.00
Swp[ ] 0K/0K Uptime: 03:07:53

Main 1/0
PID USER PRI NI VIRT RES SHR S CPU% MEM% TIME+ Command
184 root RT 0 282M 27136 8704 S 0.0 2.8 0:00.11 /sbin/multipathd -d -s
192 root RT 0 282M 27136 8704 S 0.0 2.8 0:00.00 /sbin/multipathd -d -s
193 root RT 0 282M 27136 8704 S 0.0 2.8 0:00.00 /sbin/multipathd -d -s
194 root RT 0 282M 27136 8704 S 0.0 2.8 0:00.00 /sbin/multipathd -d -s
195 root RT 0 282M 27136 8704 S 0.0 2.8 0:00.64 /sbin/multipathd -d -s
196 root RT 0 282M 27136 8704 S 0.0 2.8 0:00.00 /sbin/multipathd -d -s
125 root 19 -1 66812 14912 13760 S 0.0 1.5 0:00.27 /usr/lib/systemd/systemd-journald
1 root 20 0 22172 13276 9436 S 0.0 1.4 0:01.41 /sbin/init
189 root 20 0 26472 8188 5116 S 0.0 0.8 0:00.14 /usr/lib/systemd/systemd-udev
191 root 20 0 282M 27136 8704 S 0.0 2.8 0:00.00 /sbin/multipathd -d -s
323 systemd-re 20 0 21584 12928 10624 S 0.0 1.3 0:00.12 /usr/lib/systemd/systemd-resolved
464 systemd-ne 20 0 22396 9728 8576 S 0.0 1.0 0:00.05 /usr/lib/systemd/systemd-networkd
506 root 20 0 2720 1920 1792 S 0.0 0.2 0:00.00 /usr/sbin/acpid
510 root 20 0 7224 2688 2432 S 0.0 0.3 0:00.01 /usr/sbin/cron -f -p
511 messagebus 20 0 9800 5504 4608 S 0.0 0.6 0:00.10 @dbus-daemon --system --address=systemd: --nofork --nopidfile --systemd-activation --syslog
518 root 20 0 32512 20736 10496 S 0.0 2.1 0:00.07 /usr/bin/python3 /usr/bin/networkd-dispatcher --run-startup-triggers
519 polkitd 20 0 374M 9352 7296 S 0.0 1.0 0:00.06 /usr/lib/polkit-1/polkitd --no-debug
521 root 20 0 1645M 19112 10880 S 0.0 1.9 0:00.35 /snap/amazon-ssm-agent/9881/amazon-ssm-agent
524 root 20 0 1728M 31028 20608 S 0.0 3.2 0:00.02 /usr/lib/snapd/snapd
532 root 20 0 18156 8704 7680 S 0.0 0.9 0:00.07 /usr/lib/systemd/systemd-logind
543 root 20 0 1728M 31028 20608 S 0.0 3.2 0:00.03 /usr/lib/snapd/snapd
547 root 20 0 457M 13440 11392 S 0.0 1.4 0:00.03 /usr/libexec/udisks2/udisksd
548 root 20 0 1728M 31028 20608 S 0.0 3.2 0:00.00 /usr/lib/snapd/snapd
549 root 20 0 1728M 31028 20608 S 0.0 3.2 0:00.00 /usr/lib/snapd/snapd
577 root 20 0 457M 13440 11392 S 0.0 1.4 0:00.18 /usr/libexec/udisks2/udisksd
579 root 20 0 457M 13440 11392 S 0.0 1.4 0:00.00 /usr/libexec/udisks2/udisksd
585 root 20 0 457M 13440 11392 S 0.0 1.4 0:00.00 /usr/libexec/udisks2/udisksd
595 root 20 0 1728M 31028 20608 S 0.0 3.2 0:00.03 /usr/lib/snapd/snapd
596 root 20 0 1728M 31028 20608 S 0.0 3.2 0:00.02 /usr/lib/snapd/snapd
644 root 20 0 6148 2048 1920 S 0.0 0.2 0:00.00 /sbin/agetty -o -p -- \u --keep-baud 115200,57600,38400,9600 - vt220
660 _chrony 20 0 19388 3728 3072 S 0.0 0.4 0:00.30 /usr/sbin/chronyd -F 1
669 _chrony 20 0 11060 2204 1664 S 0.0 0.2 0:00.00 /usr/sbin/chronyd -F 1
684 root 20 0 107M 23040 13696 S 0.0 2.4 0:00.06 /usr/bin/python3 /usr/share/unattended-upgrades/unattended-upgrade-shutdown --wait-for-sign
686 polkitd 20 0 374M 9352 7296 S 0.0 1.0 0:00.00 /usr/lib/polkit-1/polkitd --no-debug
687 polkitd 20 0 374M 9352 7296 S 0.0 1.0 0:00.00 /usr/lib/polkit-1/polkitd --no-debug
690 polkitd 20 0 374M 9352 7296 S 0.0 1.0 0:00.00 /usr/lib/polkit-1/polkitd --no-debug
702 root 20 0 457M 13440 11392 S 0.0 1.4 0:00.00 /usr/libexec/udisks2/udisksd
703 syslog 20 0 217M 6272 4608 S 0.0 0.6 0:00.03 /usr/sbin/rsyslogd -n -iNONE
728 root 20 0 457M 13440 11392 S 0.0 1.4 0:00.00 /usr/libexec/udisks2/udisksd
F1Help F2Setup F3Search F4Filter F5Tree F6SortBy F7Nice F8Nice F9Kill F10Quit
```

2) Open terminal with 2 tabs or sessions

a) run command "vmstat 1"

b) switch to another tab, pause running vmstat command for few seconds and resume it again

use appropriate SIGNALS to do this activity.

In 1st tab

Vmstat 1

```
...@ip-172-31-12-145: ~ -- ssh -i test2.pem ubuntu@ec2-35-154-213-118.ap-south-1.compute.amazonaws.com ...172-31-12-145: ~ -- ssh -i test2.pem ubuntu@ec2-35-154-213-118.ap-south-1.compute.amazonaws.com +
ubuntu@ip-172-31-12-145:~$ vmstat 1
procs-----memory-----swap-----io-----system--cpu-----
r b swpd free buff cache si so bi bo in cs us sy id wa st gu
1 0 0 223976 17736 561476 0 0 53 26 73 1 0 0 94 0 5 0
0 0 0 223976 17736 561480 0 0 0 0 243 111 0 0 100 0 0 0
0 0 0 223976 17736 561480 0 0 0 0 226 101 0 0 98 0 2 0
0 0 0 223976 17736 561480 0 0 0 0 40 30 0 0 100 0 0 0
0 0 0 223976 17736 561480 0 0 0 0 30 17 0 0 93 0 7 0
0 0 0 223976 17736 561480 0 0 0 0 36 21 0 0 96 0 4 0
0 0 0 223976 17736 561480 0 0 0 0 26 17 0 0 84 0 16 0
0 0 0 223976 17736 561480 0 0 0 0 34 22 0 0 98 0 2 0
0 0 0 223976 17736 561480 0 0 0 0 28 19 0 0 99 0 1 0
0 0 0 223976 17736 561480 0 0 0 0 32 23 0 0 100 0 0 0
0 0 0 223976 17736 561480 0 0 0 0 26 16 0 0 92 0 8 0
0 0 0 223976 17736 561480 0 0 0 0 30 20 0 0 100 0 0 0
0 0 0 223976 17736 561480 0 0 0 0 40 26 0 0 90 0 10 0
0 0 0 223976 17736 561480 0 0 0 0 46 35 0 0 93 0 7 0
0 0 0 223976 17736 561480 0 0 0 0 24 13 0 0 100 0 0 0
0 0 0 223976 17736 561480 0 0 0 0 32 23 0 0 100 0 0 0
0 0 0 223976 17736 561480 0 0 0 0 28 25 0 0 91 0 9 0
0 0 0 223976 17736 561480 0 0 0 0 26 16 0 0 100 0 0 0
0 0 0 223976 17736 561480 0 0 0 0 30 26 0 0 100 0 0 0
0 0 0 223976 17736 561480 0 0 0 0 34 15 0 0 99 0 1 0
```

In 2nd tab

Pgrep vimstat

This will return the pid of the process vmstat

Using that pid

kill -SIGSTOP 2776

```
...@ip-172-31-12-145: ~ -- ssh -i test2.pem ubuntu@ec2-35-154-213-118.ap-south-1.compute.amazonaws.com ...172-31-12-145: ~ -- ssh -i test2.pem ubuntu@ec2-35-154-213-118.ap-south-1.compute.amazonaws.com +
ubuntu@ip-172-31-12-145:~$ pgrep vmstat
2776
ubuntu@ip-172-31-12-145:~$ kill -SIGSTOP 2776
ubuntu@ip-172-31-12-145:~$
```

It stops the process

```

0 0 0 206868 17752 561528 0 0 0 0 36 25 0 0 100 0 0 0
0 0 0 206868 17752 561528 0 0 0 0 26 18 0 0 100 0 0 0
0 0 0 206868 17752 561528 0 0 0 0 32 23 0 0 98 0 2 0
0 0 0 206868 17752 561528 0 0 0 0 24 17 0 0 81 0 19 0
0 0 0 206868 17752 561528 0 0 0 0 237 203 1 0 98 0 1 0
0 0 0 206868 17752 561528 0 0 0 0 307 157 0 0 98 0 2 0
0 0 0 206868 17752 561528 0 0 0 0 302 122 0 0 100 0 0 0
0 0 0 206868 17752 561528 0 0 0 0 255 99 0 0 98 0 2 0
0 0 0 206868 17752 561528 0 0 0 0 289 111 0 0 100 0 0 0
0 0 0 206868 17752 561528 0 0 0 0 86 41 0 0 96 0 4 0
0 0 0 206868 17752 561528 0 0 0 116 185 110 0 0 95 0 5 0
0 0 0 206868 17752 561528 0 0 0 0 313 124 0 0 100 0 0 0
0 0 0 206868 17752 561528 0 0 0 0 311 140 0 0 99 0 1 0
0 0 0 206868 17752 561528 0 0 0 0 336 132 0 0 98 0 2 0
0 0 0 206868 17752 561528 0 0 0 0 317 139 0 0 99 0 1 0
0 0 0 206868 17752 561528 0 0 0 0 309 120 0 0 98 0 2 0
0 0 0 206868 17752 561528 0 0 0 0 302 114 0 0 100 0 0 0
0 0 0 206868 17752 561528 0 0 0 0 302 116 0 0 100 0 0 0
0 0 0 206868 17752 561528 0 0 0 0 164 64 0 0 96 0 4 0
0 0 0 206868 17752 561528 0 0 0 0 36 32 0 0 100 0 0 0

[1]+  Stopped                  vnstat 1
ubuntu@ip-172-31-12-145:~$

```

Now

In 2nd tab

kill -SIGSCONT 2776

```

[1]+  Stopped                  vnstat 1
ubuntu@ip-172-31-12-145:~$ 2 0 0 221740 17908 561804 0 0 0 0 319 123 0 1 98 0 1 0
0 0 0 221740 17908 561804 0 0 0 0 311 112 0 0 100 0 0 0
0 0 0 221740 17908 561804 0 0 0 0 143 81 0 0 98 0 2 0
0 0 0 221740 17908 561804 0 0 0 0 37 26 0 0 87 0 13 0
0 0 0 221740 17908 561804 0 0 0 0 30 24 0 0 99 0 1 0
0 0 0 221740 17908 561804 0 0 0 0 28 22 0 0 100 0 0 0
0 0 0 221740 17908 561804 0 0 0 0 28 24 0 0 83 0 17 0
0 0 0 221740 17908 561804 0 0 0 0 32 25 1 0 99 0 0 0
0 0 0 221740 17908 561804 0 0 0 0 30 20 0 0 96 0 4 0
0 0 0 221740 17908 561804 0 0 0 0 38 37 0 0 99 0 1 0

```

This resumes the command

3) Find the process which is sleeping in "wait" state.

ps -eo pid,state,command | awk '\$2=="D"'

Or for Running state

ps -eo pid,state,command | awk '\$2=="R"'

Or for sleeping state

ps -eo pid,state,command | awk '\$2=="S"'

```
...@ip-172-31-12-145: ~ -- ssh -i test2.pem ubuntu@ec2-35-154-213-118.ap-south-1.compute.amazonaws.com ... 172-31-12-145: ~ -- ssh -i test2.pem ubuntu@ec2-35-154-213-118.ap-south-1.compute.amazonaws.com +
ubuntu@ip-172-31-12-145:~$ ps -eo pid,state,command | awk '$2=="D"'
ubuntu@ip-172-31-12-145:~$ ps -eo pid,state,command | awk '$2=="R"'
2876 R ps -eo pid,state,command
ubuntu@ip-172-31-12-145:~$ ps -eo pid,state,command | awk '$2=="S"'
PID S COMMAND
1 S /sbin/init
2 S [kthreadd]
3 S [pool_workqueue_release]
15 S [ksoftirqd/0]
17 S [migration/0]
18 S [idle_inject/0]
19 S [cpuhp/0]
20 S [kdevtmpfs]
23 S [kauditd]
24 S [khungtaskd]
25 S [oom_reaper]
28 S [kcompactd0]
29 S [ksmd]
30 S [khugepaged]
34 S [irq/9-acpi]
35 S [xen-balloon]
42 S [watchdogd]
44 S [kswapd0]
45 S [cryptfs-kthread]
48 S [xenbus]
49 S [xenwatch]
54 S [scsi_eh_0]
56 S [scsi_eh_1]
84 S [jbd2/xvda1-8]
125 S /usr/lib/systemd/systemd-journald
184 S /sbin/multipathd -d -s
189 S /usr/lib/systemd/systemd-udev
213 S [psimon]
269 S [jbd2/xvda16-8]
323 S /usr/lib/systemd/systemd-resolved
464 S /usr/lib/systemd/systemd-networkd
506 S /usr/sbin/acpid
510 S /usr/sbin/cron -f -p
511 S @dbus-daemon --system --address=systemd: --nofork --nopidfile --systemd-activation --syslog-only
518 S /usr/bin/python3 /usr/bin/networkd-dispatcher --run-startup-triggers
519 S /usr/lib/polkit-1/polkitd --no-debug
521 S /snap/amazon-ssm-agent/9881/amazon-ssm-agent
524 S /usr/lib/snapd/snapd
532 S /usr/lib/systemd/systemd-logind
547 S /usr/libexec/udisks2/udisksd
```