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5724dde · 1 minute ago



170 lines (137 loc) · 5.06 KB

Linux Process Management Commands

This document explains various Linux commands to manage and monitor processes.



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- **a** → show processes for all users
- **u** → show user/owner of process
- **x** → show processes not attached to a terminal

Example Output:

USER	PID	%CPU	%MEM	VSZ	RSS	TTY	STAT	START	TIME
root	1	0.0	0.1	167500	1100	?	Ss	Sep25	0:05
/sbin/init									
vibhu	1234	1.2	1.5	274532	15632	?	Sl	10:15	0:12
/usr/bin/python3 script.py									
mysql	2001	0.5	2.0	450000	20988	?	Ssl	Sep25	1:02
/usr/sbin/mysqld									



```
vboxuser@sehajpreet:~$ ps aux
```

USER	PID	%CPU	%MEM	VSZ	RSS	TTY	STAT	START	TIME	COMMAND
root	1	4.5	0.1	23500	14408	?	Ss	08:52	0:03	/sbin/init splash
root	2	0.0	0.0	0	0	?	S	08:52	0:00	[kthreadd]
root	3	0.0	0.0	0	0	?	S	08:52	0:00	[pool_workqueue_release]
root	4	0.0	0.0	0	0	?	I<	08:52	0:00	[kworker/R-rcu_gp]
root	5	0.0	0.0	0	0	?	I<	08:52	0:00	[kworker/R-sync_wq]
root	6	0.0	0.0	0	0	?	I<	08:52	0:00	[kworker/R-kvfree_rcu_reclaim]
root	7	0.0	0.0	0	0	?	I<	08:52	0:00	[kworker/R-slub_flushwq]
root	8	0.0	0.0	0	0	?	I<	08:52	0:00	[kworker/R-netns]
root	9	0.0	0.0	0	0	?	I	08:52	0:00	[kworker/0:0-events]
root	10	0.0	0.0	0	0	?	I	08:52	0:00	[kworker/0:1-cgroup_destroy]
root	11	0.1	0.0	0	0	?	I<	08:52	0:00	[kworker/0:0H-kblockd]
root	12	1.1	0.0	0	0	?	I	08:52	0:01	[kworker/u16:0-loop7]
root	13	0.0	0.0	0	0	?	I<	08:52	0:00	[kworker/R-mm_percpu_wq]
root	14	0.0	0.0	0	0	?	I	08:52	0:00	[rcu_tasks_kthread]
root	15	0.0	0.0	0	0	?	I	08:52	0:00	[rcu_tasks_rude_kthread]
root	16	0.0	0.0	0	0	?	I	08:52	0:00	[rcu_tasks_trace_kthread]
root	17	0.1	0.0	0	0	?	S	08:52	0:00	[ksoftirqd/0]
root	18	1.1	0.0	0	0	?	I	08:52	0:00	[rcu_preempt]
root	19	0.0	0.0	0	0	?	S	08:52	0:00	[rcu_exp_par_gp_kthread_worker/0]
root	20	0.2	0.0	0	0	?	S	08:52	0:00	[rcu_exp_gp_kthread_worker]
root	21	0.0	0.0	0	0	?	S	08:52	0:00	[migration/0]
root	22	0.0	0.0	0	0	?	S	08:52	0:00	[idle_inject/0]
root	23	0.0	0.0	0	0	?	S	08:52	0:00	[cpuhp/0]
root	24	0.0	0.0	0	0	?	S	08:52	0:00	[cpuhp/1]
root	25	0.0	0.0	0	0	?	S	08:52	0:00	[idle_inject/1]
root	26	1.6	0.0	0	0	?	S	08:52	0:01	[migration/1]
root	27	0.4	0.0	0	0	?	S	08:52	0:00	[ksoftirqd/1]
root	28	0.0	0.0	0	0	?	I	08:52	0:00	[kworker/1:0-events]
root	29	0.0	0.0	0	0	?	I<	08:52	0:00	[kworker/1:0H-events_highpri]
root	30	0.0	0.0	0	0	?	S	08:52	0:00	[cpuhp/2]

```
vboxuser@sehajpreet:~$ ps aux
```

USER	PID	%CPU	%MEM	VSZ	RSS	TTY	STAT	START	TIME	COMMAND
vboxuser	2403	5.1	0.3	421524	29480	?	Sl	08:53	0:02	/usr/libexec/ibus-extension-gtk3
vboxuser	2408	0.1	0.0	310424	7048	?	Sl	08:53	0:00	/usr/libexec/ibus-portal
vboxuser	2428	0.1	0.1	416236	15020	?	Sl	08:53	0:00	/usr/libexec/gsd-printer
vboxuser	2468	0.1	0.0	309792	6416	?	Ssl	08:53	0:00	/usr/libexec/gvfs-mtp-volume-monitor
vboxuser	2494	0.2	0.2	546660	23928	?	Sl	08:53	0:00	/usr/libexec/goa-daemon
vboxuser	2497	0.1	0.0	310760	6844	?	Ssl	08:53	0:00	/usr/libexec/gvfs-gphoto2-volume-monitor
vboxuser	2507	0.0	0.0	309772	6228	?	Ssl	08:53	0:00	/usr/libexec/gvfs-goa-volume-monitor
vboxuser	2519	0.0	0.1	389124	9040	?	Sl	08:53	0:00	/usr/libexec/goa-identity-service
vboxuser	2527	0.0	0.0	389376	7892	?	Ssl	08:53	0:00	/usr/libexec/gvfs-afc-volume-monitor
vboxuser	2529	0.5	0.2	890732	24124	?	Ssl	08:53	0:00	/usr/libexec/evolution-calendar-factory
vboxuser	2535	0.6	0.8	260460	71176	?	S	08:53	0:00	/usr/bin/Xwayland :0 -rootless -noreset -accessx -cor
vboxuser	2549	0.5	0.3	825308	29760	?	Ssl	08:53	0:00	/usr/libexec/evolution-addressbook-factory
vboxuser	2576	0.0	0.0	230108	5552	?	Ssl	08:53	0:00	/usr/libexec/dconf-service
vboxuser	2579	0.0	0.0	236768	6976	?	Sl	08:53	0:00	/usr/libexec/ibus-engine-simple
vboxuser	2607	0.1	0.1	609440	8956	?	Sl	08:53	0:00	/usr/libexec/gvfsd-trash --spawner :1.20 /org/gtk/gvf
vboxuser	2631	0.5	0.1	39136	11676	?	Ss	08:53	0:00	/snap/snapd-desktop-integration/315/usr/bin/snapd-des
vboxuser	2655	1.6	0.7	2941464	61536	?	Sl	08:53	0:00	gjs /usr/share/gnome-shell/extensions/ding@rastersoft
vboxuser	2686	0.5	1.0	640840	83084	?	Ssl	08:53	0:00	/usr/libexec/gsd-xsettings
vboxuser	2769	0.8	0.3	429620	30760	?	Sl	08:53	0:00	/snap/snapd-desktop-integration/315/usr/bin/snapd-des
vboxuser	2787	0.2	0.3	2597064	26912	?	Sl	08:53	0:00	/usr/bin/gjs -m /usr/share/gnome-shell/org.gnome.Scre
vboxuser	2812	0.3	0.1	701608	13916	?	Ssl	08:53	0:00	/usr/libexec/xdg-desktop-portal
vboxuser	2821	0.2	0.3	267136	24520	?	Sl	08:53	0:00	/usr/libexec/ibus-x11
vboxuser	2823	1.0	0.3	734596	27496	?	Ssl	08:53	0:00	/usr/libexec/tracker-miner-fs-3
vboxuser	2824	0.4	0.5	556868	40984	?	Ssl	08:53	0:00	/usr/libexec/xdg-desktop-portal-gnome
vboxuser	2825	0.5	1.2	1412600	101572	?	Sl	08:53	0:00	/usr/libexec/mutter-x11-frames
vboxuser	2827	0.0	0.0	236268	6096	?	Ssl	08:53	0:00	/usr/libexec/gvfsd-metadata
vboxuser	2879	0.4	0.3	417856	25680	?	Ssl	08:53	0:00	/usr/libexec/xdg-desktop-portal-gtk
vboxuser	2923	3.4	0.6	698568	55636	?	Ssl	08:53	0:01	/usr/libexec/gnome-terminal-server
vboxuser	2930	0.1	0.0	11020	4956	pts/0	Ss	08:53	0:00	bash
root	2964	0.0	0.0	0	0	?	I	08:53	0:00	[kworker/2:3-cgroup_destroy]
vboxuser	2994	150	0.0	13616	4508	pts/0	R+	08:54	0:00	ps aux

2. Process Tree: pstree -p

Shows parent-child process relationships.

Example Output:

```
systemd(1)─NetworkManager(778)
           └─sshd(895)─sshd(1023)─bash(1024)─pstree(1101)
```



```

├─mysqld(2001)
└─python3(1234)

```

```

vboxuser@sehajpreet:~$ pstree -p
systemd(1)─ModemManager(952)─{ModemManager}(985)
                        │   {ModemManager}(990)
                        │   {ModemManager}(994)
                        └─NetworkManager(872)─{NetworkManager}(981)
                                                │   {NetworkManager}(983)
                                                │   {NetworkManager}(987)
                        └─accounts-daemon(809)─{accounts-daemon}(843)
                                                │   {accounts-daemon}(844)
                                                │   {accounts-daemon}(855)
                        └─anydesk(1148)─{anydesk}(1212)
                                                │   {anydesk}(1213)
                                                │   {anydesk}(1214)
                                                │   {anydesk}(1245)
                                                │   {anydesk}(2871)
                                                │   {anydesk}(2874)
                        └─avahi-daemon(778)─avahi-daemon(871)
                        └─colord(1516)─{colord}(1521)
                                                │   {colord}(1522)
                                                │   {colord}(1524)
                        └─cron(818)
                        └─cups-browsed(1165)─{cups-browsed}(1218)
                                                │   {cups-browsed}(1220)
                                                │   {cups-browsed}(1221)
                        └─cupsd(1135)─dbus(1156)
                        └─dbus-daemon(779)
                        └─xdm(1172)─xdm-session-wm(1876)─xdm-session-wm(1866)─xdm-session-bl(1876)─xdm-session-bl(2061)

```

```

vboxuser@sehajpreet:~$ pstree -p
systemd(1)─ModemManager(952)─{ModemManager}(985)
                        │   {ModemManager}(990)
                        │   {ModemManager}(994)
                        └─NetworkManager(872)─{NetworkManager}(981)
                                                │   {NetworkManager}(983)
                                                │   {NetworkManager}(987)
                        └─accounts-daemon(809)─{accounts-daemon}(843)
                                                │   {accounts-daemon}(844)
                                                │   {accounts-daemon}(855)
                        └─anydesk(1148)─{anydesk}(1212)
                                                │   {anydesk}(1213)
                                                │   {anydesk}(1214)
                                                │   {anydesk}(1245)
                                                │   {anydesk}(2871)
                                                │   {anydesk}(2874)
                        └─avahi-daemon(778)─avahi-daemon(871)
                        └─colord(1516)─{colord}(1521)
                                                │   {colord}(1522)
                                                │   {colord}(1524)
                        └─cron(818)
                        └─cups-browsed(1165)─{cups-browsed}(1218)
                                                │   {cups-browsed}(1220)
                                                │   {cups-browsed}(1221)
                        └─cupsd(1135)─dbus(1156)
                        └─dbus-daemon(779)
                        └─xdm(1172)─xdm-session-wm(1876)─xdm-session-wm(1866)─xdm-session-bl(1876)─xdm-session-bl(2061)
                        └─xdg-permission-(2017)─{xdg-document-po}(2041)
                                                │   {xdg-document-po}(2055)
                                                │   {xdg-permission-}(2029)
                                                │   {xdg-permission-}(2030)
                                                │   {xdg-permission-}(2032)
                        └─systemd-journal(264)
                        └─systemd-logind(826)
                        └─systemd-oomd(475)
                        └─systemd-resolve(482)
                        └─systemd-timesyn(488)─{systemd-timesyn}(542)
                        └─systemd-udev(344)
                        └─tailscaled(1143)─{tailscaled}(1158)
                                                │   {tailscaled}(1159)
                                                │   {tailscaled}(1160)
                                                │   {tailscaled}(1161)
                                                │   {tailscaled}(1239)
                                                │   {tailscaled}(1272)
                                                │   {tailscaled}(1273)
                                                │   {tailscaled}(1275)
                                                │   {tailscaled}(1281)
                        └─udisksd(831)─{udisksd}(883)
                                                │   {udisksd}(888)
                                                │   {udisksd}(892)
                                                │   {udisksd}(962)
                                                │   {udisksd}(986)
                        └─unattended-upgr(1144)─{unattended-upgr}(1169)
                        └─upowerd(1558)─{upowerd}(1595)
                                                │   {upowerd}(1596)
                                                │   {upowerd}(1598)
                        └─vsftpd(1153)
                        └─wpa_supplicant(877)

```

3. Real-Time Monitoring: top

Displays real-time CPU/memory usage.

Example Output:

```

top - 10:40:46 up 22 min, 1 user, load average: 0.22, 0.38, 0.27
Tasks: 211 total, 1 running, 210 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.1 us, 0.3 sy, 0.0 ni, 99.5 id, 0.0 wa, 0.0 hi, 0.1 si,
0.0 st
MiB Mem : 5776.9 total, 2161.6 free, 1138.6 used, 2799.3

```



buff/cache

MiB Swap: 0.0 total, 0.0 free, 0.0 used. 4638.2 avail
Mem

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+
COMMAND										
1992	sameerb+	20	0	4967692	411396	141592	S	3.6	7.0	0:59.64
gnome-s+										
12065	sameerb+	20	0	553448	52396	42096	S	0.5	0.9	0:00.63
gnome-t+										
1394	root	20	0	316824	8788	7380	S	0.3	0.1	0:00.39
upowerd										
2568	sameerb+	20	0	2947568	67764	51612	S	0.3	1.1	0:01.47 gjs
11299	root	20	0	0	0	0	I	0.3	0.0	0:01.92
kworker+										
12078	sameerb+	20	0	14500	5924	3748	R	0.3	0.1	0:00.06 top
1	root	20	0	23212	14144	9664	S	0.0	0.2	0:09.05
systemd										
2	root	20	0	0	0	0	S	0.0	0.0	0:00.02
kthreadd										
3	root	20	0	0	0	0	I	0.0	0.0	0:00.00
pool_wo+										
4	root	20	0	0	0	0	I	0.0	0.0	0:00.00
kworker+										
5	root	0	-20	0	0	0	I	0.0	0.0	0:00.00
kworker+										
6	root	0	-20	0	0	0	I	0.0	0.0	0:00.00
kworker+										
7	root	0	-20	0	0	0	I	0.0	0.0	0:00.00
kworker+										
8	root	0	-20	0	0	0	I	0.0	0.0	0:00.00
kworker+										
10	root	0	-20	0	0	0	I	0.0	0.0	0:00.00
kworker+										
11	root	0	-20	0	0	0	I	0.0	0.0	0:00.00
kworker+										
13	root	0	-20	0	0	0	I	0.0	0.0	0:00.00
kworker+										

👉 Press **q** to quit.

```
vboxuser@sehajpreet:~$ top
top - 08:59:09 up 6 min, 1 user, load average: 0.09, 0.46, 0.32
Tasks: 211 total, 1 running, 210 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.7 us, 2.8 sy, 0.0 ni, 93.2 id, 0.0 wa, 0.0 hi, 3.3 si, 0.0 st
MiB Mem : 7941.9 total, 6049.3 free, 1143.2 used, 1023.7 buff/cache
MiB Swap: 0.0 total, 0.0 free, 0.0 used, 6798.7 avail Mem

  PID USER      PR  NI  VIRT  RES  SHR S %CPU  %MEM    TIME+  COMMAND
 2136 vboxuser  20   0 4767112 398712 147428 S 17.3   4.9   0:25.68  gnome-shell
    47 root      20   0     0     0     0 I  1.3   0.0   0:00.16  kworker/u16:1-events_power_efficient
 2923 vboxuser  20   0 699128 56276 45040 S  1.0   0.7   0:04.02  gnome-terminal-
    78 root      20   0     0     0     0 I  0.7   0.0   0:00.13  kworker/u16:5-ipv6_addrconf
 1143 root      20   0 1254028 35584 23168 S  0.7   0.4   0:02.19  tailscaled
 3067 vboxuser  20   0 14516  5828  3652 R  0.7   0.1   0:00.06  top
 1558 root      20   0 316760 9008 7600 S  0.3   0.1   0:00.36  upowerd
    1 root      20   0  23500 14408 9416 S  0.0   0.2   0:03.89  systemd
    2 root      20   0     0     0     0 S  0.0   0.0   0:00.03  kthreadd
    3 root      20   0     0     0     0 S  0.0   0.0   0:00.00  pool_workqueue_release
    4 root      0 -20     0     0     0 I  0.0   0.0   0:00.00  kworker/R-rcu_gp
    5 root      0 -20     0     0     0 I  0.0   0.0   0:00.00  kworker/R-sync_wq
    6 root      0 -20     0     0     0 I  0.0   0.0   0:00.00  kworker/R-kvfree_rcu_reclaim
    7 root      0 -20     0     0     0 I  0.0   0.0   0:00.00  kworker/R-slub_flushwq
    8 root      0 -20     0     0     0 I  0.0   0.0   0:00.00  kworker/R-netns
   10 root      20   0     0     0     0 I  0.0   0.0   0:00.07  kworker/0:1-cgroup_destroy
   11 root      0 -20     0     0     0 I  0.0   0.0   0:00.11  kworker/0:0H-kblockd
   13 root      0 -20     0     0     0 I  0.0   0.0   0:00.00  kworker/R-mm_percpu_wq
   14 root      20   0     0     0     0 I  0.0   0.0   0:00.00  rcu_tasks_kthread
   15 root      20   0     0     0     0 I  0.0   0.0   0:00.00  rcu_tasks_rude_kthread
  Show Apps 16 root      20   0     0     0     0 I  0.0   0.0   0:00.00  rcu_tasks_trace_kthread
   17 root      20   0     0     0     0 S  0.0   0.0   0:00.14  ksoftirqd/0
```

⚡ 4. Adjust Process Priority

- Start process with low priority:

```
nice -n 10 sleep 300 &
[1] 3050
```



- Change priority of running process:

```
renice -n -5 -p 3050
3050 (process ID) old priority 10, new priority -5
```



🔧 5. CPU Affinity: taskset

- Show affinity:

```
taskset -cp 3050
pid 3050's current affinity list: 0-3
```



- Restrict to core 1 only:

```
taskset -cp 1 3050  
pid 3050's current affinity list: 1
```



6. I/O Scheduling Priority: **ionice**

```
ionice -c 3 -p 3050  
successfully set pid 3050's IO scheduling class to idle
```



👉 Class 3 (idle) → Process only gets I/O when system is idle.

7. File Descriptors: **lsuf**

```
sleep 3347 vboxuser cwd DIR 8,2 4096 3407874 /home/vboxuser  
sleep 3347 vboxuser rtd DIR 8,2 4096 2 /  
sleep 3347 vboxuser txt REG 8,2 35336 275947 /usr/bin/sleep  
sleep 3347 vboxuser mem REG 8,2 5719296 278970 /usr/lib/locale/locale-archi
```



8. Trace System Calls: **strace**

```
strace -p 3347  
strace: Process 3347 attached  
restart_syscall(<... resuming interrupted nanosleep ...>) = 0  
nanosleep({tv_sec=300, tv_nsec=0}, 0x7ffd4a60d8b0) = ?  
ERESTART_RESTARTBLOCK (Interrupted by signal)
```



9. Find Process Using a Port: **fuser**

```
sudo fuser -n tcp 8080  
8080/tcp:          4321
```





10. Per-Process Stats: pidstat

```
pidstat -p 3347 2 3
```



```
linux 6.14.0-33-generic (sehajpreet) 11/01/2025 _x86_64 (4 cpu)
```

```
09:21:21 AM UID PID %usr %system %guest %wait %CPU command
```



11. Control Groups (cgroups)

- Create new cgroup:

```
sudo cgcreate -g cpu,memory:/testgroup
```



- Limit CPU and Memory:

```
echo 50000 | sudo tee /sys/fs/cgroup/cpu/testgroup/cpu.cfs_quota_us  
echo 100M | sudo tee  
/sys/fs/cgroup/memory/testgroup/memory.limit_in_bytes
```



- Add a process (PID 3050) to cgroup:

```
echo 3050 | sudo tee /sys/fs/cgroup/cpu/testgroup/cgroup.procs
```



```
vboxuser@sehajpreet:~$ nice -n 10 sleep 300 &
[2] 3347
vboxuser@sehajpreet:~$ renice -n -5 -p 3347
renice: failed to set priority for 3347 (process ID): Permission denied
vboxuser@sehajpreet:~$ taskset -cp 3347
pid 3347's current affinity list: 0-3
vboxuser@sehajpreet:~$ taskset -cp 1 3347
pid 3347's current affinity list: 0-3
pid 3347's new affinity list: 1
vboxuser@sehajpreet:~$ ionice -c 3 -p 3347
vboxuser@sehajpreet:~$ lsop -p 3347 | head -5
Command 'lsop' not found, did you mean:
  command 'lsof' from deb lsof (4.95.0-1)
  command 'lzop' from deb lzop (1.04-2build2)
  command 'slop' from deb slop (7.6-4build1)
  command 'lscp' from deb nilfs-tools (2.2.9-1)
Try: sudo apt install <deb name>
vboxuser@sehajpreet:~$ sudo apt install <deb name>
bash: syntax error near unexpected token `newline'
[1]-  Done                  nice -n 10 sleep 300
```

```
vboxuser@sehajpreet:~$ lsof -p 3347 | head -5
COMMAND PID USER FD TYPE DEVICE SIZE/OFF NODE NAME
sleep 3347 vboxuser cwd DIR 8,2 4096 1441794 /home/vboxuser
sleep 3347 vboxuser rtd DIR 8,2 4096 2 /
sleep 3347 vboxuser txt REG 8,2 35336 526705 /usr/bin/sleep
sleep 3347 vboxuser mem REG 8,2 5719296 524368 /usr/lib/locale/locale-archive
vboxuser@sehajpreet:~$ strace -p 3347
strace: attach: ptrace(PTRACE_SEIZE, 3347): Operation not permitted
vboxuser@sehajpreet:~$ sudo fuser -n tcp 8080
[2]+  Done                  nice -n 10 sleep 300
vboxuser@sehajpreet:~$ pidstat -p 3347 2 3
Linux 6.14.0-33-generic (sehajpreet) 11/01/2025 _x86_64_ (4 CPU)

09:21:21 AM UID PID %usr %system %guest %wait %CPU CPU Command
vboxuser@sehajpreet:~$
```