

COMMANDS

1. ps aux

Explanation:

a → show processes for all users

u → show user/owner of process

x → show processes not attached to a terminal

*Example Output:

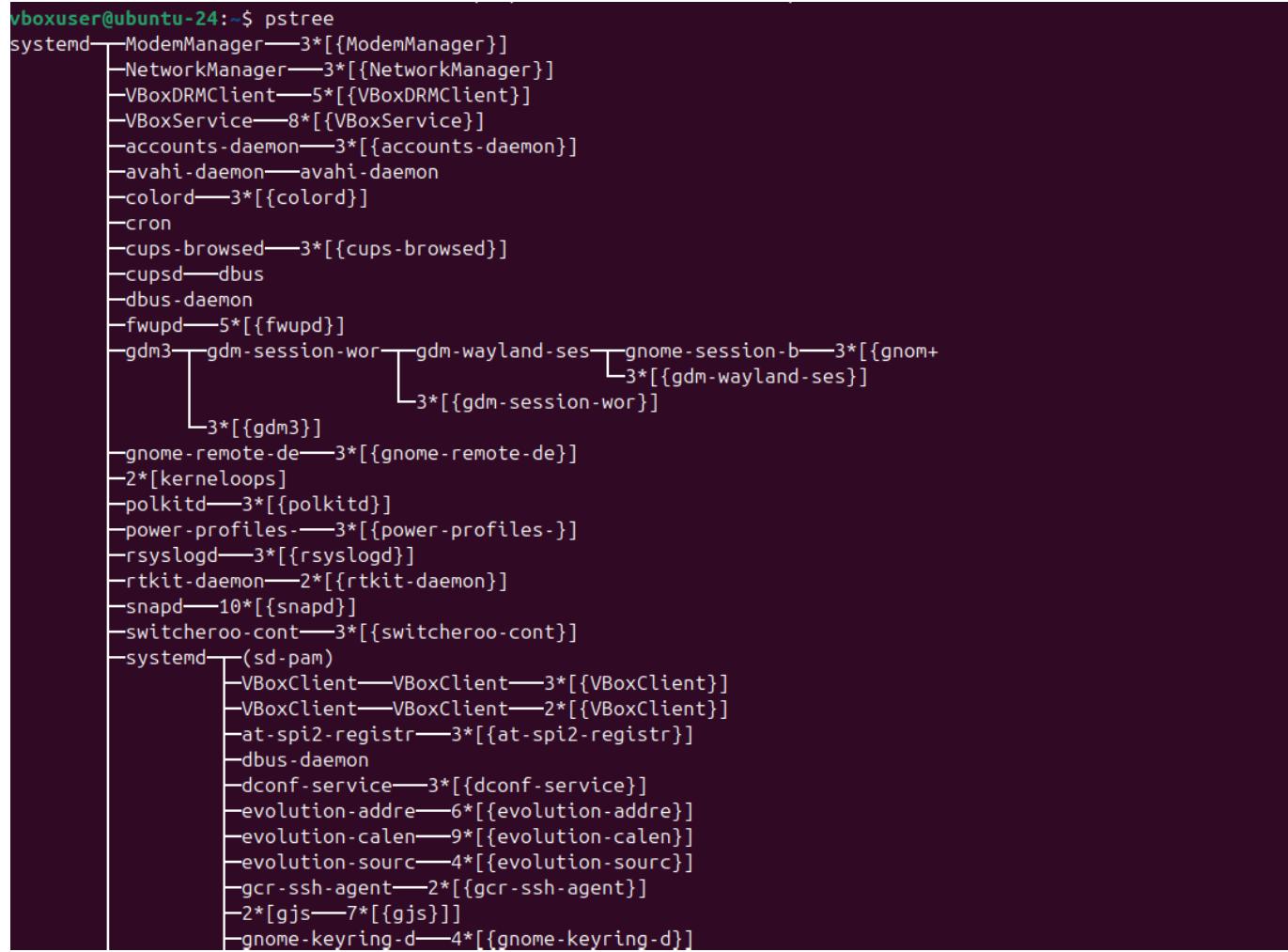
USER	PID	%CPU	%MEM	VSZ	RSS	TTY	STAT	START	TIME	COMMAND
root	1	0.0	0.3	23384	14084	?	Ss	03:45	0:02	/sbin/init sp
root	2	0.0	0.0	0	0	?	S	03:45	0:00	[kthreadd]
root	3	0.0	0.0	0	0	?	S	03:45	0:00	[pool_workque]
root	4	0.0	0.0	0	0	?	I<	03:45	0:00	[kworker/R-rc]
root	5	0.0	0.0	0	0	?	I<	03:45	0:00	[kworker/R-sy]
root	6	0.0	0.0	0	0	?	I<	03:45	0:00	[kworker/R-kv]
root	7	0.0	0.0	0	0	?	I<	03:45	0:00	[kworker/R-sl]
root	8	0.0	0.0	0	0	?	I<	03:45	0:00	[kworker/R-ne]
root	11	0.0	0.0	0	0	?	I<	03:45	0:00	[kworker/0:0H]
root	12	0.0	0.0	0	0	?	I	03:45	0:00	[kworker/u16:]
root	13	0.0	0.0	0	0	?	I<	03:45	0:00	[kworker/R-mm]
root	14	0.0	0.0	0	0	?	I	03:45	0:00	[rcu_tasks_kt]
root	15	0.0	0.0	0	0	?	I	03:45	0:00	[rcu_tasks_ru]
root	16	0.0	0.0	0	0	?	I	03:45	0:00	[rcu_tasks_tr]
root	17	0.0	0.0	0	0	?	S	03:45	0:00	[ksoftirqd/0]
root	18	0.0	0.0	0	0	?	I	03:45	0:03	[rcu_preempt]
root	19	0.0	0.0	0	0	?	S	03:45	0:00	[rcu_exp_par_]
root	20	0.0	0.0	0	0	?	S	03:45	0:00	[rcu_exp_gp_k]
root	21	0.0	0.0	0	0	?	S	03:45	0:00	[migration/0]
root	22	0.0	0.0	0	0	?	S	03:45	0:00	[idle_inject/]
root	23	0.0	0.0	0	0	?	S	03:45	0:00	[cpuhp/0]
root	24	0.0	0.0	0	0	?	S	03:45	0:00	[cpuhp/1]
root	25	0.0	0.0	0	0	?	S	03:45	0:00	[idle_inject/]
root	26	0.0	0.0	0	0	?	S	03:45	0:00	[migration/1]
root	27	0.0	0.0	0	0	?	S	03:45	0:00	[ksoftirqd/1]
root	29	0.0	0.0	0	0	?	I<	03:45	0:00	[kworker/1:0H]
root	30	0.0	0.0	0	0	?	S	03:45	0:00	[cpuhp/2]
root	31	0.0	0.0	0	0	?	S	03:45	0:00	[idle_inject/]
root	32	0.0	0.0	0	0	?	S	03:45	0:00	[migration/2]
root	33	0.0	0.0	0	0	?	S	03:45	0:00	[ksoftirqd/2]
root	35	0.0	0.0	0	0	?	I<	03:45	0:00	[kworker/2:0H]
root	36	0.0	0.0	0	0	?	S	03:45	0:00	[cpuhp/3]
root	37	0.0	0.0	0	0	?	S	03:45	0:00	[idle_inject/]
root	38	0.0	0.0	0	0	?	S	03:45	0:00	[migration/3]
root	39	0.0	0.0	0	0	?	S	03:45	0:00	[ksoftirqd/3]
root	41	0.0	0.0	0	0	?	I<	03:45	0:00	[kworker/3:0H]
root	44	0.0	0.0	0	0	?	I	03:45	0:01	[kworker/u19:]

2. Process Tree

Command:

pstree -p

Example Output:



⌚ Shows parent-child process relationships.

💻 3. Real-Time Monitoring

Command:

top

Example Output (partial):

```
top - 06:30:28 up 2:44, 1 user, load average: 0.19, 0.06, 0.02
Tasks: 243 total, 1 running, 242 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.3 us, 0.6 sy, 0.0 ni, 98.8 id, 0.1 wa, 0.0 hi, 0.2 si, 0.0 st
MiB Mem : 4523.9 total, 1544.9 free, 1348.9 used, 1918.4 buff/cache
MiB Swap: 0.0 total, 0.0 free, 0.0 used. 3174.9 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
2231	vboxuser	20	0	5119948	487652	153680	S	5.3	10.5	3:43.79	gnome-shell
5177	vboxuser	20	0	711108	67364	52320	S	1.0	1.5	0:15.63	gnome-terminal-
2376	vboxuser	20	0	666644	26252	22028	S	0.7	0.6	0:00.44	gsd-power
327	root	20	0	0	0	0	I	0.3	0.0	0:08.00	kworker/3:3-events
875	message+	20	0	12220	6988	4428	S	0.3	0.2	0:06.10	dbus-daemon
1245	root	20	0	355648	2492	2364	S	0.3	0.1	0:23.54	VBoxDRMClient
5348	vboxuser	20	0	14536	5776	3728	R	0.3	0.1	0:12.73	top
5448	root	20	0	0	0	0	I	0.3	0.0	0:00.83	kworker/u19:2-kvfree_rcu_reclaim
1	root	20	0	23384	14084	9348	S	0.0	0.3	0:02.81	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.07	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
12	root	20	0	0	0	0	I	0.0	0.0	0:00.00	kworker/u16:0-ipv6_addrconf
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
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	0:00.20	ksoftirqd/0
18	root	20	0	0	0	0	I	0.0	0.0	0:06.83	rcu_preempt
19	root	20	0	0	0	0	S	0.0	0.0	0:00.00	rcu_exp_par_gp_kthread_worker/0
20	root	20	0	0	0	0	S	0.0	0.0	0:00.12	rcu_exp_gp_kthread_worker
21	root	rt	0	0	0	0	S	0.0	0.0	0:00.51	migration/0
22	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inject/0
23	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/0
24	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/1
25	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inject/1
26	root	rt	0	0	0	0	S	0.0	0.0	0:00.96	migration/1

⚡ 4. Adjust Process Priority

Start a process with low priority:

```
nice -n 10 sleep 300 &
```

OUTPUT:

```
vboxuser@ubuntu-24:~$ nice -n 10 sleep 300 &
[1] 5427
vboxuser@ubuntu-24:~$ sudo renice -n -5 -p 5427
5427 (process ID) old priority 10, new priority -5
vboxuser@ubuntu-24:~$ taskset -cp 1 5427
pid 5427's current affinity list: 0-3
pid 5427's new affinity list: 1
vboxuser@ubuntu-24:~$ ionice -c 3 -p 5427
vboxuser@ubuntu-24:~$ lsof -p 5427 | head -5
```

📁 6. I/O Scheduling Priority

Command: ionice -c 3 -p 3050

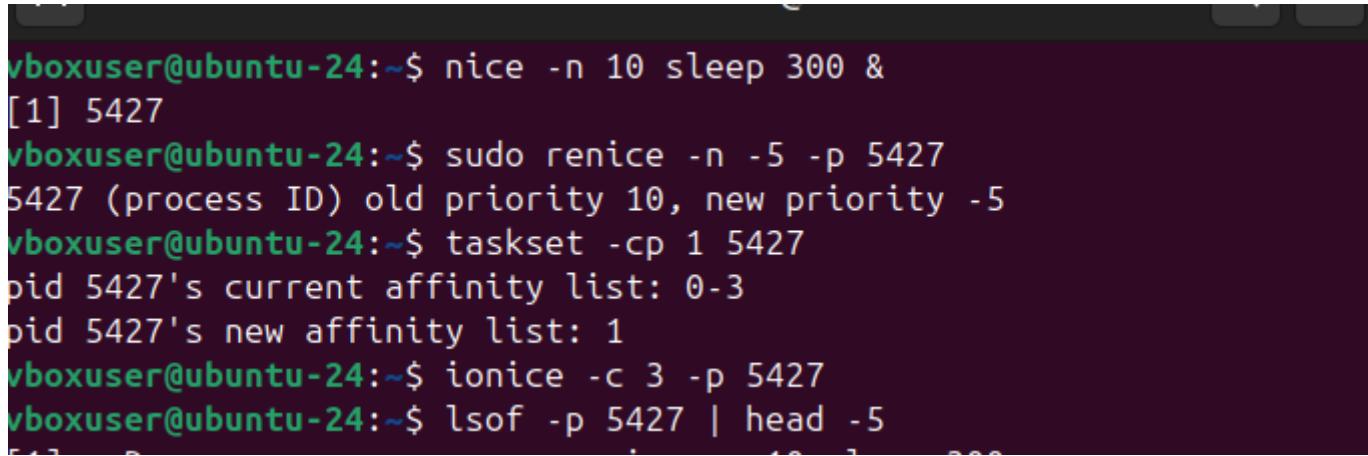
***Output:**

successfully set pid 3050's IO scheduling class to idle

7. File Descriptors Used by a Process

Command:

```
lsof -p 3050 | head -5
```



```
vboxuser@ubuntu-24:~$ nice -n 10 sleep 300 &
[1] 5427
vboxuser@ubuntu-24:~$ sudo renice -n -5 -p 5427
5427 (process ID) old priority 10, new priority -5
vboxuser@ubuntu-24:~$ taskset -cp 1 5427
pid 5427's current affinity list: 0-3
pid 5427's new affinity list: 1
vboxuser@ubuntu-24:~$ ionice -c 3 -p 5427
vboxuser@ubuntu-24:~$ lsof -p 5427 | head -5
```

9. Find Process Using a Port

Command:

```
sudo fuser -n tcp 8080
```

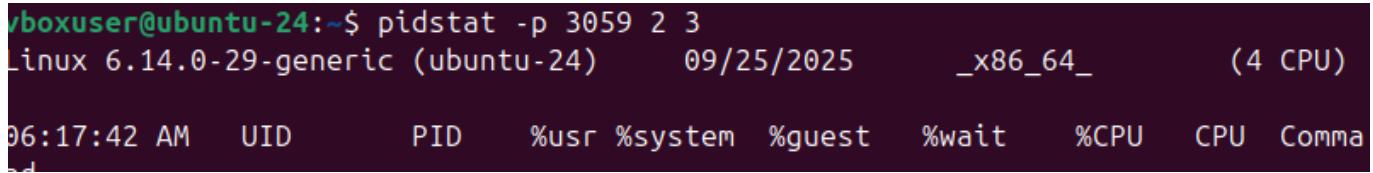
Output:

8080/tcp: 4321

10. Per-Process Statistics

Command:

```
pidstat -p 3050 2 3
```

Example Output:


```
vboxuser@ubuntu-24:~$ pidstat -p 3059 2 3
Linux 6.14.0-29-generic (ubuntu-24)        09/25/2025      _x86_64_        (4 CPU)
 06:17:42 AM     UID          PID    %usr %system  %guest   %wait    %CPU     CPU  Comm

```

11. Control Groups (cgroups) for Resource Limits

Create a 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

