

Linux Practice - Process and Services

Command: ps -ef | head

Observation: PID 1 is systemd, which is the parent of all user-space processes.

```
ubuntu@ip-172-31-13-238:~$ ps -ef | head
UID          PID    PPID  C STIME TTY          TIME CMD
root         1        0  0 Jan27 ?        00:00:07 /usr/lib/systemd/systemd --system --deserialize=123
root         2        0  0 Jan27 ?        00:00:00 [kthreadd]
root         3        2  0 Jan27 ?        00:00:00 [pool_workqueue_release]
root         4        2  0 Jan27 ?        00:00:00 [kworker/R-rcu_gp]
root         5        2  0 Jan27 ?        00:00:00 [kworker/R-sync_wq]
root         6        2  0 Jan27 ?        00:00:00 [kworker/R-kvfree_rcu_reclaim]
root         7        2  0 Jan27 ?        00:00:00 [kworker/R-slub_flushwq]
root         8        2  0 Jan27 ?        00:00:00 [kworker/R-netns]
root        10        2  0 Jan27 ?        00:00:00 [kworker/0:0H-events_highpri]
```

Command: top

Observation: System load average is 0.00 and CPU is 100% idle. No high CPU-consuming processes were observed.

```
ubuntu@ip-172-31-13-238:~$ top
top - 17:31:30 up 2 days, 6:08, 3 users, load average: 0.00, 0.00, 0.00
Tasks: 123 total, 1 running, 122 sleeping, 0 stopped, 0 zombie
%Cpu(s):  0.2 us,  0.0 sy,  0.0 ni, 99.8 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
MiB Mem :  914.2 total,  248.3 free,  428.5 used,  404.9 buff/cache
MiB Swap:   0.0 total,   0.0 free,   0.0 used,  485.7 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR S  %CPU  %MEM    TIME+  COMMAND
    1 root        20   0  22732  14224  9756 S   0.0   1.5   0:07.69 systemd
    2 root        20   0     0     0     0 S   0.0   0.0   0:00.04 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        0 -20   0     0     0 I   0.0   0.0   0:00.00 kworker/0:0H-events_highpri
   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_rude_kthread
   15 root        20   0     0     0     0 I   0.0   0.0   0:00.00 rcu_tasks_trace_kthread
   16 root        20   0     0     0     0 S   0.0   0.0   0:00.17 ksoftirqd/0
   17 root        20   0     0     0     0 I   0.0   0.0   0:03.42 rcu_sched
   18 root        20   0     0     0     0 S   0.0   0.0   0:00.00 rcu_exp_par_gp_kthread_worker/0
   19 root        20   0     0     0     0 S   0.0   0.0   0:00.00 rcu_exp_gp_kthread_worker
   20 root        rt   0     0     0     0 S   0.0   0.0   0:00.93 migration/0
   21 root       -51   0     0     0     0 S   0.0   0.0   0:00.00 idle_inject/0
   22 root        20   0     0     0     0 S   0.0   0.0   0:00.00 cpuhp/0
   23 root        20   0     0     0     0 S   0.0   0.0   0:00.00 cpuhp/1
   24 root       -51   0     0     0     0 S   0.0   0.0   0:00.00 idle_inject/1
   25 root        rt   0     0     0     0 S   0.0   0.0   0:00.85 migration/1
   26 root        20   0     0     0     0 S   0.0   0.0   0:00.17 ksoftirqd/1
   28 root        0 -20   0     0     0 I   0.0   0.0   0:00.00 kworker/1:0H-events_highpri
   29 root        20   0     0     0     0 S   0.0   0.0   0:00.00 kdevtmpfs
   30 root        0 -20   0     0     0 I   0.0   0.0   0:00.00 kworker/R-inet_frag_wq
   31 root        20   0     0     0     0 S   0.0   0.0   0:00.00 kauditd
```

Command: pgrep sshd

Observation: It searches for **running processes** and returns their **PID(s)** (Process ID).

```
ubuntu@ip-172-31-13-238:~$ pgrep sshd
4406
9186
9323
9555
9691
```

Command: systemctl list-units --type=service --state=running | head

Observation: Identified active systemd services like cron, ssh, docker, and containerd running on the system.

```
ubuntu@ip-172-31-13-238:~$ systemctl list-units --type=service --state=running | head
UNIT                                LOAD    ACTIVE SUB    DESCRIPTION
acpid.service                       loaded active running ACPI event daemon
chrony.service                      loaded active running chrony, an NTP client/server
containerd.service                 loaded active running containerd container runtime
cron.service                       loaded active running Regular background program processing daemon
dbus.service                       loaded active running D-Bus System Message Bus
docker.service                    loaded active running Docker Application Container Engine
fwupd.service                     loaded active running Firmware update daemon
getty@tty1.service                loaded active running Getty on tty1
irqbalance.service               loaded active running irqbalance daemon
ubuntu@ip-172-31-13-238:~$ |
```

Command: systemctl status cron

Observation: cron service is enabled and running. Recent logs show hourly cron jobs executing successfully.

```
ubuntu@ip-172-31-13-238:~$ systemctl status cron
● cron.service - Regular background program processing daemon
   Loaded: loaded (/usr/lib/systemd/system/cron.service; enabled; preset: enabled)
   Active: active (running) since Tue 2026-01-27 11:22:56 UTC; 2 days ago
     Docs: man:cron(8)
    Main PID: 579 (cron)
      Tasks: 1 (limit: 1008)
    Memory: 1.4M (peak: 4.2M)
       CPU: 5.594s
    CGroup: /system.slice/cron.service
            └─579 /usr/sbin/cron -f -P

Jan 29 17:15:01 ip-172-31-13-238 CRON[9545]: pam_unix(cron:session): session closed for user root
Jan 29 17:17:01 ip-172-31-13-238 CRON[9548]: pam_unix(cron:session): session opened for user root(uid=0) by root(uid=0)
Jan 29 17:17:01 ip-172-31-13-238 CRON[9549]: (root) CMD (cd / && run-parts --report /etc/cron.hourly)
Jan 29 17:17:01 ip-172-31-13-238 CRON[9548]: pam_unix(cron:session): session closed for user root
Jan 29 17:25:01 ip-172-31-13-238 CRON[9703]: pam_unix(cron:session): session opened for user root(uid=0) by root(uid=0)
Jan 29 17:25:01 ip-172-31-13-238 CRON[9704]: (root) CMD (command -v debian-sal > /dev/null && debian-sal 1 1)
Jan 29 17:25:01 ip-172-31-13-238 CRON[9703]: pam_unix(cron:session): session closed for user root
Jan 29 17:35:01 ip-172-31-13-238 CRON[9716]: pam_unix(cron:session): session opened for user root(uid=0) by root(uid=0)
Jan 29 17:35:01 ip-172-31-13-238 CRON[9717]: (root) CMD (command -v debian-sal > /dev/null && debian-sal 1 1)
Jan 29 17:35:01 ip-172-31-13-238 CRON[9716]: pam_unix(cron:session): session closed for user root
ubuntu@ip-172-31-13-238:~$ |
```

Command: journalctl -u cron

Observation: Cron logs show regular execution of scheduled jobs with no errors.

```
ubuntu@ip-172-31-13-238:~$ journalctl -u cron --no-pager | tail -n 10
Jan 29 17:17:01 ip-172-31-13-238 CRON[9548]: pam_unix(cron:session): session closed for user root
Jan 29 17:25:01 ip-172-31-13-238 CRON[9703]: pam_unix(cron:session): session opened for user root(uid=0) by root(uid=0)
Jan 29 17:25:01 ip-172-31-13-238 CRON[9704]: (root) CMD (command -v debian-sal > /dev/null && debian-sal 1 1)
Jan 29 17:25:01 ip-172-31-13-238 CRON[9703]: pam_unix(cron:session): session closed for user root
Jan 29 17:35:01 ip-172-31-13-238 CRON[9716]: pam_unix(cron:session): session opened for user root(uid=0) by root(uid=0)
Jan 29 17:35:01 ip-172-31-13-238 CRON[9717]: (root) CMD (command -v debian-sal > /dev/null && debian-sal 1 1)
Jan 29 17:35:01 ip-172-31-13-238 CRON[9716]: pam_unix(cron:session): session closed for user root
Jan 29 17:45:01 ip-172-31-13-238 CRON[9732]: pam_unix(cron:session): session opened for user root(uid=0) by root(uid=0)
Jan 29 17:45:01 ip-172-31-13-238 CRON[9733]: (root) CMD (command -v debian-sal > /dev/null && debian-sal 1 1)
Jan 29 17:45:01 ip-172-31-13-238 CRON[9732]: pam_unix(cron:session): session closed for user root
```

Command: tail -n 20 /var/log/syslog

Observation: System logs show normal cron and sysstat activity. Noticed amazon-ssm-agent errors due to missing EC2 IAM role configuration

```
ubuntu@ip-172-31-13-238:~$ tail -n 20 /var/log/syslog
2026-01-29T17:10:02.430398+00:00 ip-172-31-13-238 systemd[1]: sysstat-collect.service: Deactivated successfully.
2026-01-29T17:10:02.430691+00:00 ip-172-31-13-238 systemd[1]: Finished sysstat-collect.service - system activity accounting tool.
2026-01-29T17:15:01.785676+00:00 ip-172-31-13-238 CRON[9546]: (root) CMD (command -v debian-sal1 > /dev/null && debian-sal1 1)
2026-01-29T17:17:01.823372+00:00 ip-172-31-13-238 CRON[9549]: (root) CMD (cd / && run-parts --report /etc/cron.hourly)
2026-01-29T17:20:02.423577+00:00 ip-172-31-13-238 systemd[1]: Starting sysstat-collect.service - system activity accounting tool...
2026-01-29T17:20:02.432083+00:00 ip-172-31-13-238 systemd[1]: sysstat-collect.service: Deactivated successfully.
2026-01-29T17:20:02.432396+00:00 ip-172-31-13-238 systemd[1]: Finished sysstat-collect.service - system activity accounting tool.
2026-01-29T17:23:01.418163+00:00 ip-172-31-13-238 systemd[1]: Started session-396.scope - Session 396 of User ubuntu.
2026-01-29T17:25:01.833091+00:00 ip-172-31-13-238 CRON[9704]: (root) CMD (command -v debian-sal1 > /dev/null && debian-sal1 1)
2026-01-29T17:30:02.462993+00:00 ip-172-31-13-238 systemd[1]: Starting sysstat-collect.service - system activity accounting tool...
2026-01-29T17:30:02.463236+00:00 ip-172-31-13-238 systemd[1]: sysstat-collect.service: Deactivated successfully.
2026-01-29T17:32:17.235317+00:00 ip-172-31-13-238 amazon-ssm-agent.amazon-ssm-agent[592]: 2026-01-29 17:32:17.2346 WARN EC2RoleProvider Failed to connect to Systems Manager with instance profile role credentials. Err: retrieved credentials failed to report to ssm. Error: EC2RoleRequestError: no EC2 instance role found
2026-01-29T17:32:17.335588+00:00 ip-172-31-13-238 amazon-ssm-agent.amazon-ssm-agent[592]: 2026-01-29 17:32:17.2712 ERROR EC2RoleProvider Failed to connect to Systems Manager with SSM role credentials. error calling RequestManagedInstanceRoleToken: AccessDeniedException: Systems Manager's instance management role is not configured for account: 920398711465
2026-01-29T17:32:17.335690+00:00 ip-172-31-13-238 amazon-ssm-agent.amazon-ssm-agent[592]: #011status code: 400, request id: f6c3297f-45f8-471b-8fe7-2b632f085c48
2026-01-29T17:35:01.854362+00:00 ip-172-31-13-238 CRON[9717]: (root) CMD (command -v debian-sal1 > /dev/null && debian-sal1 1)
2026-01-29T17:40:02.428822+00:00 ip-172-31-13-238 systemd[1]: Starting sysstat-collect.service - system activity accounting tool...
2026-01-29T17:40:02.435873+00:00 ip-172-31-13-238 systemd[1]: sysstat-collect.service: Deactivated successfully.
2026-01-29T17:40:02.436247+00:00 ip-172-31-13-238 systemd[1]: Finished sysstat-collect.service - system activity accounting tool.
2026-01-29T17:45:01.867805+00:00 ip-172-31-13-238 CRON[9733]: (root) CMD (command -v debian-sal1 > /dev/null && debian-sal1 1)
ubuntu@ip-172-31-13-238:~$
```

Command: systemctl restart cron

Observation: cron service restarted successfully and is running with a new PID.

```
ubuntu@ip-172-31-13-238:~$ sudo systemctl restart cron
ubuntu@ip-172-31-13-238:~$ sudo systemctl status cron
● cron.service - Regular background program processing daemon
   Loaded: loaded (/usr/lib/systemd/system/cron.service; enabled; preset: enabled)
   Active: active (running) since Thu 2026-01-29 17:51:00 UTC; 1s ago
     Docs: man:cron(8)
    Main PID: 9772 (cron)
      Tasks: 1 (limit: 1008)
     Memory: 352.0K (peak: 584.0K)
        CPU: 3ms
    CGroup: /system.slice/cron.service
            └─9772 /usr/sbin/cron -f -P

Jan 29 17:51:00 ip-172-31-13-238 systemd[1]: Started cron.service - Regular background program processing daemon.
Jan 29 17:51:00 ip-172-31-13-238 (cron)[9772]: cron.service: Referenced but unset environment variable evaluates to an empty string: EXTRA_OPTS
Jan 29 17:51:00 ip-172-31-13-238 cron[9772]: (CRON) INFO (pidfile fd = 3)
Jan 29 17:51:00 ip-172-31-13-238 cron[9772]: (CRON) INFO (Skipping @reboot jobs -- not system startup)
ubuntu@ip-172-31-13-238:~$
```