



MAWLANA BHASHANI SCIENCE AND TECHNOLOGY UNIVERSITY

Santosh, Tangail-1902

LAB REPORT

Department of : Information & Communication Technology

Lab Report No : 06

Lab Report On : **Linux command for process**

Course Title : Operating Systems Lab

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Lab 06 - Linux command for process

1) **top**: The top command is the traditional way to view your system's resource usage and see the processes that are taking up the most system resources. Top displays a list of processes, with the ones using the most CPU at the top.

```
File Edit View Search Terminal Help
top - 19:23:15 up 38 min, 1 user, load average: 0.89, 0.71, 0.67
Tasks: 315 total, 4 running, 237 sleeping, 4 stopped, 0 zombie
%Cpu(s): 6.7 us, 2.1 sy, 0.0 ni, 90.5 id, 0.2 wa, 0.0 hi, 0.5 si, 0.0 st
KiB Mem : 8032424 total, 2973724 free, 2299812 used, 2758888 buff/cache
KiB Swap: 4883452 total, 4883452 free, 0 used, 4172856 avail Mem

  PID USER      PR  NI   VIRT    RES    SHR  S  %CPU  %MEM   TIME+ COMMAND
 1692 zahid     20   0 4222412 233288 106248 R   20.1   2.9   1:49.17 gnome-shell
 2794 zahid     20   0 5995856 413292 116956 S   11.2   5.1   3:32.49 chrome
 2011 zahid     20   0 4052424 609028 371412 S   10.2   7.6   2:05.35 chrome
 2165 zahid     20   0 1482076 231204 137128 R   10.2   2.9   2:02.84 chrome
 2377 zahid     20   0 6151348 536028 253812 S    7.6   6.7   5:04.89 chrome
 1566 zahid     20   0 909548   62072  42972 R    7.3   0.8   1:12.61 Xorg
 1718 zahid      9  -11 2383624 18532   14288 S    5.6   0.2   2:01.78 pulseaudio
 3778 zahid     20   0 9850.7m 169964 123164 S    3.6   2.1   0:06.69 chrome
 3501 zahid     20   0 5776196 112168  85224 S    3.0   1.4   0:04.67 chrome
 2429 zahid     20   0 1482632 55752  46084 S    1.7   0.7   0:42.68 chrome
 244 root       20   0      0      0      0 D    1.0   0.0   0:03.26 kworker/u16:5+e
 3179 zahid     20   0 791504   35824  26868 S    1.0   0.4   0:14.67 gnome-terminal-
 3712 root       20   0      0      0      0 I    1.0   0.0   0:00.11 kworker/0:1-eve
 943 root       20   0 559168   16776 13572 S    0.7   0.2   0:01.15 NetworkManager
 2171 zahid     20   0 1302916 88780  64152 S    0.7   1.1   0:26.55 chrome
 3387 root       20   0      0      0      0 I    0.7   0.0   0:00.30 kworker/6:4-eve
 3845 zahid     20   0  44544   4052   3348 R    0.7   0.1   0:00.29 top
 1 root       20   0 225664   9484   6796 S    0.3   0.1   0:05.01 systemd
 310 root       0  -20      0      0      0 I    0.3   0.0   0:00.08 kworker/2:1H-ev
 479 root      -51   0      0      0      0 S    0.3   0.0   0:04.87 irq/128-iwlwifi
 1105 mysql     20   0 1555616 189856 15684 S    0.3   2.4   0:03.50 mysqld
```

To exit top or htop, use the Ctrl- C keyboard shortcut. This keyboard shortcut usually kills the currently running process in the terminal.

2) **htop**: The htop command is an improved top. It's not installed by default on most Linux distributions — here's the command you'll need to install it on Ubuntu:

`sudo apt-get install htop`

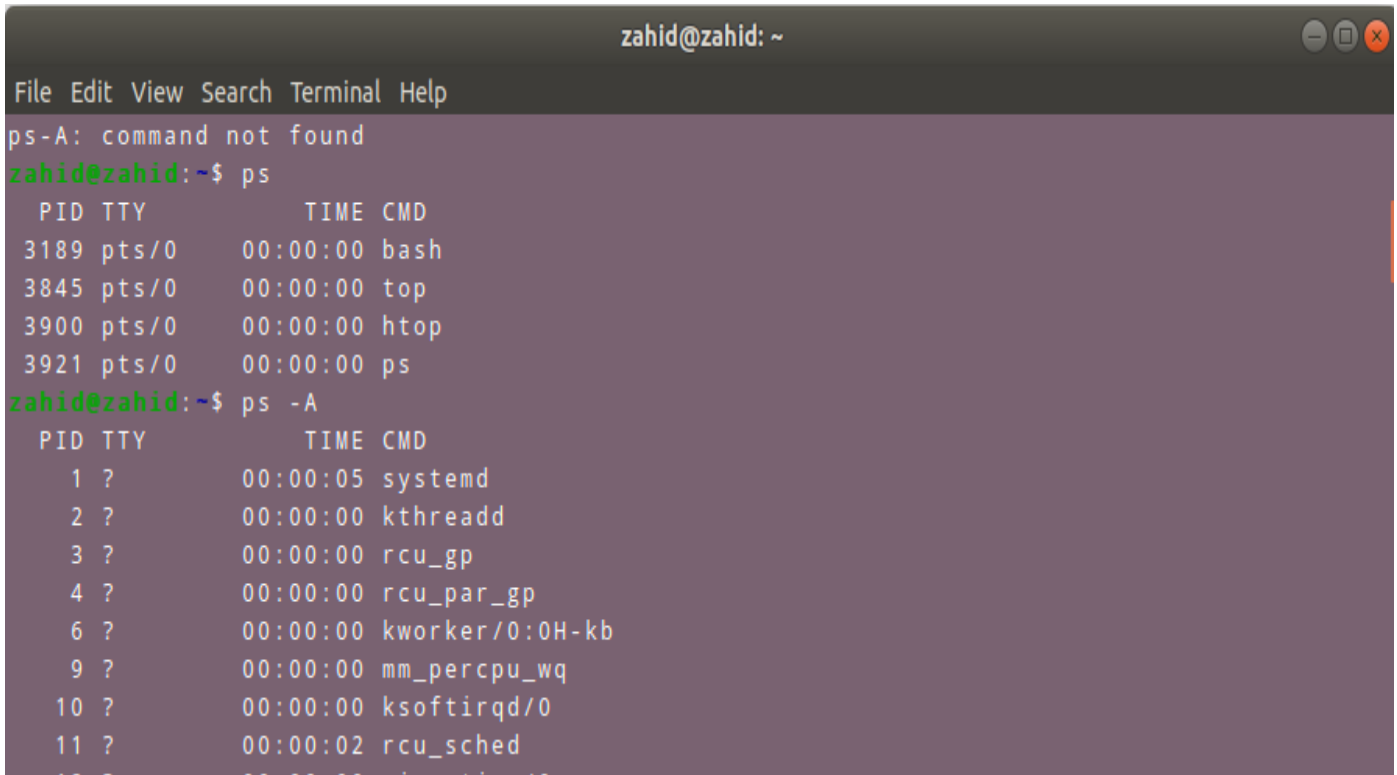
```
File Edit View Search Terminal Help

 1  [||||] 9.0%] 5 [||] 3.3%]
 2  [||] 1.9%] 6 [||||] 4.6%]
 3  [||||] 6.0%] 7 [||||] 9.7%]
 4  [||||] 5.9%] 8 [||||||] 13.7%]
Mem[|||||||||||||||||||||||3.68G/7.66G] Tasks: 162, 636 thr; 1 running
Swp[|||||0K/4.66G] Load average: 1.11 0.78 0.69
Uptime: 00:38:24

  PID USER      PRI  NI   VIRT    RES    SHR  S  CPU%  MEM%   TIME+  Command
 3778 zahid     20   0 9.7G   294M   119M S  13.7   3.8   0:07.66 /snap/chromium/1298/usr/l
 1692 zahid     20   0 4123M  228M   103M S   9.1   2.9   1:51.17 /usr/bin/gnome-shell
 2377 zahid     20   0 6007M  522M   247M S   7.2   6.7   5:06.38 /snap/chromium/1298/usr/l
 1718 zahid      9  -11 2327M 18532  14288 S   5.9   0.2   2:02.82 /usr/bin/pulseaudio --sta
 2794 zahid     20   0 5854M  400M   114M S   5.9   5.1   3:32.82 /snap/chromium/1298/usr/l
 2165 zahid     20   0 1566M  334M   242M S   4.6   4.3   2:04.27 /snap/chromium/1298/usr/l
 1566 zahid     20   0 887M  61152  42052 S   3.9   0.8   1:13.60 /usr/lib/xorg/Xorg vt2 -d
 1719 zahid     -6   0 2327M 18532  14288 S   3.3   0.2   1:09.68 /usr/bin/pulseaudio --sta
 2414 zahid     20   0 6007M  522M   247M S   2.6   6.7   1:08.11 /snap/chromium/1298/usr/l
 2699 zahid     20   0 1613M 55308  30756 S   2.6   0.7   0:04.72 /usr/bin/nautilus --gapl
 2011 zahid     20   0 3956M  594M   362M S   2.0   7.6   2:06.17 /snap/chromium/1298/usr/l
 2429 zahid     20   0 1447M 55752  46084 S   2.0   0.7   0:43.04 /snap/chromium/1298/usr/l
 2171 zahid     20   0 1272M 88780  64152 S   1.3   1.1   0:26.67 /snap/chromium/1298/usr/l
 3900 zahid     20   0 34152  4940   3796 R   1.3   0.1   0:00.19 htop
 2174 zahid     20   0 1272M 88780  64152 S   1.3   1.1   0:20.93 /snap/chromium/1298/usr/l
 2436 zahid     20   0 1447M 55752  46084 S   1.3   0.7   0:39.08 /snap/chromium/1298/usr/l
 3501 zahid     20   0 5640M 110M  85600 S   0.7   1.4   0:05.17 /snap/chromium/1298/usr/l
F1Help F2Setup F3Search F4Filter F5Tree F6SortBy F7Nice F8Nice F9Kill F10Quit
```

3) **ps -A** : The **ps** command lists running processes. The following command lists all processes running on your system:

ps -A



A terminal window titled 'zahid@zahid: ~' with a menu bar (File, Edit, View, Search, Terminal, Help). The user enters 'ps -A', which results in the error 'ps-A: command not found'. Then, the user enters 'ps', which displays a list of processes:

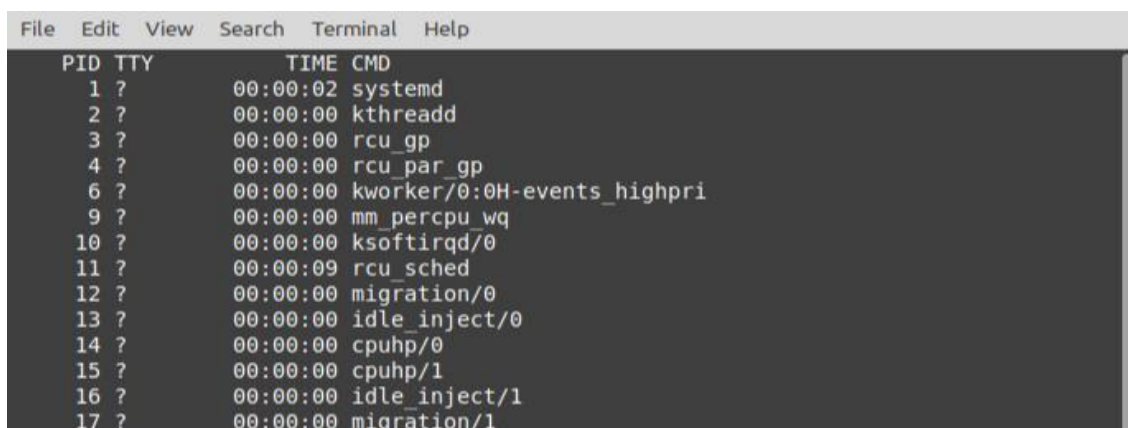
PID	TTY	TIME	CMD
3189	pts/0	00:00:00	bash
3845	pts/0	00:00:00	top
3900	pts/0	00:00:00	htop
3921	pts/0	00:00:00	ps

Next, the user enters 'ps -A', which displays a more comprehensive list of system processes:

PID	TTY	TIME	CMD
1	?	00:00:05	systemd
2	?	00:00:00	kthreadd
3	?	00:00:00	rcu_gp
4	?	00:00:00	rcu_par_gp
6	?	00:00:00	kworker/0:0H-kb
9	?	00:00:00	mm_percpu_wq
10	?	00:00:00	ksoftirqd/0
11	?	00:00:02	rcu_sched

4) **ps -A | less**: **ps -A** may be too many processes to read at one time, so we can pipe the output through the **less** command to scroll through them at own pace.

ps -A | less:



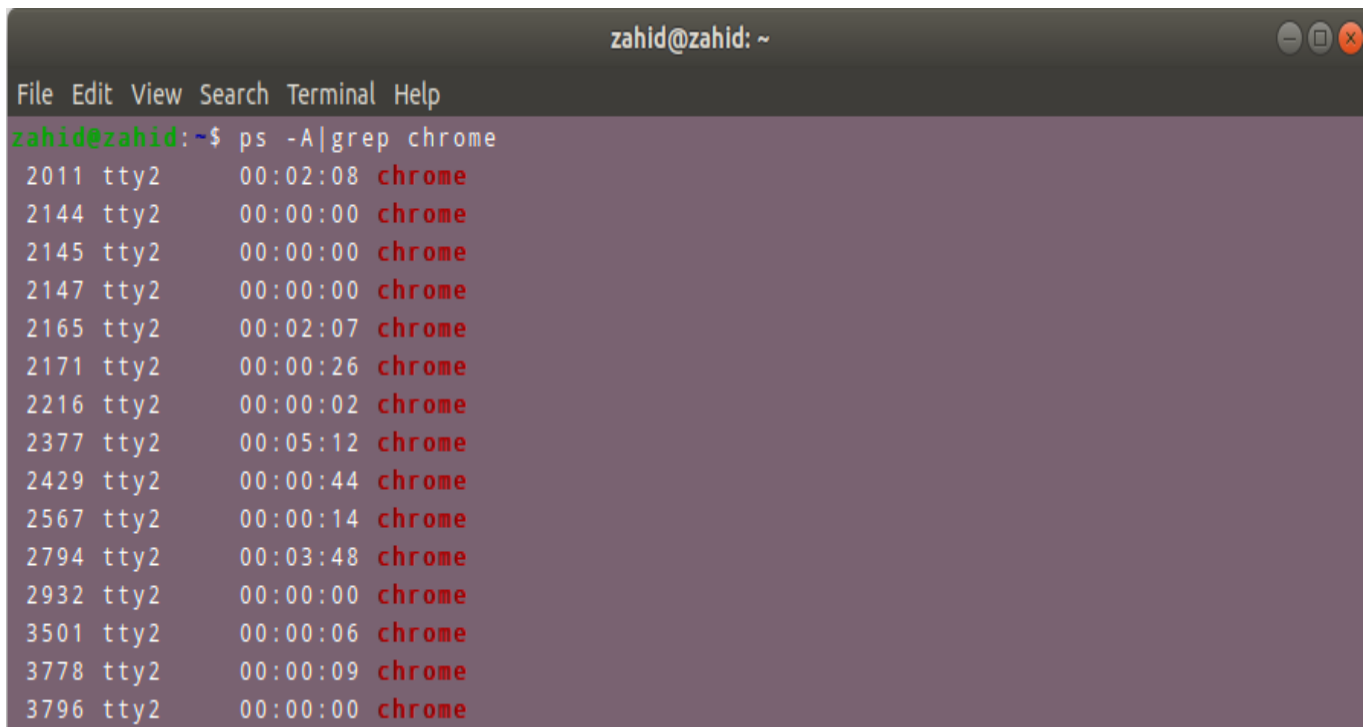
A terminal window showing the output of 'ps -A | less'. The menu bar (File, Edit, View, Search, Terminal, Help) is visible. The list of processes is displayed in a scrollable format:

PID	TTY	TIME	CMD
1	?	00:00:02	systemd
2	?	00:00:00	kthreadd
3	?	00:00:00	rcu_gp
4	?	00:00:00	rcu_par_gp
6	?	00:00:00	kworker/0:0H-events_highpri
9	?	00:00:00	mm_percpu_wq
10	?	00:00:00	ksoftirqd/0
11	?	00:00:09	rcu_sched
12	?	00:00:00	migration/0
13	?	00:00:00	idle_inject/0
14	?	00:00:00	cpuhp/0
15	?	00:00:00	cpuhp/1
16	?	00:00:00	idle_inject/1
17	?	00:00:00	migration/1

Press q to exit when you're done.

5) **ps -A | grep** : We could also pipe the output through **grep** to search for a specific process without using any other commands. The following command would search for the Firefox process:

`ps -A | grep firefox`



A terminal window titled 'zahid@zahid: ~' with standard window controls. The terminal shows the command 'ps -A | grep chrome' being executed. The output lists 15 processes, all named 'chrome', with their respective PIDs, TTYs, and run times. The processes are listed in descending order of PID.

```
File Edit View Search Terminal Help
zahid@zahid:~$ ps -A | grep chrome
2011 tty2      00:02:08 chrome
2144 tty2      00:00:00 chrome
2145 tty2      00:00:00 chrome
2147 tty2      00:00:00 chrome
2165 tty2      00:02:07 chrome
2171 tty2      00:00:26 chrome
2216 tty2      00:00:02 chrome
2377 tty2      00:05:12 chrome
2429 tty2      00:00:44 chrome
2567 tty2      00:00:14 chrome
2794 tty2      00:03:48 chrome
2932 tty2      00:00:00 chrome
3501 tty2      00:00:06 chrome
3778 tty2      00:00:09 chrome
3796 tty2      00:00:00 chrome
```

6) pstree:

The **ps**tree command is another way of visualizing processes. It displays them in tree form

```
zahid@zahid: ~  
File Edit View Search Terminal Help  
  
zahid@zahid:~$ pstree  
systemd--ModemManager--2*[{ModemManager}]  
--NetworkManager--dhclient  
--2*[{NetworkManager}]  
--accounts-daemon--2*[{accounts-daemon}]  
--acpid  
--avahi-daemon--avahi-daemon  
--bluetoothd  
--boltd--2*[{boltd}]  
--colord--2*[{colord}]  
--cron  
--cups-browsed--2*[{cups-browsed}]  
--cupsd  
--dbus-daemon  
--fwupd--4*[{fwupd}]  
--gdm3--gdm-session-wor--gdm-wayland-ses--gnome-session-b--gnome-shell--Xw+  
--ib+  
--24+  
--gsd-a11y-settin--+  
++  
--gsd-clipboard--+  
--gsd-color--7*[{+  
--gsd-datetime--2+  
--gsd-housekeepin--+  
++  
--gsd-keyboard--7+
```

7) kill :

The **kill** command can kill a process, given its process ID. You can get this information from the **ps -A**, **top** or **pgrep** commands.

kill PID

```
zahid@zahid: ~  
File Edit View Search Terminal Help  
3712 ? 00:00:00 kworker/0:1-eve  
3745 ? 00:00:00 kworker/7:1-mm_  
3778 tty2 00:00:13 chrome  
3796 tty2 00:00:00 chrome  
3845 pts/0 00:00:00 top  
3846 ? 00:00:00 kworker/u16:0-e  
3854 ? 00:00:00 zeitgeist-daemo  
3870 ? 00:00:00 zeitgeist-fts  
3875 ? 00:00:00 gvfsd-metadata  
3896 ? 00:00:00 kworker/2:0-eve  
3897 ? 00:00:00 kworker/3:2  
3900 pts/0 00:00:00 htop  
3905 ? 00:00:00 kworker/6:1-eve  
3906 ? 00:00:00 kworker/6:2  
3935 ? 00:00:00 kworker/5:1-eve  
3936 ? 00:00:00 kworker/0:0-eve  
3937 ? 00:00:00 kworker/0:3-eve  
3948 ? 00:00:00 kworker/5:3-eve  
3998 pts/0 00:00:00 ps  
zahid@zahid:~$ kill 3998  
bash: kill: (3998) - No such process  
zahid@zahid:~$ kill 3948  
bash: kill: (3948) - Operation not permitted  
zahid@zahid:~$ kill 3269  
bash: kill: (3269) - Operation not permitted  
zahid@zahid:~$ sudo kill 3269  
[sudo] password for zahid:  
zahid@zahid:~$ _
```

08) r enice:

The **renice** command changes the nice value of an already running process. The nice value determines what priority the process runs with. A value of **-19** is very high priority, while a value of **19** is very low priority. A value of **0** is the default priority.

The renice command requires a process's PID. The following command makes a process run with very low priority:

renice 19 *PID*

```
zahid@zahid:~$ renice 19 2011  
2011 (process ID) old priority 0, new priority 19  
zahid@zahid:~$ renice 19 $(pgrep chrome)  
2011 (process ID) old priority 19, new priority 19  
2144 (process ID) old priority 0, new priority 19  
2145 (process ID) old priority 0, new priority 19  
2147 (process ID) old priority 0, new priority 19  
2165 (process ID) old priority 0, new priority 19  
2171 (process ID) old priority 0, new priority 19  
2216 (process ID) old priority 0, new priority 19  
2377 (process ID) old priority 0, new priority 19  
2429 (process ID) old priority 0, new priority 19  
2567 (process ID) old priority 0, new priority 19  
2794 (process ID) old priority 0, new priority 19  
2932 (process ID) old priority 0, new priority 19  
3501 (process ID) old priority 0, new priority 19  
3778 (process ID) old priority 0, new priority 19  
3796 (process ID) old priority 0, new priority 19  
zahid@zahid:~$
```