

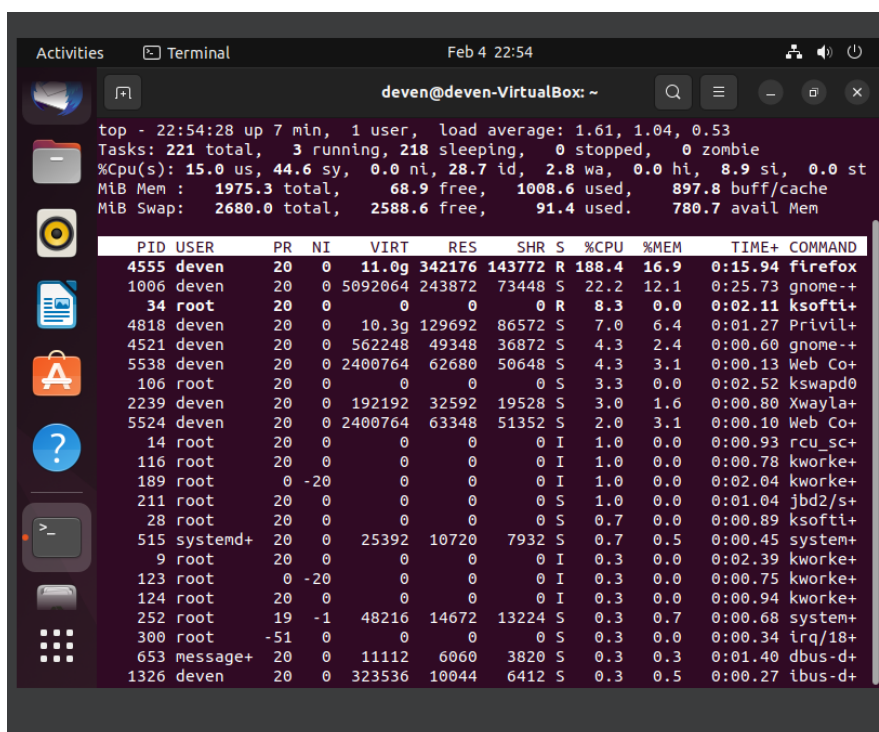
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Feb 1 2023

CS 470 Lab 3

Lab 3 Running C code in Ubuntu

1. Given the example snippet of C code, there will be three processes created upon the execution of the program.
2. The process at the top of the display becomes Firefox; it consumes about 1-4% of the allotted CPU and between 11-20% of memory. As can be seen in the image below:



```
top - 22:54:28 up 7 min, 1 user, load average: 1.61, 1.04, 0.53
Tasks: 221 total, 3 running, 218 sleeping, 0 stopped, 0 zombie
%Cpu(s): 15.0 us, 44.6 sy, 0.0 ni, 28.7 id, 2.8 wa, 0.0 hi, 8.9 si, 0.0 st
MiB Mem : 1975.3 total, 68.9 free, 1008.6 used, 897.8 buff/cache
MiB Swap: 2680.0 total, 2588.6 free, 91.4 used, 780.7 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR  S  %CPU  %MEM     TIME+ COMMAND
 4555 deven     20   0  11.0g 342176 143772 R 188.4 16.9   0:15.94 firefox
 1006 deven     20   0 5092064 243872 73448 S 22.2 12.1   0:25.73 gnome-+
   34 root       20   0     0     0     0 R   8.3  0.0   0:02.11 ksofti+
 4818 deven     20   0  10.3g 129692 86572 S  7.0  6.4   0:01.27 Privil+
 4521 deven     20   0 562248 49348 36872 S  4.3  2.4   0:00.60 gnome-+
 5538 deven     20   0 2400764 62680 50648 S  4.3  3.1   0:00.13 Web Co+
  106 root       20   0     0     0     0 S  3.3  0.0   0:02.52 kswapd0
 2239 deven     20   0 192192 32592 19528 S  3.0  1.6   0:00.80 Xwayla+
 5524 deven     20   0 2400764 63348 51352 S  2.0  3.1   0:00.10 Web Co+
   14 root       20   0     0     0     0 I  1.0  0.0   0:00.93 rcu_sc+
  116 root       20   0     0     0     0 I  1.0  0.0   0:00.78 kworke+
  189 root       0 -20     0     0     0 I  1.0  0.0   0:02.04 kworke+
  211 root       20   0     0     0     0 S  1.0  0.0   0:01.04 jbd2/s+
   28 root       20   0     0     0     0 S  0.7  0.0   0:00.89 ksofti+
  515 systemd+   20   0  25392 10720 7932 S  0.7  0.5   0:00.45 system+
    9 root       20   0     0     0     0 I  0.3  0.0   0:02.39 kworke+
  123 root       0 -20     0     0     0 I  0.3  0.0   0:00.75 kworke+
  124 root       20   0     0     0     0 I  0.3  0.0   0:00.94 kworke+
  252 root      19  -1  48216 14672 13224 S  0.3  0.7   0:00.68 system+
  300 root      -51   0     0     0     0 S  0.3  0.0   0:00.34 trq/18+
  653 message+   20   0  11112 6060 3820 S  0.3  0.3   0:01.40 dbus-d+
 1326 deven     20   0 323536 10044 6412 S  0.3  0.5   0:00.27 tbus-d+
```

3. Based once again on the image above and the statistics of when I made the virtual machine, I have 1975.3 Mib Memory
4. At present it is still Firefox that is taking up the most CPU resources along with gnome++ and ksofti+
5. Firefox routinely takes up the most memory while no other user processes are running
6. Explaining the following commands according to the explanation given in the terminal:
 - a. Apt-get: Is a command line interface for retrieval of packages and information about them from authenticated sources and for installation, upgrade, and removal of packages together with their dependencies.
 - b. Yum is the primary tool for getting, installing, deleting, querying, and managing Red hat Enterprise Linux RPM software packages.

- c. A non-interactive network retriever. It is a command line tool that makes it possible to download files and interact with REST API's
- d. Gzip did not pull up on my system; however, doing some research I found that it is a file format and a software application used for compression and decompression.
- e. Tar; GNU 'tar' saves many files together into a single tape or disk archive, and can restore individual files from the archive

```

deven@deven-VirtualBox:~$ tar --help
Usage: tar [OPTION...] [FILE]...
GNU 'tar' saves many files together into a single tape or disk archive, and can
restore individual files from the archive.

Examples:
  tar -cf archive.tar foo bar    # Create archive.tar from files foo and bar.
  tar -tvf archive.tar           # List all files in archive.tar verbosely.
  tar -xf archive.tar            # Extract all files from archive.tar.

Main operation mode:
  -A, --catenate, --concatenate  append tar files to an archive
  -C, --create                   create a new archive
  --delete                      delete from the archive (not on mag tapes!)
  -d, --diff, --compare         find differences between archive and file system
  -r, --append                  append files to the end of an archive
  --test-label                  test the archive volume label and exit
  -t, --list                    list the contents of an archive
  -u, --update                  only append files newer than copy in archive
  -x, --extract, --get          extract files from an archive

Operation modifiers:
  --check-device                check device numbers when creating incremental
                                archives (default)
  -g, --listed-incremental=FILE handle new GNU-format incremental backup
  -G, --incremental             handle old GNU-format incremental backup

```

- f. Rar; used to work with archives in Linux, getting help from the terminal provides this:

```

deven@deven-VirtualBox:~$ rar -?

RAR 5.50 Copyright (c) 1993-2017 Alexander Roshal 11 Aug 2017
Trial version Type 'rar -?' for help

Usage: rar <command> [-<switch 1> -<switch N> <archive> <files...>
               <@listfiles...> <path_to_extract\>]

Commands>
a          Add files to archive
c          Add archive comment
ch         Change archive parameters
cw         Write archive comment to file
d          Delete files from archive
e          Extract files without archived paths
f          Freshen files in archive
i[par]=<str> Find string in archives
k          Lock archive
l[t[a],b]  List archive contents [technical[all], bare]
m[f]       Move to archive [files only]
p          Print file to stdout
r          Repair archive
rc         Reconstruct missing volumes
rn         Rename archived files
rr[N]      Add data recovery record
rv[N]      Create recovery volumes
s[name|-]  Convert archive to or from SFX
t          Test archive files
u          Update files in archive

```

Activities Terminal Feb 4 23:41

deven@deven-VirtualBox: ~

```
Setting up binutils (2.38-4ubuntu2.1) ...
Setting up gcc-11 (11.3.0-1ubuntu1~22.04) ...
Setting up gcc (4:11.2.0-1ubuntu1) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for libc-bin (2.35-0ubuntu3.1) ...
deven@deven-VirtualBox:~$ sudo apt install gcc
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
gcc is already the newest version (4:11.2.0-1ubuntu1).
The following packages were automatically installed and are no longer required:
  libflashrom1 libftdi1-2 libllvm13
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 13 not upgraded.
deven@deven-VirtualBox:~$ gcc -o lab3_fork_trace lab3_fork_trace.c
deven@deven-VirtualBox:~$ ./lab3_fork_trace
I am the parent process
I am th echild process
deven@deven-VirtualBox:~$ ./lab3_fork_trace
I am the parent process
I am th echild process
deven@deven-VirtualBox:~$ gcc -o lab3_fork_trace lab3_fork_trace.c
deven@deven-VirtualBox:~$ ./lab3_fork_trace
I am the parent process
deven@deven-VirtualBox:~$ I am the child process
./lab3_fork_trace
I am the parent process
I am the child process
deven@deven-VirtualBox:~$
```

1.