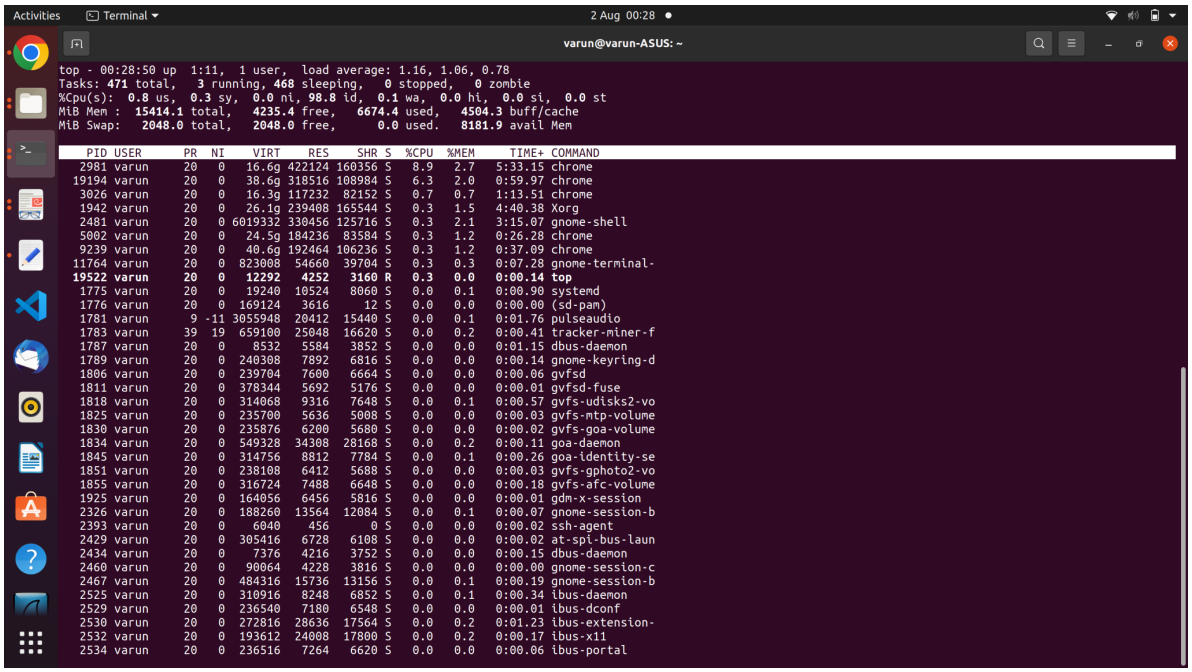
200050073 - Varun Mattapally
LAB-1

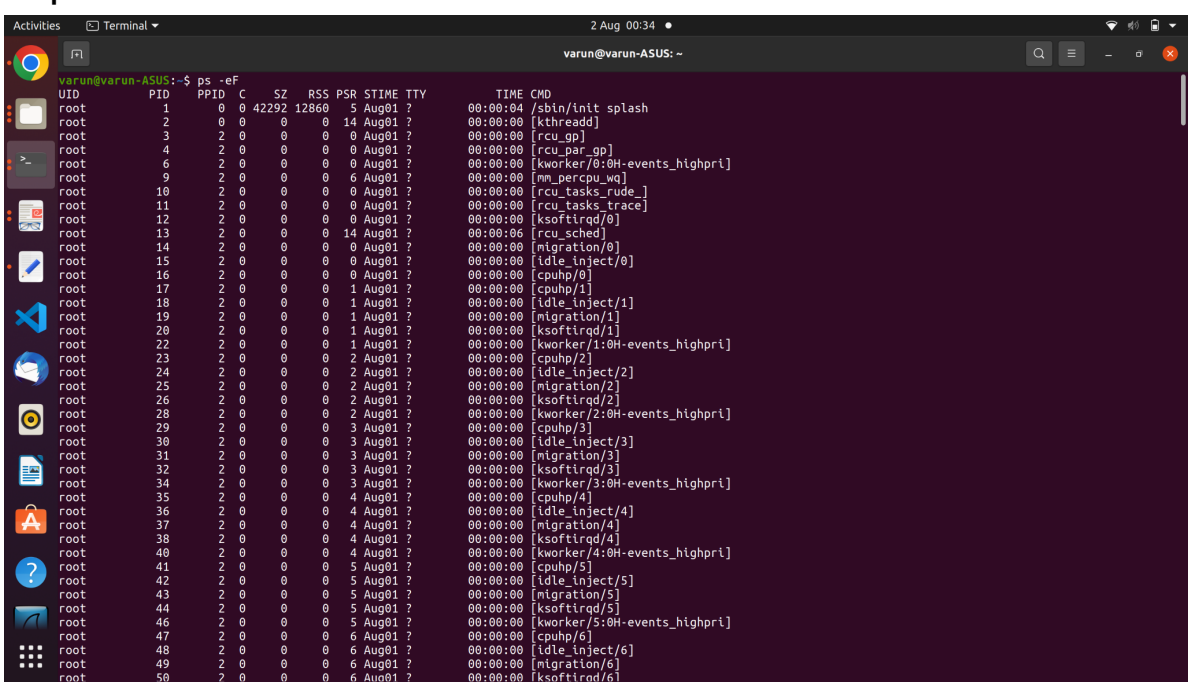
Part 1: The OS view

(a) Tools

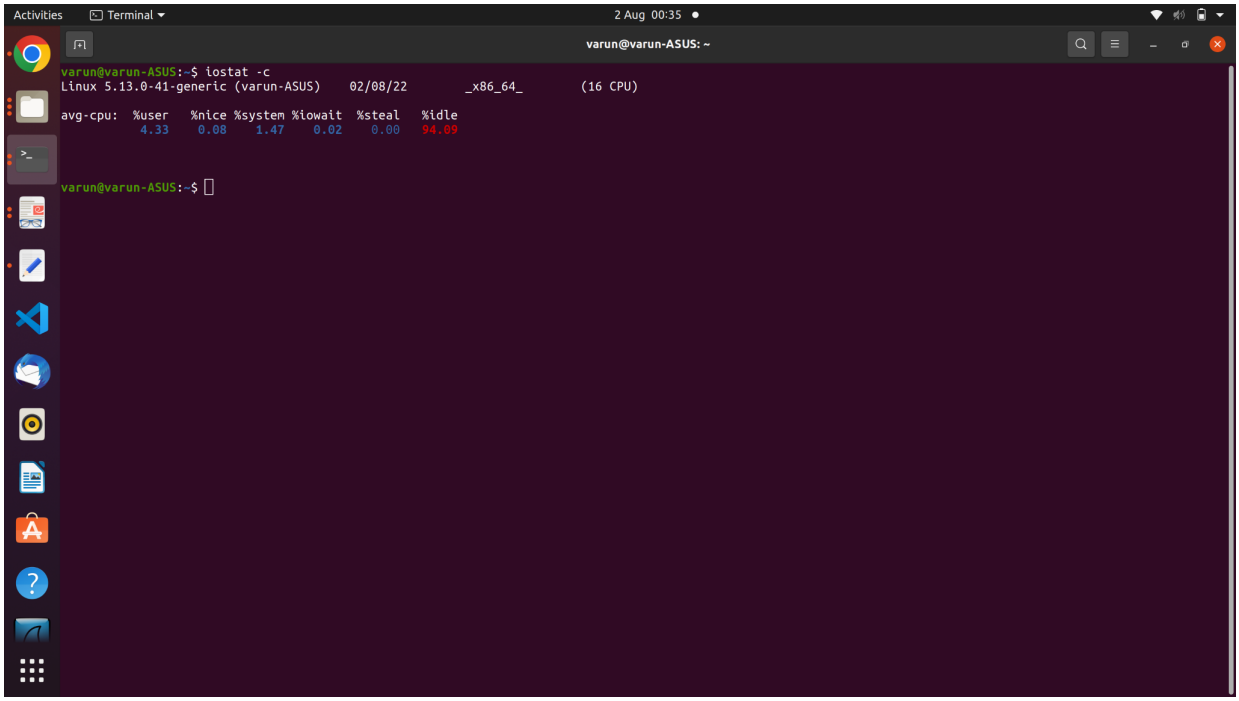
- top



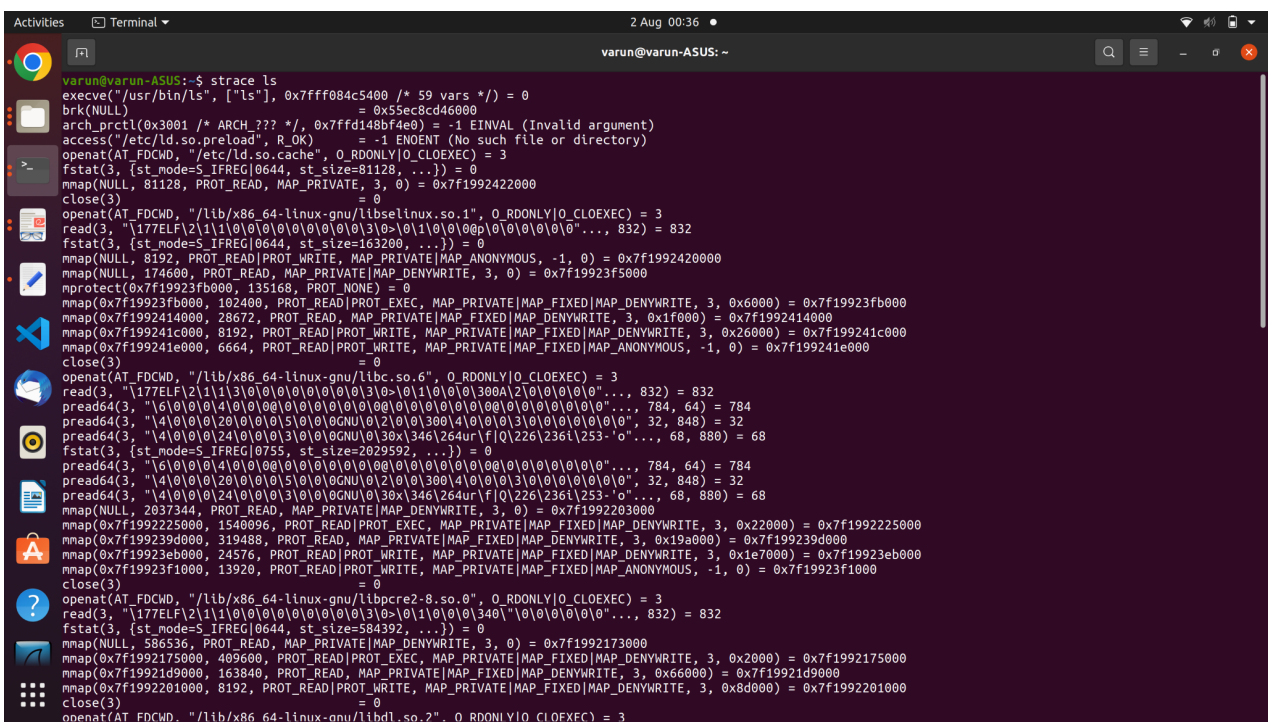
- ps



- iostat

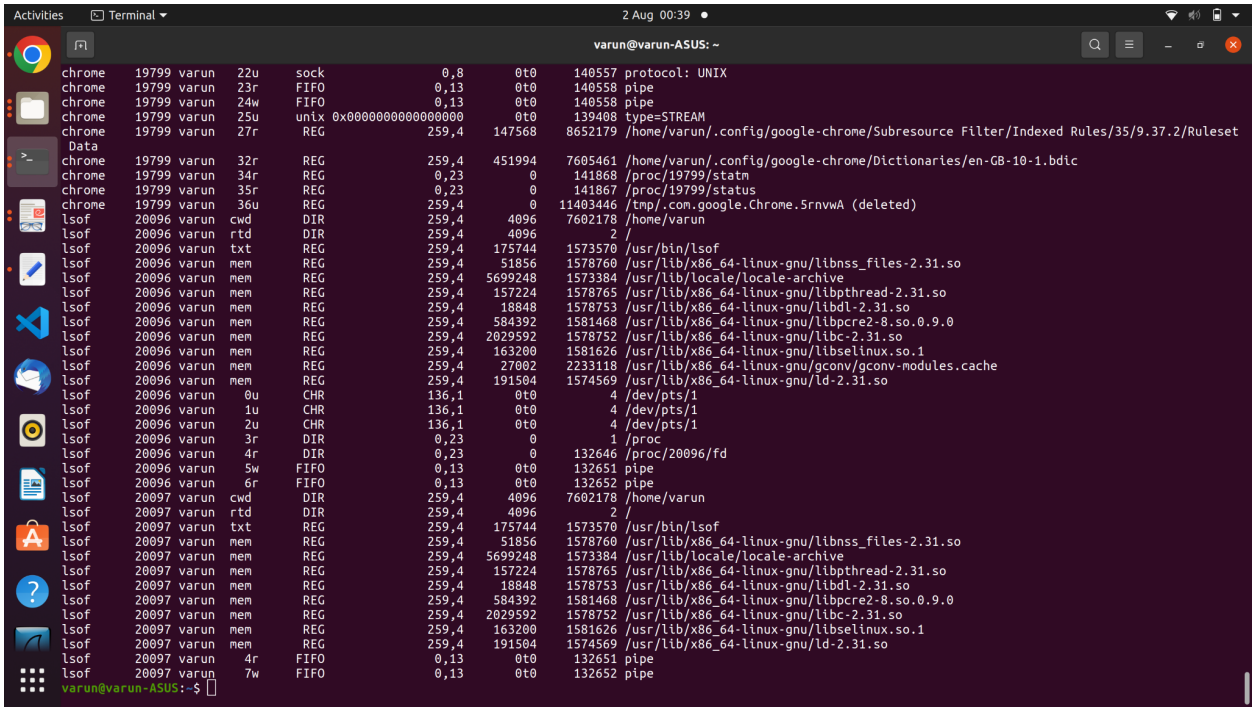


- strace

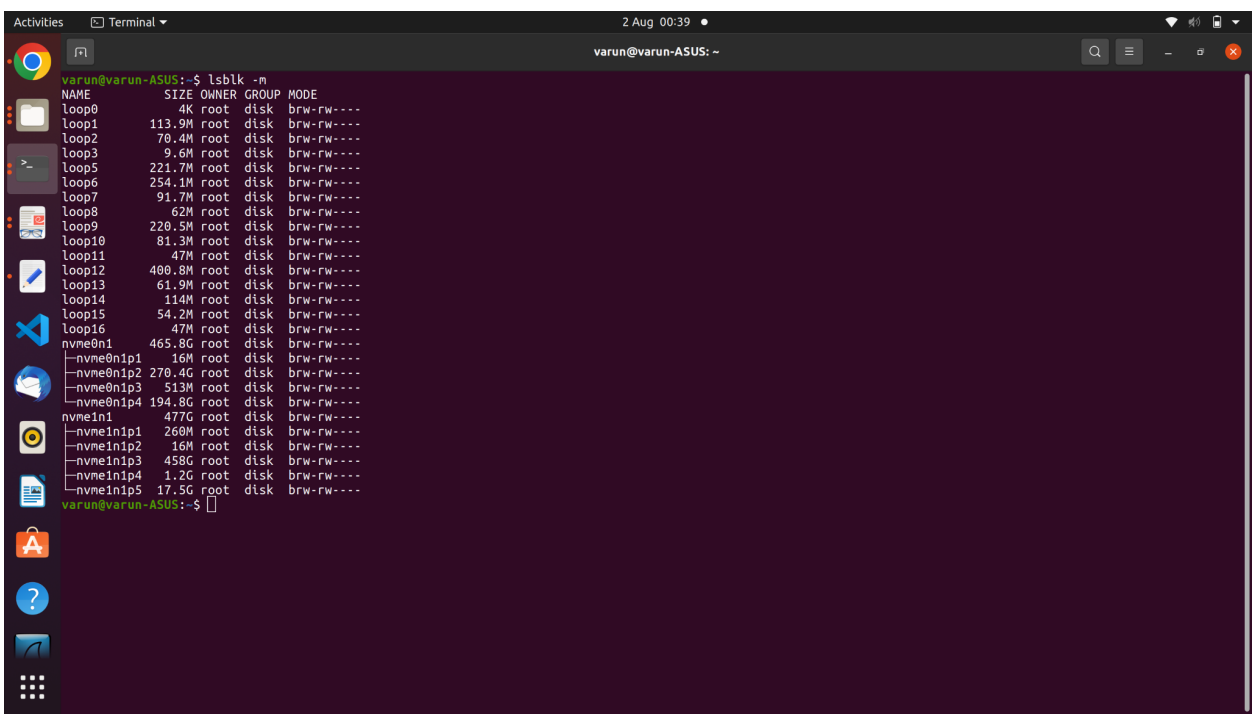


- lsof

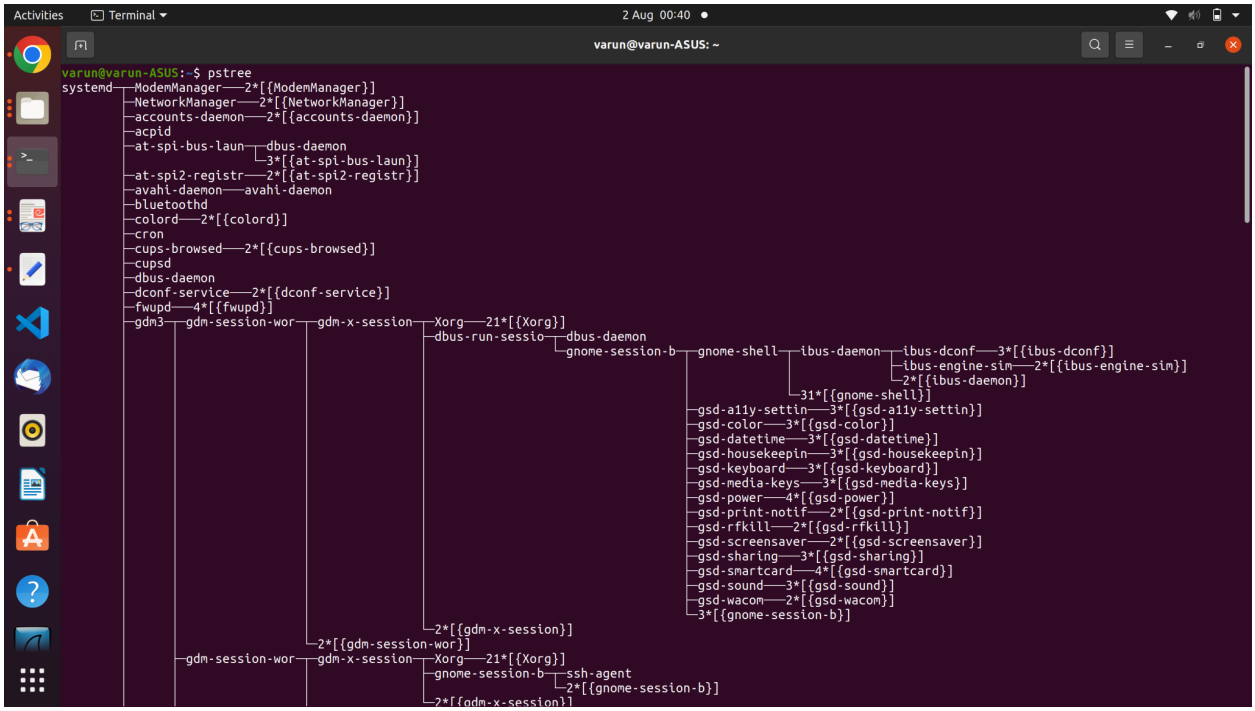
  lsof -u username



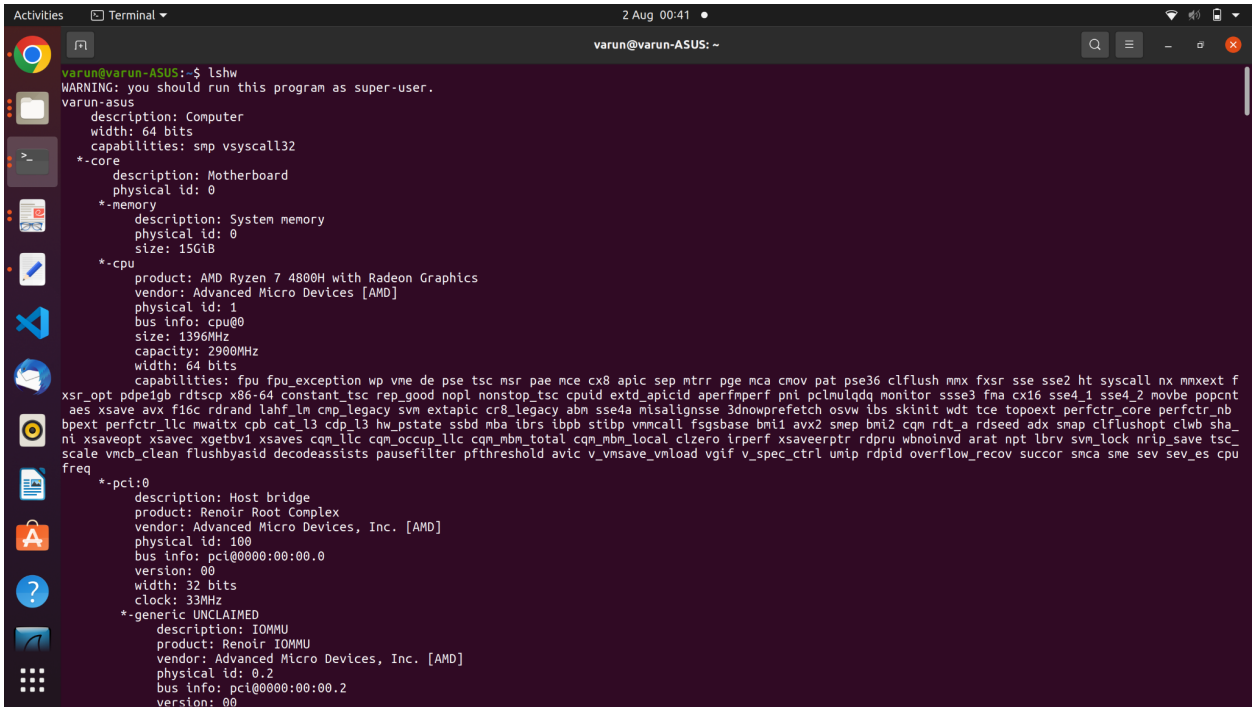
- lsblk



- pstree


Activities
Terminal
2 Aug 00:40
varun@varun-ASUS: ~
varun@varun-ASUS:~$ pstree
systemd─┬─ModemManager───2*[{ModemManager}]
├─NetworkManager───2*[{NetworkManager}]
├─accounts-daemon───2*[{accounts-daemon}]
├─acpid
├─at-spi-bus-laun─┬─dbus-daemon
└─3*[{at-spi-bus-laun}]
├─at-spi2-registr───2*[{at-spi2-registr}]
├─avahi-daemon───avahi-daemon
├─bluetoothd
├─colord───2*[{colord}]
├─cron
├─cups-browsed───2*[{cups-browsed}]
├─cupsd
├─dbus-daemon
├─dconf-service───2*[{dconf-service}]
├─fwupd───4*[{fwupd}]
├─gdm3─┬─gdm-session-wor─┬─gdm-x-session─┬─Xorg───21*[{Xorg}]
├─dbus-run-sessio─┬─dbus-daemon
└─gnome-session-b─┬─gnome-shell─┬─ibus-daemon─┬─ibus-dconf───3*[{ibus-dconf}]
├─ibus-engine-sim───2*[{ibus-engine-sim}]
└─2*[{ibus-daemon}]
└─31*[{gnome-shell}]
├─gsd-a11y-settin───3*[{gsd-a11y-settin}]
├─gsd-color───3*[{gsd-color}]
├─gsd-datetime───3*[{gsd-datetime}]
├─gsd-housekeepin───3*[{gsd-housekeepin}]
├─gsd-keyboard───3*[{gsd-keyboard}]
├─gsd-media-keys───3*[{gsd-media-keys}]
├─gsd-power───4*[{gsd-power}]
├─gsd-print-notif───2*[{gsd-print-notif}]
├─gsd-rfkill───2*[{gsd-rfkill}]
├─gsd-screensaver───2*[{gsd-screensaver}]
├─gsd-sharing───3*[{gsd-sharing}]
├─gsd-smartcard───4*[{gsd-smartcard}]
├─gsd-sound───3*[{gsd-sound}]
├─gsd-wacom───2*[{gsd-wacom}]
└─3*[{gnome-session-b}]
└─2*[{gdm-x-session}]
└─2*[{gdm-session-wor}]
├─gdm-session-wor─┬─gdm-x-session─┬─Xorg───21*[{Xorg}]
├─gnome-session-b─┬─ssh-agent
└─2*[{gnome-session-b}]
└─2*[{gdm-x-session}]

- lshw


Activities
Terminal
2 Aug 00:41
varun@varun-ASUS: ~
varun@varun-ASUS:~$ lshw
WARNING: you should run this program as super-user.
varun-asus
description: Computer
width: 64 bits
capabilities: smp vsyscall32
*-core
description: Motherboard
physical id: 0
*-memory
description: System memory
physical id: 0
size: 15GiB
*-cpu
product: AMD Ryzen 7 4800H with Radeon Graphics
vendor: Advanced Micro Devices [AMD]
physical id: 1
bus info: cpu@0
size: 1396MHz
capacity: 2900MHz
width: 64 bits
capabilities: fpu fpu_exception wp vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ht syscall nx mmxext f
xsr_opt pdpe1gb rdtscp x86-64 constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid aperfmperf pni pclmulqdq monitor ssse3 fma cx16 sse4_1 sse4_2 movbe popcnt
aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch osvw ibs skinit wdt tce topoext perfctr_core perfctr_nb
bpext perfctr_llc mwaitx cpb cat_l3 cdp_l3 hw_pstate ssbd mba ibrs ibpb stibp vmmcall fsgsbase bmi1 avx2 smep bmi2 cqm rdt_a rdseed adx smap clflushopt clwb sha_
ni xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local clzero irperf xsaveerptr rdpru wbnoinvd arat npt lbrv svm_lock nrip_save tsc_
scale vmcb_clean flushbyasid decodeassists pausefilter pfthreshold avic v_vmsave_vmload vgif v_spec_ctrl umip rdpid overflow_recov succor smca sme sev sev_es cpu
freq
*-pci:0
description: Host bridge
product: Renoir Root Complex
vendor: Advanced Micro Devices, Inc. [AMD]
physical id: 100
bus info: pci@0000:00:00.0
version: 00
width: 32 bits
clock: 33MHz
*-generic UNCLAIMED
description: IOMMU
product: Renoir IOMMU
vendor: Advanced Micro Devices, Inc. [AMD]
physical id: 0.2
bus info: pci@0000:00:00.2
version: 00

(b) The proc file system

1.

a)command:lscpu

Architecture: x86_64
Byte Order: Little Endian
Address sizes: 44 bits physical, 48 bits virtual

b)command:lscpu

CPU(s): 16
On-line CPU(s) list: 0-15
Thread(s) per core: 2
Core(s) per socket: 8
Socket(s): 1

c)command:lscpu

L1d cache: 256 KiB
L1i cache: 256 KiB
L2 cache: 4 MiB
L3 cache: 8 MiB

d)MemTotal: 15784020 kB
MemFree: 9458212 kB
MemAvailable: 11552008 kB

e)command:top

Tasks: 424 total, 1 running, 423 sleeping, 0 stopped, 0 zombie

f)

2.

	VmSize	VmRss
memory_1.c	6284 kB	4296 kB
memory_2.c	10192 kB	8568 kB
memory_3.c	6280 kB	4932 kB
memory_4.c	6284 kB	4916 kB

VmSize: It is the measure of how much RAM the process is using

VmRss: It is the measure of how much virtual memory the process has used

The abnormally difference of memory_2 stats are due to defining the size of array as 2000000 but in the remaining three codes it was defined as 1000000.

3.

./subprocesses 200050073

15-subprocesses

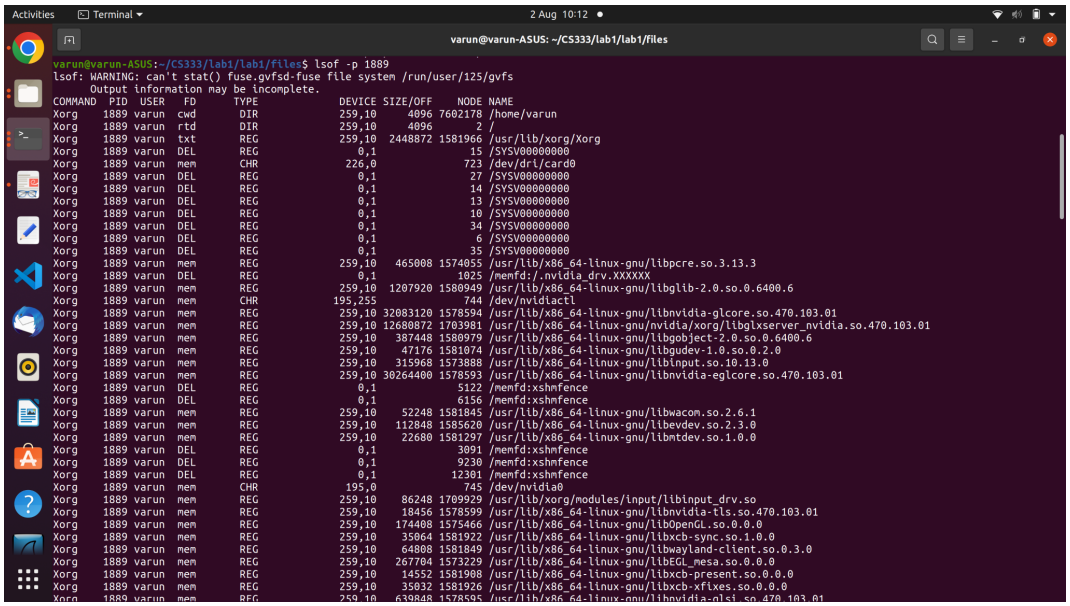
To get the above answer first while the executable is running I have typed the command "ps -aF" and then I have used the first pid mentioned against the user in Output and entered the command "pstree pid" and this gave 15 as the answer.

4.

5.

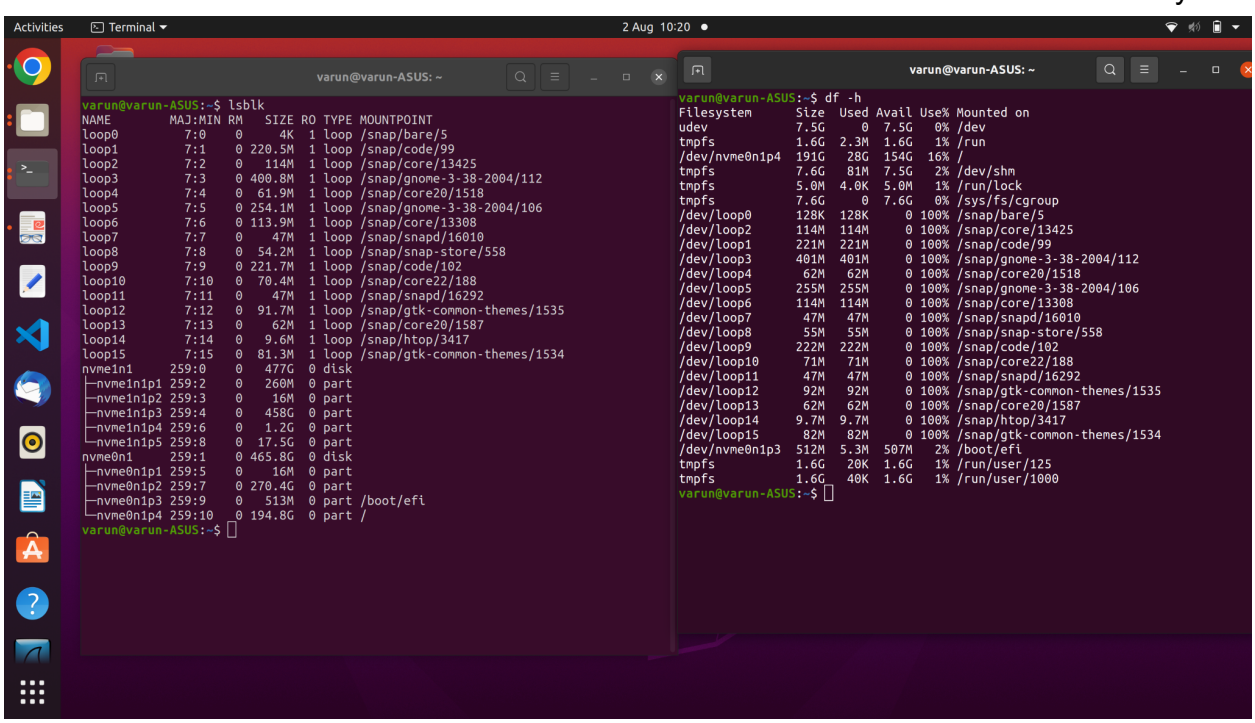
./openfiles

Executed the executable and typed “ps -aF” in other terminal to get the pid and used the command “lsof -p” pid to get the list of files which are opened by this program



6.

Here I used “df -h” and “lsblk” commands to see all block devices and their File Systems,Mount points



(c) Object Files

Here I used the command “objdump -d -j.rodata password.out” in the object directory of the lab. The Password hardcoded in the file is “Password123” which was observed when I executed the above command.