# Day-12 SRE Training

## Topic: Advanced Linux Commands

### System Monitoring Commands

free -h → Displays system memory usage in a human-readable format.

ps → Lists currently running processes.

ps aux --sort -%mem → Lists all running processes, sorted by memory usage in descending order. The processes consuming the most RAM appear at the top.

```
veenaroot@LAPTOP-S0KHU6AM:~$ ps aux --sort +%mem | head
USER         PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
veenaro+    5568  0.0  0.0   8300     4 ?        Ss   12:34   0:00 ssh-agent -s
veenaro+    6198  0.0  0.0   8300     8 ?        Ss   12:41   0:00 ssh-agent -s
veenaro+    6203  0.0  0.0   8300    12 ?        Ss   12:42   0:00 ssh-agent -s
veenaro+    6209  0.0  0.0   8300    16 ?        Ss   12:42   0:00 ssh-agent -s
root        5856  0.0  0.0   2776   108 ?        S    12:37   0:00 /init
root           7  0.0  0.0   2776   132 ?        Sl   11:45   0:00 plan9 --control-socket 7 --log-level 4 --server-fd 8
ipe-fd 10 --log-truncate
root        5056  0.0  0.0   2780   132 ?        Ss   12:29   0:00 /init
root       10178  0.0  0.0   4608   488 ?        Ss+  13:57   0:00 /bin/bash
veenaro+     333  0.0  0.0  21144   528 ?        S    11:45   0:00 (sd-pam)
```

ps aux --sort +%mem → Lists all running processes, sorted by memory usage in ascending order (lowest memory usage first).

top → Provides a real-time view of system processes, CPU, and memory usage.

ping chatgpt.com → Checks network connectivity to chatgpt.com.

```
veenaroot@LAPTOP-S0KHU6AM:~$ ping chatgpt.com
PING chatgpt.com (172.64.155.209) 56(84) bytes of data.
64 bytes from 172.64.155.209: icmp_seq=1 ttl=57 time=90.7 ms
64 bytes from 172.64.155.209: icmp_seq=2 ttl=57 time=72.9 ms
64 bytes from 172.64.155.209: icmp_seq=3 ttl=57 time=21.3 ms
64 bytes from 172.64.155.209: icmp_seq=4 ttl=57 time=18.8 ms
^C
--- chatgpt.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3154ms
```

nslookup google.com → Resolves the IP address of google.com.

ifconfig → Shows network interfaces and their IP addresses (deprecated, use ip a).

## File & Package Management

stat a.txt → Displays detailed information about the file a.txt.

```
veenaroot@LAPTOP-S0KHU6AM:~$ stat a.txt
  File: a.txt
  Size: 20942           Blocks: 48         IO Block: 4096   regular file
Device: 8,32    Inode: 13014       Links: 1
Access: (0644/-rw-r--r--)  Uid: ( 1000/veenaroot)   Gid: ( 1000/veenaroot)
Access: 2025-02-25 15:07:26.194543330 +0530
Modify: 2025-02-25 15:05:46.006485044 +0530
Change: 2025-02-25 15:05:46.006485044 +0530
 Birth: 2025-02-25 15:05:45.988238352 +0530
```

sudo apt update → Updates the package list from repositories.

sudo apt search firefox → Searches for firefox in available packages.

sudo apt search python → Searches for python in available packages.

dpkg -l → Lists installed Debian packages.

dpkg -l | grep mysql → Filters the installed packages containing mysql.

```
veenaroot@LAPTOP-S0KHU6AM:~$ dpkg -l |grep mysql
ii  mysql-client-8.0                          8.0.41-0ubuntu0.24.04.1              amd64
ii  mysql-client-core-8.0                     8.0.41-0ubuntu0.24.04.1              amd64
ii  mysql-common                              5.8+1.1.0build1                      all
ii  mysql-server                              8.0.41-0ubuntu0.24.04.1              all
ii  mysql-server-8.0                          8.0.41-0ubuntu0.24.04.1              amd64
ii  mysql-server-core-8.0                     8.0.41-0ubuntu0.24.04.1              amd64
```

sudo apt upgrade → Upgrades installed packages to the latest version.

sudo apt remove stress → Removes the stress package.

## User & Group Management

sudo adduser root1→ Creates a new user root1 with a home directory.

su - root1→ Switches to user root1.

sudo userdel -r root1→ Deletes user root1 and their home directory.

ps -u root1→ Lists processes running under root1.

sudo pkill -9 -u root1→ Forcefully terminates all processes of root1.

sudo useradd -m roottest → Creates a new user roottest with a home directory.

sudo passwd roottest → Sets a password for roottest .

finger roottest → Shows user details (if finger is installed).

sudo usermod -a -G c406cohort roottest → Adds roottest to the c406cohort group.

sudo chgrp c406cohort /home/grouptry → Changes the group of /home/grouptry to c406cohort.

sudo chgrp c406cohort /home/grouptry/root1/a → Changes the group of a inside /home/grouptry/root1/.

sudo chmod 2775 grouptry/ → Sets group ownership (2 sets SGID, 775 gives read/write/execute to group).

```
veenaroot@LAPTOP-S0KHU6AM:~$ sudo chown :c406cohort roottest
```

```
-rw-r--r-- 1 veenaroot veenaroot    749 Feb 25 16:13 key.txt.pub
-rw------- 1 veenaroot veenaroot   3389 Feb 25 16:13 key.txt
drwxr-xr-x 2 root      c406cohort  4096 Feb 25 19:25 roottest
```

**(SGID - Set Group ID)**

- The 2 at the beginning sets the **SGID (Set Group ID) bit**.
- When SGID is set on a directory, **all new files and subdirectories inside inherit the group of the parent directory instead of the creating user's primary group**.

sudo chmod g+s grouptry/root1/a → Ensures files inside inherit the group of the parent directory.

## SSH Key Setup for GitHub

ssh-keygen -t rsa -b 4096 -C "@gmail.com" → Generates an RSA SSH key.

eval "$(ssh-agent -s)" → Starts the SSH agent.

ssh-add ~/.ssh/id_ed25519 → Adds the SSH key to the agent (should match the key type generated).

cat ~/.ssh/id_ed25519.pub → Displays the public key to add to GitHub.

ssh -T git@github.com → Tests SSH authentication with GitHub.

## Printing & System Logs

lpq → Displays the printer queue. Shows pending print jobs.

dmesg → Displays system boot and hardware logs.

dmesg | tail -50 → Shows the last 50 lines of system logs.

dmesg | grep "USB" → Filters logs to show USB-related messages.

## Network Performance & Testing

iperf → Tests network speed between two systems.

sudo apt install iperf → Installs iperf if not already installed.

iperf -s → Starts iperf in **server mode** to receive network speed tests.

iperf -s -f M → Runs iperf server but displays results in **megabytes per second (MBps)** instead of bits.

sudo tcpdump -i any → Captures all network traffic on any interface (requires root).

## Network Connectivity & DNS

telnet google.com → Attempts to connect to google.com using Telnet (useful for testing open ports).

dig google.com → Queries DNS records for google.com (used to check domain resolution).