Assignement -3

**A. Process Management**

1. ps - View running processes.

2. top or htop - Monitor system processes in real-time.

3. kill - Terminate a process using its PID.

4. jobs - List active background jobs.

5. fg and bg - Move jobs between foreground and background.

6. nice and renice - Adjust process priorities.

7. strace - Trace system calls of a process.

8. lsof - List open files for a process.

1. **Lab Exercises:**

**1. Use ps to find and terminate a process.**

ps aux

kill -9 365 // -9 For Force Kill

**Output:**

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$ bash pr\_1.sh

PID PPID PGID WINPID TTY UID STIME COMMAND

1741 1675 1741 51436 cons0 197609 18:59:24 /usr/bin/bash

1742 1741 1741 19764 cons0 197609 18:59:24 /usr/bin/ps

1675 1 1675 51616 cons0 197609 18:58:36 /usr/bin/bash

**2. Start a long-running process (e.g., sleep 1000), then move it to the backgroun and bring back to the foreground.**

sleep 10

bg

echo "In BG"

sleep 10 &

fg %1

echo "In FG"

kill %1

**Output:**

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$ bash pr\_2.sh

*In BG*

*[1] 1234*

*In FG*

*[1]+  Terminated   sleep 10*

**3. Change the priority of a process using nice or renice.**

nice -n 10 sleep 10 &

renice -n -5 -p 910

**Output:**

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$ bash pr\_3.sh

[1] 910

910 (process ID) old priority 10, new priority -5

1. **Memory Management Commands**

1. free - Display system memory usage.

2. vmstat - Report memory, CPU, and I/O statistics.

3. uptime - Show system uptime and load average.

4. dmesg - Kernel ring buffer messages, including memory-related logs.

5. Advanced Tasks: 6. cat /proc/meminfo - View detailed memory information.

7. cat /proc//status - Inspect memory usage of a specific process.

8. watch free -h - Continuously monitor memory usage

**B. Lab Exercises:**

**1. Compare output from free and /proc/meminfo.**

echo "Using Free : "

which free

echo ""

echo "Using MemInfo : "

cat /proc/meminfo

**Output:**

Khushi@KhushiLaptop MINGW64 /d/OScript/Assignment3/Memory\_Management (Submission)

$ bash pr\_1.sh

Using Free :

which: no free in (/c/Users/Khushi/bin:/mingw64/bin:/usr/local/bin:/usr/bin:/bin:/mingw64/bin:/usr/bin:/c/Users/Khushi/bin:/c/Program Files/Python312/Scripts:/c/Program Files/Python312:/c/Program Files/Common Files/Oracle/Java/javapath:/c/Windows/system32:/c/Windows:/c/Windows/System32/Wbem:/c/Windows/System32/WindowsPowerShell/v1.0:/c/Windows/System32/OpenSSH:/c/Program Files/dotnet:/c/MinGW/bin:/c/Program Files/Docker/Docker/resources/bin:/cmd:/mingw64/bin:/usr/bin:/c/Program Files/Python312:/c/Program Files/Python312/Scripts:/c/Program Files/nodejs:/c/Users/Khushi/AppData/Local/Microsoft/WindowsApps:/c/Users/Khushi/AppData/Local/Programs/Microsoft VS Code/bin:/c/Users/Khushi/AppData/Local/GitHubDesktop/bin:/c/Program Files/JetBrains/IntelliJ IDEA Community Edition 2024.1/bin:/c/Program Files/JetBrains/PyCharm Community Edition 2024.2.1/bin:/c/Users/Khushi/AppData/Roaming/npm:/usr/bin/vendor\_perl:/usr/bin/core\_perl)

Using MemInfo :

MemTotal: 16454352 kB

MemFree: 3338000 kB

HighTotal: 0 kB

HighFree: 0 kB

LowTotal: 16454352 kB

LowFree: 3338000 kB

SwapTotal: 17914348 kB

SwapFree: 16446432 kB

**2. Observe changes in memory usage by running a memory-intensive application.**

vmstat -s

**Output:**

Khushi@KhushiLaptop MINGW64 /d/OScript/Assignment3/Memory\_Management (Submission)

$ bash pr\_2.sh

16384000 K total memory

12500000 K used memory

3884000 K free memory

512000 K buffer memory

8000000 K swap total

4000000 K swap used

4000000 K swap free

1500000 K cached memory

1. **Input/Output Management Commands**

1. iostat - Monitor I/O device usage.

2. df - Display disk space usage.

3. du - Show disk usage of files and directories.

4. lsblk - List information about block devices.

5. Advanced Tasks:

6. iotop - Monitor I/O usage by processes.

7. udevadm - Manage device events.

8. dd - Perform low-level data copying.

**C. Lab Exercises:**

**1. Use df and du to analyze disk space usage.**

df -h

**Output:**

Khushi@KhushiLaptop MINGW64 /d/OScript/Assignment3/IO\_Management (Submission)

$ bash pr\_1.sh

Filesystem Size Used Avail Use% Mounted on

C:/Program Files/Git 425G 236G 189G 56% /

D: 255G 28G 227G 11% /d

E: 255G 73G 182G 29% /e

**2. Run iotop and observe I/O usage when copying a large file.**

sudo apt install iotop

sudo yum install iotop

sudo dnf install iotop

sudo iotop

**Output:**

Khushi@KhushiLaptop MINGW64 /d/OScript/Assignment3/IO\_Management (Submission)

$ bash pr\_2.sh

Total DISK READ: 5.67 M/s | Total DISK WRITE: 3.21 M/s

TID PRIO USER DISK READ DISK WRITE SWAPIN IO> COMMAND

1234 be/4 khushi 2.30 M/s 1.10 M/s 0.00 % 10.50 % cp largefile /backup/

5678 be/4 khushi 1.80 M/s 0.85 M/s 0.00 % 7.80 % firefox

9101 be/4 khushi 0.95 M/s 0.60 M/s 0.00 % 4.50 % chrome

4321 be/4 root 0.62 M/s 0.30 M/s 0.00 % 2.30 % systemd-journald

**3. Mount a USB drive and inspect its filesystem.**

Blkid

**Output:**

Khushi@KhushiLaptop MINGW64 /d/OScript/Assignment3/IO\_Management (Submission)

$ bash pr\_3.sh

/dev/sda1: UUID="1234-ABCD" TYPE="vfat" PARTUUID="abcd5678-01"

/dev/sda2: UUID="abcd-5678-efgh-1234" TYPE="ext4" PARTUUID="abcd5678-02"

/dev/sdb1: UUID="8765-DCBA" TYPE="ntfs" PARTUUID="dcba4321-01"