

Session-5

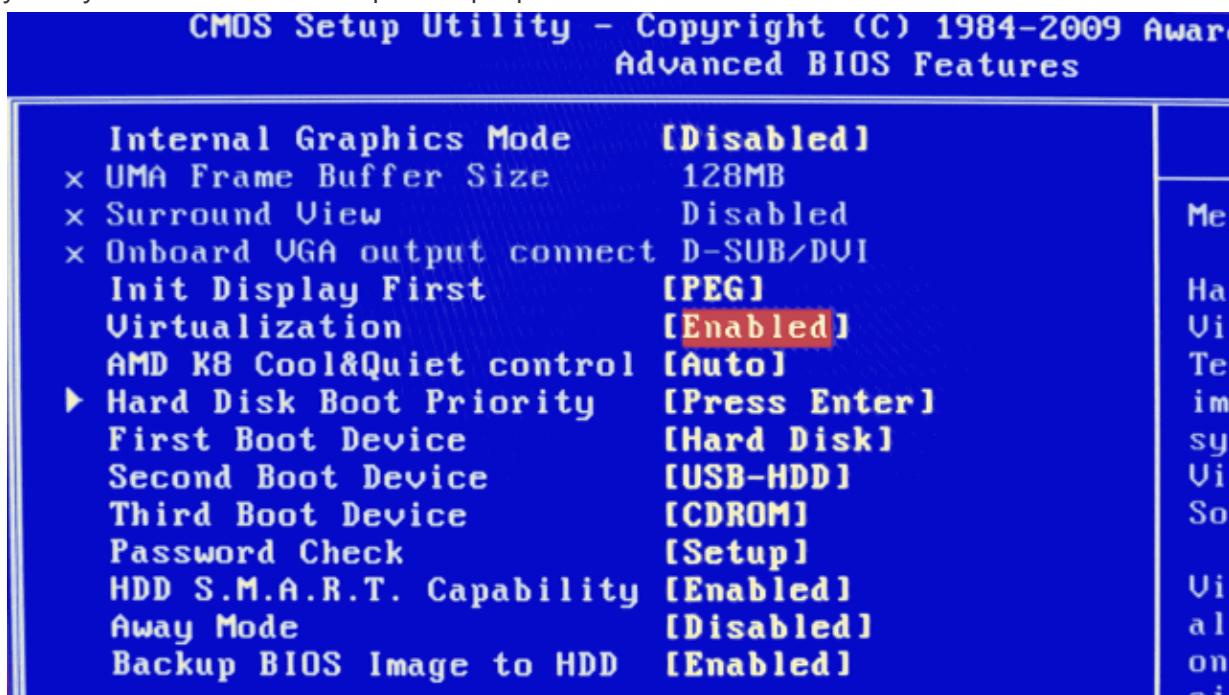
Monitoring Process and Performance
download linux in your machine
open the cmd

```
wsl --install
```

even after doing this if linux is not installed restart your computer and check the system settings

open cmd
> wsl

while restarting press F9,F11,F12 or esc button to enter into setup and enable Virtualization in your system and restart the pc or laptop



open the cmd> wsl

```
top
```

after running command you will see an interface that updates in real time with details like CPU usage.memory usage, running process

Understanding top output

line 1 : Uptime Information

line 2 : Task information

line 3 : CPU Usage Information

- **%us-** user process
- **%sy-** system process
- **%ni-** nice priority process
- **%id-** idle time
- **%wo** - waiting for I/O

line 4: Memory Usage Information

Important

to kill any running process the command is

- a. press : k
- b. enter the PID(Process ID)
- c. Enter

Common Commands

1. short by memory: shift +M
2. short by Time: Shift + T
3. short by CPU Usage: Shift + P

htop : interactive Process Viewer

install htop in linux:

```
sudo apt install htop -y
```

for mac os

```
brew install htop
```

for centos

```
sudo yum install -y htop
```

or

```
sudo dnf install -y htop
```

Useful Shortcuts:

press F3 --> search a process
press F9 --> to kill the process
press F6 --> to sort by different metrics
press q --> to exit
to run htop --> htop

how it will work?

to search any process search by using command name

1. press F3
2. enter **command** name
3. press F9 (its is used to KILL the Process)
4. Select the type **SIGKILL**

Free - Memory usage Monitoring

- The free command provides a quick overview of system memory usage
- How to Run ?
- open command Prompt

```
free -h
```

understanding the output

total	-> total memory Available
used	-> RAM currently in Use
free	-> Completely FREE RAM
shared	-> Memory Shared Between The Process
buff/ cache	-> Memory used for buffers and Cache
available	-> RAM Available for new Process

Some of the important commands

1. display the value in MB

```
free -m
```

2. display the Value in GB

```
free -g
```

3. Continuously monitoring memory usage (That Updates on Every One Seconds)

```
watch -n 1 free -h
```

4. get the memory in n numbers of seconds

```
free -s 5
```

this will give you 5 iterations of memory

5. get the total summary

```
free -t
```

this will give total summary of memory available

CONCLUSION:

1. **top:** for a quick overview of CPU /Memory Usage
2. **htop:** for an interactive user friendly process monitor
3. **free:** to check the memory available as a glance

Exporting information to a file

open WSL

```
top -b -n 1 > /mnt/c/Users/yourusername/Desktop/my_top_output.txt
```



System Load Average in LINUX and ITS Significance

- it displayed as three numbers over different time intervals:

`uptime`

output: 15:17:50 up 4:47, 1 user, load average: 0.00, 0.01, 0.00

these values represents the system load for the last **1 minute, 5 minutes and 15 minutes**

Significance of LOAD Average

- **ideal Load**
 - if load is < or equals to no.of CPU Core --> System is running Smooth
 - ex: on 4-core CPU a Load of 8.0 means CPU is Overloaded

`nproc`

or

```
grep -c ^processor /proc/cpuinfo
```

- **Over Loaded System**
 - if load exceeds CPU Core for a Long time periods, Performance Degrades.
 - ex. on 4 Core CPU a Load of 8.0 means CPU is Overloaded

CONTEXT SWITCHING

- context switching occurs when the CPU Switched from one Process to Another
- how to check context Switching in Linux?

```
sudo apt install vmstat  
sudo apt install sysstat
```

run the below commands

```
vmstat 1 5 --> look at CS (context per Seconds)
```

```
sar -w 1 5 --> show no.of context switches over time
```

```
cat /proc/stat | grep ctxt --> display the context swicthing since Boot
```

for any process you can tract and kill using top

you can also short and filter using top

sort by cpu usage Hihghest First

Shift + P

Sort by Memory Usage

Shift + M

find a Specific Process

```
ps aux | grep process_name
```

1. Hands on- Open Top and Kill the process using K
 2. Hands on- Open htop Process and Kill the process using f9 and SIGKILL
- get the list of High priority Process

```
ps -eo pid,ppid,cmd,%mem,%cpu --sort=-%mem | head -15
```