Session-1

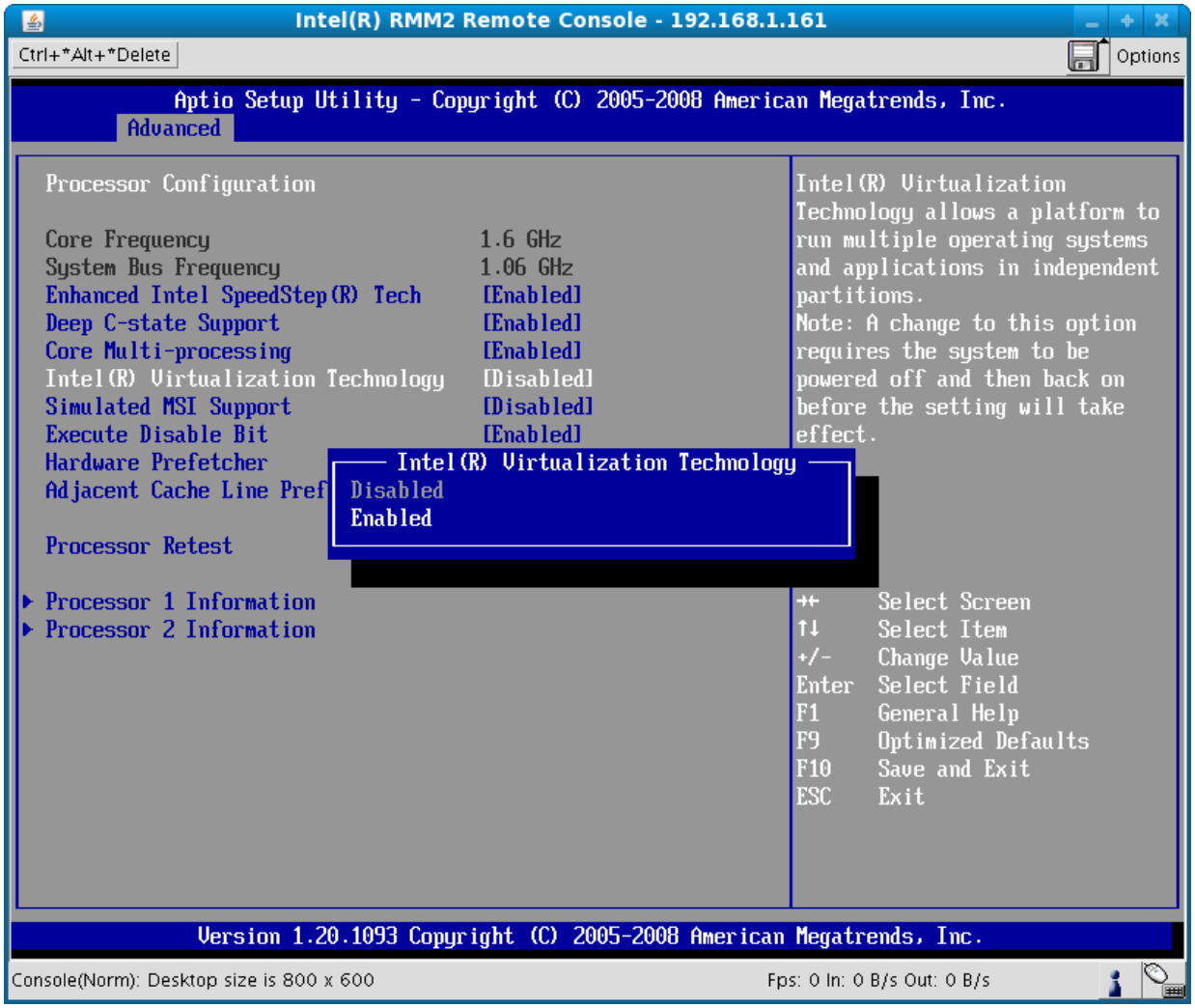
monitoring Process and Performance
download linux in your machine
open the Command Prompt

```
wsl --install
```

even running this code if linux is not installed restart your machine and check
open the cmd

```
wsl
```

restart you machine press F9, F11,F12 or esc button to enter into setup
got to setup and enable vertualization and restart the pc or laptop



Process and Resource :

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 informtaion

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

to kill any running process the commad is

1. press: k
2. enter the PID(Process ID)
3. Enter

htop: interactive Process Viewer

```
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 htop 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
```

to Search any process: search by using command name

1. search the command using F3
2. press enter
3. press F9
4. select the type like SIGKILL(9)

free -Memory Usage Monitoring

the free command provides a quick overview of system memory usage.

How to Run?

```
free -h
```

understanding output:

total: ->total memory available
used: -> RAM currently in use
free: ->completely Free RAM
shared: -> Memory Shared Between Process
buff/cache: -> Memory used for buffers and Cache
available: -> RAM available for new process

some of the important commands

display the value in MB

```
free -m
```

display the value in GB

```
free -g
```

Continuously monitoring memory usage (Update on every One Seconds)

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

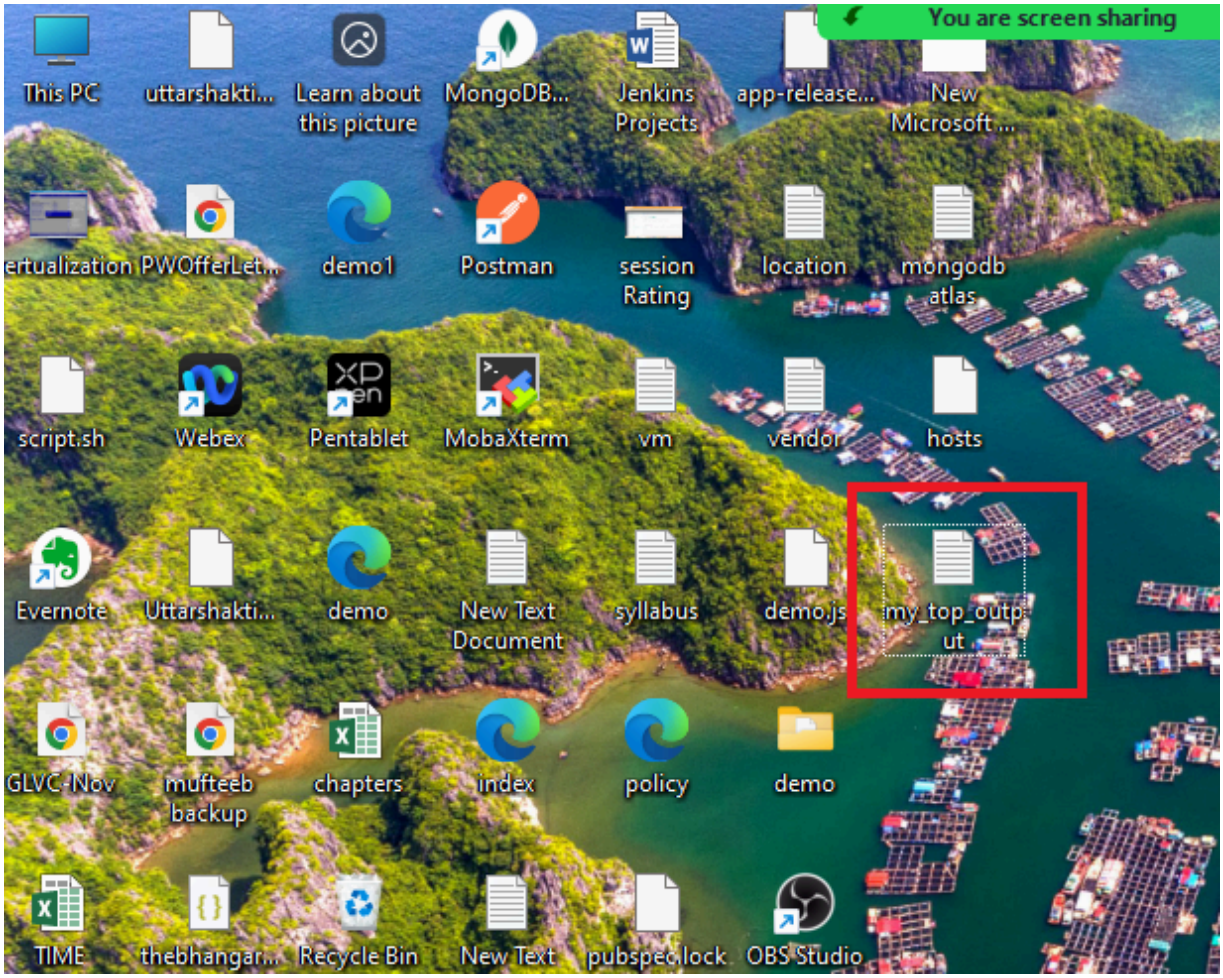
Conclusion

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 availability 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 is displayed as three numbers over different time intervals:

```
uptime
```

```
output: load average: 0.50, 0.75,1.20
```

these values represents the system load for the last **1 minutes,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 average load of 3.0 is considered to be fine
- **Overloaded System**
  - if load exceeds CPU core for a long 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 switches from one process to another

how to check context switching in LINUX?

```
sudo apt install vmstat
sudo apt install sysstat

vmstat 1 5 -> look at cs (context per seconds)

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

cat /proc/stat | grep ctxt -> display the context switching since boot
```

for any Process you can track and kill using top

also you can short and filder using top

sorts by CPU usage highest first

```
Shift+ P
```

sorts by memory Usage

```
Shift+ M
```

kill the process

```
k
```

find a specific process

```
ps aux | grep process_name
```

get the list of High priority Process

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