OS LAB 01

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K036

B. Tech CSE (Cybersecurity)

Q1) What do you mean by 64-bit Operating System and how does it differ from 32-bit Operating System in various aspects like performance and timing.

Ans)

A 64-bit operating system is designed to handle more data at once compared to a 32-bit operating system. This is because it can process data in 64-bit chunks, which allows for more efficient data handling and processing. Here are some key aspects:

Performance:

Data Processing: 64-bit systems can process more data per clock cycle. This means that they can handle more complex calculations and tasks more efficiently. For example, applications that require a lot of memory and processing power, such as video editing software, 3D rendering programs, and large databases, will perform better on a 64-bit system.

Speed: The ability to process larger chunks of data at once can lead to faster execution of tasks. This is particularly noticeable in applications that are optimized for 64-bit processing.

Memory:

RAM Usage: One of the most significant advantages of a 64-bit operating system is its ability to use more RAM. While a 32-bit system is limited to using around 4GB of RAM, a 64-bit system can theoretically use up to 16 exabytes of RAM. This means that 64-bit systems can handle more applications running simultaneously without slowing down.

Multitasking: With more RAM available, 64-bit systems are better suited for multitasking. Users can run multiple memory-intensive applications at the same time without experiencing significant slowdowns.

Compatibility:

Application Support: 64-bit operating systems can run both 32-bit and 64-bit applications. This provides greater flexibility and ensures that users can continue to use older 32-bit applications while taking advantage of the performance improvements offered by 64-bit applications.

Driver Support: Hardware drivers need to be compatible with the operating system. 64-bit operating systems require 64-bit drivers, which are designed to take full advantage of the system's capabilities.

32-bit Operating System

A 32-bit operating system processes data in 32-bit chunks. While this was sufficient for many applications in the past, it has become a limitation for modern computing needs. Here are some key aspects:

Performance:

Data Processing: 32-bit systems can process less data per clock cycle compared to 64-bit systems. This can lead to slower performance, especially with applications that require a lot of memory and processing power.

Speed: The smaller data chunks processed by 32-bit systems can result in slower execution of tasks, particularly for applications that are optimized for 64-bit processing.

Memory:

RAM Usage: 32-bit systems are limited to using around 4GB of RAM. This limitation can be a bottleneck for modern applications that require more memory to run efficiently.

Multitasking: With less RAM available, 32-bit systems may struggle with multitasking, especially when running multiple memory-intensive applications simultaneously.

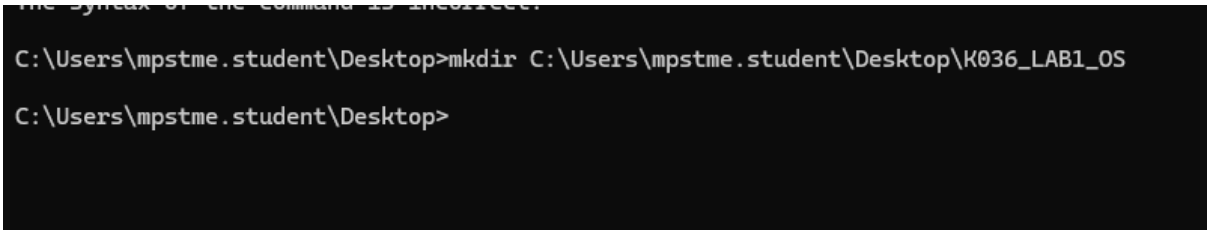
Compatibility:

Application Support: 32-bit operating systems can only run 32-bit applications. This limits the range of software that can be used and may prevent users from taking advantage of newer, more powerful 64-bit applications.

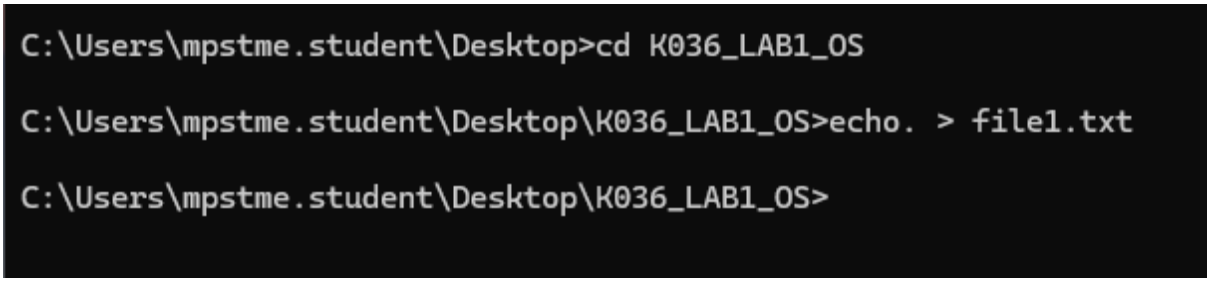
Driver Support: 32-bit operating systems require 32-bit drivers. As hardware manufacturers focus on developing 64-bit drivers, finding compatible drivers for newer hardware may become more challenging.

In-Lab Assignment

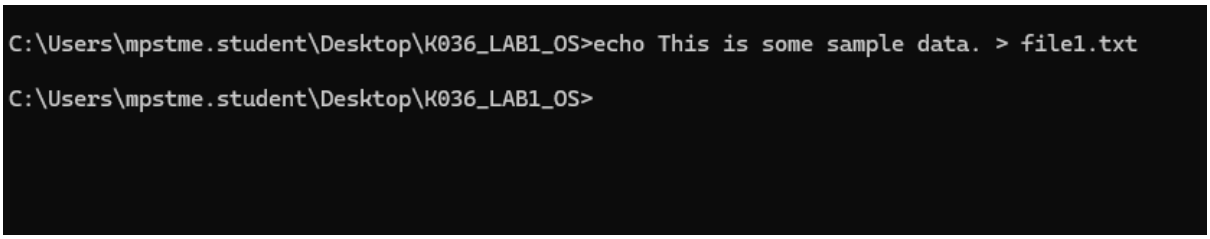
1. Create a directory or folder, change directory



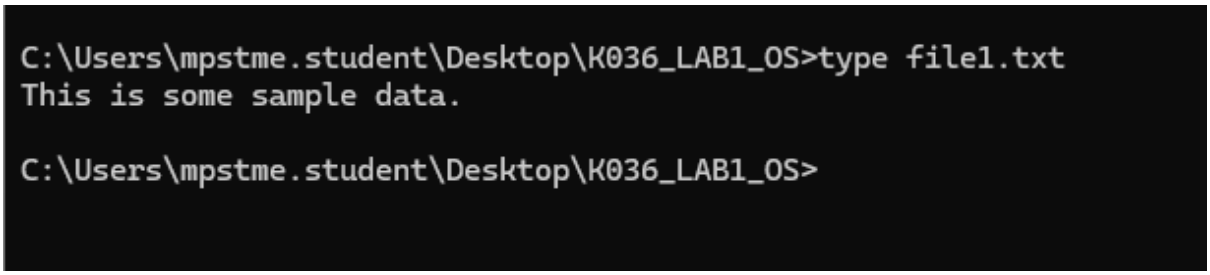
2. Create a file in the above folder



3. Type some data in the file created,



4. Read the data,



5. Rename the file and folder,

```
C:\Users\mpstme.student\Desktop\K036_LAB1_OS>ren file1.txt file1_renamed.txt

C:\Users\mpstme.student\Desktop\K036_LAB1_OS>ren K036_LAB1_OS K036_LAB1_OS_RENAMED
The system cannot find the file specified.

C:\Users\mpstme.student\Desktop\K036_LAB1_OS>cd ..\

C:\Users\mpstme.student\Desktop>ren K036_LAB1_OS K036_LAB1_OS_RENAMED

C:\Users\mpstme.student\Desktop>
```

6. Create second folder and copy file from first folder to the second folder newly created

```
C:\Users\mpstme.student\Desktop>mkdir C:\Users\mpstme.student\Desktop\K036_LAB1_OS_RENAMED\Second_Folder

C:\Users\mpstme.student\Desktop>
```

```
C:\Users\mpstme.student\Desktop\K036_LAB1_OS_RENAMED>copy file1_renamed.txt C:\Users\mpstme.student\Desktop\K036_LAB1_OS_RENAMED\Second_Folder
        1 file(s) copied.

C:\Users\mpstme.student\Desktop\K036_LAB1_OS_RENAMED>
```

7. Delete folder,

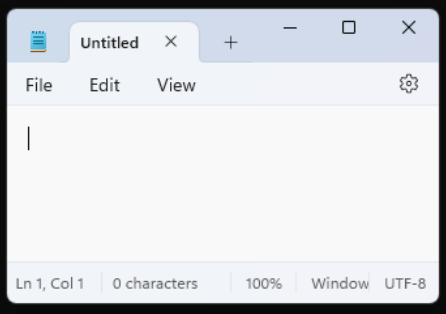
```
C:\Users\mpstme.student\Desktop\K036_LAB1_OS_RENAMED>rmdir /s /q C:\Users\mpstme.student\Desktop\K036_LAB1_OS_RENAMED\Second_Folder

C:\Users\mpstme.student\Desktop\K036_LAB1_OS_RENAMED>
```

8. Open an application,

```
C:\Users\mpstme.student\Desktop\K036_LAB1_OS_RENAMED>start notepad.exe

C:\Users\mpstme.student\Desktop\K036_LAB1_OS_RENAMED>
```



9. close an application,

```
C:\Users\mpstme.student\Desktop\K036_LAB1_OS_RENAMED>taskkill /IM notepad.exe /F
SUCCESS: The process "Notepad.exe" with PID 19780 has been terminated.

C:\Users\mpstme.student\Desktop\K036_LAB1_OS_RENAMED>
```

10. Access different drives

```
C:\Users\mpstme.student\Desktop\K036_LAB1_OS_RENAMED>taskkill /IM notepad.exe /F
SUCCESS: The process "Notepad.exe" with PID 19780 has been terminated.

C:\Users\mpstme.student\Desktop\K036_LAB1_OS_RENAMED>cd /d E:\

E:\>
```

11. Create 2 files and compare them FC: File Compare,

```
E:\>echo This is file 1. > file1.txt

E:\>echo This is file 2. > file2.txt

E:\>fc file1.txt file2.txt
Comparing files file1.txt and FILE2.TXT
***** file1.txt
This is file 1.
***** FILE2.TXT
This is file 2.
*****


E:\>
```

12. Network troubleshooting is never simple, but one command that makes it much easier is IPCONFIG.

```
E:\>ipconfig

Windows IP Configuration


Ethernet adapter VirtualBox Host-Only Network:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::8f5c:eb25:d629:dbf0%9
   IPv4 Address. . . . . . . . . . . : 192.168.56.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :

Ethernet adapter Ethernet:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::3fc4:e2aa:1d87:318f%22
   IPv4 Address. . . . . . . . . . . : 10.125.107.57
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 10.125.107.1

Ethernet adapter vEthernet (Default Switch):

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::e9a6:6cc1:b76d:e37d%26
   IPv4 Address. . . . . . . . . . . : 172.26.224.1
   Subnet Mask . . . . . . . . . . . : 255.255.240.0
   Default Gateway . . . . . . . . . :

E:\>
```

13. NETSTAT command in the command prompt,

```
E:\>netstat

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    10.125.107.57:30295    190:https              CLOSE_WAIT
  TCP    10.125.107.57:31766    52.123.170.79:https    ESTABLISHED
  TCP    10.125.107.57:31785    a23-54-82-209:https    ESTABLISHED
  TCP    10.125.107.57:31792    246:https              TIME_WAIT
  TCP    10.125.107.57:31804    190:https              CLOSE_WAIT
  TCP    10.125.107.57:31844    52.168.117.168:https   TIME_WAIT
  TCP    10.125.107.57:31846    246:https              ESTABLISHED
  TCP    10.125.107.57:31979    52.111.232.84:https    ESTABLISHED
  TCP    10.125.107.57:37068    a23-212-254-113:https  CLOSE_WAIT
  TCP    10.125.107.57:37069    a23-212-254-113:https  CLOSE_WAIT
  TCP    10.125.107.57:37070    a23-212-254-113:https  CLOSE_WAIT
  TCP    10.125.107.57:37071    a23-212-254-113:https  CLOSE_WAIT
  TCP    10.125.107.57:37072    a23-212-254-113:https  CLOSE_WAIT
  TCP    10.125.107.57:37073    a23-212-254-113:https  CLOSE_WAIT
  TCP    10.125.107.57:37129    a23-212-254-10:https   CLOSE_WAIT
  TCP    10.125.107.57:37130    a23-212-254-10:https   CLOSE_WAIT
  TCP    10.125.107.57:37131    a23-212-254-10:https   CLOSE_WAIT
  TCP    10.125.107.57:37132    a23-212-254-10:https   CLOSE_WAIT
  TCP    10.125.107.57:37133    a23-212-254-10:https   CLOSE_WAIT
```

14. PING command,

```
E:\>ping nmims.edu

Pinging nmims.edu [95.217.93.209] with 32 bytes of data:
Reply from 95.217.93.209: bytes=32 time=150ms TTL=47
Reply from 95.217.93.209: bytes=32 time=150ms TTL=47
Reply from 95.217.93.209: bytes=32 time=150ms TTL=47
Reply from 95.217.93.209: bytes=32 time=150ms TTL=47

Ping statistics for 95.217.93.209:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 150ms, Maximum = 150ms, Average = 150ms

E:\>
```

15. TRACERT nmims.edu

```
E:\>tracert nmims.edu

Tracing route to nmims.edu [95.217.93.209]
over a maximum of 30 hops:

  1    <1 ms    <1 ms    <1 ms  10.125.107.1
  2     2 ms     2 ms    27 ms  10.125.138.1
  3     1 ms    <1 ms    <1 ms  mumbaicampus.svkm.ac.in [10.0.1.9]
  4     1 ms     1 ms    <1 ms  14.139.125.226
  5     3 ms     3 ms     3 ms  10.152.12.117
  6     3 ms     3 ms     3 ms  10.152.7.38
  7     3 ms     3 ms     3 ms  115.247.69.85
  8     *        *        *     Request timed out.
  9     4 ms     5 ms     5 ms  103.198.140.176
 10   120 ms   122 ms   119 ms  103.198.140.81
 11     *      129 ms   129 ms  ae15-0.fra20.core-backbone.com [5.56.20.229]
 12     *      144 ms     *     ae1-2081.sth10.core-backbone.com [80.255.14.194]
 13   148 ms  ^C
E:\>

E:\>
```

16. SYSTEMINFO,

```
E:\>systeminfo

Host Name:                 MUM15221CPU1259
OS Name:                   Microsoft Windows 11 Pro
OS Version:                10.0.22621 N/A Build 22621
OS Manufacturer:           Microsoft Corporation
OS Configuration:          Member Workstation
OS Build Type:             Multiprocessor Free
Registered Owner:          Admin
Registered Organization:   HP Inc.
Product ID:                00330-53758-85595-AAOEM
Original Install Date:     09-03-2024, 17:11:00
System Boot Time:          21-11-2024, 09:44:48
System Manufacturer:       HP
System Model:              HP ProOne 600 G6 22 All-in-One PC
System Type:               x64-based PC
Processor(s):              1 Processor(s) Installed.
                           [01]: Intel64 Family 6 Model 165 Stepping 3 GenuineIntel ~2304 Mhz
BIOS Version:              HP S12 Ver. 02.20.01, 02-09-2024
Windows Directory:         C:\WINDOWS
System Directory:          C:\WINDOWS\system32
Boot Device:               \Device\HarddiskVolume1
System Locale:             en-us;English (United States)
Input Locale:              00004009
Time Zone:                 (UTC+05:30) Chennai, Kolkata, Mumbai, New Delhi
Total Physical Memory:     7,967 MB
Available Physical Memory: 1,010 MB
Virtual Memory: Max Size:  14,511 MB
Virtual Memory: Available: 2,602 MB
Virtual Memory: In Use:    11,909 MB
Page File Location(s):     C:\pagefile.sys
Domain:                    SVKMGRP.COM
Logon Server:              \\MUMDC-PRIM
Hotfix(s):                 3 Hotfix(s) Installed.
                           [01]: KB5022497
                           [02]: KB5026372
                           [03]: KB5025351
Network Card(s):           3 NIC(s) Installed.
                           [01]: VirtualBox Host-Only Ethernet Adapter
                                 Connection Name: VirtualBox Host-Only Network
                                 DHCP Enabled:    No
                                 IP address(es)
                                 [01]: 192.168.56.1
                                 [02]: fe80::8f5c:eb25:d629:dbf0
                           [02]: Intel(R) Ethernet Connection (11) I219-LM
                                 Connection Name: Ethernet
                                 DHCP Enabled:    No
                                 IP address(es)
                                 [01]: 10.125.107.57
                                 [02]: fe80::3fc4:e2aa:1d87:318f
                           [03]: Intel(R) Wi-Fi 6 AX201 160MHz
                                 Connection Name: Wi-Fi
                                 Status:          Hardware not present
Hyper-V Requirements:      A hypervisor has been detected. Features required for Hyper-V will not be displayed.

E:\>
```

17. SFC: System File Checker,

```
E:\>sfc /scannow

You must be an administrator running a console session in order to
use the sfc utility.

E:\>
```

18. task list command to provide a current list of all tasks running on your PC,

```
E:\>tasklist

Image Name                     PID Session Name        Session#    Mem Usage
========================= ======== ================ =========== ============
System Idle Process              0 Services                   0          8 K
System                           4 Services                   0      5,400 K
Secure System                  140 Services                   0     24,116 K
Registry                       180 Services                   0     39,836 K
smss.exe                       716 Services                   0        680 K
csrss.exe                     1088 Services                   0      4,204 K
wininit.exe                   1184 Services                   0      1,312 K
services.exe                  1312 Services                   0     12,248 K
LsaIso.exe                    1360 Services                   0      2,692 K
lsass.exe                     1384 Services                   0     26,132 K
svchost.exe                   1504 Services                   0     28,560 K
fontdrvhost.exe               1540 Services                   0        564 K
svchost.exe                   1648 Services                   0     19,808 K
svchost.exe                   1696 Services                   0      4,140 K
svchost.exe                   1940 Services                   0      5,956 K
svchost.exe                   1968 Services                   0      1,880 K
svchost.exe                   2000 Services                   0      1,676 K
svchost.exe                   2008 Services                   0      4,228 K
svchost.exe                   2016 Services                   0      4,180 K
svchost.exe                   2024 Services                   0      3,028 K
svchost.exe                   1200 Services                   0      4,744 K
svchost.exe                   2096 Services                   0      3,796 K
svchost.exe                   2168 Services                   0      5,032 K
svchost.exe                   2176 Services                   0     13,316 K
svchost.exe                   2200 Services                   0      7,648 K
svchost.exe                   2216 Services                   0      6,764 K
IntelCpHDCPSvc.exe            2320 Services                   0      1,868 K
svchost.exe                   2328 Services                   0      3,404 K
svchost.exe                   2376 Services                   0      1,944 K
svchost.exe                   2468 Services                   0      9,020 K
svchost.exe                   2532 Services                   0      3,136 K
```

19. if possible, do a simple c language or python program, after the file submitted in Ms teams,

```
C:\Users\mpstme.student>cd desktop

C:\Users\mpstme.student\Desktop>echo print("Hello, World!") > hello_world.py

C:\Users\mpstme.student\Desktop>python hello_world.py
Hello, World!

C:\Users\mpstme.student\Desktop>
```

20. just shutdown using cmd prompt

    Command is

    shutdown /s /t 0