



1.Title Page

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Operating Systems OS are essential software that manage computer hardware and software resources while providing services for users and applications. This report explores the core functions of general-purpose operating systems and demonstrates the use of command-line interfaces CLI in both Windows and Linux environments. It also highlights scripting techniques used to automate tasks, improving efficiency and system management.

Operating systems OS are fundamental software that manage computer hardware and provide services for applications programs .Popular general -purpose operating system performance and usability . [1]

Screenshot 1: Windows Task Manager

Another critical function is **memory management**. The OS is responsible for allocating and deallocating memory space to programs as needed. It ensures that each process has sufficient memory to operate without interfering with others, enhancing systems stability. Techniques such as virtual memory allow interfering with others, enhancing systems stability. Techniques such as virtual memory allows systems to use disks spaces as an extensions of RAM, improving performance when physical memory is limited. [3]

Screenshot 2: Task Manager

```
PS C:\Users\lucia> Get-Process
```

Handles	NPM(K)	PM(K)	WS(K)	CPU(s)	Id	SI	ProcessName
248	14	4584	8848	11488	0		AggregatortHost
328	27	23824	30828	2.38	28432	16	ai
328	28	35384	33832	1.58	28888	16	ai
399	28	12356	17132	3.19	8684	16	AppActions
378	20	12584	26436	0.73	19828	16	ApplicationFrameHost
281	11	4816	15936	0.89	8268	8	audiodg
287	23	16276	3348	0.25	5848	16	backgroundTaskHost
335	28	18596	7948	0.52	5924	16	backgroundTaskHost
287	23	16464	3988	0.25	11476	16	backgroundTaskHost
289	23	16544	3588	0.36	14156	16	backgroundTaskHost
287	23	16468	3496	0.25	14356	16	backgroundTaskHost

File system management is also essential ,as it organizes and controls how data is stored and acceded on storage devices. The OS provides a structured way to store files in directories and insure data integrity and security .Windows typically uses the NTFS file system ,while Linux commonly uses EXT4. These file systems naming permissions, file naming ,and storage allocation. [4]

Screenshot 3: Windows File Explorer

```
PS C:\Users\lucia> dir
```

Directory: C:\Users\lucia

Document last modified: Yesterday at 14:23

Mode	LastWriteTime	Length	Name
d-----	14/04/2026 07:22		.VirtualBox
d-r----	09/01/2025 18:14		Contacts
d-----	07/02/2023 13:37		Documents
d-r----	23/04/2026 09:15		Downloads
d-r----	09/01/2025 18:14		Favorites
d-r----	09/01/2025 18:14		Links
d-r----	09/01/2025 18:14		Music
dar--l	26/04/2026 11:17		OneDrive
d-----	19/02/2025 18:22		PCAppStore
d-r----	09/01/2025 18:14		Saved Games
d-r----	09/01/2025 18:14		Searches
d-r----	03/03/2026 12:42		Videos
d-----	16/02/2026 12:43		VirtualBox VMs
d-----	20/11/2024 20:48		Wavesor Software

The operating system also perform **device management** ,which involves controlling hardware components through device drivers. These drivers act as intermediaries between the OS and hardware devices such as printers ,keyboards and storage drives. The OS ensures that multiple devices can function simultaneously without conflicts ,handling input and output operations efficiently . [5]

Screenshot 4: Windows Device Manager

```
PS C:\Users\lucia> Get-PnpDevice
```

Status	Class	FriendlyName
OK	Volume	Volume
OK	Volume	Volume
Unknown	HIDClass	USB Input Device
OK	SoftwareDevice	Windows.Devices.Sms.SmsDevice
OK	HIDClass	Bluetooth Low Energy GATT compliant HID device
OK	System	Samsung PMIC 3rd Party Driver
OK	NetTrans	Qualcomm(R) Data Device
OK	Volume	Volume
OK	Bluetooth	Qualcomm(R) Bluetooth Radio Driver
OK	System	Qualcomm(R) System Manager Device
OK	System	Qualcomm(R) System Manager Device

Another important function is providing a **user interface UI** .Operating system. The OS control access to system resources through authentication mechanism such as usernames and passwords .It is also enforces permissions to ensure that users can only access files and resources they are authorized to use . This helps protect sensitive data and maintain system integrity.

Screenshot 5: Windows Desktop

```

PS C:\Users\lucia> net
The syntax of this command is:
NET
[ ACCOUNTS | COMPUTER | CONFIG | CONTINUE | FILE | GROUP | HELP |
  HELPMMSG | LOCALGROUP | PAUSE | SESSION | SHARE | START |
  STATISTICS | STOP | TIME | USE | USER | VIEW ]
PS C:\Users\lucia>
PS C:\Users\lucia> whoami

```

Finally ,**security and user management** are vital functions of an operating system. The OS control access to system resources promotions to instore that users can only access files and resources they are authorized to use .This helps protect sensitive data and maintain system integrity. [6]

Screenshot 9: Windows User Accounts

```

PS C:\Users\lucia> schtasks
Folder: \
TaskName      Next Run Time      Status
-----
OneDrive Per-Machine Standalone Update 1  26/04/2026 12:04:14  Ready
OneDrive Reporting Task-5-1-5-21-9126142  26/04/2026 12:09:33  Ready
OneDrive Startup Task-5-1-5-21-912614235  N/A                  Ready
WindowsUpdateTaskUser5-1-5-21-9126142  26/04/2026 11:48:09  Ready
WindowsUpdateTaskUser5-1-5-21-9126142  25/04/2026 14:48:09  Ready

Folder: \GoogleSystem
TaskName      Next Run Time      Status
-----
INFO: There are no scheduled tasks presently available at your access level.

Folder: \McAfee
TaskName      Next Run Time      Status
-----
INFO: There are no scheduled tasks presently available at your access level.

Folder: \McAfee\apps
TaskName      Next Run Time      Status
-----
McAfee Windows Notification Token  26/04/2026 12:29:06  Ready

Folder: \Microsoft
TaskName      Next Run Time      Status
-----
INFO: There are no scheduled tasks presently available at your access level.

Folder: \Microsoft\Office
TaskName      Next Run Time      Status
-----
Office Actions Server  26/04/2026 15:08:00  Ready
Office Automatic Updates 2.0  26/04/2026 13:57:05  Ready
Office Background Push Maintenance  26/04/2026 12:05:35  Ready
Office ClickToRun Service Monitor  26/04/2026 06:23:42  Ready
Office Feature Updates  25/04/2026 18:28:21  Ready
Office Feature Updates Logon  N/A                  Ready

```

In conclusion ,operating systems perform a wide range of essential functions, including process .memory ,file and device management ,as well as providing user interfaces and security controls .These functions work together to ensure that computer system operate efficiently ,securely and reliably.

3.windows CLI Commands

How the Operating System Woks

The Operating System OS is like the manager of a very busy office. It makes sure that the hardware and the software ,the office building and software the workers work together without any trouble .Using PowerShell is like the manager giving direct orders through a loudspeaker .Instead of clicking icons, you use switches extra command like **F o r c e** or **-R e c u r s e** to give very specific instructions. [7]

Process management

```

PS C:\Users\lucia> Get-Process

```

Handles	NPM(K)	PM(K)	WS(K)	CPU(s)	Id	SI	ProcessName
252	14	4616	6276		11400	0	AggregatorHost
328	28	23908	5768	2.52	20432	16	ai
328	28	35396	6548	1.77	20888	16	ai
399	20	12284	6976	3.28	8684	16	AppActions
373	20	12632	9188	0.84	19828	16	ApplicationFrameHost
242	11	6992	18888	0.23	9600	0	audiodg
287	23	16276	184	0.25	5840	16	backgroundTaskHost
335	28	18596	288	0.52	5924	16	backgroundTaskHost

Process

```
PS C:\Users\lucia> Stop-Process

cmdlet Stop-Process at command pipeline position 1
Supply values for the following parameters:
Id[0]: name
```

In Process Management ,the OS is responsible for sharing the computer's brain the CPU between different apps .Commands like Get-Process show you exactly how thw OS is dividing this power. If an app stops responding, it means it has crashed and is no longer-Force ,you can use Stop-Process Force, you are telling the OS to step in, cut off the power to that app ,and give that extra memory back to other programs so the computer doesn't slow down.

File directory management

```
C:\Users\lucia>cd documents
C:\Users\lucia\Documents>cd
C:\Users\lucia\Documents>cd document
The system cannot find the path specified.
C:\Users\lucia\Documents>dir
Volume in drive C has no label.
Volume Serial Number is 12A5-B529

Directory of C:\Users\lucia\Documents

07/02/2023  14:37    <DIR>          .
26/04/2026  13:35    <DIR>          ..
                0 File(s)                0 bytes
                2 Dir(s)  26,469,765,120 bytes free

26/04/2026  13:35    <DIR>          .
13/10/2025  13:15    <DIR>          ..
14/04/2026  07:22    <DIR>          .VirtualBox
09/01/2025  19:14    <DIR>          Contacts
07/02/2023  14:37    <DIR>          Documents
23/04/2026  09:15    <DIR>          Downloads
09/01/2025  19:14    <DIR>          Favorites
09/01/2025  19:14    <DIR>          Links
09/01/2025  19:14    <DIR>          Music
26/04/2026  12:58    <DIR>          OneDrive
                26/04/2026  13:35             104 OUTPUT
                26/04/2026  13:35             1,035 output.txt
10/02/2025  19:22    <DIR>          PCAppStore
09/01/2025  19:14    <DIR>          Saved Games
09/01/2025  19:14    <DIR>          Searches
03/03/2026  13:42    <DIR>          Videos
16/02/2026  13:43    <DIR>          VirtualBox VMs
20/11/2024  21:40    <DIR>          Wavesor Software
                2 File(s)                1,139 bytes
                16 Dir(s)  26,471,903,232 bytes free
```

File and Directory Management is how the OS acts as a librarian. It keeps track of millions of files stored on the hard drive. By using the -Recurse switch, the OS can search through every single drawer in its library in a split second. This is much faster than searching by hand and helps administrators find hidden files or clear out old data to save space.

Network testing/monitoring

```
NET
[ ACCOUNTS | COMPUTER | CONFIG | CONTINUE | FILE | GROUP | HELP |
  HELPMMSG | LOCALGROUP | PAUSE | SESSION | SHARE | START |
  STATISTICS | STOP | TIME | USE | USER | VIEW ]
```

```
C:\Users\lucia\Documents>time
The current time is: 13:59:20.84
```

```
PS C:\Users\lucia> Test-NetConnection google.com

ComputerName           : google.com
RemoteAddress          : 2a00:1450:4009:c0b::65
InterfaceAlias         : WiFi
SourceAddress          : 2a02:6b6f:f187:8300:617d:cc72:baff:ae9d
PingSucceeded          : True
PingReplyDetails (RTT) : 20 ms
```

```
PS C:\Users\Lucia> Get-NetIPConfiguration

InterfaceAlias           : Ethernet
InterfaceIndex           : 9
InterfaceDescription     : VirtualBox Host-Only Ethernet Adapter
IPv4Address               : 192.168.56.1
IPv6DefaultGateway       :
IPv4DefaultGateway       :
DNSServer                 : fec0:0:0:ffff::1
                          fec0:0:0:ffff::2
                          fec0:0:0:ffff::3

InterfaceAlias           : WiFi
InterfaceIndex           : 18
InterfaceDescription     : Qualcomm(Q) Wi-Fi B/G/N/AC (2x2) Svc
NetAdapterName           : Intel(R) Wi-Fi 6E AX210
IPv4Address               : 2a02:6b6f:f187:830d:3dec:a23a:877c:eba8
IPv6Address               : fe80::8269:1aff:fe9a:73bd
IPv4DefaultGateway       : 192.168.1.1
IPv6DefaultGateway       :
DNSServer                 : 2a02:6b6f:f187:830d:8269:1aff:fe9a:73bd
                          192.168.1.1

InterfaceAlias           : Mobile
InterfaceIndex           : 15
InterfaceDescription     : Qualcomm Snapdragon (TM) X15 LTE Modem Mobile Broadband Device
NetAdapterStatus         : Disconnected
```

Network Testing allows the OS to talk to other computers. Cmdlets like Test-NetConnection act like a digital shout to see if another computer responds. The OS manages the complicated math and signals needed to send data across the world, so the user only has to see a simple Success or Fail message

User management

```
C:\Users\lucia> Get-LocalUser
```

Name	Enabled	Description
Administrator	False	Built-in account for administering the computer/domain
DefaultAccount	False	A user account managed by the system.
Guest	False	Built-in account for guest access to the computer/domain
lucia	True	
WDAGUtilityAccount	False	A user account managed and used by the system for Windows Defender Application Guard scenarios.
WsaAccount	False	A user account managed and used by the system for Web Sign-in scenarios.

Finally, User Management and Task Scheduling are about safety and automation. The OS uses these to decide who is allowed to enter the system and what they are allowed to touch. Scheduling tasks ensures that the computer stays healthy by running cleanups and updates while you aren't using it. As noted in technical guides, mastering these CLI tools is the best way to keep a computer running perfectly [8]

Task scheduling

```
PS C:\Users\lucias> Get-ScheduledTask
```

TaskPath	TaskName	State
	OneDrive Per-Machine Standalone...	Ready
	OneDrive Reporting Task-5-1-5...	Ready
	OneDrive Startup Task-5-1-5-21...	Ready
	WavexUpdaterTaskUser-1-5...	Ready
	WavexUpdaterTaskUser-1-5...	Ready
McAfee\Wps\	McAfee Windows Notification Task	Ready
Microsoft\Office\	Office Actions Server	Ready
Microsoft\Office\	Office Automatic Updates 2.0	Ready
Microsoft\Office\	Office Background Push Maintena...	Ready
Microsoft\Office\	Office ClickToRun Updates Monitor	Ready
Microsoft\Office\	Office Feature Updates	Ready
Microsoft\Office\	Office Feature Updates Logon	Ready
Microsoft\Office\	Office ServiceAbility Manager	Ready
Microsoft\Windows.NET Framework\	.NET Framework NGEN v4.0.30319	Ready
Microsoft\Windows.NET Framework\	.NET Framework NGEN v4.0.30319 64	Ready
Microsoft\Windows.NET Framework\	.NET Framework NGEN v4.0.30319	Disabled
Microsoft\Windows.NET Framework\	.NET Framework NGEN v4.0.30319	Ready
Microsoft\Windows.NET Framework\	.NET Framework NGEN v4.0.30319	Disabled
Microsoft\Windows.NET Framework\	.NET Framework NGEN v4.0.30319	Disabled

4.Linux CLI Commands

5.Windows Scripts

 Cleanup
C:\Users\lucia\OneDrive\Documents\trabajoweb\Ne... Type: Windows Batch File

```
@echo off
echo === Network Diagnostic Tool ===

:: 1. User Input
set /p target="Enter IP or Domain to test (e.g., google.com): "
set /p loops="Enter number of test packets to send: "

echo Starting diagnostics for %target%...

:: 2. Loop & Math (Simulated via Ping count)
ping %target% -n %loops%

:: 3. Conditional Logic (Checking Error Level)
if %errorlevel% EQU 0 (
    echo.
    echo [SUCCESS] %target% is reachable.
) else (
    echo.
    echo [FAILURE] %target% is down or blocking ICMP.
)
```

```
=== Network Diagnostic Tool ===
Enter IP or Domain to test (e.g., google.com): 8.8.8.8
Enter number of test packets to send: 8.8.8.8
Starting diagnostics for 8.8.8.8...

Pinging 8.8.8.8 with 32 bytes of data:
Reply from 8.8.8.8: bytes=32 time=8ms TTL=112
Reply from 8.8.8.8: bytes=32 time=7ms TTL=112
Reply from 8.8.8.8: bytes=32 time=6ms TTL=112
Reply from 8.8.8.8: bytes=32 time=8ms TTL=112
```

 NetworkTest
C:\Users\lucia\OneDrive\Documents\trabajoweb\Ne... Type: Windows Batch File

```
@echo off
echo === Network Diagnostic Tool ===

:: 1. User Input
set /p target="Enter IP or Domain to test (e.g., google.com): "
set /p loops="Enter number of test packets to send: "

echo Starting diagnostics for %target%...

:: 2. Loop & Math (Simulated via Ping count)
ping %target% -n %loops%

:: 3. Conditional Logic (Checking Error Level)
if %errorlevel% EQU 0 (
    echo.
    echo [SUCCESS] %target% is reachable.
) else (
    echo.
    echo [FAILURE] %target% is down or blocking ICMP.
)
```

```
C:\WINDOWS\system32\cmd. x + v
=== Network Diagnostic Tool ===
Enter IP or Domain to test (e.g., google.com): google.com.
Enter number of test packets to send: 4
Starting diagnostics for google.com...

Pinging google.com [2a00:1450:4009:c08::8b] with 32 bytes of data:
Reply from 2a00:1450:4009:c08::8b: time=5ms
Reply from 2a00:1450:4009:c08::8b: time=8ms
Reply from 2a00:1450:4009:c08::8b: time=4ms
```

6.Linux Scripts

7.Conclusion

This report has explored how we control the two most popular operating systems Windows and Linux. By using the Commands Line interface CLI ,such as PowerShell and Bash, we have seen that compute's brain the kernel While using a mouse is ease for daily tasks, using command and switches allows a professional to manage processes, memory, and network connections with much higher speed and accuracy.

On of the most important findings of this assessment is the power of Automation .Through the creation of Batch and Bash scripts, we demonstrated that a computer can be programmed to thing for itself using logic like loops and if/else statements instead of a human having to manually check for errors or back up files every time. This not only saves time but also prevents the small mistakes that humans often make when doing repetitive work.

In summary ,whether you are using a Windows PC or a Linux server ,the core functions of the Operating System remain the same: it must manage the hardware, protect the user's data and keep the network running. Mastering the CLI and scripting is not just a technical skilo, it is the key to understanding how modern technology actually works under the surface. This knowledge is essential for anyone looking to manage or secure the complex computer systems we rely on today.

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9.Appendices

Welcome to LabEx, Lucia Nieto!

Next Milestone

1

5

Earn 5 skills (0/5)

5

Complete 5 streaks (1/5)

Sun

Mon

Tue

Wed

Thu

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