OS

**What is an Operating System?**

An operating system, or "OS," is software that communicates with the hardware and allows other programs to run. It is comprised of system software, or the fundamental files your computer needs to boot up and function. Every desktop computer, tablet, and smartphone includes an operating system that provides basic functionality for the device.

Common desktop operating systems include Windows, OS X, and Linux. While each OS is different, most provide a graphical user interface, or GUI, that includes a desktop and the ability to manage files and folders. They also allow you to install and run programs written for the operating system. Windows and Linux can be installed on standard PC hardware, while OS X is designed to run on Apple systems. Therefore, the hardware you choose affects what operating system(s) you can run.

**How do Operating Systems impact software development?**

Being a developer you might have focused your skills on problem-solving and data structures. However, consider a scenario where you’re executing code, but your program runs too slowly. You check your code, and you find that there is nothing wrong with your code. What could be the reason behind this?

Well, one of the reasons could be your operating system. If you need to debug your program then how would you do that if you don’t know how your operating system works? Some possibilities are that you’re accessing too many files, you’re running out of memory or that swap is in high usage.

Other considerations include:

* Is it a local program or is the code running over the Internet?
* Why do some programmers prefer one OS over another?

As a developer, you should understand the importance of the operating systems. Today we are going to discuss some important concepts about operating systems that will help in your professional development.

**Process and Process Management**

The process is basically defined as a program in execution. The process should be executed sequentially. When you write a computer program in a text file and when you execute this program it becomes a process in your system. This process performs all the tasks mentioned in the program. A process generally passes through (but doesn't always) five different states: Start, Ready, Running, Waiting, Terminated, or Exit. These states may have different names depending on the operating system.

**Threads**

You can define a thread as a flow of execution through the process code. The thread keeps track of all the instructions that need to be executed next in the program counter. Also, the thread contains system registers that hold the current working variables. Also, the thread's stack contains the execution history.

**Scheduling**

In scheduling, the process manager takes the responsibility to remove the running process from the CPU and chooses another process based on a specific strategy. For multiprocessing operating systems scheduling is the essential part. More than one process can be loaded into the executable memory at a time. The processes share the CPU using time multiplexing once they are loaded.

**Memory Management**

Memory management refers to the functionality of an operating system that handles and manages the primary memory. Processes move back and forth between the main memory and the disk during the execution.

Unix/Linux: Demo Moving and Deleting Files (Using Git Bash)

*Linux is a free and open-source software that operates on its own operating system. The term ‘****Linux’*** *stands for* ***GNU + Linux****. Initially developed by* ***Linus Torvalds****, it was created alongside the source code of Unix.*

**Linux commands** are a type of Unix command or [**shell**](https://www.geeksforgeeks.org/introduction-linux-shell-shell-scripting/) procedure. They are the basic tools used to interact with Linux on an individual level. Linux commands areused to perform a variety of tasks, including displaying information about files and directories.

Commands

**1. Is command in Linux**

The [ls command](https://www.geeksforgeeks.org/practical-applications-ls-command-linux/) is commonly used to identify the files and directories in the working directory.

**2. pwd command in Linux**

The [**pwd command**](https://www.geeksforgeeks.org/pwd-command-in-linux-with-examples/) is mostly used to print the current working directory on your terminal.

**3. mkdir command in Linux**

This [mkdir command](https://www.geeksforgeeks.org/mkdir-command-in-linux-with-examples/) allows you to create fresh directories in the terminal itself. The default syntax is **mkdir <directory name>** and the new directory will be created.

Mkdir linux

**4. cd command in Linux**

The [**cd command**](https://www.geeksforgeeks.org/cd-command-in-linux-with-examples/) is used to navigate between directories. It requires either the full path or the directory name, depending on your current working directory.

**5. rmdir command in Linux**

The [**rmdir command**](https://www.geeksforgeeks.org/rmdir-command-in-linux-with-examples/) is used to delete permanently an empty directory.

Rmdir linux

**6. cp command in Linux**

The [**cp command**](https://www.geeksforgeeks.org/cp-command-linux-examples/)of Linux is equivalent to copy-paste and cut-paste in Windows.

Cp file1.txt file2.txt

7. mv command in Linux

The mv command is generally used for renaming the files in Linux.

Mv file1.txt rename.txt

**8. rm command in Linux**

[**rm command**](https://www.geeksforgeeks.org/rm-command-linux-examples/) in Linux is generally used to delete the files created in the directory.

Rm file2.txt

**9. uname command in Linux**

The [**uname command**](https://www.geeksforgeeks.org/uname-command-in-linux-with-examples/) is used to check the complete OS information of the system.

**10. locate command in Linux**

The [**locate command**](https://www.geeksforgeeks.org/locate-command-in-linux-with-examples/) is generally used to locate the files in the database. Use an asterisk (\*) to search for content that contains two or more words. As an example: **locate first\*file.**This command will search the database for the files that contain these two names **first**and **file.**

Locate rename

**11. touch command in Linux**

The [**touch command**](https://www.geeksforgeeks.org/touch-command-in-linux-with-examples/) creates an empty file when put in the terminal in this format as touch **<file name>**

Touch file.txt

**12. ln command in Linux**

The [**ln command**](https://www.geeksforgeeks.org/ln-command-in-linux-with-examples/) is used to create a shortcut link to another file.

Mkdir Demo

Mkdir Linked

Ln -S Demo Linked

**13. cat command in Linux**

The [**cat command**](https://www.geeksforgeeks.org/cat-command-in-linux-with-examples/) is the simplest command to use when you want to see the contents of a particular file.

Cat rename.txt

**14. clear command in Linux**

The [**clear command**](https://www.geeksforgeeks.org/clear-command-in-linux-with-examples/) is a standard command to clear the terminal screen.

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~

$ ls

'#11529788.xls'

'#30875EAF.pptx'

'#5FFC725E.jpg'

'#99745836.doc'

'$0049E269.pptx'

'$3F10BB8A.jpg'

'$43FA8C3C.doc'

'$F77FDBC5.xls'

**'3D Objects'**/

**AppData**/

**'Application Data'**@

**Contacts**/

**Cookies**@

**Documents**/

**Downloads**/

**Favorites**/

**IntelGraphicsProfiles**/

**Links**/

**'Local Settings'**@

**Music**/

**'My Documents'**@

NTUSER.DAT

NTUSER.DAT{49a2fef9-b067-11ef-8227-84a93855a2a7}.TM.blf

NTUSER.DAT{49a2fef9-b067-11ef-8227-84a93855a2a7}.TMContainer00000000000000000001.regtrans-ms

NTUSER.DAT{49a2fef9-b067-11ef-8227-84a93855a2a7}.TMContainer00000000000000000002.regtrans-ms

**NetHood**@

**OneDrive**/

**'OneDrive - revature.com'**/

**Postman**/

**PrintHood**@

**Recent**@

**'Saved Games'**/

**Searches**/

**SendTo**@

**'Start Menu'**@

**Templates**@

Untitled.ipynb

Untitled1.ipynb

Untitled2.ipynb

Untitled3.ipynb

**Videos**/

**anaconda3**/

**angular-course**/

**angular-firstapp**/

**eclipse**/

**eclipse-workspace**/

**linuxCommands**/

**ml-docker-app**/

**mlartifacts**/

**mlruns**/

**my-app**/

ntuser.dat.LOG1

ntuser.dat.LOG2

ntuser.ini

**test**/

test.mv.db

test.trace.db

**zipkin-server-2.12.9-exec.jar**\*

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$ pwd

/c/Users/RemyaGopalakrishnan

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~

$ cd linuxCommands

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands

$ mkdir linux

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands

$ ls

**linux**/

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands

$ mkdir command

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands

$ ls

**command**/ **linux**/

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands

$ rmdir linux

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands

$ ls

**command**/

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands

$ ls

**command**/

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands

$ cp file1.txt file2.txt

cp: cannot stat 'file1.txt': No such file or directory

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands

$ cd command

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands/command

$ cp file1.txt file2.txt

cp: cannot stat 'file1.txt': No such file or directory

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands/command

$ ls

file1.txt.txt

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands/command

$ cp file1.txt file2.txt

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands/command

$ mv file1.txt rename.txt

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands/command

$ rm file2.txt

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands/command

$ uname

MINGW64\_NT-10.0-22631

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands/command

$ locate rename

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands/command

$ locate rename.txt

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands/command

$ cd..

bash: cd..: command not found

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands/command

$ cd linuxCommands

bash: cd: linuxCommands: No such file or directory

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands/command

$ ..cd

bash: ..cd: command not found

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands/command

$ cd/

bash: cd/: No such file or directory

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands/command

$ touch file.txt

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands/command

$ mkdir Demo

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands/command

$ mkdir Linked

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands/command

$ ln -S Demo Linked

ln: Linked: hard link not allowed for directory

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands/command

$ ln -s Demo Linked

ln: failed to create symbolic link 'Linked/Demo': No such file or directory

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands/command

$ ln -S Demo Linked

ln: Linked: hard link not allowed for directory

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands/command

$ cat rename.txt

hello

AzureAD+RemyaGopalakrishnan@Rev-PG02Q4F4 MINGW64 ~/linuxCommands/command

$ clear

**15. ps command in Linux**

[**ps command**](https://www.geeksforgeeks.org/ps-command-in-linux-with-examples/) in Linux is used to check the active processes in the terminal.

**16. man command in Linux**

The [**man command**](https://www.geeksforgeeks.org/man-command-in-linux-with-examples/) displays a user manual for any commands or utilities available in the Terminal, including their name, description, and options.

Man ls

**17. grep command in Linux**

The [**grep command**](https://www.geeksforgeeks.org/grep-command-in-unixlinux/) is used to find a specific string in a series of outputs.

cat rename.txt

cat rename.txt | grep “hello”

**18. echo command in Linux**

[**echo command**](https://www.geeksforgeeks.org/echo-command-in-linux-with-examples/) in Linux is specially used to print something in the terminal

echo “hello world”

**19. wget command in Linux**

The [**wget command**](https://www.geeksforgeeks.org/wget-command-in-linux-unix/) in the Linux command line allows you to download files from the internet. It runs in the background and does not interfere with other processes.

Wget <http://www.google.com/sample.php>

**20. whoami command in Linux**

The [**whoami command**](https://www.geeksforgeeks.org/whoami-command-linux-example/) provides basic information that is extremely useful when working on multiple systems.

Whoami

**21. sort command in Linux**

The **sort**command is used generally to sort the output of the file.

Cat rename.txt

Sort rename.txt

**22. cal command in Linux**

The [**cal command**](https://www.geeksforgeeks.org/cal-command-in-linux-with-examples/) is not the most famous command in the terminal but it functions to view the calendar for a particular month in the terminal.

Cal April 2025

**23. df command in Linux**

[**df command**](https://www.geeksforgeeks.org/df-command-linux-examples/)**in Linux gets the details of the file system.**

Df -h

we have used **df -h** as simply typing **df**will return the output in bytes which is not readable, so we add **-h**to make the outputs more readable and understandable.

**25. wc command in Linux**

[**wc command**](https://www.geeksforgeeks.org/wc-command-linux-examples/) in Linux indicates the number of words, characters, lines, etc using a set of options.

* **wc -w** shows the number of words
* **wc -l**shows the number of lines
* **wc -m** shows the number of characters present in a file

touch newfile.txt

echo -e “This file has only six words”>newfile.txt

wc -w newfile.txt