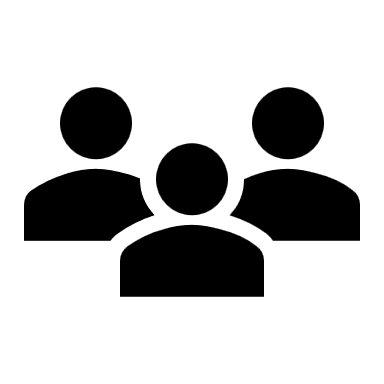
**Operating System?**

* Operating System (OS) is a software that acts as a interface between Computer hardware and user

Operating System



**Users Hardware Component**

* Every computer must have at least one operating system to run other programs.
* Operating System providing platform/environment to run our applications.
  + Examples: Browsers, Notepad, MS-Paint, Calculator etc.
* Operating Systems help us to communicate with computers without knowing how to speak computer language.

Note: we cannot use a computer without having an operating system.

* An Operating System is a software which will allocate the resources to my program for its successful execution. It will take the resources back once my program is completed.
* Operating System acts as a Resource Allocation & De-Allocation Manager

**History Operating System:**

* Operating systems developed in 1950’s.
* General Motors Research Lab implemented the first Operating System in the early 1950 for their IBM 701
* In the mid 1960’s, the version of the UNIX Operating System developed.
* The first operating system developed by Microsoft is MS DOS (1981)
* In 1985 operating system released with GUI (Graphical Based Interface)

**General Use:**

* We are using Windows operating system in our computers/laptops.
* Windows operating system is recommended for personal usage.
* Windows is a single user-based operating system.
* Windows is commercially available software.

A computer screen with black text

Description automatically generated

* In real time environments, we will use LINUX operating systems to run our applications.
  + Linux is Free & Open Source.
  + Linux is Multiuser Based Operating System
  + Linux is a Highly Secured Operating System.

A computer screen with arrows pointing to the screen

Description automatically generated

* Multiple users can connect to Linux machine at a time that’s the reason we called it a multiuser based operating system.

Activities performed by various members of the IT:

* Cloud Engineers will set up Linux Machines in Cloud.
* DevOps Engineers will deploy our applications to the servers which are running in Linux Operating System.
* Developers will connect to Linux Machine to check server/application logs.

Windows OS:

* Developed by Microsoft
* It is having GUI.
* It is a single user-based operating system.
* It is commercial, Less Security, it is recommended for personal use.

Linux OS:

* Linux is Community Based Operating System
* Linux is Free & Open Source
* Linux is Multiuser Based Operating System
* High Security
* Recommended to use for Applications, Servers, Databases etc...

History of Linux:

* In 1991, a student “Linus Torvalds” developed this Linux Operating System
* Linus Torvalds Identified some challenges in UNIX Operating System & he suggested some changes for UNIX Operating System, but UNIX Operating System rejected Linux Torvalds Suggestion.
* Linus Torvalds used Minux Operating System to Develop Linux
  + - * Linus + Minux
* First 2 letters from his name & last 3 letters from Minux Operating System.
  + - * LI + NUX => LINUX
* Linus Torvalds released LINUX OS with source code into market so that anybody can modify LINUX OS that’s why it is called as Open-Source Operating System.
* As Linux Operating System is Open-Source so many people & companies taken that Linux Operating System & modified according to their requirement & released into market with different names those are called Linux Distributions.

RHEL -- Red Hat

Ubuntu OS

Cent OS

Fedora

Open SUSE

Kali Linux

Debian

Note: 200+ Linux Distributions are available in the market.

Environment Setup:

* We can setup Linux Machine in 2 ways
  1. By using Hypervisor with Virtual Box/VM Ware.
  2. By using Cloud Service

Approach-1:

A diagram of a computer program

Description automatically generated with medium confidence

Approach-2:

A computer and data center logo

Description automatically generated

1. Create an account in AWS!
2. Launch Virtual Machine in AWS

(Account is free for 1 Year)

AWS: Amazon Web Services

EC2 INSTANCES = ELASTIC COMPUTE CLOUD.

TO CREATE EC2 WE NEED TO PERFORM 7 STEPS:

SERVER = COMPUTER

1. TAGS = NAME
2. AMI = OPERATING SYSTEM, SOFTWARE PACKAGES
3. INSTANCE\_TYPE = CPU & RAM
4. KEY\_PAIR = LOGIN (public=aws, private=user)
5. NETWORK = VPC, SECURITY GROUPS (port numbers=0-65535)
6. STORAGE = 8 GB – 16 TB
7. SUMMARY = TO REVIEW

For Connecting EC2 Instances we have several options available. They are:

1. Git Bash
2. EC2 Instance Connect
3. By using SSH Client (Putty, Mobaxterm, Tabby,…..)

* Convert .pem to .ppk using puttygen software
* Open putty software and connect to EC2 VM using IP & PPK File.

Linux Commands:

whoami : it will display currently logged in username\

pwd : present working directory / print working directory

date : to display current date

cal : to display calendar.

In Linux everything will be represented as file

We have 3 types of files in Linux

1. Ordinary file / Normal file
2. Directory file
3. Link file

* The file which contains data is called as ordinary file
* Directory file is equal to the folder (it can contain files and folders)
* The file which is having linking is called as Link File

touch : it is used to create empty file

$ touch f1.txt

$ touch f2.txt

$ touch f3.txt f4.txt

To display files, we will use ‘ls’ command.

$ ls

To create a file with data we will use ‘cat’ command.

$ cat > hello.txt

// write data

Press CTRL + d ( to save and exit )

$ cat hello.txt ( to display file data )

$ cat >> hello.txt ( to append data in the file )\

// write data

Press CTRL + d ( to save and exit )

To create directory, we will use ‘mkdir’ command.

$ mkdir dirname

To remove the file, we will use ‘rm’ command.

$ rm filename

To remove empty directory, we will use ‘rmdir’ command.

$ rmdir dirname

* ‘ls’ is used to list out all files & directories available in the given directory.

Note: we can pass several options for ‘ls’ commands

* ls : it will display all files in alphabetical order. (a to z)
* ls -r : it will display all files in reverse of alphabetical order. (z to a)
* ls -l : it will display files in a long listing of files.
* ls -t : it will display all files based on last modified data and time. Most recent files will display at top and old files will display at bottom.
* ls -rt : it will display all files based on reverse of last modified date and time. Old files will display at top and recent files will display bottom.
* ls -a: it will display all files including hidden files (hidden files will start with .)
* ls -li : it will display files with inode.
* ls -lR : it will display all files & directories along with sub directories content

Note: -R represents recursive

Note: we can use several options for ‘ls’ command at a time. When we are using multiple options order of the options is not important.

$ ls -ltr

$ ls -tlr

$ ls -l -t -r

$ ls -trl

Note: all the above commands will give same output

* to display content of given directory we can execute like below

$ ls <dirname>

* to delete a file we will use ‘rm’ command

$ rm <filename>

* to delete empty directory we will use ‘rmdir’ command

$ rmdir dirname

* to delete non-empty directory we will use ‘rm’ command like below

$ rm -r dirname

* to display file content we will use ‘cat’ command

$ cat filename

* to display file content with line numbers we will use '-n’ option

$ cat -n filename

* to display multiple files content at a time execute command like below

$ cat file1 file2 file3

* copy one file data into another file using ‘cat’ command

$ cat f1.txt > f8.txt

* copy more than one file data into another file

$ cat f1.txt f2.txt > f9.txt

Reversing File Content:

* ‘tac’ command is used to reverse file content

$ tac filename

* ‘rev’ command is used to reverse each line content of the file

$ rev filename

Head command:

* head command is used to display file data from top (default 10 lines)

$ head filename

$ head -n 5 hello.txt (first 5 lines data)

$ head -n 20 hello.txt (first 20 lines data)

Tail command:

* tail command is used to display file data from bottom (default 10 lines)

$ tail filename

$ tail -n 50 hello.txt (last 50 lines data)

$ tail -n 200 hello.txt (last 200 lines data)

$ tail +25 filename (it will display data from 25th line to bottom)

Note: To see on-growing logs we can use ‘-f’ option

$ tail -f data.log

wc command:

* it is used to count no. of lines, no. of words and no. of characters in the file.

$ wc f1.txt

* when application running, it will generate log messages and it will store log messages at bottom of the file.
* To see log messages of the application we will use ‘tail’ command.

**cp command:**

* To copy the data from one file to another file

$ cp one.txt two txt (or) $ cat one.txt > two.txt

$ cp f1.txt f2.txt f3.txt (invalid syntax)

* We can’t copy more than one file data using ‘cp’ command. To copy multiple files data we should go for ‘cat’ command

$ cat f1.txt f2.txt > f3.txt

**Rename the file or directory:**

* To rename the files we will use ‘mv’ command

$ mv f1.txt f111.txt

* To rename the directory we will same ‘mv’ command.

$ mv dirname dirnewname

Note: we can use ‘mv’ command for renaming and moving files

**Comparing Files:**

* To compare file we can use the below commands

$ cmp f1.txt f2.txt

$ diff f1.txt f2.txt

* cmp command will display only first difference in given 2 files
* diff command will display all the differences in the content

**grep command:**

* grep stands for global regular expression print.
* grep command will process text line by line and prints any line which matches given pattern.

Example:

I want to print all line which contains ‘NullPointerException”