## What is the Difference between Linux and Windows ?

Linux is open source and free to use but Windows is neither open source nor free to use.

Linux File Systems are case sensitive and windows file systems are not case sensitive.

Linux is highly secure but windows provides less security.

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## What is Linux ?

Linux is an Open Source and Free Operating System.

An Operating System enables the communication between hardware and software.

Linux is used from phones to supercomputers by almost all major hardware devices.

Linux has a number of different versions to suit any type of user.

These versions are called distributions.

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## Different flavors of Linux & differences.

Linux Mint

Android

CentOS

Arch Linux

Debian

Elementary OS

Fedora Linux

Kali Linux

Manjaro Linux

MX Linux

Open SUSE

SlackWave

Ubuntu

### Differences:- The 5 Key Differences Between Linux Distributions.

Desktop Environments

Package managers

Display servers

Goals and aims

Open source philosophy

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## Why is Linux a more preferred OS in IT?

Linux is open source in nature.

Linux is more secure than other OS and less vulnerable.

Linux can be installed from new to old computers.

Linux supports almost all major programming languages like C, C#, C++, Java, Python, JavaScript, Perl, Ruby etc.

Linux terminal is superior to use over Windows' command-line for Developers.

Linux has a variety of distributions and we can install according to our requirements.

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## How to Share/ Transfer files from one linux machine to another linux machine:-

Command :- scp Source\_filename username@destination\_host:destination \_folder

scp is a program for copying files between computers. It uses the SSH protocol.

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## SSH

The Secure Shell Protocol is a cryptographic network protocol for operating network services securely over an unsecured network. Its most notable applications are remote login and command-line execution.

Command :- ssh HostName@IP  
ssh username@hostname\_or\_ip   
export DISPLAY=:0

nohup <application Name>

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## What is Root?

Root is the linux SuperUser. Root can do each and everything in the Linux System. Nothing is restricted or off Limits for Root.

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## Absolute and Relative Path?

Absolute Path starts from “ / ” root. A file or directory which can be accessed from the root directory “ / ” , we can say that the Absolute Path is a complete path from the start of the actual file system from the root directory .

Relative Path is defined as a path related to the present working directory.

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## Directory Listing Attributes

The ls Command lists the files and directories within the file system.

The ls -l Command is a long listing format.

The ls -a Command lists the hidden files and directories.

The ls -R Command lists subdirectories as well.

The ls -al Command displays the files and directories with detailed information like permissions, file size, owner etc.

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## Linux File System and Description.

| Directory | Purpose |
| --- | --- |
| / | The very top (Root) of the File Tree. Holds everything else. |
| /bin | Stores common Linux User Command Binaries. date, cat etc. |
| /boot | Bootable linux kernel and bootloader config files. |
| /dev | Stores all attached hardware devices files. |
| /etc | Contains local system configuration files for the host computer. |
| /home | Home directories for the regular user. |
| /media | Stores the removable devices information that are mounted. E.g. USB, External HD. |
| /lib | Contains shared libraries needed by application in /bin and /sbin to boot the system. |
| /lib32 | Contains shared libraries needed by application in /bin and /sbin to boot the 32-bit system. |
| /lib64 | Contains shared libraries needed by application in /bin and /sbin to boot the 64-bit system. |
| /mnt | A place to mount external devices. This can still be used but has been superseded by /media. |
| /opt | Directory Structure to store additional / Optional Software. |
| /proc | Information about System Processes Resource. |
| /root | The home folder for the Root User aka SuperUser. |
| /sbin | Contains Administrative commands (binaries) for Root users. |
| /tmp | Contains temporary files used by running applications. |
| /usr | usr is a user directory used in Linux, which is the location of user programs and files. |
| /var | Contains directories of variable data that could be used by various applications. System log files usually found here. |
| /run | /run directory is a temporary filesystem (tmpfs) which stores volatile runtime data. |
| /sys | /sys is an interface to the kernel. Specifically, it provides a filesystem-like view of information and configuration settings that the kernel provides, much like /proc |
| /srv | This directory gives users the location of data files for a particular service, such as FTP, WWW, or CVS. Data that only pertains to a specific user should go in the /home/ directory. |

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## What is the difference between Find and Locate Command?

Find command is used to find a file on a specific path and Locate command is used to get the path of a specific file.

Find command - find . -name data.txt

find . type -f -name file {This will search only file}

find . type -d -name file {This will search only directory}

Locate command - locate data.txt {locate will take full\_file\_name}

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## Creating Files and Directories.

Creating Files Command:- touch file1\_name file2\_name

Creating Directories Command:- mkdir dir1 dir2 dir3

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## Changing Passwords and setting their age.

Changing Password of User:- switch to a user whose password needs to be changed.

Command:- sudo su user\_name

passwd

Setting User’s age :- Switch to root user.

Command:- sudo su {This command switch user to root user}

chage -l username {To view a user account aging information}

chage -d YYYY-MM-DD user\_name {Set the last password changed}

chage -E YYYY-MM-DD user\_name {Set the expires date of user}

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## Copying Files and Directories.

Copying files Command:- cp source\_filename Destination\_dir\_name

Copying folder Command:- cp -R source\_dir Destination\_dir

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## Wild Card

Wild card is used to match the filename that have some-same patterns (like same extension, file name starts with common word or alphabet etc.)

We can perform many operations using wildcards like copying files, listing files and directories.

They are of three types:-

1. An (\*) asterisk :- Asterisk wildcard is used to to match one or more occurrences of any character, including no character.

Command :- ls -l \*.txt

1. (?) Question Mark :- Question Mark Wildcard is used to match single occurrences of any character.

Command :- ls -l shubh?.txt

1. ([ ]) Bracketed Character :- Bracket Character used to match any occurrences enclosed in square brackets.

Command :- ls -l s[abcsdf123].txt

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## Soft Links and Hard Links

Links are similar to the windows shortcut in which a shortcut file points to the actual data of any file. Linux has the same.

Soft link :- Soft link contains only the path of a file not content of the original file. If the original file is removed/ deleted then the soft link file becomes a dangling file which points to the nonexistent file.

Command:- ln -s [full\_path\_with\_file\_name] [name\_of\_soft\_link\_file]

Hard Link :- Hard link contains path as well as content of the original file. If the original file is removed/ deleted, the soft link file will give the output as the original file.

Command:- ln [full\_path\_with\_file\_name] [name\_of\_hard\_link\_file]

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## Linux Command Syntax

### Listing Files:- Syntax - ls [OPTIONS]

OPTIONS : DESCRIPTIONS

No\_Option : List the files and directories.

-l : List the files & dir with permission, size, owner etc

-a : List the hidden files and directories.

-al : List the hidden contents with information.

-R : List all files, directories and subdirectories.

### Creating and Viewing files:- Syntax - touch [Create\_file\_name] & cat [view\_file\_name]

### Deleting a file and directory:- Syntax - rm [option] [file\_or\_directory\_name]

OPTIONS : DESCRIPTIONS

No\_Option : Removes the single file.

-r : Removes matching directories, subdirectories and files.

-f : Removes files forcefully never prompts before removing.

-d : Removes directory.

-i : Prompt before removing each time.

-v : Explain what is being done.

### Moving file/directory :- Syntax - mv [source\_file/directory] [destination\_Directory]

### Renaming file/directory :- Syntax - mv [old\_file\_name] [new\_file\_name]

### Copying file :- Syntax - cp [source\_old\_filename] [destination\_new\_filename]

### Creating Directory :- Syntax - mkdir [OPTIONS] [dir\_name]

OPTIONS : DESCRIPTIONS

No\_Option : Create a directory in the present working directory.

{} : Create multiple directories, separate by “,” without space

-p : Creates Directory inside directory. E.g. dir1/dir2/dir3

-m : Set permissions while creating a directory. E.g. -m777 dir

-v : Verify Directory.

### Check used command in Terminal since user created :- Syntax - $ history

### Clear the terminal screen :- Syntax - $ clear

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## Repositories

A Linux repository is the storage location that contains the essential and popular Software/ Application for different linux distributions, and each linux distribution has its own official repositories.

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## Packages installing in different linux machine CLI (downloaded Packages)

$ sudo apt install package (on Debian, Ubuntu, & Mint)

$ sudo dnf install package (on Fedora, CentOS & RHEL)

$ sudo pacman -S package (on Arch and Manjaro)

$ sudo zypper install package (on OpenSuse)

## Packages Downloading in different linux machine CLI (New Packages)

$ wget file\_url Download single file.

$ wget -r url Download the whole website.

$ wget -r -A ext1,ext2 url Download the specific file type from url

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## Split And Combine Files From Command Line In Linux

### Split files in Linux from command line

Syntax - split -b 1M zoom.deb

split : split command

-b : -b defines bytes

1M : partitions in MB (1MB)

zoom.deb : file name

### 

### Combine files in Linux from command line

### Syntax - cat x\* > zoom\_2.deb

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## Truncate Command in Linux

Truncate command is used to shrink or extend the file size. Truncate is not the same as compressing and decompressing a file using zip. Truncate command chop the actual file into specific file size, and also content of file will be lost.

Syntax - truncate -s [new\_file\_size] [file\_name]

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## Compress and uncompress (tar, gzip, gunzip)

Syntax - tar [-cf] [file.tar] [path\_file] {Compress the file/Directory}

Syntax - tar [-xf] [path\_file] {Decompress the tar file}

Syntax - gzip [-cvf] [file.gz] [path\_file] {Compress the file/Directory}

Syntax - gunzip [-xv] [path\_file] {Decompress the tar.gz file}

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## Web Server

A web server is software and hardware that uses [HTTP](https://www.techtarget.com/whatis/definition/HTTP-Hypertext-Transfer-Protocol) (Hypertext Transfer Protocol) and other protocols to respond to [client](https://www.techtarget.com/searchenterprisedesktop/definition/client) requests made over the World Wide Web. The main job of a web server is to display website content through storing, processing and delivering web pages to users. Besides HTTP, web servers also support [SMTP](https://www.techtarget.com/whatis/definition/SMTP-Simple-Mail-Transfer-Protocol) (Simple Mail Transfer Protocol) and FTP (File Transfer Protocol), used for email, file transfer and storage.

### Common and top web server software on the market

#### Apache HTTP Server

#### Internet Information Services

#### lighttpd

#### Sun Java System Web Server

#### Jigsaw Server

#### Nginx

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## MySQL

MySQL is a free and open source relational database management system with Structured Query Language. MySQL is used to create, alter, delete, manipulate databases. Database is created in the form of a table.

MySQL is also pronounced as “My Se Que Ell”.

MySQL is written in C & C++ Programming language. MySQL is supported by Oracle. MySQL is easy to use in comparison to Microsoft SQL server and Oracle DataBase.

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## XAMPP

XAMPP stands for cross-platform, Apache, MySQL, PHP, Perl. XAMPP allows you to build wordPress sites offline on a local web server.

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## Port Numbers

| Port Number | Protocols |
| --- | --- |
| 20 & 21 | FTP (File Transfer Protocol) |
| 22 | SSH (Secure Shell ) |
| 23 | TELNET |
| 25 | SMTP (Simple Mail Transfer Protocol) |
| 53 | DNS (Domain Name System) |
| 80 | HTTP (HyperText Transfer Protocol), Apache Web Server,XAMPP |
| 110 | POP3(Post Office Protocol) |
| 119 | Network News Transfer Protocol (NNTP) |
| 123 | NTP (Network Time Protocol) |
| 139 & 445 | SMB (Server Message Block) |
| 143 | IMAP(Internet Message Access Protocol), |
| 161 | Simple Network Management Protocol (SNMP) |
| 179 | BGP (Border Gateway Protocol) |
| 194 | Internet Relay Chat (IRC) |
| 443 | HTTPS (HyperText Transfer Protocol Secure) |
| 500 | ISAKMP (Internet Security Association & Key Management Protocol) |
| 3306 | MySQL (My Se Que Ell) |
| 3389 | RDP (Remote Desktop Protocol) |

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## PHP

PHP is a recursive acronym for Hypertext Preprocessor. PHP is a programming language that allows us to create dynamic web contents that interact with databases. PHP is basically used for the development of web based applications.

PHP is free and Open Source software.

1. Flexible
2. Secure
3. Familiar
4. Simple
5. Efficient

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## Cut - Text Processor Command

Cut command is used to cut-out the specific section of each line from a file and write the result to standard output.

Syntax - cut [-b] [range] [filename]

-b : defines the byte.

Range: defines the range into bytes.[1-5,8-10] or [1,2,3,4,5,6,7]

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## wc - Text Processor Commands

Wc gives the word count from a file.

Syntax - wc [option] [filename]

-l : gives line count

-w : gives word count

-c : gives byte count

-m : gives character count

-L : gives length of longest line

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## Uniq - Text Processor Commands

Uniq removes the duplicate lines and give unique lines output

Syntax - uniq - [option] [filename]

-c : Gives unique lines & -d : Gives repeated lines

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## Sort - Text Processor Commands

Sort performs sorting on lines into a file and gives sorted output

Syntax - sort - [option] [filename]

-n : sort by numeric & -r : reverse

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## Grep - Text Processor Command

Grep(Global Regular Expression Print) is a multi-purpose file search tool that works on regular expressions.

Syntax - grep [option] [pattern] [filename]

Option : -E —-> PATTERN is an extended regular expression

-F —-> PATTERN is a set of newline-separated strings

-r —-> like --directories=recursive.

egrep = grep -E

fgrep = grep -F

rgrep = grep -r

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## Monitor Users

These commands used system administrator to monitor the users for suspicious activities, login time, user logged in etc.

### Who Command:- The who command Shows who is currently logged in to the system and information such as the time of the last login

Syntax - who [OPTION]

-H : Displays column heading.

-r : Current runlevel.

-a : Displays information provided by most options.

### W Command:- This command displays the user currently logged in and processes information.

Syntax - w

### Last Command:- This command displays a list of users who logged in and out since /var/log/wtmp file was created.

Syntax - last -ax

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## How to install Mysql Server 5.7 Install the required packages.

apt-get update

apt-get install wget

Download and install the MySQL repository package.

mkdir /downloads

cd /downloads

wget https://dev.mysql.com/get/mysql-apt-config\_0.8.12-1\_all.deb

dpkg -i mysql-apt-config\_0.8.12-1\_all.deb

### Select the option UBUNTU BIONIC.

On the MySQL Server and Cluster screen, select the option MYSQL-5.7.

Verify the configuration summary and click on the OK button.

### Update the MySQL packages repository.

sudo apt-key adv --keyserver hkp://keyserver.ubuntu.com:80 --recv-keys 467B942D3A79BD29

sudo apt-get update

### Verify the Ubuntu policy for the MySQL package installation.

sudo apt-cache policy mysql-server

### Simulate the installation of the MySQL 5.7 client package.

apt-get install -s mysql-client=5.7.39-1ubuntu18.04

### If no errors were detected, perform the installation of the MySQL 5.7 client package.

apt-get install mysql-client=5.7.39-1ubuntu18.04

### Optionally, simulate the installation of the remaining MySQL packages.

apt-get install -s mysql-community-server=5.7.39-1ubuntu18.04

apt-get install -s mysql-server=5.7.39-1ubuntu18.04

### Install the MySQL server version 5.7.

apt-get install mysql-community-server=5.7.39-1ubuntu18.04

apt-get install mysql-server=5.7.39-1ubuntu18.04

### Configure the password to the MySQL account named ROOT.

### Verify the MySQL version installed.

mysql -V

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## Connect MySQL to phpMyAdmin

### Connect to mysql

sudo mysql -uroot -pyour\_password

### Create a user for phpMyAdmin

CREATE USER 'phpmyadmin'@'localhost' IDENTIFIED BY '<your\_password>';

GRANT ALL PRIVILEGES ON \*.\* TO 'phpmyadmin'@'localhost' WITH GRANT OPTION; FLUSH PRIVILEGES;

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## Docker Ubuntu With Key file

ssh -i "docker-key.pem" [ubuntu@ec2-13-232-214-242.ap-south-1.compute.amazonaws.com](mailto:ubuntu@ec2-13-232-214-242.ap-south-1.compute.amazonaws.com)

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## Check OS Version & New Release

$ cat /etc/os-release

$ lsb\_release -a

$ hostnamectl

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## How to check Disk size and space in Linux

df -h

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## Port

Port is a software defined number associated with a network protocol that transmits or receives communication for specific service.

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## Remove phpMyAdmin Deprecation Warnings

Edit the following file : config.inc.php. It can be located in /etc/phpmyadmin/config.inc.php

or in

/usr/share/phpmyadmin/config.inc.php

Add following line at the end of file

$cfg['SendErrorReports'] = 'never';

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## Magento

### What is Magento ?

Magento is an open-source as well as commercial ecommerce platform that gives users the ability to control the look, functionality and content on their online store without compromising the shopping experience.

It provides a variety of tools and features to the users including marketing, search-engine optimization and catalog management tools.

Magento 2 is the latest update of Magento launched by the developers.

### Features of Magento 2

* Flexible Architecture for websites.
* More Efficient Business Experience.
* 50% Faster Loading Speed.
* More Secure Payments.
* Easier Maintenance and Upgrades.

### Extension in Magento

* Customer services
* [Payments](https://docs.rapyd.net/works-with/docs/rapyd-payments-plugin-for-magento)
* Security
* Marketing
* Accounting and finance
* Shipping and fulfillment
* Site optimization

### Technologies

* Composer – allows you to reuse third-party libraries without dealing with source code, reduces extension conflicts
* NGINX – serves as a reverse proxy, HTTP cache, and load balancer
* Redis – uses database cache and broker for messages
* Symfony – make content control easier, improves functionality, and betters website appearance
* Varnish – increases website speed

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## Create User with Different Home Directory

### Create User

sudo useradd -m {username}

### Set Password

sudo passwd {username}

New Password: {Enter New Password}

### Change Home Directory

sudo useradd -m -d /var/www/cedshubh -s /bin/bash -c "Shubh Owner" -U cedshubh

or

sudo useradd -m -d user\_defined\_directory username

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### Varnish

Varnish cache is a popular, powerful, free and open-source HTTP engine/ reverse HTTP proxy that can speed up the website software used by millions of websites.

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## Git

Git is a free and open source distributed version control system designed to handle everything from small to very large projects with speed and efficiency.

Developed in 2005 by Linus Torvalds, the famous creator of the Linux operating system kernel.

### Why Git for your organization

* Git for developers
* Git for marketing
* Git for product management
* Git for designers
* Git for customer support
* Git for human resources
* Git for anyone managing a budget

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## Create User and Group

### Creating 5 Users

sudo adduser u1

sudo adduser u2

sudo adduser u3

sudo adduser u4

sudo adduser u5

### Creating 3 Groups

sudo groupadd g1

sudo groupadd g2

sudo groupadd g3

### u1 and u2 in g1

sudo usermod -g g1 u1

sudo usermod -g g1 u2

### u3 and u4 in g2

sudo usermod -g g2 u3

sudo usermod -g g2 u4

### u5 in g3

sudo usermod -g g3 u5

### Set permission to Read and Execute but not write to each others home directory

sudo setfacl -mR g:g1:rx /home

sudo setfacl -mR g:g2:rx /home  
sudo setfacl -mR g:g3:rx /home

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## Nagios

Nagios is an open source monitoring system for computer systems. It was designed to run on the Linux operating system and can monitor devices running Linux, Windows and Unix operating systems.

Nagios software runs periodic checks on critical parameters of application, network and server resources. For example, Nagios can monitor memory usage, disk usage, microprocessor load, the number of currently running processes and log files. Nagios also can monitor services, such as Simple Mail Transfer Protocol (SMTP), Post Office Protocol 3 (POP3), Hypertext Transfer Protocol (HTTP) and other common network protocols.