Linux Basics

Operating System

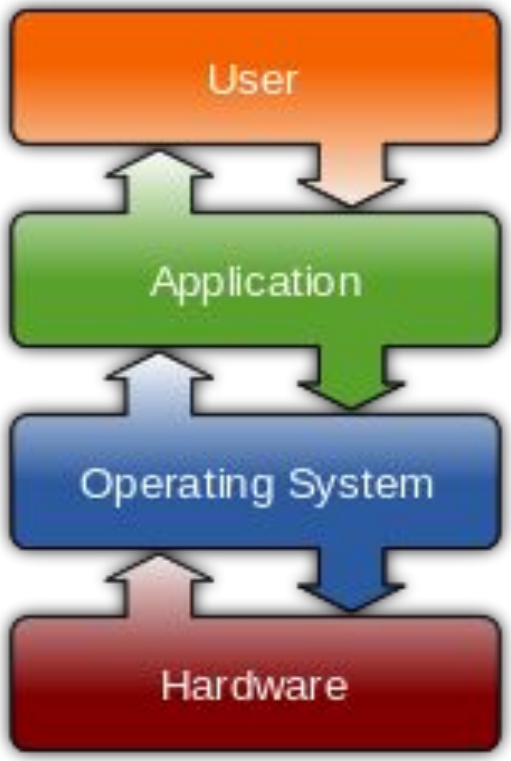
What is Operating System (OS) ?

OS is a collection of system programs that supports computer hardware to interact and work with the end-user .

Example: Windows , Linux , Mac

Operating System

Architecture



Operating System

What is Open source ?

Open source is a freely available software to the public and no license restriction for open source software . The user can modify the source code .

Operating System

What is Linux ?

Linux is an open source operating system . Unlike Microsoft Windows OS , linux have so many distros such as Redhat , Ubuntu , SUSE , Mandriva etc .

Operating System

Difference between Windows and Linux

Windows	Linux
Paid license	Majority of Linux variants are free
Reliable , but not more than linux	more reliable than windows
vulnerability of virus	Virus free and In-built security than windows
File system: NTFS , FAT	File System: Ext (2,3,4) , xfs
Only one user can use at a time	Many user can login and use simultaneously via SSH

Files and directories

#Used to change a file's access and modification timestamps. It is also used to create a new empty file.

touch <my_file>

#Create many empty files in single command with same name

touch <file_name>{01..03}.txt

Prints content to standard output

cat <my_file>

Files and directories

Creates specified directory

mkdir <dir_name>

Create many directories using single command

mkdir <dir_name>{01..03}

Create multiple sub directories

mkdir -p <dir_name/dir_name>

Files and directories

Redirection symbols

- cat file_1 > file_2 (overwrites)
- cat file_1 >> file_2 (appends)

Find commands:

grep -RI “find_string” .

Find . -iname find_word

Files and directories

#Command line Text editor

Vim <filename>

Search a word in vim editor

Esc - > [shift+:] -> /<search-word>

#Go to a line using line number in vim editor

Esc -> [shift+:] -> :<line-number>

Files and directories

Delete a line in vim editor

Esc -> dd

#Copy a line in vim editor

Esc -> yy

Cut a line in vim editor

Esc -> cc

Files and directories

Save in vim editor

Esc -> [shift+:] -> w

#Quit a vim editor

Esc -> [shift+:] -> q

Open vim editor in Read-Only mode

vim -R <filename>

Files and directories

Go to last line in vim editor

Esc + [shift+g]

Go to first line in vim editor

Esc + gg

Find and replace

Esc + : + %s/search_word/replace_word/gc

Files and directories

#To reach parent/home directory.

cd ~ or cd ~/

#To reach to desktop directory.

cd ~/Desktop

#To view details about any command in linux.

man <command_name>

(or)

<command> --help

Files and directories

Get full path of the present working directory

pwd

Content of pwd

ls

Similar as ls, but provides additional info on files and directories

ls -l

Includes hidden files (.name) as well

ls -a

Calculate the file sizes in your home

du -sch ~/*

Files and directories

Removes empty directory
rmdir <dir_name>
Removes file name
rm <file_name>
Removes directory including its content, but asks for confirmation, 'f' argument turns confirmation off
rm -rf <dir_name>

Copy file/directory as specified in path (-r to include content in directories)
cp <name> <path>

Files and directories

Rename directories or files

mv <name1> <name2>

Move file/directory as specified in path

mv <name> <path>

Finding files, directories and applications

searches for *pattern* in and below current directory

find -name "*pattern*"

finds file names *emp* in specified directory

find /home/user -name "*emp*"

Files and directories

#The grep command allows you to search one file or multiple files for lines that contain a pattern

grep "pattern" /tmp/filename

Process Management

view top consumers of memory and CPU

top

Shows who is logged into system

who

Shows processes running by user

ps

Shows all processes on system

ps -ef

Kills a specific process

kill <process-ID>

NOTICE: "kill -9" is a very violent approach.

kill -9 <process-ID>

Process Management

SSH

To log-in into the remote Linux shell, open terminal and type:

ssh user@remoteip or hostname

hostname is the remote server's domain name

#You will be asked to enter the password, simply type it and press enter.

Remote Management

Copies file from server to local machine (type from local machine prompt). The '.' copies to pwd, you can specify

here any directory, use wildcards to copy many files.

scp user@remote_host:file.name.

#Copies file from local machine to server.
scp file.name user@remote_host:~/dir/newfile.name

Copies entire directory from server to local machine.
scp -r user@remote_host:directory/ ~/dir

#To show what user id's system are logged on with date and time.

who

#To show the name of user id that is currently logged on.

whoami or who am i or who are you

Disk Management

#To display file or file system status.

stat

#Return information like absolute path, size, inod,created and last modified time, etc about the specified file.

du -sch *

#Gives the memory usage of system including all files under root directory and home directory.

du -sch ~/*

Process Details & its Termination

#To display all processes of users by timewise

ps -f

#To display all the processes of system

ps -e

#To display all the files opened along with their path by timewise.

ps -ef

#To end the process that is currently running.

kill <pid>

Process Details & its Termination

#To give signal to end the process.

kill -9 <pid>

To display running processes in top order

top

#To display to the processes running by a particular user

top -u <username>

View

#To View the output of the last contents of the file.

tail <filename>

#To view the last given number of lines

t**ail -n**<number> **<filename>**

To view the updating file

tail -f <filename>

View

View the top 10 lines of a file

head <filename>

View the n number of line

head -n<number> <filename>

Network Management

#A response confirms that the host is operational.

ping

#To view the IP address of your system

ifconfig

To execute commands as another user

sudo <command>

#To execute commands like root user

sudo su - (or) sudo -i

User Management

#To log in new user without logging out

su <user>

#To change username and password.

passwd

(or)

passwd <username>

Keyboard Shortcuts:

#To see previous/next commands we typed.

up/down

#To get back to command page.

ctrl+z

#To kill the current running process.

ctrl+c

#To erase the current line.

ctrl+u

Keyboard Shortcuts:

close a terminal

ctrl + d

#clear the terminal

ctrl + l

Lock the system

ctrl + alt + L (or) splKey + L

Network Connection

Find your IP

ifconfig //check ur IP in interface like eth or wlan

check your hostname

hostname

Network Connection

To connect with remote computer,

ssh bambeeq@192.162.1.64

To copy with remote Peer

scp file.txt bambeeq@192.162.1.64:file.txt

To disconnect with remote peer

exit

To create individual key as Private or public use

key-gen -r rsa -b 2014

Key

The path of private key

/home/bambeeq/.ssh/id_rsa

#The path of public key

/home/bambeeq/.ssh/id_rsa.pub

#To share public key, copy and paste your public key to remote user in a separate file

```
# To view the private key
ls -l ~/.ssh
cat ~/.ssh/id_rsa

# To view public key
cat ~/.ssh/id_rsa.pub
```

Create file links

#Hard link

ln <source-file> <destination>

Soft link

ln -s <source> <destination>

Run levels

init 0 // shutdown the system

init 1 // single user mode

init 2 // multi user with network

init 3 // multi user command mode with network

init 4 // unused

init 5 // Multi user with GUI

init 6 // reboot the system

#find the runlevel

runlevel

General

```
# find your OS version
lsb_release -a

#Find kernel version
uname -a

# Find your RAM size
free -m
```

Installation

Install a package from repository
apt-get install <package-name>

#Install from local
dpkg -i <package-name>

Download a package on command line
wget <download -link>

Compression

Compress using tar

tar -cvf <output.tar> <source>

tar -czvf <output.tar.gz> <source>

tar -cjvf <output.tar.bz2> <source>

Decompress

Extract the tar files

tar -xvf <sourcefile.tar>

tar -xzvf <sourcefile.tar.gz>

tar -vxjvf <sourcefile.tar.bz>

Standard Input, Output and Error in linux

Redirect output to a file

$ command > filename

#Redirect Standard Error to a file

$ command 2> filename

Redirect Standard Output and Error to file

$ command &> filename