Linux Operating System (L.O.S)

Linux Operating System (LOS)
Invented by Linus Torvalds
Place Helsinki University
Main function performing part Kernel

Components of Linux Operating System :-

i) Hardware - RAM, CPU

ii) Kernel - Interface between user and system

iii) Shell - Used for Command Performing

log in & log Out.

Following are steps for login Super user account

Step 1 :- Access the Super user account at the login prompt type root & press enter. The password prompt will appear.

Step 2 :- Type the root password & press enter. The shell prompt for the root user account display & it like as.
[root@localhost /root]#

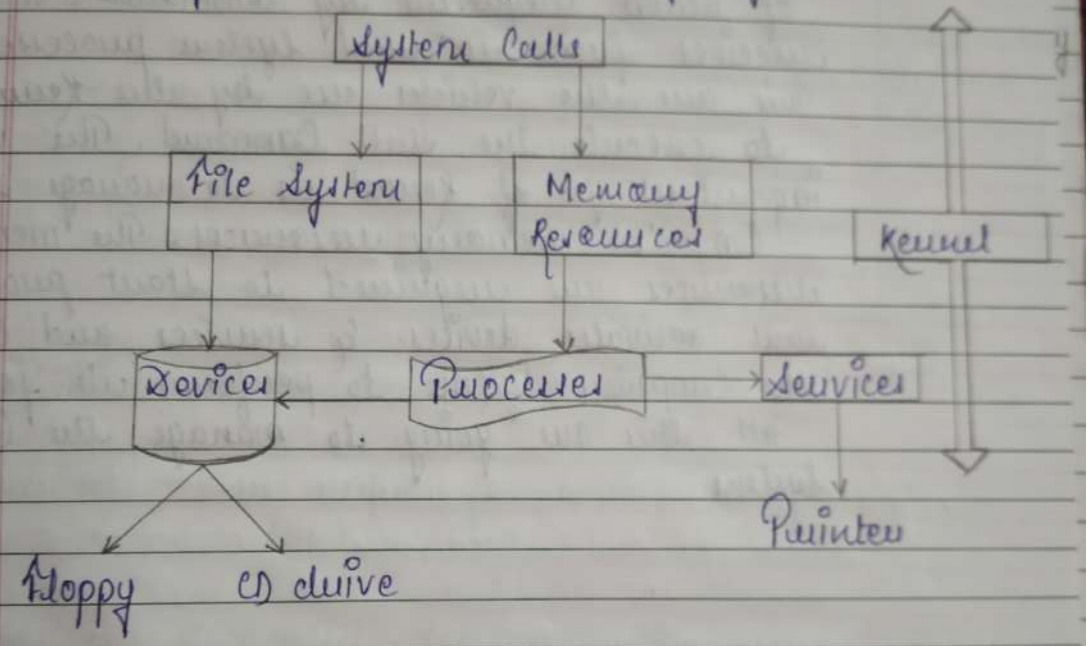
Step 3 :- Change to different console press alt + F2 from Keyboard.

Step 1 :- Access to your user account at the login prompt type the user name that we set up during the installation & press enter. Then we ask for password and type the password & press enter.

Step 5 :- Tempararily change to the Super user account from unpriviliage user account type ( ) & press enter. Then we will be asked for password for root account. Type the password. & press enter. The shell prompt will look like as
[sunty@localhost /sunty]#.

Step 6 :- To exit the super user account type exit & press enter we will return to user account

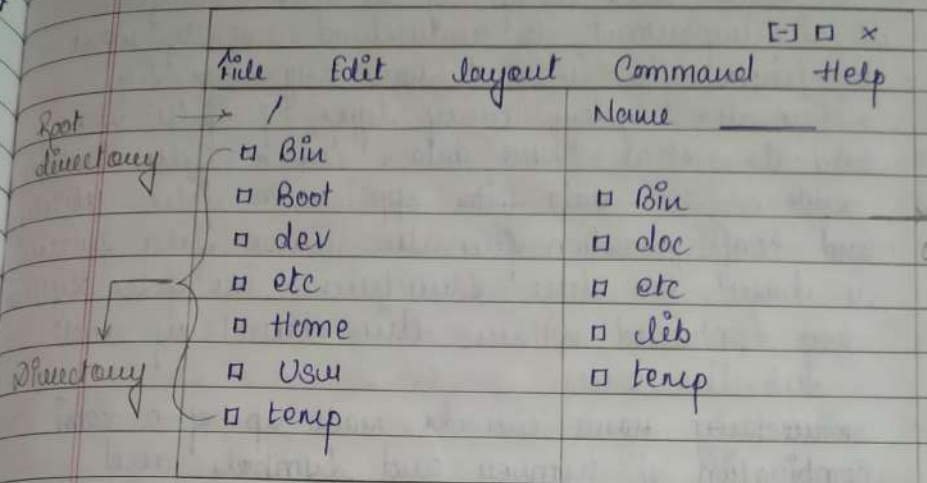
Anatomy of Linux Operating System (LOS)



i) The Center of L.O.S is Kernel. The kernel is a piece of software that provides an interface between user & Computer hardware & attach peripherals. The kernel is responsible for maintaining file system executing Commands, starting programmes, timing system activities, & managing system memory etc. The kernel gives instruction to the system using system

calls. This system calls co-ordinates the activities of kernel to produced the Output for a command that has been executed by the system user. System calls are communication between kernel and devices. it manages which directs the performance of action requested by commands. It receives from internal system processes. This are the vehicles use by the kernel to execute the shell Command. The most important job of kernel is to manage the Computer memory resources. The memory resources are required to start processes that activates devices & services and cause the Computer system to perform its job & all this are going to manage the Computer System.

Exploring the Directory Structure.



/Bin :- Stores executable files.

/Boot :- Files useful for booting are present in /boot

/dev :- Computer Hardware files.

/etc :- Initializing process related Configuration files.
eg :- Password & login name etc.

/Home :- Particular personal files created by user

/Lib :- Includes library of C language & other functions & files related programming language

/proc :- For saving virtual files.

Explain the Linux Operating System.

Linux see everything as files therefore it is important to understand exactly what a Linux file is and how organizes files within the system every types of files are need to store some data. Linux files contain system files, data files application files, utility and configuration files the linux file system is based on tree structure. The files system are contained within this directory and sub-directories

Directory name can be made up of a combination of number and symbols and character. The Name of directory includes location of directory in the file system related to root (/).

The following is a list of directory in linux file system :-

i) The base of operating system is root (/) it contain all the sub-directory and file in linux system.

ii) Executable files are stored in /bin directory all the basic command and program are stored in this directory.

iii) The /boot directory is where a configuration file and command are stored. This directory contain every thing need to boot the system

iv) /dev directory is where all the device files are kept for all your computer hardware Component

v) /etc directory is where linux keep the system configuration files and initialization scripts.

vi) Each user on the system has a personal directory in which to store file which are created by user. This directory is contain in /Home directory.

vii) The /lib directory contain the lib for C & other programing language

viii) /proc directory contains files that are not a part contains virtual files that linux use to keep track of on going process

ix) /usr directory contains files that are not a part of linux file system. Application for windows system and linux game collection are example of that directory.

Explain the /usr directory

ls /usr/games

Follow this step for an example of useful information and programs that we can find in /usr directory :-

i) Start with some fun & find the /usr/games directory. From the command line use the ls command to list the directory contain.

ii) Type the following directory : ls /usr/games & press enter we should see the list of games on computer screen.

Ex :- I mustry @ . $. ls /usr/games

Banner, Bomber, Fortune, matchen.

[mustry @ local host mustry] $

iii) Play the fortune game at the command line. Type - Fortune & press Enter.

iv) View the list of applications that are installed on system & are available for use by any user. Type ls/usr/game bin & press enter. This display a long list.

v) To read the content of /usr/bin directory in a page. Type ls /usr/bin & press enter. This display a long list. the documentable page we finish looking at the file list press q key to escape the page.

vi) Find the help manual for the applications type :- ls /usr/doc/less & press enter. The file in this directory are a combination

of text & documentable file.

vii) We will find desktop background in the /usr/share /wallpapers wallpaper directory and in /usr/share /pixmap / backgrounds directory there are a variety of icons in pics maps directory. This all have the file formats.

Looking at file system :-

Types of file system :-

i) user data file
ii) system data file
iii) Executable data file.

i) User data files :-

User data files are created by user & usually contend simple data made up of text & a numbers. Files such as text files can be read with text editor such as those we create with Graphics for spreadsheet program.

ii) System data files :-

System data files are used by Operating system to keep track of user password. Logins, file permissions & other things related to user system properly.

Executable files :

Executable files contain the instructions that tell the computer what to do. This files are usually called programs whenever we give computer command to do something, we are telling it to follow instructions in execution file.

Naming files & Directories :

The following rules apply to naming the directories because a directory is just seen as a file by the linux file system.

i) Determine the length of a file name. A file name can contain 256 characters. The files name is not just the name of individual file it includes the directory path that leads to file : /home, /username, /images, /pictures. The above directory contains 30 characters.

ii) Use appropriate characters for creating file name : Use any characters from alphabet i.e A to Z, a to z, 0 to 9. We also dash (-), underscore (_) & dot (.)

iii) Avoid keyboard characters that can cause problem in file names. Do not put a space in the file name & do not use the following characters <, >, $, ', ", {, }, (,) etc.

v) To create hidden files begin the file name with a dot Ex :- Diary.text

vi) Find the command line & change to our home directory. Type cd & press enter. Enter to make sure we are in home directory.

vi) Create a file name pract

vii) To read the file we just created type cat _ practice & press enter.

Spawning Process - lpd

Linux define running programs, utilities as processes. Linux maintain a virtual file system in directory where it maintains position to all the on going process in the system Linux is a true multi-tasking operating system meaning it can do one thing at a time to accomplish all this Linux kernel just calls up a few daemons and the daemons take over and perform the job doing whatever is necessary suppose that we have a document that we want to print so we sent a print command to kernel the kernel does not know about printing to do the printing itself so it calls lpd line printer daemon. The lpd takes the printer job from the kernel and spawns. This just means that it make a copy of itself then the lpd gives the job to it along with all the details about which printer and where and when and send it to the printer for printing.

Creating User Account :-

When we install Linux we create a super user account for unprivilege user account. For each account we might shell programs by the default setting Linux Operating system need to create a login for user account by using following steps :-

i) Select a user name each user on the system needs a unique name to access the system and his/her user account. User name should not more than 8 characters. To make the job of the system administrator simpler use lower case letter for user name.

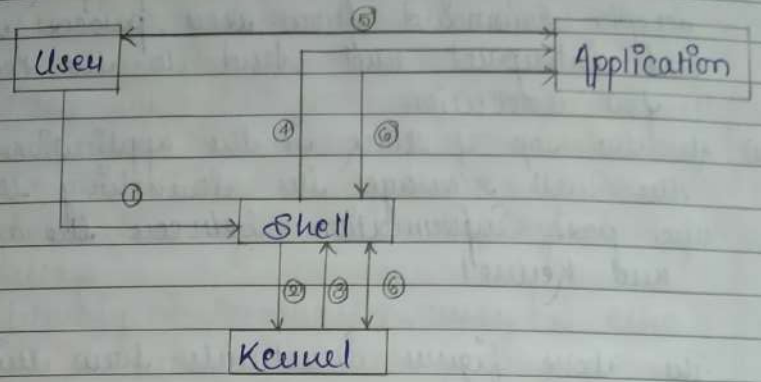
ii) Select a password a good password should be a combination of upper case or lower case letter & number a password should be of 8 character.

iii) Login as a super at the login prompt type root and press enter. We are then display a login prompt as [root@localhost/root]#

iv) Create the user account at the shell prompt type adduser space username and press enter for eg :- [root@localhost/root]# adduser username

v) Assign the password to the account type password space username and press enter.
eg :- [root@localhost/root]# passwd username
Changing password for user username
New password.

Shell program



What is mean by shell program ?

A example of shell prompt for the super user on Linux Operating System is
[root@localhost/root]#
The shell program is a gateway to the Linux kernel and enable to work with any program Command installed on the system. A shell program user interface to the computer system for the Linux Operating System this interface accept Command from user and translate it into a language that Operating system can understand. The shell can also be used to write program. Linux Operating system is a collection of stack.

i) The kernel is on the bottom of stack making use of modules and compile it to run the

Computer and manage other peripherals.

ii) The shell program sits on top of kernel it accepts command from user, process that and interpret and send to the kernel for execution.

iii) At the top of stack is the application layer the shell manage the launching the application and pass information between the application and kernel.

The above figure illustrate how this process Operates in step one the user type a command after the shell prompt and send it to shell. The shell first determine wheather the command built in or an application program.
If the command is application it must be located in one of the directories list in shell search path. If the command is found the shell interpret the command and send it to kernel that is (step 2). The kernel tells that the shell to launch the application (i.e step 3), which is done (step 4). After the Application is running the user communicate directly (step 5) with the application while the shell (step 6) maintain the necessary data flows between the application and kernel.

Bash Shell

Follow this steps to start bash shell as :-

i) Display the shell you are using this information is found in shell environment variable. Type echo $ shell and press enter if we are using bash the system will display the following message.

```
[username @ localhost /username] $ echo $ shell
/bin / bash
[username @ localhost /username] $
```

ii) If we are not using bash change to the bash shell type bash and press enter. We will see the same shell prompt on screen

iii) If we want bash to be the default shell type echo $ shell and press enter that means we double check that we are using bash.

iv) Display the bash help function type help and press enter.

Changing Shell Prompt :-

To change the shell prompt for our current login session follow this step :-

i) Display the shell variable at the shell prompt printenv and press enter.

ii) Look for the PS1 variable on linux system look like as follows.

PS1 - [\u\@\h\w]$

This variable tells the systems to display the user name for the host computer and that user current working directory inside bracket followed by $ prompt.

iii) Write down the information from PS1 variable

iv) Decide how we want to prompt looks like.

v) Change the prompt so that it display the time, date, current working directory and the $ prompt type PS1 = '[\t \d \w]$' and press enter.

Character Codes use to change the shell prompt are as follows :-

/d - display the current date

/h - display the host name of shell in which we are working

\s - display the name of shell in which we are working
\t - display the current time
\u - display the user name of user who is logged into system.
\w - display the current working directory.

For Example : The shell prompt will change to display the following output for the above command as.

PS1 = [\t \d \w] $ ↵
[14:15:33 Fri June 16 work] $

Basic Syntax for Command.

For each command there will be an example of command usage. similar to the following example.

Commandname -Options [parameter]. This single line Command is type after shell prompt.

Command Option are type the Command and are use to modify the result of Command. Before typing an Option into the Command line there must first the space between Command and Command Option. Then a - character must be precede the Command Option.

For eg : ls -l /www/doc
The above command we in this example
is ls which display a file list for the
content of current working directory the
-l option modifies the information display
about each file in listing. The parameter
/www/doc display the content instead
of current working directory.
Command parameter - a Command parameter
is some other type of information that the
Command can use to modify its Output a
parameter can be file, directory. Parameter
are not perceded by -.

Exploring the home directory :-

When User are asign account on the
system they are also alocated space within
the /home directory in which to stored
their personal files. If a user has login
name of sunty that user personal file all
stored in /home/sunty this is known
as home directory and is the directory
in which the user is working after
logging into his account from there
directory the user can Create sub -
directory in which to organised file,
create to new file, Modified there file
and delete file.

When we first login to our account the shell prompt looks like as if your username as mursty here.

[mursty @ localhost mursty] $

Where does that lives our file system then type pwd and press enter the response appears on the following line on screen like

[mursty @ localhost mursty] $ pwd ↵

/home/mursty

ls Commands

The ls commands list the contain of the directory in a verity of formats and files are listed vertically if no options are used the name of file and directory appears in coloum across the screen the syntax is

ls [option] [filename]

The ls commands can be used with the filename parameter to specified a directory path the ls command will list there file in our working directory if a directory path is used all the file in that directory will be listed following are the useful Commands Option

1. To list the file horizontal instead of vertically type

eg: ls -x

2. File information such as permission and owner, file size, modification date for each file can be display in the long listing type.
ls -l

3. To display all files including hidden file types
ls -a

1. Then to display all files including the hidden files in the longlisting type
ls -la

Mkdir Command

Mkdir [option] directory name
Mkdir bca ↵
Mkdir -p Cou
It is easy to create new directory with the mkdir commands if the working directory is the directory that will contain the new directory the following syntax show the mkdir [option]
The directory name parameter is the name of new directory to be created this directory will be the child directory of the working directory.

There are two command option along with mkdir.

1. To create partner directory with a series of sub directory use -P along with Commands Option.

Example :-

mkdir -p Courses/client/2000

and press enter

Deleting Directories.

The rmdir Command is use to remove directories before we can delete a directories we must first delete the Contained of directories, this means that any file contained in the directories two be remove with a command and subDirectories need to be delete and then delete way rmdir Command Syntax : Rmdir.

The directory name parameter is the name of directories to be deleted.

If the directories is not empty a massage display as

Rmdir directory is not empty.

Cat Command (Creating files) - use cat command

The Cat command can read one or more files of a time or it can be used to combine the contained of two files into one file also it will create a new file when we execute cat command type
Syntax :- Cat filename ↵

Here some are the other use of Cat Command pointers.

i) When we need to combine contained of several files into one file tell Cat Command which combines the files and create a new file.
ex :- rusty collects jokes each joke is place in a seperate file and occationaly and rusty picks a best few good jokes to share with friends rusty wants to send the jokes file name joke 27 and joke 55 to some place to combine this two file into third file name.

ii) To add the contained of one file to the one another file tell Cat to appear the file for example. if rusty has a file name guffaws that some friends enjoy, but also want to share joke 27, rusty would use cat to copy the contained of joke 27 and then pass the

Contained to the end of file name guffaws 1
Ex :- Cat jokes 27 >> guffaws 1 ↵

Stat Commands

The stat Command can also display same information for a directory the ls Command display quit a bit information about a file another way to display file information but this time and individual file is with the stat Command.

Following step explain the stat Commands :-

① Change to the Directory that contains the file about which we want more information
② Display the file list for the directory we ls Command.
③ Type stat file name and press enter it display name of that file, size, mod, divise etc.

Deleting file

To get ride of unneed files delete them with rm commands when we use rm command we need to specific the file that we want to delete for ex :-
rm filename and press enter

The following manage display rm or remove 'filename' ?
If we want to default this file type why and press enter otherwise type N.

Renaming file

The mv command is use for renaming file.

mv Commands
when we rename a file the Original file name erase and then replace with the new file. All the information stays the same only the name is change the syntax.

The Source file parameter is the name of file to be Copied and the target file. Parameter is the new file name ex. If a filename sample one we

want to change sample 2 then type mv sample space sample two and press enter then mv Command delete the Original file i.e sample one and Rename to sample two

Command Option are used to backup Command (-b) Option. to use these Option type

mv -b - Sample one sample two. It creats a backup file another to ensure that we don't copy over and existing file it a use the interactive Commands Option (-i) ex. mv -i - sample one sample two.

Duplicating file