



## Ch-6 Linux Basics



# This chapter will cover following topics...

- Introduction to Linux
- Basic Linux commands
- Software management in Linux
- User and group management

# Introduction to Linux

Linux is a free, open-source operating system

Linux has been under active development since 1991. It has evolved to be versatile and is used all over the world, from web servers to cell phones.

The main advantage of Linux was that programmers were able to use the Linux Kernel to design their own custom operating systems.

Now, Linux is one of the most popular and widely used Kernel, and it is the backbone of popular operating systems like Debian, Ubuntu, and Fedora.

It offers a free operating system. You do not have to pay to get the OS like Windows!

# Introduction to Linux(Conti...)

## Advantages:

Being open-source, anyone with programming knowledge can modify it

The Linux operating systems now offer millions of programs/applications to choose from, most of them free!

Once you have Linux installed you no longer need an antivirus! Linux is a highly secure system

Linux is the OS of choice for Server environments due to its stability and reliability (Mega-companies like Amazon, Facebook, and Google use Linux for their Servers)

A Linux based server could run non-stop without a reboot for years on end

# Introduction to Linux(Conti...)

## Unix or Linux - Confusion?

Unix is called the mother of operating systems which laid out the foundation to Linux.

Unix is designed mainly for mainframes and is in enterprises and universities.

While Linux is fast becoming a household name for computer users, developers, and server environment.

You may have to pay for a Unix kernel while in Linux it is free.

But, the commands used on both the operating systems are usually the same. There is not much difference between UNIX and Linux.

Linux is a clone of Unix.

# Basic Commands of Linux

## Linux Terminal:

A shell is a program that receives commands from the user and gives it to the OS to process, and it shows the output.

Linux's shell is its main part. Linux has a CLI (command line interface).

You can try commands in any of the following online Linux terminal.

<https://bellard.org/jslinux/vm.html?url=https://bellard.org/jslinux/buildroot-x86.cfg>

<https://linuxcontainers.org/lxd/try-it/>

# Basic Commands of Linux

## 1. pwd

When you first open the terminal, you are in the home directory of your user. To know which directory you are in, you can use the “pwd” command. It gives us the absolute path, which means the path that starts from the root. The root is the base of the Linux file system. It is denoted by a forward slash( / ). The user directory is usually something like "/home/username".

```
root@tryit-crisp:~# pwd
/root
root@tryit-crisp:~#
```

# Basic Commands of Linux

## 2. ls

Use the "ls" command to know what files are in the directory you are in.  
You can see all the hidden files by using the command "ls -a".

```
root@tryit-crisp:~# ls
root@tryit-crisp:~# ls -a
.  ..  .config  .ssh
root@tryit-crisp:~#
```

## 3. cd

Use the "cd" command to go to a directory.

For example, if you are in the home folder, and you want to go to the downloads folder, then you can type in "cd Downloads".

```
root@tryit-crisp:~# mkdir downloads
root@tryit-crisp:~# ls
downloads
root@tryit-crisp:~# cd downloads/
root@tryit-crisp:~/downloads# pwd
/root/downloads
root@tryit-crisp:~/downloads#
```



# Basic Commands of Linux

## 4. mkdir & rmdir

Use the mkdir command when you need to create a folder or a directory.

For example, if you want to make a directory called “DIY”, then you can type “mkdir DIY”.

Use rmdir to delete a directory. But rmdir can only be used to delete an empty directory. To delete a directory containing files, use rm.

## 5. rm

Use the rm command to delete files and directories.

But rm cannot simply delete a directory.

Use “rm -r” to delete a directory. In this case, it deletes both the folder and the files in it.

```
root@tryit-crisp:~# mkdir downloads
root@tryit-crisp:~# cd downloads
root@tryit-crisp:~/downloads# touch file1.txt
root@tryit-crisp:~/downloads# ls
file1.txt
root@tryit-crisp:~/downloads# cd..
cd..: command not found
root@tryit-crisp:~/downloads# cd ..
root@tryit-crisp:~# ls
downloads
root@tryit-crisp:~# rm -r downloads/
root@tryit-crisp:~# ls
root@tryit-crisp:~#
```

# Basic Commands of Linux

## 6. Touch

The touch command is used to create a file.

It can be anything, from an empty txt file to an empty zip file. For example, “touch new.txt”.

## 7. cp

Use the cp command to copy files through the command line.

It takes two arguments: The first is the location of the file to be copied, the second is where to copy.

## 8. mv

We can also use the mv command to rename a file. For example, if we want to rename the file “text” to “new”, we can use “mv text new”. It takes the two arguments, just like the cp command.

```
root@tryit-crisp:~# touch file1.txt
root@tryit-crisp:~# ls
file1.txt
root@tryit-crisp:~# cp file1.txt file2.txt
root@tryit-crisp:~# ls
file1.txt  file2.txt
root@tryit-crisp:~# mv file2.txt newfile2.txt
root@tryit-crisp:~# ls
file1.txt  newfile2.txt
root@tryit-crisp:~#
```

# Basic Commands of Linux

## 9. echo

The "echo" command helps us move some data, usually text into a file.

## 10. Cat

Use the cat command to display the contents of a file. It is usually used to easily view programs.

```
root@tryit-crisp:~# ls
file1.txt  newfile2.txt
root@tryit-crisp:~# echo "Hello this is Rajan" >> file1.txt
root@tryit-crisp:~# echo file1.txt
file1.txt
root@tryit-crisp:~# cat file1.txt
Hello this is Rajan
root@tryit-crisp:~#
```

## 11. uname

Use uname to show the information about the system your Linux distro is running. Using the command "uname -a" prints most of the information about the system. This prints the kernel release date, version, processor type, etc.

```
root@tryit-crisp:~# uname
Linux
root@tryit-crisp:~# uname -a
Linux tryit-crisp 4.4.0-134-generic #160-Ubuntu SMP Wed Aug 15 14:58:00 UTC 2018 x86_64 x86_64 x86_64 GNU/Linux
root@tryit-crisp:~#
```

# Basic Commands of Linux

## 12. Sudo

A widely used command in the Linux command line, sudo stands for "SuperUser Do".

So, if you want any command to be done with administrative or root privileges, you can use the sudo command.

## 13. Chmod

Use chmod to make a file executable and to change the permissions granted to it in Linux. This command is also used to change the permission of file according to the usage.

## 14. hostname

Use hostname to know your name in your host or network.

Basically, it displays your hostname and IP address.

Just typing "hostname" gives the output.

Typing in "hostname -I" gives you your IP address in your network.

```
-rw-r--r-- 1 root root  0 Aug 25 05:21 file1.txt
root@tryit-civil:~# chmod 771 file1.txt
root@tryit-civil:~# ls -la
total 0
drwx----- 1 root root  40 Aug 25 05:21 .
drwxr-xr-x 1 root root 140 Aug 25 05:07 ..
drwxr-x--- 1 root root   6 Aug 25 05:07 .config
drwx----- 1 root root  30 Aug 25 05:07 .ssh
-rwxrwx--x 1 root root   0 Aug 25 05:21 file1.txt
root@tryit-civil:~# hostname
tryit-civil
root@tryit-civil:~#
```

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```
-rw-r--r-- 1 root root  0 Aug 25 05:21 file1.txt
root@tryit-civil:~# chmod 771 file1.txt
root@tryit-civil:~# ls -la
total 0
drwx----- 1 root root  40 Aug 25 05:21 .
drwxr-xr-x 1 root root 140 Aug 25 05:07 ..
drwxr-x--- 1 root root   6 Aug 25 05:07 .config
drwx----- 1 root root  30 Aug 25 05:07 .ssh
-rwxrwx--x 1 root root   0 Aug 25 05:21 file1.txt
root@tryit-civil:~# hostname
tryit-civil
root@tryit-civil:~#
```

# Maintaining Software Using RPM (Red Hat Package Manager) in Linux

RPM is a powerful software manager which can be used to build, install, query, verify, update, and uninstall individual software packages.

An RPM package consists of an archive of files, and package information such as name, version, a description and information about dependencies on other RPM packages. RPM is more than a Red Hat specific tool. Many other modern distributions, such as Ubuntu and SuSE, use RPM too.

## **Benefits of using RPM include:**

- Simplified software distribution, installation, upgrading and removal

- Guarantees that:

  - prerequisite software is installed on system.

  - versions of prerequisite software stay compatible.

  - locally-modified configuration files are not clobbered when the RPM is updated.

  - locally-modified configuration files are saved with an “.rpmsave” suffix if the package is later deleted.

- Allows certification that installed software has not been altered, modified, corrupted, or changed in any way.

# Maintaining Software Using RPM (Red Hat Package Manager) in Linux

## Types of RPM Packages

RPM packages come in two categories:

1. source
2. binary

### Source RPM

A source RPM can always be recognized because the filename ends with the string “.src.rpm”. In a source RPM are not only the original program source code files but scripts that allow the code to be recompiled automatically, to be installed automatically, and to be removed automatically. There are no end-user executable files in a source RPM. Usually, only developers are interested in a source RPM.

### Binary RPM

A binary RPM contains the end-user components of an RPM. Binary RPM filenames identify the host architecture for the contents.

# Maintaining Software Using RPM (Red Hat Package Manager) in Linux

## Installation and Removal

rpm -i or --install ### (install new RPM; error if already installed)  
rpm -U or --upgrade ### (delete existing RPM, if any; install new)  
rpm -F or --freshen ### (update RPM only if package already installed)  
rpm -e or --erase ### (remove, delete, expunge)

## Examples:

rpm -ivh binutils-2.11.90.0.8-12.i386.rpm  
rpm -Uvh finger-0.17-9-i386.rpm  
rpm -Fvh ftp://updates.redhat.com/current/i386/\*.rpm  
rpm -e diffutils  
rpm -e kernel-enterprise-2.4.9-e.12



# User and group management in Linux

Since Linux is a multi-user operating system (in that it allows multiple users on different computers or terminals to access a single system), you will need to know how to perform effective user management: how to add, edit, suspend, or delete user accounts, along with granting them the necessary permissions to do their assigned tasks.

To add a new user account, you can run either of the following two commands as root.

```
# adduser [new_account]
```

```
# useradd [new_account]
```

When a new user account is added to the system, the following operations are performed:

1. His/her home directory is created (/home/username by default).
2. The following hidden files are copied into the user's home directory, and will be used to provide environment variables for his/her user session.  
.bash\_logout .bash\_profile .bashrc
3. A group is created and given the same name as the new user account.

# User and group management in Linux(Conti...)

After adding an account, you can edit the following information (to name a few fields) using the usermod command, whose basic syntax of usermod is as follows:

```
# usermod [options] [username]
```

Setting the expiry date for an account

Use the `--expiredate` flag followed by a date in YYYY-MM-DD format.

```
# usermod --expiredate 2014-10-30 tecmint
```

Adding the user to supplementary groups

Use the combined `-aG`, or `--append --groups` options, followed by a comma separated list of groups.

```
# usermod --append --groups root,users tecmint
```

Displaying the groups an user is a member of

```
# groups tecmint
```

```
# id tecmint
```

# Complete list of Linux commands

Complete set of commands for Linux can be found at

<https://www.loggly.com/wp-content/uploads/2015/05/Linux-Cheat-Sheet-Sponsored-By-Loggly.pdf>

# Summary

In this chapter, we have gone through following topics

- Introduction to Linux
- Basic Linux commands
- Software management in Linux
- User and group management

See you soon...

*Thank You!*