Name- Gaurav Saini
Reg. No- 12114923
Roll No:- RDOC09A62

Assignment- 1
Linux and Shell Scripting
Course Code: CAP 448

Q.1 Explain the command with syntax and example for

(1) Remove a non- empty directory.

Soln (1) To remove a non- empty directory we use the command rm -rf.

Syntax is:

```
rm -rf ${dirName}
rm -rf ${/Path /to /dirName}
```

Note: Be carefull all files will be deleted forever.

For example, the following will deletes all files and sub- directories contained in the movies directory your home directory. Run rm command.

```
rm -rfv movies
```

OR

```
rm -rfv $HOME/movies
```

Since all the files and sub- directories are which contained in the movies directory are deleted permanently.

(11) Check all command used in past

Soln (11) History command is used to view the previously executed command. This feature was not available in the Bourne shell Bash and korn support this feature in which every command executed is treated as the event and is associated with an event number using which they can be recalled and change is required. These Commands are saved in a history file. In Bash shell history command shows the whole list of the command.

Syntax:

$ history

to show the limited number of commands that executed previously as follows:

$ history 6

It will show the last 6 used command.

3. Different ways to create a file

Soln 3 There are various ways of creating files in Linux. All of them have their own purpose and benefits Some are as follows:

1. Cat command

It is the most universal command / tool for creating files on Linux systems we cannot edit a file using the cat command. Major operations that can be done using it are as follows:

To create the files and write the data into them:

```
cat > file1
```

This command creates a new file1 If any file1 with file name file1 exits in the current directory then it is overwritten.

2 touch command:

We can create an empty file (or multiple empty files) using this command But its main purpose is to change or update the time-stamp of a file. Major operations that can be done using it are as follows:

Creating a file:

```
touch filea
cat filea
```

3. gedit command:

Linux's users normally use the command line interface (CLI) for writing or editing the text files

"gedit" stands for GNOME text editor. It's a standard default text editor found in and system with a GNOME desktop environment including Ubuntu, Fedora, Debian, CentOS and Redhat. Using gedit we can create as well as write / edit the text files.

Create a file:

gedit file-2

This comman create a new file file2.

4. Vi Command

Its main function is to edit files. It is commonly used by programmers to edit the textual content of any file on vi text editor. Major operations that can be done using it are as follow.

Create a file

vi file-1

This command create a new file file-1

Note: To save and exit from the vi text editor, press Escape key and then type :wq and hit enter.

5 Nano Command:

It may / may not be found in all distributions of LINUX. We can create as well as edit files. Syntax is:

```
nano file_1
```

Note: To exit nano Text Editor press ctrl + x.

6. mv command:

We normally use mv command to move the files or directories from one palace to another in LINUX system. But we can also use it create new files with the content of some other file on the system. Syntax is:

```
mv File_2 file-3
```

This command creates a new file file-3 with the contents of File-2.

(iv) Usage of more and less Command

Soln (iv) Less Command:

Less command is a linux utility that can be used to read the contents of a text file one page. complete file. but accesses it page by page

Syntax

less filename

For example, if its a large file you are reading it using any text editor, then the complete file will be part by part. which makes it faster

More Command:-

More command is used to view the text files in the command prompt, displaying one screen at a time in case the file is large (for example log files). The more command also allows the user do scroll up and down through the page. The syntax along with options and command is as follows.

Another application of more is to use it with some other command after a pipe.

When the output is large, we can use more command to see output one by one

Syntax:

more [-options] [-num] [+/pattern] [+linenum] [file_name]

(v) Check all disk partition

Soln (v) (i) fdisk

fdisk is the most commonly used command to check the partition on a disk. The fdisk command can display the partition and detail like file system. However it does not report the size of each partitions.

(ii) Sfdisk

Sfdisk is another utility with a purpose similar to fdisk, but with more features. It can display the size of each partition in MB

(iii) Cfdisk :-

Cfdisk is a linux partition editor with an interactive user interface based on ncurse. It can be used to list out the existing partions as well as create or modify them.

(iv) Parted :-

Parted is yet another command line utility to list out partitions and modify them if needed.

(v) df

df is not a partioning utility, but prints out details about only mounted file systems. The list generated by df even includes file systems that are not real disk partition

(vi) pydf

Improved version of df, written in python. Print out all the hard disk partitions in a easy to read

(vii) lsblk :-

List out all the storage blocks, which includes disk partitions and optical drives Details include the size of the partition / block and mount point if any

Does not report the used / free disk space on the partitions.

(viii) blkid :-

Print the block device (partitions and storage media) attribute like uuid and file system type. Does not report the space on the partitions

(ix) hwinfo :-

hwinfo is a general purpose hardware information tool and can be used to print out the disk and partition list.

(x) Inxi :-

Inxi is a very useful command line program that can display information about various hardware components present on the system.

Q 2 How to create a shortcut and take a backup of file in Linux. Explain with the help of suitable commands and syntaxes.

Soln. 2 Backup of file in Linux:

(i) If the file you want to copy already exits in the destination directory, you can backup your existing file with the use of this command

Syntax:

cp --backup <filename><destination Directory>

Example:-

cp --backup File2.txt-/home/ssit-/Downloads

'File2.txt' already exits in the destination directory. Hence, we have created a backup of this file and copied in the same directory (having samename).

Now our destination directory that is 'Downloads' has two files with the same name (that is 'file2.txt')

(ii) dump command:-

dump command in Linux is used for backup the filesystem to some storage

device. It backup the complete file system and not the individual files in the other words, it backups the required files to tape, disk or any other storage device for safe storage. The dump command in Linux works only ext2/ext3 filesystem and not with others like FAT and Reiser FS. One special feature of dump is that it allows incremental backups. Incremental backups means that the user can set up a backup plan according to which the file system will be backed up weekly or only those files will be backed up which have been changed or added recently.

Syntax:

dump [-level #] [-a autosize] [-A file] [-B records] [-b blocksize] [-d density] [-D file] [-e inode numbers] [-E file] [-f file] [-F script] [-h level] [-I nr errors] [-j compression level] [-L label] [-q file] [-s feet] [-T date] [-y] [-z compression level] file-to-dump

dump [-w | -W]

dump Command without any option: It prints the general syntax of the command along with the various option that can be used with the dump command. It also prints the version number of the dump command being used.

## Shortcut of file in Linux:

To create a shortcut (symlink) in the terminal you can use the command.

To create create a symbolic link of folder /home/Documents which is at /mnt/docs!

```
ln -s /home/Documents /mnt/docs
```

If you like to find more about command ln check!

```
man ln
```

Note! Using command ln will create a shortcut with the same name as the original folder.

Once the shortcut is create it can be followed from the context menu!

- Right click on Shortcut (it will appear arrow in the right bottom corner)
- follow link to original file

The Shortcuts are displayed differently from folders.

Another way to create the shortcut would be using the terminal. There are two examples:-

- Create new shortcut (symlink):

  ln -s /path/to file /path/to symlink

  ln -s /home/user/Pictures /home/user/Videos

- Create / update new shortcut (symlink):

  ln -sf /path/to/file /path/to/symlink

  ln -sf /home/user/Pictures /home/user/Videos

Creating a shortcut from right click menu:

Let say that we have folders: pictures and videos our goal is to create link from videos to pictures:

- /home/user/Pictures
- /home/user videos

Steps:

- open parent folder or Pictures or the other folders - /home/user/
- Right click folder Pictures
- Make Link (You may need to press + - next to open - in order to show more commands)
- Copy paste the new link into videos folder

Q.3 Suppose you are an administrator and wants to reboot all user system. Explain all steps to achieve this scenario.

Soln 3 For this scenario there are some way which are discuss below.

(i) Run the systemctl command:

On most modern linux distributions, systemd is the init system, so both rebooting and powering down can be performed through the system user-interface, systemctl. The systemctl command accepts, among many other options, halt (halt disk activity but does not cut power) reboot (halt disk activity, and then cut power). These commands are mostly equivalent to starting the target file of the same name.

for instances, to bigger a reboot:

$ sudo systemctl start reboot.target

(ii) Run the Shutdown Command:

The shutdown command, for instance, can power down your machine, but it has several options to control exactly what that means.

This commands requires a time argument, in minutes, so that shutdown knows when to execute. To reboot immediately. append the -r flag'

$ sudo shutdown -r now

To power down immediately

$ sudo shutdown -P now

Or you can use the Poweroff command

$ Poweroff

To reboot after 10 minutes!

$ sudo shutdown -r 10

The shutdown command is a safe way to power off or reboot your computer, allowing disks to sync and processes to end.

3. Run the reboot command:

The reboot command, on its own, is basically a shortcut to shutdown -r now. From a terminal, this is the easiest and quickest reboot command.

$ sudo reboot

4 Init:

The telinit command is the front-end to your init system. If you are using systemd, then this command is a link to systemctl with the appropriate options.

To power off your computer by sending it into runlevel 0:

$ sudo telinit 0

to reboot using the same method

$ sudo telinit 6

How unsafe this command is for your data depends entirely on your init configuration.

5 Proc:

A step lower than the init system is the /proc filesystem, which is a virtual representation of nearly everything happening on your computer.

An option less likely to fail is using echo to insert information into /proc, manually. First, make sure that the Sysrq system is enabled.

$ sudo echo 1 > proc/sys/kernel/sysrq

To reboot, you can use either Alt+Sysrq+B or type

$ sudo echo b > /proc/sysrq-trigger

This method is not a reasonable way to reboot your machine on a regular basis, but it gets the job done in a pinch.

6. Sysctl:

Kernel parameters can be managed during runtime with sysctl. There are lots of kernel parameters and you can see them all with sysctl --all Most probably don't mean much to you until you know what to look for, and in this case, you're looking for kernel.panic.

You can query kernel parameters using --value option

$ sudo sysctl 1 -- value kernel.panic

If you get a 0 back, then the kernel you're running has no special setting, at least by default, to reboot upon a kernel panic.

You can activate this feature as an experiment

$ sudo sysctl kernel.reboot=1

You can test this by simulating a catastrophic crash with sysrq. First make sure sysrq is enabled:

$ sudo echo1 > /proc/sys/kernel/sysrq

And then simulate a kernel panic

$ sudo echo c > /proc/sysrq-trigger

Your computer reboot immediately.