DHRUV GARG 16 BCE 1190

BASIC LINUX COMMANDS

LAB 1

Aim: To understand and implement file permissions and system admin commands.

FILE PERMISSIONS

1. CHMOD – Change permissions

sudo chmod -R ugo+rw /DATA/SHARE

The breakdown of the above command looks like:

sudo – this is used to **gain admin rights for the command on any system** that makes use of sudo (otherwise you'd have to 'su' to root and run the above command without 'sudo')

chmod – the command to **modify permissions**

-R – this modifies the permission of the **parent folder and the child objects within**

ugo+rw – this gives **User, Group, and Other** read and write access.

Sample screenshots:

Original file permissions:

```
dhruv@dhruv-Inspiron-5559:~$ cd Documents
dhruv@dhruv-Inspiron-5559:~/Documents$ ls -l
total 0
-rw-rw-r-- 1 dhruv dhruv 0 Dec 11 04:39 hello.txt
```

Adding permission write(w) to all (users, groups and others):

```
dhruv@dhruv-Inspiron-5559:~$ sudo chmod -R ugo+w ~/Documents
dhruv@dhruv-Inspiron-5559:~$ cd Documents
dhruv@dhruv-Inspiron-5559:~/Documents$ ls -l
total 0
-rw-rw-rw- 1 dhruv dhruv 0 Dec 11 04:39 hello.txt
```

Removing permission write(w) to all (users, groups and others):

```
dhruv@dhruv-Inspiron-5559:~/Documents$ sudo chmod -R ugo-w ~/Documents
dhruv@dhruv-Inspiron-5559:~/Documents$ ls -l
total 0
-r--r--r-- 1 dhruv dhruv 0 Dec 11 04:39 hello.txt
```

Removing permission write(w) of only “others”:

```
dhruv@dhruv-Inspiron-5559:~/Documents$ sudo chmod -R o-r ~/Documents
dhruv@dhruv-Inspiron-5559:~/Documents$ ls -l
total 0
-r--r----- 1 dhruv dhruv 0 Dec 11 04:39 hello.txt
```

Removing permission write(w) of “users,groups” as well. Thus denied permission when trying to read from “user”:

```
dhruv@dhruv-Inspiron-5559:~/Documents$ sudo chmod -R ug-r ~/Documents
dhruv@dhruv-Inspiron-5559:~/Documents$ ls -l
ls: cannot open directory '.': Permission denied
```

Adding permission read(r) and write(w) to all (users, groups and others):

```
dhruv@dhruv-Inspiron-5559:~/Documents$ sudo chmod -R ugo+rw ~/Documents
dhruv@dhruv-Inspiron-5559:~/Documents$ ls -l
total 0
-rw-rw-rw- 1 dhruv dhruv 0 Dec 11 04:39 hello.txt
```

2. CHOWN – Change ownership

sudo chown -R bethany /DATA/SHARE

The breakdown of the above command looks like:

sudo – admin rights must be used since we are dealing with a folder that belongs to another user

chown – the command for **changing ownership**

-R – the **recursive switch** to make sure **all child objects get the same ownership changes**

bethany – the **new owner** of the folder

/DATA/SHARE – the directory to be modified

Sample screenshots:

No other user was present. Thus error thrown.

```
dhruv@dhruv-Inspiron-5559:~/Documents$ sudo chown -R OSLab ~/Documents
chown: invalid user: ‘OSLab’
```

Adding user using “adduser”

```
dhruv@dhruv-Inspiron-5559:~/Documents$ sudo adduser oslab
Adding user `oslab' ...
Adding new group `oslab' (1001) ...
Adding new user `oslab' (1001) with group `oslab' ...
Creating home directory `/home/oslab' ...
Copying files from `/etc/skel' ...
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
Changing the user information for oslab
Enter the new value, or press ENTER for the default
        Full Name []: OSLab
        Room Number []: none
        Work Phone []: none
        Home Phone []: none
        Other []: none
Is the information correct? [Y/n] Y
```

Now changing ownership using “chown”.

```
dhruv@dhruv-Inspiron-5559:~$ sudo chown -R oslab ~/Documents
[sudo] password for dhruv:
dhruv@dhruv-Inspiron-5559:~$ cd Documents && ls -l
total 0
-rw-rw-rw- 1 oslab dhruv 0 Dec 11 04:39 hello.txt
```

We see that the first name is “oslab” who is the new owner of the file. The second name (Dhruv) is the file’s group.

3. VIEWING PERMISSIONS

$ ls -l /path/to/directory

Character	Effect on files	Effect on directories	
Read permission (first character)	-	The file cannot be read.	The directory's contents cannot be shown.
	r	The file can be read.	The directory's contents can be shown.
Write permission (second character)	-	The file cannot be modified.	The directory's contents cannot be modified.
	w	The file can be modified.	The directory's contents can be modified (create new files or folders; rename or delete existing files or folders); requires the execute permission to be also set, otherwise this permission has no effect.
Execute permission	-	The file cannot be	The directory cannot be accessed with cd.

(third character)		executed.	
	x	The file can be executed.	The directory can be accessed with cd; this is the only permission bit that in practice can be considered to be "inherited" from the ancestor directories, in fact if *any* folder in the path does not have the x bit set, the final file or folder cannot be accessed either, regardless of its permissions; see path_resolution(7) for more information.
	s	The setuid bit when found in the **u**ser triad; the **setgid** bit when found in the **g**roup triad; it is not found in the **o**thers triad; it also implies that x is set.	
	S	Same as s, but x is not set; rare on regular files, and useless on folders.	
	t	The sticky bit; it can only be found in the **o**thers triad; it also implies that x is set.	
	T	Same as t, but x is not set; rare on regular files, and useless on folders.	

Sample screenshot:

```
dhruv@dhruv-Inspiron-5559:~$ ls -l
total 164
-rwxrwxr-x 1 dhruv dhruv 13536 Jan  3 00:51 a.out
drwxr-xr-x 2 dhruv dhruv  4096 Jan  3 16:47 Desktop
drwxr-xr-x 2 dhruv dhruv  4096 Dec 11 04:39 Documents
drwxr-xr-x 2 dhruv dhruv  4096 Dec  8 10:16 Downloads
-rw-r--r-- 1 dhruv dhruv  8980 Dec  8 04:35 examples.desktop
drwxr-xr-x 2 dhruv dhruv  4096 Dec  8 10:16 Music
-rw-rw-r-- 1 dhruv dhruv 98840 Jan  3 00:57 Network_lab2_16BCE1190.odt
-rw-rw-r-- 1 dhruv dhruv  1721 Jan  3 00:50 parityCheck.cpp
drwxr-xr-x 2 dhruv dhruv  4096 Dec  8 10:16 Pictures
drwxr-xr-x 2 dhruv dhruv  4096 Dec  8 10:16 Public
drwxr-xr-x 2 dhruv dhruv  4096 Dec  8 10:16 Templates
drwxr-xr-x 2 dhruv dhruv  4096 Dec  8 10:16 Videos
dhruv@dhruv-Inspiron-5559:~$ cd Downloads
dhruv@dhruv-Inspiron-5559:~/Downloads$ ls -l
total 0
dhruv@dhruv-Inspiron-5559:~/Downloads$ cd ..
dhruv@dhruv-Inspiron-5559:~$ cd Documents
dhruv@dhruv-Inspiron-5559:~/Documents$ ls -l
total 0
-rw-rw-r-- 1 dhruv dhruv 0 Dec 11 04:39 hello.txt
```

Note: The screenshot for “$ls –l” was taken before “chown”. Hence it is still showing the old owner.

SYSTEM ADMIN COMMANDS

4. UPTIME

#uptime

In Linux **uptime** command shows since how long your system is running and the number of users are currently logged in.

```
dhruv@dhruv-Inspiron-5559:~$ uptime
 17:21:25 up 34 min,  2 users,  load average: 0.25, 0.32, 0.28
```

5. W Command

 # w

It will displays users currently logged in and their process along-with shows **load averages**. also shows the **login name**, **tty name**, **remote host**, **login time**, **idle time**, **JCPU**, **PCPU**, command and processes.

```
dhruv@dhruv-Inspiron-5559:~$ w
 17:22:11 up 35 min,  2 users,  load average: 0.36, 0.34, 0.29
USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
dhruv    tty7     :0               16:47   35:23  52.56s  0.15s /sbin/upstart -
oslab    tty8     :1               17:19   35:23   1.76s  0.15s /sbin/upstart -
```

6. USERS Command

#users

Users command displays currently logged in users.

```
dhruv@dhruv-Inspiron-5559:~$ users
dhruv oslab
```