File permissions in Linux

Project description

The project is based on understanding the Linux file permissions. This project is to display and change file permissions of various different files and directories
This project uses various command like ls, chmod

Check file and directory details

In the above screenshot, the command used to display permissions is `ls -lah`
`ls` is a command used to the available files and directories in Linux
-l flag is used to show a long listing
-a is used to display all the files and directories including the hidden ones
-h flag is used to display the size in a human readable manner

Describe the permissions string

```
researcher2@60792e6be18e:~/projects$
researcher2@60792e6be18e:~/projects$ ls -lah
total 32K      Permissions
drwxr-xr-x 3 researcher2 research_team 4.0K Jun 27 03:43 .
drwxr-xr-x 3 researcher2 research_team 4.0K Jun 27 04:04 ..
-rw--w---- 1 researcher2 research_team   46 Jun 27 03:43 .project_x.txt
drwx--x--- 2 researcher2 research_team 4.0K Jun 27 03:43 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Jun 27 03:43 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Jun 27 03:43 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun 27 03:43 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun 27 03:43 project_t.txt
researcher2@60792e6be18e:~/projects$
```

In the permissions list,

d tells us if it is a directory. If it is a file - is shown instead of d.

The 1st three rwx represents the read, write and execute permissions for the owner of the file

The 2nd three rwx represents the read, write and execute permissions for the group

The 3rd three rwx represents the read, write and execute permissions for others

Change file permissions

```
researcher2@60792e6be18e:~/projects$ ls -lah
total 32K
drwxr-xr-x 3 researcher2 research_team 4.0K Jun 27 03:43 .
drwxr-xr-x 3 researcher2 research_team 4.0K Jun 27 04:04 ..
-rw--w---- 1 researcher2 research_team   46 Jun 27 03:43 .project_x.txt
drwx--x--- 2 researcher2 research_team 4.0K Jun 27 03:43 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Jun 27 03:43 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Jun 27 03:43 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun 27 03:43 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun 27 03:43 project_t.txt
researcher2@60792e6be18e:~/projects$ chmod u+x,g-r,o-w project_k.txt
researcher2@60792e6be18e:~/projects$ ls -la
total 32                           Command used
drwxr-xr-x 3 researcher2 research_team 4096 Jun 27 03:43 .
drwxr-xr-x 3 researcher2 research_team 4096 Jun 27 04:04 ..
-rw--w---- 1 researcher2 research_team   46 Jun 27 03:43 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jun 27 03:43 drafts
-rwx-w-r-- 1 researcher2 research_team   46 Jun 27 03:43 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Jun 27 03:43 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun 27 03:43 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun 27 03:43 project_t.txt
researcher2@60792e6be18e:~/projects$
researcher2@60792e6be18e:~/projects$
```

The chmod command is used to change file permissions

The u+x is used to give user the execute permission to the file

The g-r is used to remove read permissions for group of the file

The o-w is used to remove write permissions for others

Change file permissions on a hidden file

```
researcher2@60792e6be18e:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jun 27 03:43 .
drwxr-xr-x 3 researcher2 research_team 4096 Jun 27 04:04 ..    Permission initially
-rw--w---- 1 researcher2 research_team   46 Jun 27 03:43 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jun 27 03:43 drafts
-rwX-w-r-- 1 researcher2 research_team   46 Jun 27 03:43 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Jun 27 03:43 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun 27 03:43 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun 27 03:43 project_t.txt
researcher2@60792e6be18e:~/projects$ chmod u-w,g+r,o+r,o+w .project_x.txt
researcher2@60792e6be18e:~/projects$ ls -la        Command used
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jun 27 03:43 .
drwxr-xr-x 3 researcher2 research_team 4096 Jun 27 04:04 ..  Permission changed
-r--rw-rw- 1 researcher2 research_team   46 Jun 27 03:43 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jun 27 03:43 drafts
-rwX-w-r-- 1 researcher2 research_team   46 Jun 27 03:43 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Jun 27 03:43 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun 27 03:43 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun 27 03:43 project_t.txt
researcher2@60792e6be18e:~/projects$
researcher2@60792e6be18e:~/projects$
```

Here project_x.txt is a hidden file as it starts with a period(.)

The chmod command is used to change file permissions

The u-w is used to remove write permissions from the user of the file

The g+r is used to add read permissions for group of the file

The o+r is used to add read permissions for others

The o+w is used to add write permissions for others

The file name with a period is given at the last to specify the change in permission of the hidden file

Change directory permissions

```
researcher2@60792e6be18e:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jun 27 03:43 .
drwxr-xr-x 3 researcher2 research_team 4096 Jun 27 04:04 .   Initial permission
-r--rw-rw- 1 researcher2 research_team   46 Jun 27 03:43 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jun 27 03:43 drafts
-rwx-w-r-- 1 researcher2 research_team   46 Jun 27 03:43 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Jun 27 03:43 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun 27 03:43 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun 27 03:43 project_t.txt
researcher2@60792e6be18e:~/projects$ chmod u-x,g+r,g+w,o+r drafts/
researcher2@60792e6be18e:~/projects$ ls -al      Command used
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jun 27 03:43 .
drwxr-xr-x 3 researcher2 research_team 4096 Jun 27 04:04 .   Permission changed
-r--rw-rw- 1 researcher2 research_team   46 Jun 27 03:43 .project_x.txt
drw-rwxr-- 2 researcher2 research_team 4096 Jun 27 03:43 drafts
-rwx-w-r-- 1 researcher2 research_team   46 Jun 27 03:43 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Jun 27 03:43 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun 27 03:43 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun 27 03:43 project_t.txt
researcher2@60792e6be18e:~/projects$
```

Here drafts/ is a directory as

The chmod command is used to change directory permissions

The u-x is used to remove execute permissions from the user of the directory

The g+r is used to add read permissions for group of the directory

The g+w is used to add write permissions for group of the directory

The o+r is used to add read permissions for others

The drafts/ after the command is used to specify the directory name

Summary

The ls -la command is used to list all the files and directories and view all their permissions

The chmod command is used to change permissions of files and directories

. infront of file makes it a hidden file

d in the permission specifies that it is a directory

+   ls used to add permissions

-    ls used to remove permissions

u = user, g = group, o = others

r = read, w = write, x = execute