File permissions in Linux

Project description

When utilizing Linux commands, it is possible to create, edit, and delete files and directories within the root. Furthermore, the permissions of these files and directories can be modified for owner, group, and other user categories.

Check file and directory details

```
researcher2@a6fdc1771417:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jun  7 09:06 .
drwxr-xr-x 3 researcher2 research_team 4096 Jun  7 09:30 ..
-rw--w---- 1 researcher2 research_team   46 Jun  7 09:06 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jun  7 09:06 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Jun  7 09:06 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Jun  7 09:06 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun  7 09:06 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun  7 09:06 project_t.txt
researcher2@a6fdc1771417:~/projects$
```

I examined the permissions of all files within the project's directory, including hidden files. I utilized the **"ls"** command to list the contents of the projects directory and appended the **"-la"** option to display the permissions of all files within the directory including the hidden ones.

Describe the permissions string

The permissions string for every file/directory are all the same it is `drwxrwxrwx`. For example in this screenshot :

```
drwx--x--- 2 researcher2 research_team 4096 Jun  7 09:06 drafts
```

The first letter **d** means that it is a directory and not a file if it is a file then it will be just a hyphen. The second to fourth letter indicates that the current user can **r** - read, **w** - write, and **-** because the owner type **user's permission** to execute is prohibited. The fifth to seventh letters are **-x** meaning that the owner type **group's permissions** are to execute only the file. Lastly, the eighth to tenth letters are all hyphenated because for owner type **other's permissions** are prohibited since the drafts directory in this scenario is a confidential file.

Change file permissions

```
researcher2@a6fdc1771417:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jun  7 09:06 .
drwxr-xr-x 3 researcher2 research_team 4096 Jun  7 09:30 ..
-rw--w---- 1 researcher2 research_team   46 Jun  7 09:06 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jun  7 09:06 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Jun  7 09:06 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Jun  7 09:06 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun  7 09:06 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun  7 09:06 project_t.txt
researcher2@a6fdc1771417:~/projects$ chmod o-w project_k.txt
researcher2@a6fdc1771417:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jun  7 09:06 .
drwxr-xr-x 3 researcher2 research_team 4096 Jun  7 09:30 ..
-rw--w---- 1 researcher2 research_team   46 Jun  7 09:06 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jun  7 09:06 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Jun  7 09:06 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Jun  7 09:06 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun  7 09:06 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun  7 09:06 project_t.txt
researcher2@a6fdc1771417:~/projects$
```

In this screenshot, I changed the project_k.txt file permissions to the owner group **others** to prohibit them from writing since it's incorrect permission and I fixed the unauthorized access.

Change file permissions on a hidden file

```
researcher2@a6fdc1771417:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jun  7 09:06 .
drwxr-xr-x 3 researcher2 research_team 4096 Jun  7 09:30 ..
-rw--w---- 1 researcher2 research_team   46 Jun  7 09:06 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jun  7 09:06 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Jun  7 09:06 project_k.txt
-rw------- 1 researcher2 research_team   46 Jun  7 09:06 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun  7 09:06 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun  7 09:06 project_t.txt
researcher2@a6fdc1771417:~/projects$ chmod u-w,g+r,g-w .project_x.txt
researcher2@a6fdc1771417:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jun  7 09:06 .
drwxr-xr-x 3 researcher2 research_team 4096 Jun  7 09:30 ..
-r--r----- 1 researcher2 research_team   46 Jun  7 09:06 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jun  7 09:06 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Jun  7 09:06 project_k.txt
-rw------- 1 researcher2 research_team   46 Jun  7 09:06 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun  7 09:06 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun  7 09:06 project_t.txt
researcher2@a6fdc1771417:~/projects$ 
```

In this screenshot, I changed permissions for the hidden file `.projectx.txt`. Initially, the permissions for the hidden file is `-rw-w--` meaning that the owner-type **user** can read and write the file, and the owner-type **group** can only write. It is supposed to be that the file will only be read-only so I changed the permissions of both users using the `chmod u-w,g+r,g-w .project_x.txt.`

Change directory permissions

```
researcher2@a6fdc1771417:~/projects$ ls -l
total 20
drwx--x--- 2 researcher2 research_team 4096 Jun  7 09:06 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Jun  7 09:06 project_k.txt
-rw------- 1 researcher2 research_team   46 Jun  7 09:06 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun  7 09:06 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun  7 09:06 project_t.txt
researcher2@a6fdc1771417:~/projects$ chmod g-x drafts
researcher2@a6fdc1771417:~/projects$ ls -l
total 20
drwx------ 2 researcher2 research_team 4096 Jun  7 09:06 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Jun  7 09:06 project_k.txt
-rw------- 1 researcher2 research_team   46 Jun  7 09:06 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun  7 09:06 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun  7 09:06 project_t.txt
researcher2@a6fdc1771417:~/projects$
```

In this screenshot, I changed the permissions of the folder drafts so only the owner-type **user** can access it. So initially the current permissions for the drafts folder is `drwx-x—` meaning that the owner-type user can read, write, and execute, and then the owner-type group can execute. So I changed the permissions of the drafts folder so only the owner-type **user** can access it using the `chmod g-x drafts` command which removes the permissions of the owner-type **group** to access it.

Summary

I have mastered checking the permissions of files and folders in the current directory. Next, I learned to identify hidden files within a directory. After thoroughly checking the permissions of every file, I successfully mastered changing the permissions of each file in the directory.