File permissions in Linux

Project description

In this project I show and change file permissions in Linux. I use the ls -l command to list file details including file permission and ls -al to list including hidden files. I also describe the 10 character permission string. Lastly I show how to change permissions using chmod and +/- commands.

Check file and directory details

To check file and directory details you use the ls -l command and to include hidden files, use the ls -al command. This will also check permissions.

```
researcher2@acc897eedc74:~/projects$ ls -al
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jan  5 17:08 .
drwxr-xr-x 3 researcher2 research_team 4096 Jan  5 18:25 ..
-rw--w---- 1 researcher2 research_team   46 Jan  5 17:08 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jan  5 17:08 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Jan  5 17:08 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Jan  5 17:08 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jan  5 17:08 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jan  5 17:08 project_t.txt
researcher2@acc897eedc74:~/projects$
```

Describe the permissions string

The 10 character permission string for the project_k.txt file is -rw-rw-rw-.
The first director describes the file type, a hyphen means that is a regular file and a d would mean it is a directory.
The following three characters, rw-, describe the permissions for the user if they are the owner of the file, that is the creator. In this case, they are only allowed to read and write. The hyphen can be replaced by x which is ‘execute’ if the owner was permitted.
The following 3 characters describe the permissions for Group, that is several users and they are allowed to read and write but not permitted to execute.
The last 3 characters describe permissions for Other, that is, all other users in the system and in this case they are also only allowed to read and write and not to execute.

Change file permissions

Others are not allowed to write files. The file project_k.txt allows others to write on files therefore permissions must be changed. In order to change permissions, use the chmod o-w project_k.txt command. Chmod changes the mod and o-w is removing write permission from others and at the end you specify the file name. Once you run the instruction and check file details the write permission is removed from the file.

```
researcher2@acc897eedc74:~/projects$ chmod o-w project_k.txt
researcher2@acc897eedc74:~/projects$ ls -al
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jan  5 17:08 .
drwxr-xr-x 3 researcher2 research_team 4096 Jan  5 18:25 ..
-rw--w---- 1 researcher2 research_team   46 Jan  5 17:08 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jan  5 17:08 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Jan  5 17:08 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Jan  5 17:08 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jan  5 17:08 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jan  5 17:08 project_t.txt
researcher2@acc897eedc74:~/projects$
```

Change file permissions on a hidden file

In order to change permission for hidden files, I used the same command as before with one minor change. I added a period before the hidden file name. Since I am changing permissions multiple times, I used commas. When I listed the file details, write permissions were removed from the owner and group and read permissions were added to the group.

```
researcher2@7b54f61a962b:~/projects$ chmod u-w,g-w,g+r .project_x.txt
researcher2@7b54f61a962b:~/projects$ ls -al
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jan  5 18:55 .
drwxr-xr-x 3 researcher2 research_team 4096 Jan  5 19:26 ..
-r--r----- 1 researcher2 research_team   46 Jan  5 18:55 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jan  5 18:55 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Jan  5 18:55 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Jan  5 18:55 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jan  5 18:55 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jan  5 18:55 project_t.txt
researcher2@7b54f61a962b:~/projects$
```

Change directory permissions

The user researcher2 is the only one allowed to access the drafts directory. In order to make sure that is possible I removed the execution permission from the group. I used the chmod g-x drafts command.

```
researcher2@7b54f61a962b:~/projects$ chmod g-x drafts
researcher2@7b54f61a962b:~/projects$ ls -al
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jan  5 18:55 .
drwxr-xr-x 3 researcher2 research_team 4096 Jan  5 19:26 ..
-r--r----- 1 researcher2 research_team   46 Jan  5 18:55 .project_x.txt
drwx------ 2 researcher2 research_team 4096 Jan  5 18:55 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Jan  5 18:55 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Jan  5 18:55 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jan  5 18:55 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jan  5 18:55 project_t.txt
researcher2@7b54f61a962b:~/projects$
```

Summary

In this task I was changing permissions according to the provided scenarios. Firstly, I list the file details for the projects directory. Secondly, I removed the write permission from the project_k.txt file. Then, I remove write permissions from group and user and add read permission to the group for the hidden file, that is .project_x.txt file. Lastly, I removed the execution permission from the group in the directory drafts as it is only supposed to be accessed by researcher2.