File permissions in Linux

Project description

This project involves configuring and managing file permissions in Linux to ensure secure and appropriate access control across multiple projects.

Check file and directory details

```
researcher2@0d312ff0ba78:~$ cd projects
researcher2@0d312ff0ba78:~/projects$ ls -l
total 20
drwx--x--- 2 researcher2 research_team 4096 Oct 28 13:26 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Oct 28 13:26 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Oct 28 13:26 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Oct 28 13:26 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Oct 28 13:26 project_t.txt
researcher2@0d312ff0ba78:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Oct 28 13:26 .
drwxr-xr-x 3 researcher2 research_team 4096 Oct 28 14:20 ..
-rw--w---- 1 researcher2 research_team   46 Oct 28 13:26 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Oct 28 13:26 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Oct 28 13:26 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Oct 28 13:26 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Oct 28 13:26 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Oct 28 13:26 project_t.txt
researcher2@0d312ff0ba78:~/projects$ chmod o-w project_k.txt
researcher2@0d312ff0ba78:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Oct 28 13:26 .
drwxr-xr-x 3 researcher2 research_team 4096 Oct 28 14:20 ..
-rw--w---- 1 researcher2 research_team   46 Oct 28 13:26 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Oct 28 13:26 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Oct 28 13:26 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Oct 28 13:26 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Oct 28 13:26 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Oct 28 13:26 project_t.txt
```

Describe the permissions string

The first string starting with drwx is a directory where the user has read, write and execute capabilities. The group has only the execute permission and the other group has no permissions at all.

Change file permissions

File project_m.txt is a restricted file and should not be readable or writable by the group or other; only the user should have these permissions on this specific file. File project_k.txt needs permissions changed to reflect that the owner does not have write permissions.

We can see on the above picture screenshot that the string that contains project_m.txt has been changed using the chmod command so that the group not longer shows a (r) or a (w).

Project_k.txt now shows that the permissions for writing capabilities has been changed to a (-) for the user, this removes that specific permission.

Change file permissions on a hidden file

File project_x.txt is a hidden file that has been archived and should not have the permission of written to by anyone. The user and group should both have the permission to read the file.

In the screenshot provided below, we can see that in order to make the necessary changes, I was able to use the command (chmod u-w,g-w,g+r .project_x.txt). This removes the writing capabilities from the user and the group, while the (g+r) adds the reading permission to the group.

```
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Oct 28 13:26 .
drwxr-xr-x 3 researcher2 research_team 4096 Oct 28 14:20 ..
-rw--w---- 1 researcher2 research_team   46 Oct 28 13:26 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Oct 28 13:26 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Oct 28 13:26 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Oct 28 13:26 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Oct 28 13:26 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Oct 28 13:26 project_t.txt
researcher2@0d312ff0ba78:~/projects$ chmod g-r project_m.txt
researcher2@0d312ff0ba78:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Oct 28 13:26 .
drwxr-xr-x 3 researcher2 research_team 4096 Oct 28 14:20 ..
-rw--w---- 1 researcher2 research_team   46 Oct 28 13:26 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Oct 28 13:26 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Oct 28 13:26 project_k.txt
-rw------- 1 researcher2 research_team   46 Oct 28 13:26 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Oct 28 13:26 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Oct 28 13:26 project_t.txt
researcher2@0d312ff0ba78:~/projects$ chmod u-w,g-w,g+r .project_x.txt
researcher2@0d312ff0ba78:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Oct 28 13:26 .
drwxr-xr-x 3 researcher2 research_team 4096 Oct 28 14:20 ..
-r--r----- 1 researcher2 research_team   46 Oct 28 13:26 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Oct 28 13:26 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Oct 28 13:26 project_k.txt
-rw------- 1 researcher2 research_team   46 Oct 28 13:26 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Oct 28 13:26 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Oct 28 13:26 project_t.txt
```

Summary

The permissions string, such as drwxr-xr-x, indicates the type and access rights of a file or directory, with the first character representing the type and the following nine characters split into three groups for owner, group, and others. For example, a directory with drwx means the user has read, write, and execute permissions; the group has only execute permissions; and others have no permissions. File permissions can be changed using the chmod command to restrict or grant access—for instance, removing write and read permissions for specific users or groups on files like project_m.txt, project_k.txt, and hidden files such as .project_x.txt. These modifications help control who can view or modify the files in a Linux system.