File permissions in Linux

Project description

In this project, I am asked to examen and modify file permissions on a Linux system within the /home/researcher2/projects directory. This involves checking current permissions, understanding permission strings, changing permissions for specific files and directories, and making sure of proper access control according to organizational policies.

Check file and directory details

To check the permissions set for files and subdirectories in the projects directory and display all permissions, including hidden files, the following command can be used:
ls -la

- This command lists all hidden/non-hidden files and directories along with their permissions in the projects directory.

```
researcher2@8d9ffd50e226:~$ pwd
/home/researcher2
researcher2@8d9ffd50e226:~$ ls
projects
researcher2@8d9ffd50e226:~$ cd projects
researcher2@8d9ffd50e226:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Mar 15 22:46 .
drwxr-xr-x 3 researcher2 research_team 4096 Mar 15 23:37 ..
-rw--w---- 1 researcher2 research_team   46 Mar 15 22:46 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Mar 15 22:46 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Mar 15 22:46 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Mar 15 22:46 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Mar 15 22:46 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Mar 15 22:46 project_t.txt
researcher2@8d9ffd50e226:~/projects$ 
```

Based on this screenshot, you can observe a directory named drafts, a hidden file titled .project_x.txt, and an additional five project files.

Describe the permissions string

The permissions string consists of 10 characters representing the permissions for the owner, group, and others. Each character represents a specific permission: 'r' for read, 'w' for write, and 'x' for execute. The initial character in the permission string indicates whether it is a directory, denoted by "d," or a regular file, represented by "-". For example, the string "-rw-rw-r--" from the file project_r.txt indicates read and write permissions for the owner and group, and read-only permission for others.

Change file permissions

To adhere to the organization's policy, I utilized the file permissions I had previously obtained to identify that "**project_k.txt**" needed its write access revoked for the group others. This was achieved by executing the chmod command:

chmod o-w project_k.txt

- The first part of the chmod command shows what permissions to change, while the second part indicates the file or directory where the changes should be made.This command effectively removes the write permission for others on the specified file.

```
researcher2@8d9ffd50e226:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Mar 15 22:46 .
drwxr-xr-x 3 researcher2 research_team 4096 Mar 15 23:37 ..
-rw--w---- 1 researcher2 research_team   46 Mar 15 22:46 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Mar 15 22:46 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Mar 15 22:46 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Mar 15 22:46 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Mar 15 22:46 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Mar 15 22:46 project_t.txt
researcher2@8d9ffd50e226:~/projects$ chmod o-w  project_k.txt
researcher2@8d9ffd50e226:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Mar 15 22:46 .
drwxr-xr-x 3 researcher2 research_team 4096 Mar 15 23:37 ..
-rw--w---- 1 researcher2 research_team   46 Mar 15 22:46 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Mar 15 22:46 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Mar 15 22:46 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Mar 15 22:46 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Mar 15 22:46 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Mar 15 22:46 project_t.txt
researcher2@8d9ffd50e226:~/projects$ 
```

Change file permissions on a hidden file

The research team archived project_x.txt, wanting to restrict write access while allowing read access for the user and group. To modify the permissions of the drafts directory so that only researcher2 has access, the command is:

chmod g-w,u-w .project_x.txt

- This command sets read-only permissions for the user and group on the hidden file.

```
researcher2@8d9ffd50e226:~/projects$ chmod g-w,u-w .project_x.txt
researcher2@8d9ffd50e226:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Mar 15 22:46 .
drwxr-xr-x 3 researcher2 research_team 4096 Mar 15 23:37 ..
-r-------- 1 researcher2 research_team   46 Mar 15 22:46 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Mar 15 22:46 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Mar 15 22:46 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Mar 15 22:46 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Mar 15 22:46 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Mar 15 22:46 project_t.txt
researcher2@8d9ffd50e226:~/projects$
```

Change directory permissions

The drafts directory and its contents should only be accessible to the researcher2 user, with no other users having execute permissions. To modify the permissions of the drafts directory so that only researcher2 has access, the command is:

chmod u=rwx,go= drafts

- This command sets read, write, and execute permissions for the user (researcher2) and no permissions for the group and others on the drafts directory.

```
researcher2@8d9ffd50e226:~/projects$ chmod u=rwx,go= drafts
researcher2@8d9ffd50e226:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Mar 15 22:46 .
drwxr-xr-x 3 researcher2 research_team 4096 Mar 15 23:37 ..
-r-------- 1 researcher2 research_team   46 Mar 15 22:46 .project_x.txt
drwx------ 2 researcher2 research_team 4096 Mar 15 22:46 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Mar 15 22:46 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Mar 15 22:46 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Mar 15 22:46 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Mar 15 22:46 project_t.txt
researcher2@8d9ffd50e226:~/projects$
```

Summary

I adjusted various permissions in the projects directory to align with my organization's requirements. I checked the directory's permissions using ls -la, which guided my subsequent actions. Using the chmod command multiple times, I then altered permissions for files and directories. This project focused on inspecting, detailing, and adjusting file permissions through Linux commands to follow organizational security policies, appropriate access control and security standards within the project's directory.