File permissions in Linux

Project description

Through Linux commands, I examine and modify file system permissions to ensure that users on the research team have the appropriate authorization and remove any unauthorized access.

Check file and directory details.

```
researcher2@8fdb3013a607:~$ ls
projects
researcher2@8fdb3013a607:~$ cd projects
researcher2@8fdb3013a607:~/projects$ ls -a
.  ..  .project_x.txt  drafts  project_k.txt  project_m.txt  project_r.txt  project_t.txt
researcher2@8fdb3013a607:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jan 16 16:35 .
drwxr-xr-x 3 researcher2 research_team 4096 Jan 16 17:22 ..
-rw--w---- 1 researcher2 research_team   46 Jan 16 16:35 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jan 16 16:35 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Jan 16 16:35 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Jan 16 16:35 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jan 16 16:35 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jan 16 16:35 project_t.txt
researcher2@8fdb3013a607:~/projects$
```

Describe the permissions string.

1st character: Indicates the file type. "d" signifies a directory, while a hyphen "-" indicates a regular file.

2nd-4th characters: Represent read (r), write (w), and execute (x) permissions for the user. A hyphen (-) indicates the absence of that permission for the user.

5th-7th characters: Represent read (r), write (w), and execute (x) permissions for the group. A hyphen (-) indicates the absence of that permission for the group.

8th-10th characters: Represent read (r), write (w), and execute (x) permissions for others (users on the system apart from the owner and group). A hyphen (-) indicates the absence of that permission for others.

Change file permissions.

```
researcher2@565f7ee4afc5:~/projects$ chmod o-w project_k.txt
researcher2@565f7ee4afc5:~/projects$ chmod g-r project_m.txt
researcher2@565f7ee4afc5:~/projects$ ls -l
total 20
drwx--x--- 2 researcher2 research_team 4096 Jan 16 17:10 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Jan 16 17:10 project_k.txt
-rw------- 1 researcher2 research_team   46 Jan 16 17:10 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jan 16 17:10 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jan 16 17:10 project_t.txt
researcher2@565f7ee4afc5:~/projects$
```

In the chmod command, u sets the permissions for the user who owns the file, g sets the permissions for the group that owns the file, and o sets the permissions for others.

Change file permissions on a hidden file.

```
researcher2@565f7ee4afc5:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jan 16 17:10 .
drwxr-xr-x 3 researcher2 research_team 4096 Jan 16 17:35 ..
-rw--w---- 1 researcher2 research_team   46 Jan 16 17:10 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jan 16 17:10 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Jan 16 17:10 project_k.txt
-rw------- 1 researcher2 research_team   46 Jan 16 17:10 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jan 16 17:10 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jan 16 17:10 project_t.txt
researcher2@565f7ee4afc5:~/projects$ chmod u-w,g-w,g+r .project_x.txt
researcher2@565f7ee4afc5:~/projects$
```

The -l denotes the list of properties along with the permissions, while the -a denotes the visibility of hidden files.

Change directory permissions.

```
researcher2@565f7ee4afc5:~/projects$ chmod g-x drafts
researcher2@565f7ee4afc5:~/projects$ ls -l
total 20
drwx------ 2 researcher2 research_team 4096 Jan 16 17:10 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Jan 16 17:10 project_k.txt
-rw------- 1 researcher2 research_team   46 Jan 16 17:10 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jan 16 17:10 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jan 16 17:10 project_t.txt
researcher2@565f7ee4afc5:~/projects$
```

Each MODE is of the form '[ugoa]*([-+=]([rwxXst]*|[ugo]))+|[-+=][0-7]+'.

Summary

In the given tasks, I modified file and directory permissions using the chmod command. I removed execute permission for the group from the "drafts" directory, adjusted permissions for ".project_x.txt" to allow read access for the user and group while restricting write permissions, and restricted both read and write permissions for the group on "project_m.txt".

Additionally, I further restricted write permissions for the owner type of others on "project_m.txt". Lastly, I explored the permissions of the "projects" directory and its contents using the ls -l command, ensuring proper access control in the specified Linux environment.