File permissions in Linux

Project description

In this project I will explain the control of file permissions in linux, this is a critical area where confidentiality and integrity of the files must be secured.

Check file and directory details

ls -la is the command to use for showing the permissions and the hidden files of the directory

```
researcher2@b6341141b09b:~$ pwd
/home/researcher2
researcher2@b6341141b09b:~$ ls
projects
researcher2@b6341141b09b:~$ cd projects
researcher2@b6341141b09b:~/projects$ ls
drafts  project_k.txt  project_m.txt  project_r.txt  project_t.txt
researcher2@b6341141b09b:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug  6 16:57 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug  6 16:59 ..
-rw--w---- 1 researcher2 research_team   46 Aug  6 16:57 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug  6 16:57 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Aug  6 16:57 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Aug  6 16:57 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug  6 16:57 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug  6 16:57 project_t.txt
researcher2@b6341141b09b:~/projects$
```

Describe the permissions string

Permission in linux are 10 characters **drwxrwxrwx** first d indicate a directory.
r for read , w for write and x for execute. Lets's take a look at file project_t.txt it shows
-rw-rw-r-- first - indicate that is not a directory but instead a normal file
From 2 to 4 for user which indicate user can read and write but not execute
From 5 to 7 for group which also indicate that group read and write but no execute
From 8 to 10 for other here the permission are different as it granted only read but no write or execute

Change file permissions

```
researcher2@e560293e07b3:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug  6 19:11 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug  6 19:13 ..
-rw--w---- 1 researcher2 research_team   46 Aug  6 19:11 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug  6 19:11 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Aug  6 19:11 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Aug  6 19:11 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug  6 19:11 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug  6 19:11 project_t.txt
researcher2@e560293e07b3:~/projects$ chmod u+x project_t.txt
researcher2@e560293e07b3:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug  6 19:11 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug  6 19:13 ..
-rw--w---- 1 researcher2 research_team   46 Aug  6 19:11 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug  6 19:11 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Aug  6 19:11 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Aug  6 19:11 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug  6 19:11 project_r.txt
-rwxrw-r-- 1 researcher2 research_team   46 Aug  6 19:11 project_t.txt
researcher2@e560293e07b3:~/projects$
```

Change file permissions on a hidden file

```
researcher2@e560293e07b3:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug  6 19:11 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug  6 19:13 ..
-rwxrw---- 1 researcher2 research_team   46 Aug  6 19:11 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug  6 19:11 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Aug  6 19:11 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Aug  6 19:11 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug  6 19:11 project_r.txt
-rwxrw-r-- 1 researcher2 research_team   46 Aug  6 19:11 project_t.txt
researcher2@e560293e07b3:~/projects$ chmod u=r,g=r .project_x.txt
researcher2@e560293e07b3:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug  6 19:11 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug  6 19:13 ..
-r--r----- 1 researcher2 research_team   46 Aug  6 19:11 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug  6 19:11 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Aug  6 19:11 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Aug  6 19:11 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug  6 19:11 project_r.txt
-rwxrw-r-- 1 researcher2 research_team   46 Aug  6 19:11 project_t.txt
researcher2@e560293e07b3:~/projects$
```

The chmod command is used to change the permissions like I did here with .project_x.txt file I changed the user and group permissions to be read only with that enforcing the permission control is critical to the organization.

Change directory permissions

```
researcher2@e560293e07b3:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug  6 19:11 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug  6 19:13 ..
-r--r----- 1 researcher2 research_team   46 Aug  6 19:11 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug  6 19:11 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Aug  6 19:11 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Aug  6 19:11 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug  6 19:11 project_r.txt
-rwxrw-r-- 1 researcher2 research_team   46 Aug  6 19:11 project_t.txt
researcher2@e560293e07b3:~/projects$ chmod g-x drafts
researcher2@e560293e07b3:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug  6 19:11 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug  6 19:13 ..
-r--r----- 1 researcher2 research_team   46 Aug  6 19:11 .project_x.txt
drwx------ 2 researcher2 research_team 4096 Aug  6 19:11 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Aug  6 19:11 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Aug  6 19:11 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug  6 19:11 project_r.txt
-rwxrw-r-- 1 researcher2 research_team   46 Aug  6 19:11 project_t.txt
researcher2@e560293e07b3:~/projects$
```

Here I modifyed the permissions for drafts to be only accessed only for user because of that I had to change the permissions for goup to be non-execute.

Summary

In summary I explained how to show the permissions and hidden files using ls -la command on that directory and I also explained the chmod command that let us change the permissions on the files. In the end file permission control the is a critical thing for any organization these files may contine sensitive information that can harm the organization if it’s leaked outside the organization.