File permissions in Linux

Project description

The task was to examine the existing permissions on the file system within the projects and also determine if the permissions match the authorization that should be given to the user and if they do not match then i should modify the permissions to authorize the appropriate users and remove any unauthorized access

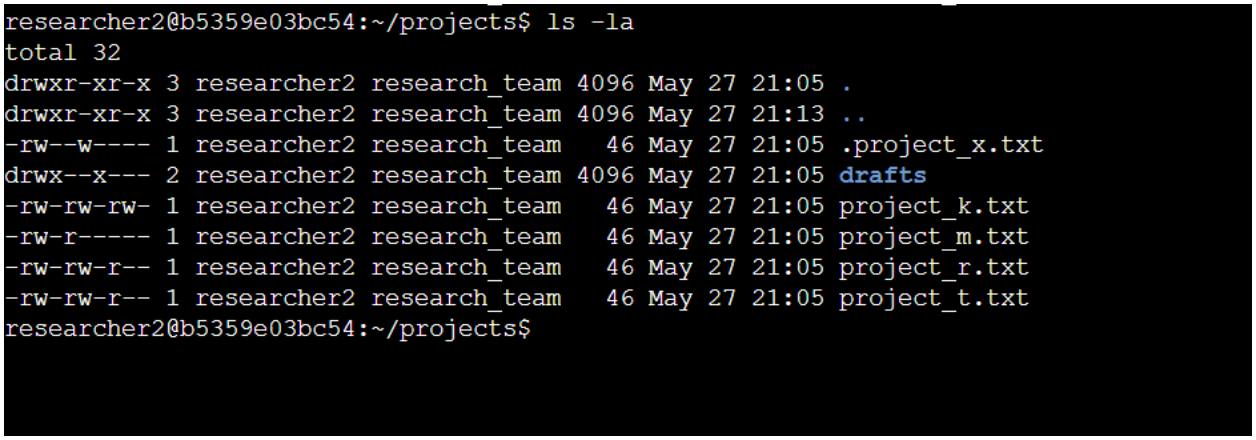
Check file and directory details

The following code demonstrates how I used Linux commands to determine the existing permissions set for a specified directory in the system

1. I navigated to the project Directory
2. I then listed the contents and the permissions of the project directory
   The permissions are as follows.

```
researcher2@b5359e03bc54:~$ cd projects
researcher2@b5359e03bc54:~/projects$ ls -l
total 20
drwx--x--- 2 researcher2 research_team 4096 May 27 21:05 drafts
-rw-rw-rw- 1 researcher2 research_team   46 May 27 21:05 project_k.txt
-rw-r----- 1 researcher2 research_team   46 May 27 21:05 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 May 27 21:05 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 May 27 21:05 project_t.txt
researcher2@b5359e03bc54:~/projects$
```

3. I then checked if there were any hidden files or folders in the directory.
   The results were as follows



The first line of the screenshot displays the command I entered, and the other lines display the output. The code lists all contents of the projects directory. I used the ls command with the -la option to display a detailed listing of the contents that also returned hidden files. The output of my command indicates that there is one directory named drafts, one hidden file named .project_x.txt. The 10-character string in the first column represents the permissions set on each file or directory.

Describe the permissions string

The 10-character string can be deconstructed to determine who is authorized to access the file and their specific permissions. The characters and what they represent are as follows:

- **1st character**: This character is either a `d` or hyphen (`-`) and indicates the file type. If it's a `d`, it's a directory. If it's a hyphen (`-`), it's a regular file.
- **2nd-4th characters**: These characters indicate the read (`r`), write (`w`), and execute (`x`) permissions for the user. When one of these characters is a hyphen (`-`) instead, it indicates that this permission is not granted to the user.
- **5th-7th characters:** These characters indicate the read (`r`), write (`w`), and execute (`x`) permissions for the group. When one of these characters is a hyphen (`-`) instead, it indicates that this permission is not granted for the group.
- **8th-10th characters:** These characters indicate the read (`r`), write (`w`), and execute (`x`) permissions for others. This owner type consists of all other users on the system apart from the user and the group. When one of these characters is a hyphen (`-`) instead, that indicates that this permission is not granted for others.

For example, the file permissions for `project_k.txt` are `-rw-rw-rw-`. Since the first character is a hyphen (`-`), this indicates that `project_t.txt` is a file, not a directory. The second, fifth, and eighth characters are all `r`, which indicates that user, group, and other all have

read permissions. The third, sixth and ninth characters are `w`, which indicates that only the user and group have write permissions. No one has execute permissions for `project_k.txt`.

Change file permissions

The organisations determined that some should not have some file permissions to protect the organisation so i have to change the permissions.

1. I changed the permissions of the files project_k.txt so that the owner type of other doesn't have write permissions.

```
researcher2@b5359e03bc54:~/projects$ chmod o-w project_k.txt
researcher2@b5359e03bc54:~/projects$
```

2. The file project_m.txt is a restricted file and should not be readable or writable by others and only the user should have these permissions on this file.
   This is how i did it

```
researcher2@b5359e03bc54:~/projects$ ls -l
total 20
drwx--x--- 2 researcher2 research_team 4096 May 27 21:05 drafts
-rw-rw-r-- 1 researcher2 research_team   46 May 27 21:05 project_k.txt
-rw-r----- 1 researcher2 research_team   46 May 27 21:05 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 May 27 21:05 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 May 27 21:05 project_t.txt
researcher2@b5359e03bc54:~/projects$ chmod g-r project_m.txt
researcher2@b5359e03bc54:~/projects$
```

Change file permissions on a hidden file

2. I changed the permissions of the hidden file .project_x.txt so that both the user and the group ca read, but not write to , the file

```
researcher2@b5359e03bc54:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 May 27 21:05 .
drwxr-xr-x 3 researcher2 research_team 4096 May 27 21:13 ..
-rw--w---- 1 researcher2 research_team   46 May 27 21:05 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 May 27 21:05 drafts
-rw-rw-r-- 1 researcher2 research_team   46 May 27 21:05 project_k.txt
-rw------- 1 researcher2 research_team   46 May 27 21:05 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 May 27 21:05 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 May 27 21:05 project_t.txt
researcher2@b5359e03bc54:~/projects$ chmod u-w,g-w,g+r .project_x.txt
researcher2@b5359e03bc54:~/projects$
```

Change directory permissions

Only the researcher2 user should be allowed to access the drafts directory and its contents so this means that only researcher2 should have execute privileges

1. I checked the permission of the draft directory
2. Remove the execute permission for the group from the `drafts` directory.

```
researcher2@b5359e03bc54:~/projects$ ls -l
total 20
drwx--x--- 2 researcher2 research_team 4096 May 27 21:05 drafts
-rw-rw-r-- 1 researcher2 research_team   46 May 27 21:05 project_k.txt
-rw------- 1 researcher2 research_team   46 May 27 21:05 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 May 27 21:05 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 May 27 21:05 project_t.txt
researcher2@b5359e03bc54:~/projects$ chmod g-x drafts
researcher2@b5359e03bc54:~/projects$
```

Summary

I changed multiple permissions to match the level of authorization my organisation wanted for files and directories in the projects directory. The first step in this was using the la -la to check the permissions of the directory. This informed my decision and then used the chmod command many times to change the permissions on files and directories.