File permissions in Linux

Project description

The research team requires me to update file permissions for certain files and directories involving the project directory. As of right now the current permissions do not reflect the needed authorization some people need. Updating the information should keep the system secure.

Check file and directory details

The code below demonstrates how I use Linux to update permissions for the set directory.

```
researcher2@6dd271070499:~$ cd projects
researcher2@6dd271070499:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Dec 11 21:25 .
drwxr-xr-x 3 researcher2 research_team 4096 Dec 11 22:00 ..
-rw--w---- 1 researcher2 research_team   46 Dec 11 21:25 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Dec 11 21:25 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Dec 11 21:25 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Dec 11 21:25 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Dec 11 21:25 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Dec 11 21:25 project_t.txt
researcher2@6dd271070499:~/projects$
```

I entered a command to show me all directories in the Projects directory. The ls command with -la option displays a detailed list of every file and hidden files. The output displays directories drafts, a hidden file named project_x.txt, and 5 other text files. The strings in front of the output tells me the permissions.

Describe the permissions string

The 10-character string can be broken apart to tell who has authority to do what.
The characters displayed represent:
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 other. 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 other.

For example the file permissions for project_k.txt are -rw-rw-rw-. Since the first character is a dash it is a file and not a directory. The second, fifth, and eighth have a r meaning users, groups, and other can read the file. Finally in the third,sixth, and ninth character have a w which means users,groups, and others can change and write into the files.

Change file permissions

The organization determined others should not have access to the file at all. I would go back to change permissions of project_k.txt.

```
researcher2@6dd271070499:~/projects$ chmod o-r,o-w project_k.txt
researcher2@6dd271070499:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Dec 11 21:25 .
drwxr-xr-x 3 researcher2 research_team 4096 Dec 11 22:00 ..
-rw--w---- 1 researcher2 research_team   46 Dec 11 21:25 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Dec 11 21:25 drafts
-rw-rw---- 1 researcher2 research_team   46 Dec 11 21:25 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Dec 11 21:25 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Dec 11 21:25 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Dec 11 21:25 project_t.txt
researcher2@6dd271070499:~/projects$
```

I use a linux command called chmod to remove permissions of any person in the directory. I specify that other users can no longer read or write into project_k.txt. You can tell since the seventh and eight characters are now "-".

Change file permissions on a hidden file

The organization decided no one should be able to access and edit the hidden file in the directory. To change this I used Linux commands to change the permission of every person with access.

```
researcher2@6dd271070499:~/projects$ chmod u-w,g-w,o-w .project_x.txt
researcher2@6dd271070499:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Dec 11 21:25 .
drwxr-xr-x 3 researcher2 research_team 4096 Dec 11 22:00 ..
-r-------- 1 researcher2 research_team   46 Dec 11 21:25 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Dec 11 21:25 drafts
-rw-rw---- 1 researcher2 research_team   46 Dec 11 21:25 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Dec 11 21:25 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Dec 11 21:25 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Dec 11 21:25 project_t.txt
```

I know project_x.txt is a hidden file because all files start with “.” are hidden files in linux. Then I use the linux command chmod to remove every possible person with access to the directory the ability to write into the file and change anything(u-w,g-w,o-w).

Change directory permissions

My organization only wants the researcher2 user to have access to the drafts directory and its contents. This means that no one other than researcher2 should have execute Permissions. Below is the code to do this.

```
researcher2@6dd271070499:~/projects$ chmod g-x drafts
researcher2@6dd271070499:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Dec 11 21:25 .
drwxr-xr-x 3 researcher2 research_team 4096 Dec 11 22:00 ..
-r-------- 1 researcher2 research_team   46 Dec 11 21:25 .project_x.txt
drwx------ 2 researcher2 research_team 4096 Dec 11 21:25 drafts
-rw-rw---- 1 researcher2 research_team   46 Dec 11 21:25 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Dec 11 21:25 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Dec 11 21:25 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Dec 11 21:25 project_t.txt
```

I used the chmod linux command to remove privileges from group category of people to execute the drafts file. Now only researcher2 has access to that specific file.

Summary

I changed permissions of who had access to what file based on my organization's wishes. I displayed them in the terminal using the ls command and then editing the permissions using chmod.