File permissions in Linux

Project description

[Multiple file permissions on both files and directories within the ‘projects’ directory need to be updated. The current permissions do not accurately align with the level of access that is given. I’m responsible for checking and updating these permissions as needed, to keep our system safe and secure. Below are the steps I took to complete this task:]

Check file and directory details

[You can use ‘ls -l’, to show file and directory permissions, and you can use ‘ls -a’, to show hidden files, these begin with a period, and you can combine them both using ‘ls -la’, to show you the file and directory permissions for all files and directories hidden or not]

Describe the permissions string

```
researcher2@61597e35ca0d:~$ pwd
/home/researcher2
researcher2@61597e35ca0d:~$ cd /home/researcher2/projects
researcher2@61597e35ca0d:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Nov  6 20:27 .
drwxr-xr-x 3 researcher2 research_team 4096 Nov  6 20:58 ..
-rw--w---- 1 researcher2 research_team   46 Nov  6 20:27 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Nov  6 20:27 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Nov  6 20:27 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Nov  6 20:27 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov  6 20:27 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov  6 20:27 project_t.txt
researcher2@61597e35ca0d:~/projects$
```

[In line 5 of the file permissions is project_k.txt. In this permission string you can see that it is a file and that the user, group and other all have read and write permissions but not execute permissions. The first character in a permission string represents if it's a directory or file with either (d) for a directory or a hyphen (-) for a file. Characters 2 through 4 represent read, write and execute permissions for the user. Characters 5 through 7 represent read, write and execute permissions for the group. Characters 8 through 10 represent read, write and execute permissions for others. [r], (w) and (x) are used to represent having that permission and a hyphen (-) represents not having that permission.]

Change file permissions

[The organization does not allow other to have write access to any files. I used ‘chmod o-w project_k.txt’, to remove the write permissions for other users. Then I use ‘ls -la’ to display the updated file permissions. The file project_m.txt is a restricted file and should not be readable or writable by the group or other; only the user should have these permissions on this file. I used ‘chmod g-w project_m.txt’, to remove group write permissions, then ‘ls -la’ again to display further updates to the file permissions.

```
researcher2@61597e35ca0d:~$ pwd
/home/researcher2
researcher2@61597e35ca0d:~$ cd /home/researcher2/projects
researcher2@61597e35ca0d:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Nov  6 20:27 .
drwxr-xr-x 3 researcher2 research_team 4096 Nov  6 20:58 ..
-rw--w---- 1 researcher2 research_team   46 Nov  6 20:27 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Nov  6 20:27 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Nov  6 20:27 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Nov  6 20:27 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov  6 20:27 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov  6 20:27 project_t.txt
researcher2@61597e35ca0d:~/projects$ chmod o-w project_k.txt
researcher2@61597e35ca0d:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Nov  6 20:27 .
drwxr-xr-x 3 researcher2 research_team 4096 Nov  6 20:58 ..
-rw--w---- 1 researcher2 research_team   46 Nov  6 20:27 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Nov  6 20:27 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Nov  6 20:27 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Nov  6 20:27 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov  6 20:27 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov  6 20:27 project_t.txt
researcher2@61597e35ca0d:~/projects$ chmod g-w project_m.txt
researcher2@61597e35ca0d:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Nov  6 20:27 .
drwxr-xr-x 3 researcher2 research_team 4096 Nov  6 20:58 ..
-rw--w---- 1 researcher2 research_team   46 Nov  6 20:27 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Nov  6 20:27 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Nov  6 20:27 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Nov  6 20:27 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov  6 20:27 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov  6 20:27 project_t.txt
researcher2@61597e35ca0d:~/projects$
```

]

Change file permissions on a hidden file

[The research team has archived .project_x.txt, which is why it's a hidden file. This file should not have write permissions for anyone, but the user and group should be able to read the file. I used 'chmod u-w,g+r,g-w .project_x.txt', to remove write permissions from both user and group and to give group read permissions, then I used 'ls -la' to display the updates to the file permissions.

```
researcher2@61597e35ca0d:~/projects$ chmod u-w,g+r,g-w .project_x.txt
researcher2@61597e35ca0d:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Nov  6 20:27 .
drwxr-xr-x 3 researcher2 research_team 4096 Nov  6 20:58 ..
-r--r----- 1 researcher2 research_team   46 Nov  6 20:27 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Nov  6 20:27 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Nov  6 20:27 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Nov  6 20:27 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov  6 20:27 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov  6 20:27 project_t.txt
researcher2@61597e35ca0d:~/projects$
```

]

Change directory permissions

[The files and directories in the projects directory belong to the researcher2 user. Only researcher2 should be allowed to access the drafts directory and its contents. I used 'chmod g-x drafts', to remove group execute permissions, then I used 'ls -la' to display the updates to the file permissions. This gives access to the directory to the user alone.

```
researcher2@61597e35ca0d:~/projects$ chmod g-x drafts
researcher2@61597e35ca0d:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Nov  6 20:27 .
drwxr-xr-x 3 researcher2 research_team 4096 Nov  6 20:58 ..
-r--r----- 1 researcher2 research_team   46 Nov  6 20:27 .project_x.txt
drwx------ 2 researcher2 research_team 4096 Nov  6 20:27 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Nov  6 20:27 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Nov  6 20:27 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov  6 20:27 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov  6 20:27 project_t.txt
researcher2@61597e35ca0d:~/projects$
```

]

Summary

[In order for me to see how to bring file permissions back to match the levels of authorization that the organization wants for its files and directories, I began by establishing a baseline of what the the current file permissions were for the ‘projects’ directory by using the ‘ls -la’ command. I then changed the file permissions multiple times using the ‘chmod’ command. I also explained the permission string by going over what each character in the string represents]