File permissions in Linux

Project description

I was tasked to revise the permissions for specific files and directories within the projects directory. The current permissions don't align with the required level of authorization. By reviewing and adjusting these permissions, the aim is to enhance the security of their system. To accomplish this objective, I went and did:

Check file and directory details

```
researcher2@bc3093ecdf67:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug 28 03:32 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug 28 04:52 ..
-rw--w---- 1 researcher2 research_team   46 Aug 28 03:32 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug 28 03:32 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Aug 28 03:32 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Aug 28 03:32 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 28 03:32 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 28 03:32 project_t.txt
researcher2@bc3093ecdf67:~/projects$
```

The command `ls -la` allows me to identify the permissions set for both hidden and non hidden files and directories.

Describe the permissions string

```
drwxr-xr-x 3 researcher2 research_team 4096 Aug 28 03:32 .
```

Taking this snippet above as an example, this represents the permissions of the current directory. The 10 character string at the beginning of this snippet represents the permissions given to the user, group, and other. The first character, `'d'`, represents that we're currently looking at the permissions for a directory. Characters two through four `('r','w','x')` represent the permissions for the user. In this case, the user has the ability to read `('r')`, write `('w')`, and execute `('x')` the directory. Characters five through seven `('r', '-', 'x')` represent the permissions for the group. In this case, the group has the ability to read `('r')` and execute `('x')` the directory. However, this group does not have the ability to edit this directory `('-')`. Characters eight through ten `('r', '-', 'x')` represent the

permissions for any other user on the system. In this case, the group has the ability to read ('r') and execute ('x') the directory. However, this group does not have the ability to edit this directory ('-').

Change file permissions

```
-rw-rw-rw- 1 researcher2 research_team    46 Aug 28 03:32 project_k.txt
```

The task here was to ensure that the write permission isn't enabled for any other user on the system for each directory and file. The snippet above represents that project_k.txt is a discrepancy of the task.

```
researcher2@bc3093ecdf67:~/projects$ chmod o-w project_k.txt
researcher2@bc3093ecdf67:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug 28 03:32 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug 28 04:52 ..
-rw--w---- 1 researcher2 research_team   46 Aug 28 03:32 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug 28 03:32 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Aug 28 03:32 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Aug 28 03:32 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 28 03:32 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 28 03:32 project_t.txt
```

The command, `chmod o-w project_k.txt`, allows me to remove ('-') the writing permission ('w') for other ('o') in the file, `project_k.txt`.

Change file permissions on a hidden file

```
-rw--w---- 1 researcher2 research_team    46 Aug 28 03:32 .project_x.txt
```

The task here was to ensure that the hidden file, .project_x.txt, does not have write permissions for anyone, but the user and group should be able to read the file. The snippet above represents a discrepancy of this task.

```
drwxr-xr-x 3 researcher2 research_team 4096 Aug 28 05:30 .
drwxr-xr-x 4 researcher2 research_team 4096 Aug 28 05:30 ..
-r--r----- 1 researcher2 research_team   46 Aug 28 03:32 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug 28 03:32 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Aug 28 03:32 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Aug 28 03:32 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 28 03:32 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 28 03:32 project_t.txt
```

The command, `chmod u-w,g+r,g-w .project_x.txt`, allows me to remove `('-')` the writing permission `('w')` for user `('u')` in the file, add `('+')` the read permission for the group `('g')`, and remove the writing permission for the hidden file, `.project_x.txt`.

Change directory permissions

```
drwx--x--- 2 researcher2 research_team 4096 Aug 28 03:32 drafts
```

The task here was to ensure that only the user should be able to access the drafts directory and its contentsThe snippet above represents a discrepancy of the task.

```
drwxr-xr-x 3 researcher2 research_team 4096 Aug 28 05:30 .
drwxr-xr-x 4 researcher2 research_team 4096 Aug 28 05:30 ..
-r--r----- 1 researcher2 research_team   46 Aug 28 03:32 .project_x.txt
drwx------ 2 researcher2 research_team 4096 Aug 28 03:32 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Aug 28 03:32 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Aug 28 03:32 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 28 03:32 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 28 03:32 project_t.txt
```

The command, `chmod g-x drafts`, allows me to remove `('-')` the execute permission `('x')` for the group`('g')` in the directory, `drafts`.

Summary

There were multiple discrepancies that I had to fix in order to achieve satisfactory permission access to the files and directories. I had to use the command, `ls -la`, to check whether the permissions were changed in accordance with the task. Then, for any file/directory that needed to be changed, I used the `chmod` command to change its permissions.