Project description

The research team in my organization needs to adjust the file permissions for several files and directories inside the projects directory. The current permissions do not match the level of access that should be applied. Reviewing and updating these permissions is important for keeping the system secure. To complete this task, I carried out the following steps.

Check file and directory details

The code in the screenshot shows the Linux commands I used to view the existing permissions for a specific directory in the file system.

```
researcher2@34bb0d9d674c:~$ cd projects
researcher2@34bb0d9d674c:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Nov 17 06:24 .
drwxr-xr-x 3 researcher2 research_team 4096 Nov 17 07:08 ..
-rw--w---- 1 researcher2 research_team   46 Nov 17 06:24 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Nov 17 06:24 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Nov 17 06:24 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Nov 17 06:24 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov 17 06:24 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov 17 06:24 project_t.txt
researcher2@34bb0d9d674c:~/projects$
```

The first line in the screenshot is the command I typed, and the lines below show the output. The results list everything inside the projects directory. I used **ls -la** to display a detailed list of all contents, including hidden files. Based on the output, there is one directory called drafts, one hidden file named .project_x.txt, and five other project files. The 10-character string in the first column indicates the permissions given to each file or directory.

Describe the permissions string

The 10-character permissions string can be divided to show who has access to the file and what actions they can perform. The meaning of each part is explained below:

- **The 1st character** shows the file type. A **d** means it is a directory, while a hyphen means it is a regular file.
- **The 2nd to 4th characters** show read (r), write (w), and execute (x) permissions for the user. A hyphen means the user does not have that permission.
- **The 5th to 7th characters** show read (r), write (w), and execute (x) permissions for the group. A hyphen means the group does not have that permission.
- **The 8th to 10th characters** show read (r), write (w), and execute (x) permissions for other, meaning anyone who is not the user or part of the group. A hyphen means other does not have that permission.

For example, the permissions for project_t.txt are **rw-rw-r**. The hyphen at the beginning shows it is a file. The second, fifth, and eighth characters are r, which means the user, group, and other all have read permission. The third and sixth characters are w, meaning the user and group can write to the file. No one has execute permission for project_t.txt.

Change file permissions

The organization decided that other should not have write access to any files. When checking the permissions earlier, I found that project_k.txt still allowed write access for other, so this needed to be removed.

The screenshot shows the commands I used. The first two lines show the commands I entered, and the remaining lines show the output after running the second command. I used **chmod** to change the permissions. The first argument specifies which permission to modify, and the second argument is the file name. In this case, I removed write permission from other for project_k.txt. After doing this, I used **ls -la** again to confirm that the permissions had been updated.

```
researcher2@34bb0d9d674c:~/projects$ chmod o-w project_k.txt
researcher2@34bb0d9d674c:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Nov 17 06:24 .
drwxr-xr-x 3 researcher2 research_team 4096 Nov 17 07:08 ..
-rw--w---- 1 researcher2 research_team   46 Nov 17 06:24 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Nov 17 06:24 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Nov 17 06:24 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Nov 17 06:24 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov 17 06:24 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov 17 06:24 project_t.txt
researcher2@34bb0d9d674c:~/projects$
```

Change file permissions on a hidden file

The research team recently archived project_x.txt, and they want to ensure that no one can write to this file anymore. However, the user and group should still be able to read it.

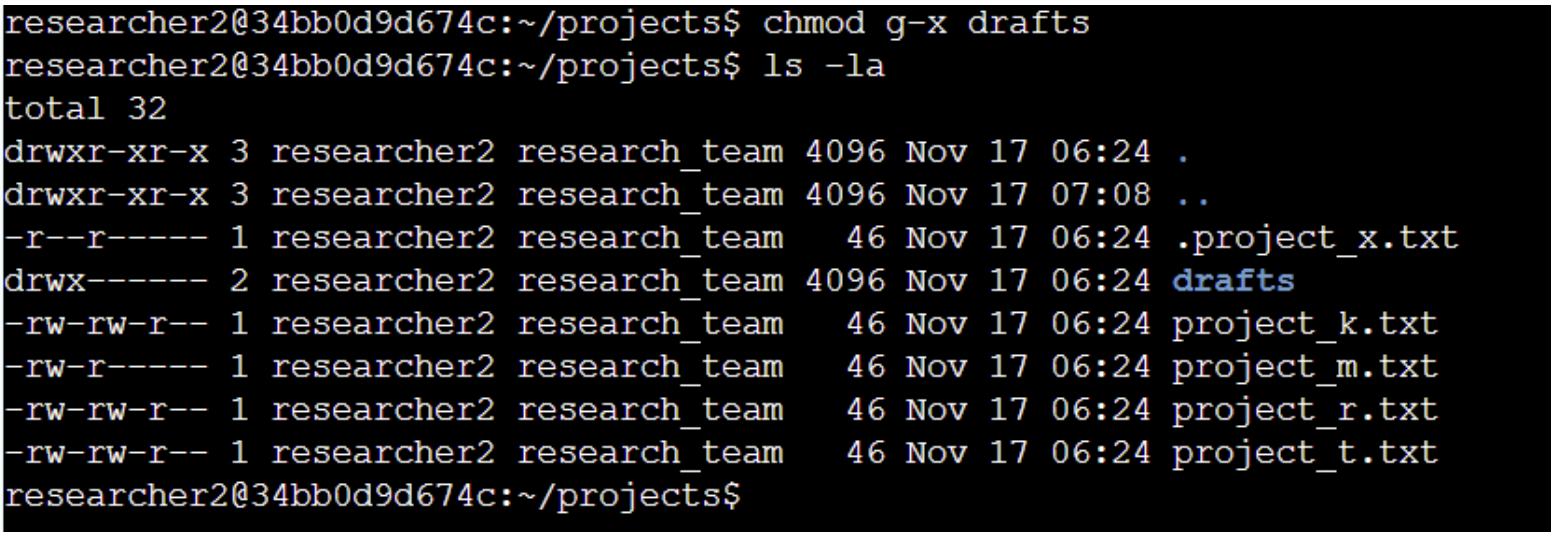
The screenshot shows the commands I used to update the permissions. I know that .project_x.txt is a hidden file because its name begins with a period. In this step, I removed write permission from both the user and the group, and I added read permission for the group. I removed write permission from the user using **u-w**, removed write permission from the group using **g-w**, and then added read permission for the group using **g+r**.

```
researcher2@34bb0d9d674c:~/projects$ chmod u-w,g-w,g+r .project_x.txt
researcher2@34bb0d9d674c:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Nov 17 06:24 .
drwxr-xr-x 3 researcher2 research_team 4096 Nov 17 07:08 ..
-r--r----- 1 researcher2 research_team   46 Nov 17 06:24 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Nov 17 06:24 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Nov 17 06:24 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Nov 17 06:24 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov 17 06:24 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov 17 06:24 project_t.txt
researcher2@34bb0d9d674c:~/projects$
```

Change directory permissions

My organization wants only the researcher2 user to have access to the drafts directory and everything inside it. This means that no other user should have execute permission.

The screenshot shows the commands and the updated output. The first line shows the current directory, projects. The second line shows the parent directory, home. The third line lists the hidden file .project_x.txt. The fourth line shows the drafts directory with its updated permissions. From the output, you can see that only researcher2 has execute permission. Previously, the group also had execute permission, so I removed it with **chmod**. The researcher2 user already had the correct permission, so no change was required.



Summary

I updated several permissions to match the access level required by my organization for the files and directories inside the projects directory. I first used **ls -la** to check the existing permissions, which helped guide the changes. Then I used **chmod** multiple times to adjust the permissions on both files and directories.