File permissions in Linux

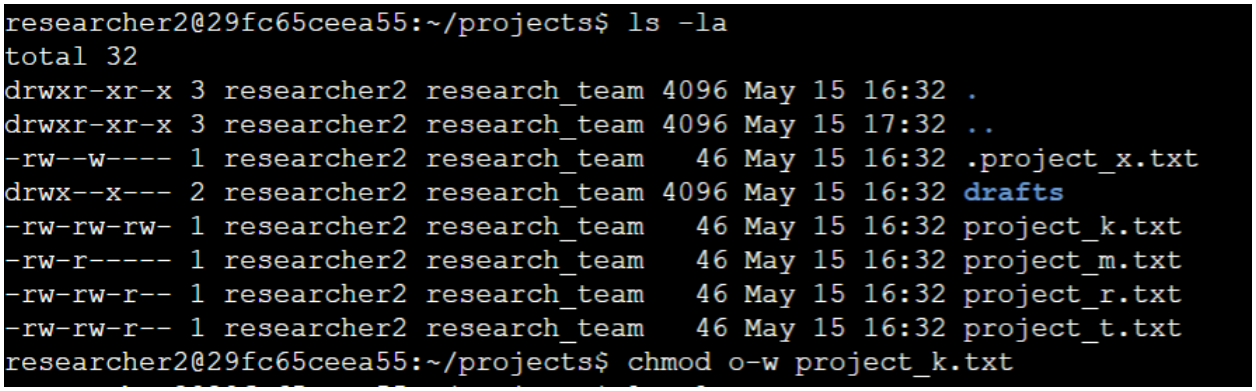
Project description

Scenario: My organization found that certain owners have unauthorized permissions to certain files in the **/home/researcher2/projects** directory. I was tasked with navigating to **projects** and changing permissions for certain files, including a hidden file. I was also tasked with changing directory permissions for **/home/researcher2/projects/drafts**.

In this document, you will see use of commands with before-and-after screenshots.

Check file and directory details

I navigated to the **projects** directory using the cd command. I then opened the files, including any hidden files, using the ls -la command:



This command also revealed that there were hidden files such as .project_x.txt.

Describe the permissions string

The permissions string displays the permissions for three types of owners:

- User (u)
- Group (g)
- Other (o)

The three permissions are:

- Read (r)
- Write (w)

- Execute (x)

The permissions string is drwxrwxrwx. Where d = directory and the first rwx represents User permissions, the second rwx Group permissions, and the third rwx Other permissions.
If a User, Group, or Other owner lack specific permissions, then the permission letter is replaced with a hyphen (-).

For example, if the User, Group, and Other owners lack permission to read and write a file, but can execute a file, then the permissions string is as follows:

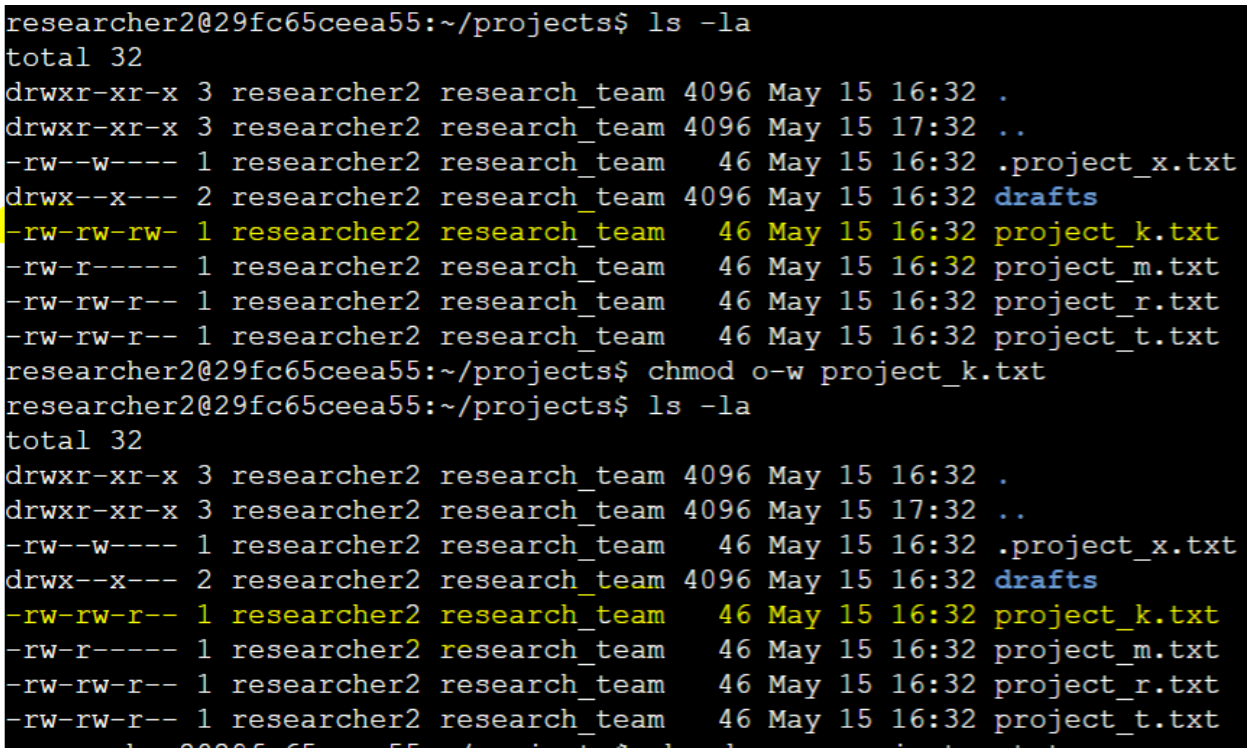
d--x--x--x

Change file permissions

The Other owner was unauthorized to have writing access for any files. Using the command ls -la, I found all the files and their permissions and that Other had writing permission for file project_k.txt. I changed their writing permission using the chmod command. The command was:

chmod o-w project_k.txt

See the permission string before-and-after for file project_k.txt:



Using chmod o-w project_k.txt, writing access was removed from Other for the only file for which they had writing permissions. The permissions string effectively lost the “w” in the Other category.

Change file permissions on a hidden file

It was determined that nobody should have writing access for .project_x.txt. To find this hidden file, I used the command ls -la to display all files, including hidden files.

```
researcher2@29fc65ceea55:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 May 15 16:32 .
drwxr-xr-x 3 researcher2 research_team 4096 May 15 17:32 ..
-rw--w---- 1 researcher2 research_team   46 May 15 16:32 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 May 15 16:32 drafts
-rw-rw-rw- 1 researcher2 research_team   46 May 15 16:32 project_k.txt
-rw-r----- 1 researcher2 research_team   46 May 15 16:32 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 May 15 16:32 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 May 15 16:32 project_t.txt
```

Both User and Group owners had writing access to .project_x.txt that needed to be removed. To do this, I used the chmod command. To remove writing access from User and Group in this file, the command needed was:

chmod u-w,g-w .project_x.txt.

See the permission string before-and-after for .project_x.txt:

```
researcher2@86b05fdc3774:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 May 15 17:56 .
drwxr-xr-x 3 researcher2 research_team 4096 May 15 18:41 ..
-rw--w---- 1 researcher2 research_team   46 May 15 17:56 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 May 15 17:56 drafts
-rw-rw-rw- 1 researcher2 research_team   46 May 15 17:56 project_k.txt
-rw-r----- 1 researcher2 research_team   46 May 15 17:56 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 May 15 17:56 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 May 15 17:56 project_t.txt
researcher2@86b05fdc3774:~/projects$ chmod u-w,g-w .project_x.txt
researcher2@86b05fdc3774:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 May 15 17:56 .
drwxr-xr-x 3 researcher2 research_team 4096 May 15 18:41 ..
-r-------- 1 researcher2 research_team   46 May 15 17:56 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 May 15 17:56 drafts
-rw-rw-rw- 1 researcher2 research_team   46 May 15 17:56 project_k.txt
-rw-r----- 1 researcher2 research_team   46 May 15 17:56 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 May 15 17:56 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 May 15 17:56 project_t.txt
```

Change directory permissions

I was tasked with removing Group execute permissions from the **drafts** subdirectory. To do this, I entered the following command from the **projects** directory:

chmod g-x drafts

I then entered ls -la to display the permission strings for the files in the **project** directory to check the changes I made. See the permission string before-and-after for drafts:

```
researcher2@c31cbb0d57eb:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 May 15 18:48 .
drwxr-xr-x 3 researcher2 research_team 4096 May 15 19:27 ..
-rw--w---- 1 researcher2 research_team   46 May 15 18:48 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 May 15 18:48 drafts
-rw-rw-rw- 1 researcher2 research_team   46 May 15 18:48 project_k.txt
-rw-r----- 1 researcher2 research_team   46 May 15 18:48 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 May 15 18:48 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 May 15 18:48 project_t.txt
researcher2@c31cbb0d57eb:~/projects$ chmod g-x drafts
researcher2@c31cbb0d57eb:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 May 15 18:48 .
drwxr-xr-x 3 researcher2 research_team 4096 May 15 19:27 ..
-rw--w---- 1 researcher2 research_team   46 May 15 18:48 .project_x.txt
drwx------ 2 researcher2 research_team 4096 May 15 18:48 drafts
-rw-rw-rw- 1 researcher2 research_team   46 May 15 18:48 project_k.txt
-rw-r----- 1 researcher2 research_team   46 May 15 18:48 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 May 15 18:48 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 May 15 18:48 project_t.txt
researcher2@c31cbb0d57eb:~/projects$
```

Summary

In this project, I changed permissions for files within the **projects** directory, as well as for the **drafts** subdirectory. This was achieved using the following commands:

- cd (to navigate to the projects directory)
- ls -l (to see permissions to files and directories)
- ls - la (to see permissions to files and directories, including hidden files)
- chmod (to change permissions to files)

Specifically, I achieved the following:

- Removed Other writing permission to file project_k.txt
- Removed User and Group writing permissions to hidden file .project_x.txt
- Removed Group execute permission to subdirectory drafts