

File Permissions in Linux

Project description

This portfolio project activity was provided by the Google Cybersecurity certificate. The task is to examine existing permissions on the file system and determine if the permissions match the authorization that should be given. If they do not match, the permissions must be modified to authorize the appropriate users and remove any unauthorized access.

The task will be done as follows: **First**, check the user and group permissions for all files in the projects directory. **Next**, check whether any files have incorrect permissions and change the permissions as needed. **Finally**, check the permissions of the /home/researcher2/projects/drafts directory and modify these permissions to remove any unauthorized access.

Check file and directory details

First, I navigated to the projects directory using the **cd projects** command. Next, I used the **ls -la** command within the projects folder to list the contents and permissions of the projects directory, including hidden files.

```
researcher2@8f932c0e26c1:~$ pwd
/home/researcher2
researcher2@8f932c0e26c1:~$ ls
projects
researcher2@8f932c0e26c1:~$ cd projects
researcher2@8f932c0e26c1:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jul 10 20:13 .
drwxr-xr-x 3 researcher2 research_team 4096 Jul 10 20:42 ..
-rw--w---- 1 researcher2 research_team  46 Jul 10 20:13 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jul 10 20:13 drafts
-rw-rw-rw- 1 researcher2 research_team  46 Jul 10 20:13 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Jul 10 20:13 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jul 10 20:13 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jul 10 20:13 project_t.txt
researcher2@8f932c0e26c1:~/projects$
```

Describe the permissions string

Using the permissions string for the project_m.txt file, the first character is a hyphen (-) that indicates that this is a file and not a directory. The second and fifth characters are both r, which indicates that the user and group both have read permissions. Next, the third character is a w, which indicates that the user has write permissions. No one has execute permissions for this file. The user is researcher2 and the group is research_team.

```
-rw-r----- 1 researcher2 research_team 46 Jul 10 20:13 project_m.txt
```

Change file permissions

None of the files should have write permissions for the other users ("other" category). File `project_k.txt` has write permissions for the other category and must be changed. Using the command **`chmod o-w project_k.txt`** the write permissions for the other category can be removed.

```
researcher2@8f932c0e26c1:~/projects$ chmod o-w project_k.txt
```

Additionally, the `project_m.txt` file is a restricted file and should not be readable or writable, even by the group. Currently, this file has read permissions for the group and should be changed. Using the command **`chmod g-r project_m.txt`** the read permissions for the group were removed from this file.

```
researcher2@8f932c0e26c1:~/projects$ chmod g-r project_m.txt
```

The new permissions for the projects directory's files and subdirectories are seen below.

```
researcher2@8f932c0e26c1:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jul 10 20:13 .
drwxr-xr-x 3 researcher2 research_team 4096 Jul 10 20:42 ..
-rw--w---- 1 researcher2 research_team  46 Jul 10 20:13 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jul 10 20:13 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Jul 10 20:13 project_k.txt
-rw----- 1 researcher2 research_team  46 Jul 10 20:13 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jul 10 20:13 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jul 10 20:13 project_t.txt
researcher2@8f932c0e26c1:~/projects$
```

Change file permissions on a hidden file

The file `.project_x.txt` is a hidden file that has been archived and should not be written to by anyone. (The user and group should still be able to read this file.) As seen in the previous image, this hidden file currently has write permissions for both the user and group that must be removed, as well as no read permission for the group that must be added. To make these changes, the command **`chmod g+r,g-w,u-w .project_x.txt`** can be used. Both this command and the resulting permissions for the projects directory's files and subdirectories are seen below.

```
researcher2@8f932c0e26c1:~/projects$ chmod g+r,g-w,u-w .project_x.txt
researcher2@8f932c0e26c1:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jul 10 20:13 .
drwxr-xr-x 3 researcher2 research_team 4096 Jul 10 20:42 ..
-r--r----- 1 researcher2 research_team  46 Jul 10 20:13 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jul 10 20:13 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Jul 10 20:13 project_k.txt
-rw----- 1 researcher2 research_team  46 Jul 10 20:13 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jul 10 20:13 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jul 10 20:13 project_t.txt
researcher2@8f932c0e26c1:~/projects$
```

Change directory permissions

Only the researcher2 user should be allowed to access the drafts directory and its contents. (This means that only researcher2 should have execute privileges.). Currently, the group has execute privileges that should be removed. These can be removed using the command **chmod g-x drafts**. Both this command and the resulting permissions for the the projects directory's files and subdirectories are seen below.

```
researcher2@8f932c0e26c1:~/projects$ chmod g-x drafts
researcher2@8f932c0e26c1:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jul 10 20:13 .
drwxr-xr-x 3 researcher2 research_team 4096 Jul 10 20:42 ..
-r--r----- 1 researcher2 research_team  46 Jul 10 20:13 .project_x.txt
drwx----- 2 researcher2 research_team 4096 Jul 10 20:13 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Jul 10 20:13 project_k.txt
-rw----- 1 researcher2 research_team  46 Jul 10 20:13 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jul 10 20:13 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jul 10 20:13 project_t.txt
researcher2@8f932c0e26c1:~/projects$
```

Summary

I changed multiple permissions to match the level of authorization my organization wanted for files and directories in the projects directory. The first step in this was using `ls -la` to check the permissions for the directory. This informed my decisions in the following steps. I then used the `chmod` command multiple times to change the permissions on files and directories.