File permissions in Linux (Bash)

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Project description

I change the permission of both the normal file and directories and hidden files accordingly, also with the rules of least privilege to enhance security of the system.

Check file and directory details

I navigate to the projects files to simplify the subsequent steps with the cd command.
I use ls -la to check all the files and directories inside “projects”; then ls -a to know which files are hidden.

```
researcher2@8520304521ee:~$ ls -la /home/researcher2/projects
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Dec 27 12:28 .
drwxr-xr-x 3 researcher2 research_team 4096 Dec 27 13:08 ..
-rw--w---- 1 researcher2 research_team   46 Dec 27 12:28 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Dec 27 12:28 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Dec 27 12:28 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Dec 27 12:28 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Dec 27 12:28 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Dec 27 12:28 project_t.txt
researcher2@8520304521ee:~$ ls
projects
researcher2@8520304521ee:~$ cd /home/researcher2/projects
researcher2@8520304521ee:~/projects$ ls -a
.  ..  .project_x.txt  drafts  project_k.txt  project_m.txt  project_r.txt  project_t.txt
```

Describe the permissions string

Permissions string is formed by 10 characters which the first character show whether the item is file or directory, and the subsequent each of them describes the permissions of user, then group and lastly other users of the system with 3 characters respectively. So that the a directory opening all permissions for all types of users would be “drwxrwxrwx”; and a file closing all permissions for everyone is “----------”.

Change file permissions

I remove the writing permission of others for the project_k.txt fie and remove the reading permission of the group “research team”; and check the output with ls -l.

```
researcher2@8520304521ee:~/projects$ chmod o-w project_k.txt
researcher2@8520304521ee:~/projects$ ls -l
total 20
drwx--x--- 2 researcher2 research_team 4096 Dec 27 12:28 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Dec 27 12:28 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Dec 27 12:28 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Dec 27 12:28 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Dec 27 12:28 project_t.txt
researcher2@8520304521ee:~/projects$ chmod g-r project_m.txt
researcher2@8520304521ee:~/projects$ ls -l
total 20
drwx--x--- 2 researcher2 research_team 4096 Dec 27 12:28 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Dec 27 12:28 project_k.txt
-rw------- 1 researcher2 research_team   46 Dec 27 12:28 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Dec 27 12:28 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Dec 27 12:28 project_t.txt
researcher2@8520304521ee:~/projects$
```

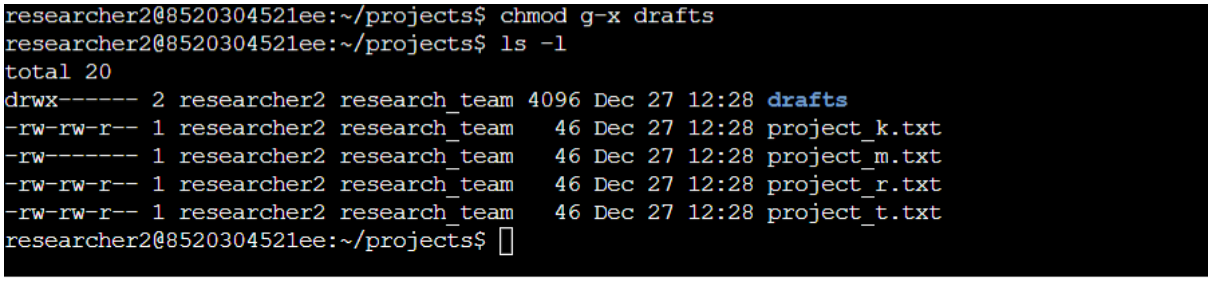
Change file permissions on a hidden file

.project_x.txt only allows the user and the group to read the file, I use chmod to remove the writing permission of user and = to assign only the reading permission to the group. The dot before project_x.txt indicates that it is hidden.

```
researcher2@8520304521ee:~/projects$ chmod u-w,g=r .project_x.txt
researcher2@8520304521ee:~/projects$ ls -a
.  ..  .project_x.txt  drafts  project_k.txt  project_m.txt  project_r.txt  project_t.txt
researcher2@8520304521ee:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Dec 27 12:28 .
drwxr-xr-x 3 researcher2 research_team 4096 Dec 27 13:08 ..
-r--r----- 1 researcher2 research_team   46 Dec 27 12:28 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Dec 27 12:28 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Dec 27 12:28 project_k.txt
-rw------- 1 researcher2 research_team   46 Dec 27 12:28 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Dec 27 12:28 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Dec 27 12:28 project_t.txt
```

Change directory permissions

The first character of permission string of “drafts” is d, indicating it is a directory. Managing directory could only be done when locating in its subdirectory. I use chmod g-x to remove the execute permission of the group.



Summary

Through the google Qwiklab, I have practice of managing the permissions of both normal and hidden files and directories with simply the chmod and ls command, so that I could review and manipulate the permissions of files and directories to maintain the cybersecurity of Bash Linux system.