File permissions in Linux

Project description

In using Linux commands, I was able to prevent unauthorized users from accessing sensitive data and strengthen the security of the system. It is the job of the security analyst to monitor permissions of files and folders in order to protect our PII.

Check file and directory details

```
researcher2@0a9f9d3cc2a3:~$ cd projects
researcher2@0a9f9d3cc2a3:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Feb  3 09:43 .
drwxr-xr-x 3 researcher2 research_team 4096 Feb  3 10:55 ..
-rw--w---- 1 researcher2 research_team   46 Feb  3 09:43 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Feb  3 09:43 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Feb  3 09:43 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Feb  3 09:43 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Feb  3 09:43 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Feb  3 09:43 project_t.txt
researcher2@0a9f9d3cc2a3:~/projects$ ^C
researcher2@0a9f9d3cc2a3:~/projects$
```

>In this section, we found that the group that owns the files in the project is named “research_team”
>.project_x.txt was seen as a hidden file.

Describe the permissions string

```
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Feb  3 09:43 .
drwxr-xr-x 3 researcher2 research_team 4096 Feb  3 10:55 ..
-rw--w---- 1 researcher2 research_team   46 Feb  3 09:43 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Feb  3 09:43 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Feb  3 09:43 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Feb  3 09:43 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Feb  3 09:43 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Feb  3 09:43 project_t.txt
```

> In the highlighted column above, we see the information on the type of permissions given to their corresponding files and folders.

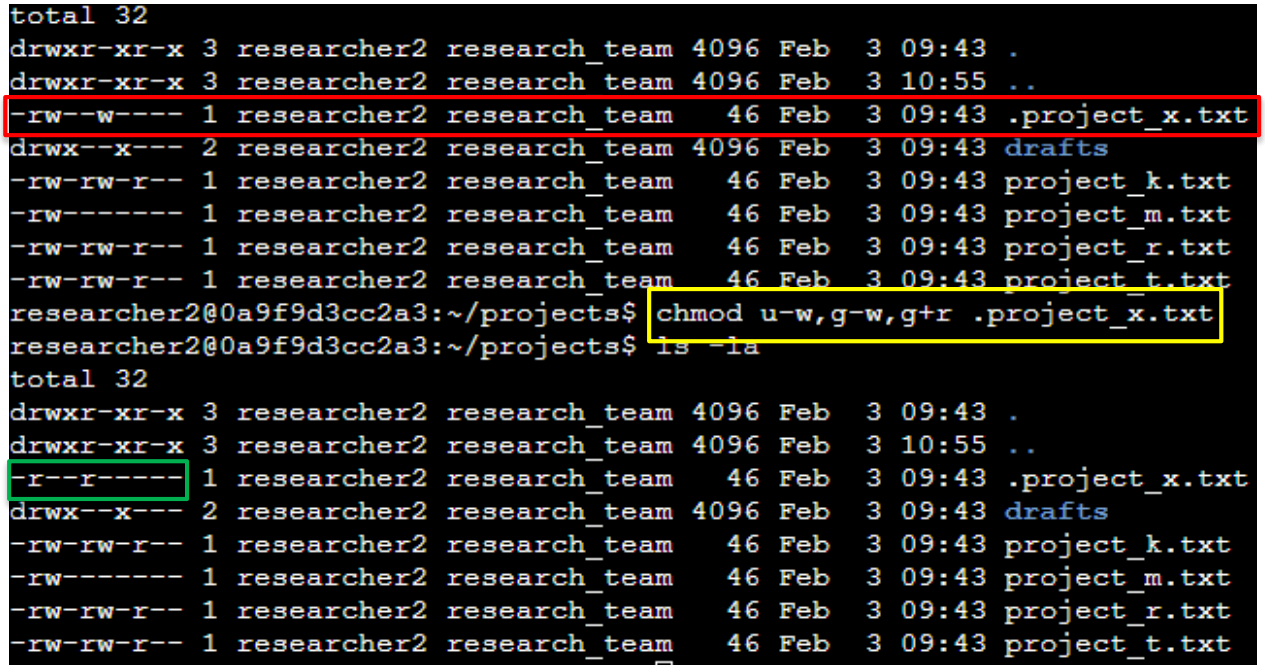
> Permissions differ in every file, but the common permission between these files is the user's access to read and write

Change file permissions

```
drwxr-xr-x 3 researcher2 research_team 4096 Feb  3 09:43 .
drwxr-xr-x 3 researcher2 research_team 4096 Feb  3 10:55 ..
-rw--w---- 1 researcher2 research_team   46 Feb  3 09:43 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Feb  3 09:43 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Feb  3 09:43 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Feb  3 09:43 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Feb  3 09:43 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Feb  3 09:43 project_t.txt
researcher2@0a9f9d3cc2a3:~/projects$ ^C
researcher2@0a9f9d3cc2a3:~/projects$ chmod o-w project_k.txt
researcher2@0a9f9d3cc2a3:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Feb  3 09:43 .
drwxr-xr-x 3 researcher2 research_team 4096 Feb  3 10:55 ..
-rw--w---- 1 researcher2 research_team   46 Feb  3 09:43 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Feb  3 09:43 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Feb  3 09:43 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Feb  3 09:43 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Feb  3 09:43 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Feb  3 09:43 project_t.txt
researcher2@0a9f9d3cc2a3:~/projects$ chmod g-r project_m.txt
researcher2@0a9f9d3cc2a3:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Feb  3 09:43 .
drwxr-xr-x 3 researcher2 research_team 4096 Feb  3 10:55 ..
-rw--w---- 1 researcher2 research_team   46 Feb  3 09:43 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Feb  3 09:43 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Feb  3 09:43 project_k.txt
-rw------- 1 researcher2 research_team   46 Feb  3 09:43 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Feb  3 09:43 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Feb  3 09:43 project_t.txt
researcher2@0a9f9d3cc2a3:~/projects$
```

>In this section, we will remove unauthorized access with the chmod command.
>We have removed write permissions for other users in project_k.txt.
>We have removed read permissions for the group in project_m.txt.

Change file permissions on a hidden file



>.project_x.txt was seen with incorrect permissions for user and the group, both the user and the group should be able to read, but not write.
>We have removed write permissions for users.
>We have removed write permissions and added read permissions for the group.

Change directory permissions

```
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Feb  3 09:43 .
drwxr-xr-x 3 researcher2 research_team 4096 Feb  3 10:55 ..
-r--r----- 1 researcher2 research_team   46 Feb  3 09:43 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Feb  3 09:43 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Feb  3 09:43 project_k.txt
-rw------- 1 researcher2 research_team   46 Feb  3 09:43 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Feb  3 09:43 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Feb  3 09:43 project_t.txt
researcher2@0a9f9d3cc2a3:~/projects$ chmod g-x drafts
researcher2@0a9f9d3cc2a3:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Feb  3 09:43 .
drwxr-xr-x 3 researcher2 research_team 4096 Feb  3 10:55 ..
-r--r----- 1 researcher2 research_team   46 Feb  3 09:43 .project_x.txt
drwx------ 2 researcher2 research_team 4096 Feb  3 09:43 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Feb  3 09:43 project_k.txt
-rw------- 1 researcher2 research_team   46 Feb  3 09:43 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Feb  3 09:43 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Feb  3 09:43 project_t.txt
```

>In this section, we see that the group has unauthorized access to execute the folder drafts.
>We removed execute permission for the group.

Summary

Using basic Linux Bash shell commands to examine file and directory permissions, change permissions on files, and change permissions on directories is an important skill for a Security analyst in managing authorization for the organization.