# File permissions in Linux

## Project description

Given the following scenario:

You are a security professional at a large organization. You mainly work with their research team. Part of your job is to ensure users on this team are authorized with the appropriate permissions. This helps keep the system secure.

Your task is to examine existing permissions on the file system. You'll need to determine if the permissions match the authorization that should be given. If they do not match, you'll need to modify the permissions to authorize the appropriate users and remove any unauthorized access.

Using Linux commands in the Bash shell, I modified and applied permissions based on organizational requirements.

## Check file and directory details

```
researcher2@efd69a286c96:~$ cd /home/researcher2/projects
researcher2@efd69a286c96:~/projects$ ls -l
total 20
drwx--x--- 2 researcher2 research_team 4096 Nov 20 00:16 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Nov 20 00:16 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Nov 20 00:16 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov 20 00:16 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov 20 00:16 project_t.txt
researcher2@efd69a286c96:~/projects$ ls -a
.   .project_x.txt  project_k.txt  project_r.txt
..  drafts          project_m.txt  project_t.txt
```

Commands Used:

- ls -l: displays all current permissions
- ls -a: displays all current hidden files

## Describe the permissions string

Analyzing "project_k.txt" as an example, the current permissions are -rw-rw-rw-, in which the user, group, and others all have the ability to read and write, but not execute file permissions.

The “-” indicates that the user, group, or other does not have the “execute” permission for any file.

## Change file permissions

The organization does not allow others to have write permissions to any files, modifying the permissions:

```
researcher2@efd69a286c96:~/projects$ chmod o-w project_k.txt
researcher2@efd69a286c96:~/projects$ ls -l
total 20
drwx--x--- 2 researcher2 research_team 4096 Nov 20 00:16 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Nov 20 00:16 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Nov 20 00:16 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov 20 00:16 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov 20 00:16 project_t.txt
```

Commands Used:

- chmod o-w project_k.txt: take away write permissions from others in the “project_k.txt” file
- ls -l: display current permissions after modifying “project_k.txt” authorization

## Change file permissions on a hidden file

The research team has archived .project_x.txt, which is why it’s a hidden file. This file should not have write permissions for anyone, but the user and group should be able to read the file, modifying the permissions:

```
researcher2@efd69a286c96:~/projects$ chmod u=r,g=r .project_x.txt
researcher2@efd69a286c96:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Nov 20 00:16 .
drwxr-xr-x 3 researcher2 research_team 4096 Nov 20 01:05 ..
-r--r----- 1 researcher2 research_team   46 Nov 20 00:16 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Nov 20 00:16 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Nov 20 00:16 project_k.txt
-rw------- 1 researcher2 research_team   46 Nov 20 00:16 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov 20 00:16 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov 20 00:16 project_t.txt
```

Commands Used:

- chmod u=r, g=r .project_x.txt: allow the user and group to read files in the hidden “project_x.txt” file

- ls -la: display all current and hidden file permissions after modification

## Change directory permissions

The files and directories in the projects directory belong to the researcher2 user. Only researcher2 should be allowed to access the drafts directory and its contents, modifying the permissions:

```
researcher2@efd69a286c96:~/projects$ chmod g-x drafts
researcher2@efd69a286c96:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Nov 20 00:16 .
drwxr-xr-x 3 researcher2 research_team 4096 Nov 20 01:05 ..
-r--r----- 1 researcher2 research_team   46 Nov 20 00:16 .project_x.txt
drwx------ 2 researcher2 research_team 4096 Nov 20 00:16 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Nov 20 00:16 project_k.txt
-rw------- 1 researcher2 research_team   46 Nov 20 00:16 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov 20 00:16 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Nov 20 00:16 project_t.txt
```

Commands Used:

- chmod g-x drafts: take away execute permissions from the group in the “drafts” directory
- ls -la: display current and hidden permissions after modification

## Summary

After reviewing current organizational permissions provided to users, groups, and others. I applied and utilized Linux commands such as “ls” and “chmod” to modify and view permissions allowing for only authorized users to access secure data when needed.