

# File permissions in Linux

## Project description

Use Linux commands to see and change file and directory permissions.

## Check file and directory details

Navigate to dir projects

Use ls -l or -la to see the permissions of the files and directories

ls -l: list file with their permissions

ls -la: list all file include hidden file with their permissions

```
researcher2@24622386ba7a:~$ cd projects
researcher2@24622386ba7a:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug 15 15:50 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug 15 16:15 ..
-rw--w---- 1 researcher2 research_team  46 Aug 15 15:50 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug 15 15:50 drafts
-rw-rw-rw- 1 researcher2 research_team  46 Aug 15 15:50 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Aug 15 15:50 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Aug 15 15:50 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Aug 15 15:50 project_t.txt
```

## Describe the permissions string

We see the first column of the first lines is the string: “drwxr-xr-x”

This is the permission string

d - directory

r - read

w - write

x - execute

After the “d” the permission divided into: user(rwx), group(r-x), other(r-x)

The “-” means someone or group do not the permission of the read, write, execute due to its position.

## Change file permissions

The organization does not allow other to have write access to any files

As you see that the project\_k.txt has the write permission from other

Command: `chmod o-w project_k.txt`

Chmod use to change permissions

o - other

-w: remove write permission

Project\_k.txt : object need to be changed

```
drwxr-xr-x 3 researcher2 research_team 4096 Aug 15 15:50 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug 15 16:15 ..
-rw--w---- 1 researcher2 research_team  46 Aug 15 15:50 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug 15 15:50 drafts
-rw-rw-rw- 1 researcher2 research_team  46 Aug 15 15:50 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Aug 15 15:50 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Aug 15 15:50 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Aug 15 15:50 project_t.txt
researcher2@24622386ba7a:~/projects$ chmod o-w project_k.txt
researcher2@24622386ba7a:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug 15 15:50 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug 15 16:15 ..
-rw--w---- 1 researcher2 research_team  46 Aug 15 15:50 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug 15 15:50 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Aug 15 15:50 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Aug 15 15:50 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Aug 15 15:50 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Aug 15 15:50 project_t.txt
```

## Change file permissions on a hidden file

The .project\_x.txt file should not have write permissions for anyone, but the user and group should be able to read the file

command: `chmod u+r,g+r,o-w .project_x.txt`

u, g: user, group

“+”: add

r, w: read, write permission

.project\_x.txt: objective need to be changed

```
researcher2@24622386ba7a:~/projects$ chmod u+r,g+r,o-w .project_x.txt
researcher2@24622386ba7a:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug 15 15:50 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug 15 16:15 ..
-rw-rw---- 1 researcher2 research_team  46 Aug 15 15:50 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug 15 15:50 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Aug 15 15:50 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Aug 15 15:50 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Aug 15 15:50 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Aug 15 15:50 project_t.txt
```

## Change directory permissions

Only `researcher2` should be allowed to access the `drafts` directory and its contents.

```
researcher2@24622386ba7a:~/projects$ chmod g-x drafts
researcher2@24622386ba7a:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug 15 15:50 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug 15 16:15 ..
-rw-rw---- 1 researcher2 research_team  46 Aug 15 15:50 .project_x.txt
drwx----- 2 researcher2 research_team 4096 Aug 15 15:50 drafts
```

## Summary

In this project, we learned how to view and modify file and directory permissions in Linux. Using `ls -l` and `ls -la`, we checked permissions and explained the structure of the permission string. We then used the `chmod` command to remove write access for "others" on a file (`project_k.txt`), adjusted permissions on a hidden file (`.project_x.txt`), and restricted access to a directory (`drafts`) so only `researcher2` could access it. This project emphasizes the importance of proper permission management to ensure system security.