

# File permissions in Linux

## Project description

This project represents my organization requesting me to verify and alter permissions for files within our projects directory to follow the principle of least privilege and protect my organization's assets. The following actions detail how I accomplish this.

## File and Directory Details

```
researcher2@fa7c94ddff42:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Sep 25 01:48 .
drwxr-xr-x 3 researcher2 research_team 4096 Sep 25 02:12 ..
-rw--w---- 1 researcher2 research_team  46 Sep 25 01:48 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Sep 25 01:48 drafts
-rw-rw-rw- 1 researcher2 research_team  46 Sep 25 01:48 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Sep 25 01:48 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Sep 25 01:48 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Sep 25 01:48 project_t.txt
researcher2@fa7c94ddff42:~/projects$
```

Here are the details in my example directory “projects” for file and directory permissions. I input the command “ls -la” to list the contents of my current directory to include hidden files, and their associated permissions, owner, and group assignment. The output is displayed in the capture.

## The Permissions String

The permissions string is a string of 10 characters that describes the file, and permissions for the user, group, and other.

For example we look at the “drafts” directory (drwx-x—)

[d] declares the file as a directory.

[rwx] declares the user as having read, write, and execute permissions.

[--x] declares the group as having execute permissions, but no read or write permissions..

[---] declares the other as having no permissions to read, write, or execute.

## Change file permissions

Here I use the `chmod` bash command to remove write permissions from the “other” class for the `project_k.txt` file. I then verify the change by using the command “`ls -la`” to show the updated permissions within my current work directory.

```
researcher2@fa7c94ddff42:~/projects$ chmod o-w project_k.txt
researcher2@fa7c94ddff42:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Sep 25 01:48 .
drwxr-xr-x 3 researcher2 research_team 4096 Sep 25 02:12 ..
-rw--w---- 1 researcher2 research_team  46 Sep 25 01:48 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Sep 25 01:48 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Sep 25 01:48 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Sep 25 01:48 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Sep 25 01:48 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Sep 25 01:48 project_t.txt
researcher2@fa7c94ddff42:~/projects$
```

## Change file permissions on a hidden file

Here I use the `chmod` bash command to remove write permissions from the “group” class for the hidden file, `.project_x.txt`. I then verify the change by using the command “`ls -la`” to show the updated permissions within my current work directory.

```
researcher2@fa7c94ddff42:~/projects$ chmod g-w .project_x.txt
researcher2@fa7c94ddff42:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Sep 25 01:48 .
drwxr-xr-x 3 researcher2 research_team 4096 Sep 25 02:12 ..
-rw----- 1 researcher2 research_team  46 Sep 25 01:48 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Sep 25 01:48 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Sep 25 01:48 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Sep 25 01:48 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Sep 25 01:48 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Sep 25 01:48 project_t.txt
```

## Change directory permissions

Here I use the `chmod` bash command to remove the execute permissions from the “group” class for the directory `drafts`. I then verify the change by using the command “`ls -la`” to show the updated permissions within my current work directory.

```
researcher2@fa7c94ddff42:~/projects$ chmod g-x drafts
researcher2@fa7c94ddff42:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Sep 25 01:48 .
drwxr-xr-x 3 researcher2 research_team 4096 Sep 25 02:12 ..
-rw----- 1 researcher2 research_team  46 Sep 25 01:48 .project_x.txt
drwx----- 2 researcher2 research_team 4096 Sep 25 01:48 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Sep 25 01:48 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Sep 25 01:48 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Sep 25 01:48 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Sep 25 01:48 project_t.txt
```

## Summary

Utilizing various bash commands I was able to change various permissions within the projects directory for multiple files and multiple classes to better suit my organization requirements and secure organization data from unnecessary risk.