

# File permissions in Linux

## Project description

The goal of this project is to understand linux commands such as displaying directories, the files within the directories and permissions it has. Then, you also learn how to modify permissions for each group associated.

## Check file and directory details

From bash, you locate the “projects” folder from the root directory. Then, typing the command to display all files within the projects directory, including hidden files and their file permissions. To check, you would use the “ls” command to list what is in the directory. Use the “ls -la” command to display all the files and directories, including hidden ones, within that directory and their permissions.

```
researcher2@a4bdd73857f0:~$ /home/researcher2/
-bash: /home/researcher2/: Is a directory
researcher2@a4bdd73857f0:~$ ls
projects
researcher2@a4bdd73857f0:~$ /home/researcher2/projects
-bash: /home/researcher2/projects: Is a directory
researcher2@a4bdd73857f0:~$ cd /home researcher2/projects
-bash: cd: too many arguments
researcher2@a4bdd73857f0:~$ cd /home/researcher2/projects
researcher2@a4bdd73857f0:~/projects$ ls
drafts  project_k.txt  project_m.txt  project_r.txt  project_t.txt
researcher2@a4bdd73857f0:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jun 30 15:27 .
drwxr-xr-x 3 researcher2 research_team 4096 Jun 30 16:08 ..
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jun 30 15:27 drafts
-rw-rw-rw- 1 researcher2 research_team  46 Jun 30 15:27 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Jun 30 15:27 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_t.txt
researcher2@a4bdd73857f0:~/projects$
```

## Describe the permissions string

There is a ten character string on the far left of the results given. The first character is identifying whether it is a directory of a file. The letter d denotes that it is a directory and a dash

denotes that it is a file. The next 3 strings belong to the “user” permissions, identifying as “r” for read, “w” for write, and “x” for execution. If any one of those strings is substituted by a dash, it means that “user” does not have that permission. The next set of 3 strings belongs to the “group” group. Those permissions follow the same as the first. The last 3 strings belong to the “other” group. They also are followed with the same permissions.

## Change file permissions

In this section, the “others” group is not allowed to have write access to any of the files. To change the permission, you need to use the “chmod” command to change permissions. “U” is identified as user group, “g” is identified as group, and “o” is identified as other group. To add a permission, you will follow the command with a + sign. To disallow a permission, you will use a - sign. Project\_k.txt from the screenshot above is the directory that has write permissions that needs to be disallowed. To use the proper command you would type “chmod o-w project\_k.txt”. Chmod represents modifying the file, then you would type the group you are modifying which is “o” for others group. Then, you would type the minus sign followed by a w to disallow write permissions. Then, type space and which file to change the permission (project\_k.txt). After is executed, you would type ls -la to display all files (including hidden) and the permissions they have. It will show that project\_k.txt does not have write permissions any longer.

```

researcher2@a4bdd73857f0:~$ /home/researcher2/
-bash: /home/researcher2/: Is a directory
researcher2@a4bdd73857f0:~$ ls
projects
researcher2@a4bdd73857f0:~$ /home/researcher2/projects
-bash: /home/researcher2/projects: Is a directory
researcher2@a4bdd73857f0:~$ cd /home/researcher2/projects
-bash: cd: too many arguments
researcher2@a4bdd73857f0:~$ cd /home/researcher2/projects
researcher2@a4bdd73857f0:~/projects$ ls
drafts  project_k.txt  project_m.txt  project_r.txt  project_t.txt
researcher2@a4bdd73857f0:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jun 30 15:27 .
drwxr-xr-x 3 researcher2 research_team 4096 Jun 30 16:08 ..
-rw--w---- 1 researcher2 research_team  46 Jun 30 15:27 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jun 30 15:27 drafts
-rw-rw-rw- 1 researcher2 research_team  46 Jun 30 15:27 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Jun 30 15:27 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_t.txt
researcher2@a4bdd73857f0:~/projects$ chmod o-w, project_k.txt
chmod: invalid mode: 'o-w,'
Try 'chmod --help' for more information.
researcher2@a4bdd73857f0:~/projects$ chmod o-w project_k.txt
researcher2@a4bdd73857f0:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jun 30 15:27 .
drwxr-xr-x 3 researcher2 research_team 4096 Jun 30 16:08 ..
-rw--w---- 1 researcher2 research_team  46 Jun 30 15:27 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jun 30 15:27 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Jun 30 15:27 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_t.txt
researcher2@a4bdd73857f0:~/projects$

```

## Change file permissions on a hidden file

This section involves changing the permissions on the hidden file “.project\_x.txt”. It is asked that no group have any write permissions on the file but the user and group groups should have read permissions. To do this, you would type it as “chmod u-w,g+r-w .project\_x.txt”. Chmod is modifying, u-w means disallow write permissions, put a comma and follow it with a g for the group groups, then type plus r and minus w to add read permissions and disallow write permissions from the output earlier in the photo above. Then hit space and type the file (.project\_x.txt). The output will result in both user and group groups having read permissions, but not write permissions.

```

researcher2@a4bdd73857f0:~$ /home/researcher2/
-bash: /home/researcher2/: Is a directory
researcher2@a4bdd73857f0:~$ ls
projects
researcher2@a4bdd73857f0:~$ /home/researcher2/projects
-bash: /home/researcher2/projects: Is a directory
researcher2@a4bdd73857f0:~$ cd /home/researcher2/projects
-bash: cd: too many arguments
researcher2@a4bdd73857f0:~$ cd /home/researcher2/projects
researcher2@a4bdd73857f0:~/projects$ ls
drafts  project_k.txt  project_m.txt  project_r.txt  project_t.txt
researcher2@a4bdd73857f0:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jun 30 15:27 .
drwxr-xr-x 3 researcher2 research_team 4096 Jun 30 16:08 ..
-rw--w---- 1 researcher2 research_team  46 Jun 30 15:27 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jun 30 15:27 drafts
-rw-rw-rw- 1 researcher2 research_team  46 Jun 30 15:27 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Jun 30 15:27 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_t.txt
researcher2@a4bdd73857f0:~/projects$ chmod o-w, project_k.txt
chmod: invalid mode: 'o-w,'
Try 'chmod --help' for more information.
researcher2@a4bdd73857f0:~/projects$ chmod o-w project_k.txt
researcher2@a4bdd73857f0:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jun 30 15:27 .
drwxr-xr-x 3 researcher2 research_team 4096 Jun 30 16:08 ..
-rw--w---- 1 researcher2 research_team  46 Jun 30 15:27 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jun 30 15:27 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Jun 30 15:27 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_t.txt
researcher2@a4bdd73857f0:~/projects$ chmod u-w,g+r-w .project_x.txt
researcher2@a4bdd73857f0:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jun 30 15:27 .
drwxr-xr-x 3 researcher2 research_team 4096 Jun 30 16:08 ..
-r--r----- 1 researcher2 research_team  46 Jun 30 15:27 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jun 30 15:27 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Jun 30 15:27 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_t.txt
researcher2@a4bdd73857f0:~/projects$ █

```

## Change directory permissions

In this section, only researcher2 should be allowed to access the drafts directory and its contents. From the photo above, it shows that the group has execution permissions for the draft directory. To disallow so that only researcher2 has access to the drafts directory, you would type “chmod g-x drafts” to disallow the group group permissions to that directory.

```

researcher2@a4bdd73857f0:~/projects$ ls
drafts project_k.txt project_m.txt project_r.txt project_t.txt
researcher2@a4bdd73857f0:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jun 30 15:27 .
drwxr-xr-x 3 researcher2 research_team 4096 Jun 30 16:08 ..
-rw--w---- 1 researcher2 research_team  46 Jun 30 15:27 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jun 30 15:27 drafts
-rw-rw-rw- 1 researcher2 research_team  46 Jun 30 15:27 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Jun 30 15:27 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_t.txt
researcher2@a4bdd73857f0:~/projects$ chmod o-w, project_k.txt
chmod: invalid mode: 'o-w,'
Try 'chmod --help' for more information.
researcher2@a4bdd73857f0:~/projects$ chmod o-w project_k.txt
researcher2@a4bdd73857f0:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jun 30 15:27 .
drwxr-xr-x 3 researcher2 research_team 4096 Jun 30 16:08 ..
-rw--w---- 1 researcher2 research_team  46 Jun 30 15:27 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jun 30 15:27 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Jun 30 15:27 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_t.txt
researcher2@a4bdd73857f0:~/projects$ chmod u-w,g+r-w .project_x.txt
researcher2@a4bdd73857f0:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jun 30 15:27 .
drwxr-xr-x 3 researcher2 research_team 4096 Jun 30 16:08 ..
-r--r----- 1 researcher2 research_team  46 Jun 30 15:27 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jun 30 15:27 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Jun 30 15:27 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_t.txt
researcher2@a4bdd73857f0:~/projects$ chmod g-x drafts
researcher2@a4bdd73857f0:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jun 30 15:27 .
drwxr-xr-x 3 researcher2 research_team 4096 Jun 30 16:08 ..
-r--r----- 1 researcher2 research_team  46 Jun 30 15:27 .project_x.txt
drwx----- 2 researcher2 research_team 4096 Jun 30 15:27 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Jun 30 15:27 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jun 30 15:27 project_t.txt
researcher2@a4bdd73857f0:~/projects$ █

```

## Summary

This project was to help understand commands used in linux in viewing folders/directories and the permissions they have. It also shows how to modify the permissions.