

File permissions in Linux

Project description

The project involves using some linux commands to determine existing permissions for users in the research team. Users will only be given the least amount of permission necessary to complete their assignments in the research. The users having more than required permissions for accomplishing their designated tasks will have their authorization adjusted appropriately.

Check file and directory details

```
researcher2@4d1feb609c7e:~$ cd projects
researcher2@4d1feb609c7e:~/projects$ ls -l
total 20
drwx--x--- 2 researcher2 research_team 4096 Feb  7 02:55 drafts
-rw-rw-rw- 1 researcher2 research_team  46 Feb  7 02:55 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Feb  7 02:55 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Feb  7 02:55 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Feb  7 02:55 project_t.txt
researcher2@4d1feb609c7e:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Feb  7 02:55 .
drwxr-xr-x 3 researcher2 research_team 4096 Feb  7 03:25 ..
-rw--w---- 1 researcher2 research_team  46 Feb  7 02:55 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Feb  7 02:55 drafts
-rw-rw-rw- 1 researcher2 research_team  46 Feb  7 02:55 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Feb  7 02:55 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Feb  7 02:55 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Feb  7 02:55 project_t.txt
researcher2@4d1feb609c7e:~/projects$
```

Describe the permissions string

A permissions string has 10 characters, `drwxrwxrwx`. The 1st character indicates the file type. The `d` indicates it's a directory. When this character is a hyphen (`-`), it's a regular file. The 2nd-4th characters indicate the read (`r`), write (`w`), and execute (`x`) permissions for the user. When one of these characters is a hyphen (`-`) instead, it indicates that this permission is not granted to the user. The 5th-7th characters indicate the read (`r`), write (`w`), and execute (`x`) permissions for the group. When one of these characters is a hyphen (`-`) instead, it indicates that this permission is not granted for the group. The

8th-10th characters indicate the read (r), write (w), and execute (x) permissions for the owner type of other. This owner type consists of all other users on the system apart from the user and the group. When one of these characters is a hyphen (-) instead, that indicates that this permission is not granted for other.

Change file permissions

```
researcher2@4d1feb609c7e:~/projects$ ls -l
total 20
drwx--x--- 2 researcher2 research_team 4096 Feb  7 02:55 drafts
-rw-rw-rw- 1 researcher2 research_team  46 Feb  7 02:55 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Feb  7 02:55 project_m.txt
-rw-rw-r--  1 researcher2 research_team  46 Feb  7 02:55 project_r.txt
-rw-rw-r--  1 researcher2 research_team  46 Feb  7 02:55 project_t.txt
researcher2@4d1feb609c7e:~/projects$ chmod o-w project_k.txt
researcher2@4d1feb609c7e:~/projects$ chmod g-r project_m.txt
researcher2@4d1feb609c7e:~/projects$ ls
drafts project_k.txt project_m.txt project_r.txt project_t.txt
researcher2@4d1feb609c7e:~/projects$ ls -l
total 20
drwx--x--- 2 researcher2 research_team 4096 Feb  7 02:55 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Feb  7 02:55 project_k.txt
-rw----- 1 researcher2 research_team  46 Feb  7 02:55 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Feb  7 02:55 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Feb  7 02:55 project_t.txt
researcher2@4d1feb609c7e:~/projects$
```

Change file permissions on a hidden file

```
researcher2@4d1feb609c7e:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Feb  7 02:55 .
drwxr-xr-x 3 researcher2 research_team 4096 Feb  7 03:25 ..
-rw--w---- 1 researcher2 research_team  46 Feb  7 02:55 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Feb  7 02:55 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Feb  7 02:55 project_k.txt
-rw----- 1 researcher2 research_team  46 Feb  7 02:55 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Feb  7 02:55 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Feb  7 02:55 project_t.txt
researcher2@4d1feb609c7e:~/projects$ chmod ug=r .project_x.txt
researcher2@4d1feb609c7e:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Feb  7 02:55 .
drwxr-xr-x 3 researcher2 research_team 4096 Feb  7 03:25 ..
-r--r----- 1 researcher2 research_team  46 Feb  7 02:55 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Feb  7 02:55 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Feb  7 02:55 project_k.txt
-rw----- 1 researcher2 research_team  46 Feb  7 02:55 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Feb  7 02:55 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Feb  7 02:55 project_t.txt
researcher2@4d1feb609c7e:~/projects$
```

Change directory permissions

```
researcher2@4d1feb609c7e:~/projects$ ls -l
total 20
drwx--x--- 2 researcher2 research_team 4096 Feb  7 02:55 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Feb  7 02:55 project_k.txt
-rw----- 1 researcher2 research_team  46 Feb  7 02:55 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Feb  7 02:55 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Feb  7 02:55 project_t.txt
researcher2@4d1feb609c7e:~/projects$ chmod g-x drafts
researcher2@4d1feb609c7e:~/projects$ ls -l
total 20
drwx----- 2 researcher2 research_team 4096 Feb  7 02:55 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Feb  7 02:55 project_k.txt
-rw----- 1 researcher2 research_team  46 Feb  7 02:55 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Feb  7 02:55 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Feb  7 02:55 project_t.txt
researcher2@4d1feb609c7e:~/projects$
```

Summary

The permissions were changed to give the least privilege for an owner group to complete their task. It follows that `project_k.txt` has the write permissions for the owner, other, changed. Then `project_m.txt` has the read permissions for the group changed since they will not require access to the file to complete their assigned tasks. A hidden file `.project_x.txt` has been changed to read only for both the user and group owners. None of the owners will require to make changes to the hidden file in order to accomplish their tasks. The `drafts` directory is authorized to be read, written to and accessed by only the user, therefore, the user is given full permissions.