

File permissions in Linux

Project description

For this project, we are ensuring that users on the team are authorized with the appropriate permissions to help keep the system secure. We examined existing permissions on the file system to determine if the permissions match the authorization that should be given. If they do not match, we will modify the permissions to authorize the appropriate users and remove any unauthorized access. The file we will be accessing today is /home/researcher2/projects.

Check file and directory details

First, we made sure we are in the right directory using `pwd`, `ls`, `cd` command lines. Then, we used the `ls -la` command line to display all permissions set for files and subdirectories including hidden files.

```
researcher2@6ac4a84babfd:~$ pwd
/home/researcher2
researcher2@6ac4a84babfd:~$ ls
projects
researcher2@6ac4a84babfd:~$ cd projects
researcher2@6ac4a84babfd:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jul 31 18:12 .
drwxr-xr-x 3 researcher2 research_team 4096 Jul 31 18:59 ..
-rw--w---- 1 researcher2 research_team  46 Jul 31 18:12 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jul 31 18:12 drafts
-rw-rw-rw- 1 researcher2 research_team  46 Jul 31 18:12 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Jul 31 18:12 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jul 31 18:12 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Jul 31 18:12 project_t.txt
```

Describe the permissions

```
drwxr-xr-x 3 researcher2 research_team 4096 Jul 31 18:12 .
```

We will use this specific line to describe the permissions. The first letter “d” stands for directory. It shows that it is a directory file. If it is a regular file, it uses the “-”. The first three letters determine if the user has access to the file which is usually the owner of the file. The following three letters determine if the group has access to the file which includes several users. The last three letters determine if others have access to the file. The next three letters “rwx” each stand for read, write, and execute. Since “rwx” is all present, the user has permission to read, write, and execute this file. The next three letters “r-x” show that the group has permission to read and execute but does not have permission to write. The last three letters “r-x” show that others have permission to read and execute but do not have permission to write.

Change file permissions

The organization does not allow others to have write access to any files. We have to check the last three letters to see if there are any “w”. From the file permissions, we can see that project_k.txt has “rw-” for the last three letters which indicates that others have access to write on this file.

```
-rw-rw-rw- 1 researcher2 research_team 46 Jul 31 18:12 project_k.txt
```

So, we have to change the permission for the project_k.txt file. We do that by entering the command line `chmod o-w project_k.txt`. `chmod` is used for modifying file permissions. `o` stands for the “other” group and `w` stands for the writing permission. By subtracting, we can get rid of the others having permission for writing. So we use `o-w` followed by the file we are modifying.

```
researcher2@6ac4a84babfd:~/projects$ chmod o-w project_k.txt
researcher2@6ac4a84babfd:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jul 31 18:12 .
drwxr-xr-x 3 researcher2 research_team 4096 Jul 31 18:59 ..
-rw--w---- 1 researcher2 research_team 46 Jul 31 18:12 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jul 31 18:12 drafts
-rw-rw-r-- 1 researcher2 research_team 46 Jul 31 18:12 project_k.txt
-rw-r----- 1 researcher2 research_team 46 Jul 31 18:12 project_m.txt
-rw-rw-r-- 1 researcher2 research_team 46 Jul 31 18:12 project_r.txt
-rw-rw-r-- 1 researcher2 research_team 46 Jul 31 18:12 project_t.txt
```

Change file permissions on a hidden file

The file that starts with a “.” indicates that it is a hidden file. The research team has archived .project_x.txt. This file should not have written permissions for anyone, but the user and group should be able to read the file. Right now, this file has written permission for both user and the group but does not have permission for the group to read.

```
-rw--w---- 1 researcher2 research_team 46 Jul 31 18:12 .project_x.txt
```

We modify this by using `chmod` followed by `u-w` for getting rid of write permission for users, `g-w` for getting rid of write permissions for groups, and `g+r` for allowing groups to read the file followed by the project name `.project_x.txt`.

```
researcher2@6ac4a84babfd:~/projects$ chmod u-w,g-w,g+r .project_x.txt
researcher2@6ac4a84babfd:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jul 31 18:12 .
drwxr-xr-x 3 researcher2 research_team 4096 Jul 31 18:59 ..
-r--r----- 1 researcher2 research_team 46 Jul 31 18:12 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jul 31 18:12 drafts
-rw-rw-r-- 1 researcher2 research_team 46 Jul 31 18:12 project_k.txt
-rw-r----- 1 researcher2 research_team 46 Jul 31 18:12 project_m.txt
-rw-rw-r-- 1 researcher2 research_team 46 Jul 31 18:12 project_r.txt
-rw-rw-r-- 1 researcher2 research_team 46 Jul 31 18:12 project_t.txt
```

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. This means only the user should have the “x” permission. Right now, the group also has access to execute since there is a “x” permission.

```
-r--r--r-- 1 researcher2 research_team 46 Jul 31 18:12 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jul 31 18:12 drafts
```

We modify this by using `chmod` followed by `g-x` for getting rid of access permission for the group followed by the directory name `drafts`.

```
-rw-rw-r-- 1 researcher2 research_team 46 Jul 31 18:12 project_c.txt
researcher2@6ac4a84babfd:~/projects$ chmod g-x drafts
researcher2@6ac4a84babfd:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jul 31 18:12 .
drwxr-xr-x 3 researcher2 research_team 4096 Jul 31 18:59 ..
-r--r----- 1 researcher2 research_team 46 Jul 31 18:12 .project_x.txt
drwx----- 2 researcher2 research_team 4096 Jul 31 18:12 drafts
-rw-rw-r-- 1 researcher2 research_team 46 Jul 31 18:12 project_k.txt
-rw-r----- 1 researcher2 research_team 46 Jul 31 18:12 project_m.txt
-rw-rw-r-- 1 researcher2 research_team 46 Jul 31 18:12 project_r.txt
-rw-rw-r-- 1 researcher2 research_team 46 Jul 31 18:12 project_t.txt
researcher2@6ac4a84babfd:~/projects$
```

Summary

In this project, we went through existing permissions for the files and directories in the `home/researcher2/projects` file and modified permissions. First, we made sure others do not have access to any of the files. Then we made sure the hidden file does not have write permissions for anyone but has permission to read for the user and group. Lastly, we made sure the `drafts` directory is only allowed to be accessed by the user **researcher2**.