File permissions in Linux

Project description

Exploring permission commands in the Bash Shell for Linux. In the scenario, I am looking at the permission string, what it means, and how to change it. I do this for normal files, hidden files, and for directories. I'll mostly be removing permissions to be in line with the "least privilege" principles.

Check file and directory details

I navigated to the projects directory using `cd projects`

```
researcher2@096b33215a8c:~$ cd projects
```

And then checked the directories, files and their permissions using `ls -la`

```
researcher2@096b33215a8c:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Apr  9 16:58 .
drwxr-xr-x 3 researcher2 research_team 4096 Apr  9 17:46 ..
-rw--w---- 1 researcher2 research_team   46 Apr  9 16:58 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Apr  9 16:58 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Apr  9 16:58 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Apr  9 16:58 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Apr  9 16:58 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Apr  9 16:58 project_t.txt
researcher2@096b33215a8c:~/projects$
```

Describe the permissions string

Three examples of permission strings:

```
drwxr-xr-x
-rw--w----
drwx--x---
```

There are 10 characters in total. The first one shows whether it is a directory (d) or a file (-). The second through fourth characters show the permission for the user. rwx means full permission, with r=read, w=write, x=execute. If they do not have a permission, it will give a - instead. So - - - means no permissions in read, write or execute. And r- - means only read permission. The fifth through seventh, and the eight through tenth show the same pattern, but instead of showing the user's permission, it shows the group permission and other permission respectively.

Change file permissions

Remove write permission for other for the `project_k.txt` file using `chmod`:

```
researcher2@096b33215a8c:~/projects$ chmod o-w project_k.txt
```

Before the command:

```
-rw-rw-rw- 1 researcher2 research_team   46 Apr  9 16:58 project_k.txt
```

After the command:

```
-rw-rw-r-- 1 researcher2 research_team   46 Apr  9 16:58 project_k.txt
```

Remove read permission for group for the `project_m.txt` file:

```
researcher2@096b33215a8c:~/projects$ chmod g-r project_m.txt
```

Before the command:

```
-rw-r----- 1 researcher2 research_team   46 Apr  9 16:58 project_m.txt
```

After the command:

```
-rw------- 1 researcher2 research_team   46 Apr  9 16:58 project_m.txt
```

Change file permissions on a hidden file

Allow only read permission for user and group for the `.project_x.txt` file:

```
researcher2@096b33215a8c:~/projects$ chmod u=r,g=r .project_x.txt
```

Before the command:

```
-rw--w---- 1 researcher2 research_team   46 Apr  9 16:58 .project_x.txt
```

After the command:

```
-r--r----- 1 researcher2 research_team   46 Apr  9 16:58 .project_x.txt
```

Change directory permissions

Removing executable permission from group for the `drafts` folder:

```
researcher2@096b33215a8c:~/projects$ chmod g-x drafts
```

Before the command:

```
drwx--x--- 2 researcher2 research_team 4096 Apr  9 16:58 drafts
```

After the command:

```
drwx------ 2 researcher2 research_team 4096 Apr  9 16:58 drafts
```

Summary

I successfully changed the permissions of several files and a directory to make them more secure. The files are now more secure due to being in line with the “least privilege” principles. This also prevents accidents.