

File permissions in Linux

Project description

In this project, we apply a scenario of a research team that is going to change file permissions on Linux. Some of the current permissions do not represent the level of authorization that should be. To complete this task I followed the steps:

Check file and directory details

To check permissions in files and directories `ls -l` command is used.

```
researcher2@2ebc64a910c4:~$ ls
projects
researcher2@2ebc64a910c4:~$ cd projects
researcher2@2ebc64a910c4:~/projects$ ls -l
total 20
drwx--x--- 2 researcher2 research_team 4096 Nov 14 07:37 drafts
-rw-rw-rw- 1 researcher2 research_team  46 Nov 14 07:37 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Nov 14 07:37 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov 14 07:37 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov 14 07:37 project_t.txt
researcher2@2ebc64a910c4:~/projects$
```

To find hidden files, `ls -la` command is used:

```
researcher2@2ebc64a910c4:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Nov 14 07:37 .
drwxr-xr-x 3 researcher2 research_team 4096 Nov 14 08:26 ..
-rw--w---- 1 researcher2 research_team  46 Nov 14 07:37 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Nov 14 07:37 drafts
-rw-rw-rw- 1 researcher2 research_team  46 Nov 14 07:37 project_k.txt
```

We can see `.project_x.txt` is hidden file.

Describe the permissions string

- First character of the permission string represents the file type. D is directory, - is regular file
- Second to fourth characters represent user permissions and there are three permission types: r(read), w(write), x(execute).
- Fifth to seventh characters represent group permissions.
- Eight to tenth characters represent other permissions.

Change file permissions

We want none of the files allow the 'other' users to write files. Firstly, permissions checked again, and a file that has write permission for 'other' had been found.

```
drwx--x--- 2 researcher2 research_team 4096 Nov 14 07:37 drafts
-rw-rw-rw- 1 researcher2 research_team  46 Nov 14 07:37 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Nov 14 07:37 project_m.txt
```

By using **chmod o-w project_k.txt** command, we delete permission to write for 'other' users.

```
drwx--x--- 2 researcher2 research_team 4096 Nov 14 07:37 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Nov 14 07:37 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Nov 14 07:37 project_m.txt
```

Let's say project_m.txt is restricted file should not be readable or writable by group or other users.

```
-rw-rw-r-- 1 researcher2 research_team  46 Nov 14 07:37 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Nov 14 07:37 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov 14 07:37 project_r.txt
```

By using **chmod g-r project_m.txt** command, permission to read for group users will be deleted.

Change file permissions on a hidden file

The file `.project_x.txt` is a hidden file that has been archived and should not be written to by anyone. (The user and group should still be able to read this file.)

```
drwxr-xr-x 3 researcher2 research_team 4096 Nov 14 08:26 ..
-rw--w---- 1 researcher2 research_team  46 Nov 14 07:37 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Nov 14 07:37 drafts
```

User and group can write on the `.project_x.txt` file. Both user and group should read the file but not write. To change it following command is used:

```
chmod: cannot access '.project_x.txt': No such file or directory
researcher2@2ebc64a910c4:~/projects$ chmod u-w,g-w,g+r .project_x.txt
researcher2@2ebc64a910c4:~/projects$ ls -ls
```

Change directory permissions

Only researcher2 should be access to drafts directory. To ensure first we check the permission of the drafts:

```
drwx--x--- 2 researcher2 research_team 4096 Nov 14 07:37 drafts
```

Then we change the group permission to access this directory:

```
researcher2@2ebc64a910c4:~/projects$ chmod g-x drafts
```

Summary

In this activity we worked on file permissions on Linux. First we observed file and directory details. Then we learned about permissions string. Then we started to change file, hidden file and directory permissions.