File permissions in Linux

Project description

This simulation project puts the performer, Maheswar Reddy Avula, into the position of a system administrator for an organization. This project documents the following : check the permissions for all files in the directory, including any hidden files, to make sure that permissions align with the authorization that should be given as specified by the organization, and to make edits to permissions as needed.

File and directory details

The **-ls** command was used along with the **-la** option to display all the files in the **/projects** directory, including hidden files.

```
researcher2@1eeb06acf491:~/projects$ ls -ls
total 20
4 drwx--x--- 2 researcher2 research_team 4096 Aug 29 08:43 drafts
4 -rw-rw-rw- 1 researcher2 research_team   46 Aug 29 08:43 project_k.txt
4 -rw-r----- 1 researcher2 research_team   46 Aug 29 08:43 project_m.txt
4 -rw-rw-r-- 1 researcher2 research_team   46 Aug 29 08:43 project_r.txt
4 -rw-rw-r-- 1 researcher2 research_team   46 Aug 29 08:43 project_t.txt
```

The contents and their current respective permissions are described below:

project_k.txt

- User = read, write.
- Group = read, write
- Other = read, write

Project_m.txt

- User = read, write
- Group = read
- Other = none

Project_r.txt

- User = read, write
- Group = read, write

- Other = read

Project_t.txt

- User = read, write
- Group = read, write
- Other = read

.project_x.txt

- User = read,write
- Group = write
- Other = none

There is also one subdirectory inside the projects directory named **drafts**. The permissions on **drafts** are:

- User = read,write,execute
- Group = execute
- Other = none

The permissions string

For instance, we use the permissions string of the **/drafts** directory to understand the meaning of the 10 character string used to describe permissions.

```
drwx--x--- 2 researcher2 research_team 4096 Aug 29 08:43 drafts
```

- 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. Here, r w x means that the user researcher2 has all 3 permissions.
- The 5th-7th characters indicate the read (r), write (w), and execute (x) permissions for the group. Here, - - x means that the group research_team does not have read or write permissions, but can still access the /drafts directory
- 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. Here, - - -

signifies that the other owner type has none of the rwx permissions for the /drafts directory.

Changing file permissions

Directions: The organization does not allow **other** to have **write** access to any files. The files that need to have their permissions modified are identified according to this demand. It is found that **project_k.txt** has write permissions for other group.

```
-rw-rw-rw- 1 researcher2 research_team   46 Aug 29 08:43 project_k.txt
```

The chmod command is used to modify these permissions as follows:

```
researcher2@1eeb06acf491:~/projects$ ls -lh
total 20K
drwx--x--- 2 researcher2 research_team 4.0K Aug 29 08:43 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Aug 29 08:43 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Aug 29 08:43 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 29 08:43 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 29 08:43 project_t.txt
researcher2@1eeb06acf491:~/projects$
```

The **write** permission was removed from the **other** group. On displaying all files and their permissions using **ls -la**, we observe that **project_k.txt** no longer has write permission.

Changing file permissions on a hidden file

Directions: The research team has archived **.project_x.txt**, which is why it's a hidden file. This file should not have write permissions for anyone, but the user and group should be able to read the file.

The **ls** command is used to display current permissions.

```
-rw--w---- 1 researcher2 research_team   46 Aug 29 08:43 .project_x.txt
```

In accordance with the guidelines specified by the organization, the **chmod** command is used to edit the permissions as follows:

```
researcher2@1eeb06acf491:~/projects$ chmod u=r--,g=r--,o=--- .project_x.txt
researcher2@1eeb06acf491:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug 29 08:43 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug 29 09:18 ..
-r--r----- 1 researcher2 research_team   46 Aug 29 08:43 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug 29 08:43 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Aug 29 08:43 project_k.txt
-rw------- 1 researcher2 research_team   46 Aug 29 08:43 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 29 08:43 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 29 08:43 project_t.txt
researcher2@1eeb06acf491:~/projects$
```

Read only settings were applied for user **researcher2** and group **research_team**. On displaying all files and their permissions using **ls -la,** we observe that **.project_x.txt** now has only read permissions for user and group and no permissions for other.

Changing directory permissions

Direction: 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.

The **ls** command is used to display current permissions.

```
drwx--x--- 2 researcher2 research_team 4096 Aug 29 08:43 drafts
```

It is observed that the group **research_team** has execute permissions for the **drafts** directory. In accordance with the guidelines specified by the organization, the **chmod** command is used to edit the permissions as follows:

```
researcher2@1eeb06acf491:~/projects$ ls -l
total 20
drwx------ 2 researcher2 research_team 4096 Aug 29 08:43 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Aug 29 08:43 project_k.txt
-rw------- 1 researcher2 research_team   46 Aug 29 08:43 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 29 08:43 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 29 08:43 project_t.txt
researcher2@1eeb06acf491:~/projects$
```

On making the necessary edits by removing **execute** permission from group **research_team**, it is observed that now only the **researcher2** user has rwx access to the drafts directory and it is no longer accessible by the **research_team** group or **other** group.

Project summary

The file and directory permissions were successfully displayed and analyzed using the **ls** command with the -**la** option. These permissions were then altered using the **chmod** command in accordance with the directions given by the overlooking organization. All tasks were successfully completed.