File permissions in Linux

Project description

The organization research team wants to update the file permissions for some files and directories in project directory. The current level of permissions did not meet the requirements for the authorization to only needed people. Changing permissions accordingly will make the system secure.

Check file and directory details

The command below is used to view the current permissions for the files in projects directory.

```
researcher2@cf2d766ad840:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug  3 15:13 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug  3 15:19 ..
-rw--w---- 1 researcher2 research_team   46 Aug  3 15:13 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug  3 15:13 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Aug  3 15:13 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Aug  3 15:13 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug  3 15:13 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug  3 15:13 project_t.txt
researcher2@cf2d766ad840:~/projects$
```

The ls -la command used to view the permissions for the files and directories including hidden files. There is 1 hidden file named .project_x.txt and 1 hidden directory drafts. The first 10 characters indicates the permissions for read, write and execute for the files or directories.

Describe the permissions string

- 1st character: d indicates that it is a directory and (-) indicates that it is regular file
- 2nd-4th character: The characters are read (r), write (w) and execute (x) permissions for the user. If there is a hyphen (-), it means that the permission is not granted to the user.
- 5th-7th character: The characters are read (r), write (w) and execute (x) permissions for the group. If there is a hyphen (-), it means that the permission is not granted to the group.
- 8th-10th character: The characters are read (r), write (w) and execute (x) permissions for others than user and group. If there is a hyphen (-), it means that the permission is not granted to others than user and group.

Change file permissions

```
researcher2@cf2d766ad840:~/projects$ chmod o-w project_k.txt
researcher2@cf2d766ad840:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug  3 15:13 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug  3 15:19 ..
-rw--w---- 1 researcher2 research_team   46 Aug  3 15:13 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug  3 15:13 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Aug  3 15:13 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Aug  3 15:13 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug  3 15:13 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug  3 15:13 project_t.txt
researcher2@cf2d766ad840:~/projects$
```

The code above was executed to remove the write permission for the others for the `project_k.txt` file. Then I used ls -la to verify the changes.

Change file permissions on a hidden file

```
researcher2@cf2d766ad840:~/projects$ chmod u-w,g-w,g+r .project_x.txt
researcher2@cf2d766ad840:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug  3 15:13 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug  3 15:19 ..
-r--r----- 1 researcher2 research_team   46 Aug  3 15:13 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug  3 15:13 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Aug  3 15:13 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Aug  3 15:13 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug  3 15:13 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug  3 15:13 project_t.txt
researcher2@cf2d766ad840:~/projects$
```

The code above was executed to remove the write permission for the user as well as group and add read permission for group for the `.project_x.txt` file which is a hidden file. Then I used ls -la to verify the changes.

Change directory permissions

```
researcher2@cf2d766ad840:~/projects$ chmod g-x drafts
researcher2@cf2d766ad840:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug  3 15:13 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug  3 15:19 ..
-r--r----- 1 researcher2 research_team   46 Aug  3 15:13 .project_x.txt
drwx------ 2 researcher2 research_team 4096 Aug  3 15:13 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Aug  3 15:13 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Aug  3 15:13 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug  3 15:13 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug  3 15:13 project_t.txt
researcher2@cf2d766ad840:~/projects$
```

The code above was executed to remove the execute permission for the group to the `drafts` directory. Then I used `ls -la` to verify the changes.

Summary

The changes were made according to the organization needs. The `ls -la` is used to verify that all the changes were successfully made. `chmod` command was used to change the permissions for the files and directories. Now, the permissions management is much more secure than before.