

File permissions in Linux

Project description

This project involves reviewing and managing file permissions for the projects directory owned by the researcher2 user, who is a member of the research_team group. The primary goal is to ensure that file permissions align with the necessary security and access requirements.

Check file and directory details

In this section, we navigate to the projects directory and inspect its contents and permissions. The permissions string provides information about the access levels for the user, group, and others. It follows a 10-character format, indicating read (r), write (w), and execute (x) permissions for each category.

```
researcher2@5d738f0f927b:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Dec  2 15:27 .
drwxr-xr-x 3 researcher2 research_team 4096 Dec  2 15:27 ..
-rw--w---- 1 researcher2 research_team  46 Dec  2 15:27 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Dec  2 15:27 drafts
-rw-rw-rw- 1 researcher2 research_team  46 Dec  2 15:27 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Dec  2 15:27 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Dec  2 15:27 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Dec  2 15:27 project_t.txt
researcher2@5d738f0f927b:~/projects$
```

Describe the permissions string

- The 1st character indicates the file type ('d' for directory, '-' for a regular file).
- Characters 2-4 represent user (owner) permissions.
- Characters 5-7 represent group permissions.
- Characters 8-10 represent other (everyone else) permissions.

Change file permissions

This section involves identifying and correcting files with incorrect permissions. The tasks include ensuring that no files allow other users to write. Specific files, such as `project_k.txt` and `project_m.txt`, require adjustments to restrict unauthorized access.

```
researcher2@5d738f0f927b:~/projects$ chmod o-w project_k.txt
researcher2@5d738f0f927b:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Dec  2 15:27 .
drwxr-xr-x 3 researcher2 research_team 4096 Dec  2 15:27 ..
-rw--w---- 1 researcher2 research_team  46 Dec  2 15:27 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Dec  2 15:27 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Dec  2 15:27 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Dec  2 15:27 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Dec  2 15:27 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Dec  2 15:27 project_t.txt
researcher2@5d738f0f927b:~/projects$
```

Change file permissions on a hidden file

Here, the focus is on a hidden file, `.project_x.txt`, which should be readable but not writable by anyone. The permissions of the user and group are adjusted accordingly.

```
researcher2@3213bbc1d047:~/projects$ chmod u-w,g-w,g+r .project_x.txt
researcher2@3213bbc1d047:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Dec 20 15:36 .
drwxr-xr-x 3 researcher2 research_team 4096 Dec 20 15:36 ..
-r--r----- 1 researcher2 research_team  46 Dec 20 15:36 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Dec 20 15:36 drafts
-rw-rw-rw- 1 researcher2 research_team  46 Dec 20 15:36 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Dec 20 15:36 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Dec 20 15:36 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Dec 20 15:36 project_t.txt
researcher2@3213bbc1d047:~/projects$
```

Change directory permissions

The tasks involve checking and modifying permissions for the drafts subdirectory within projects. The goal is to restrict access to only the researcher2 user by removing execute privileges for the group.

```
researcher2@5d738f0f927b:~/projects$ chmod g-x drafts
researcher2@5d738f0f927b:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Dec  2 15:27 .
drwxr-xr-x 3 researcher2 research_team 4096 Dec  2 15:27 ..
-r--r----- 1 researcher2 research_team  46 Dec  2 15:27 .project_x.txt
drwx----- 2 researcher2 research_team 4096 Dec  2 15:27 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Dec  2 15:27 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Dec  2 15:27 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Dec  2 15:27 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Dec  2 15:27 project_t.txt
researcher2@5d738f0f927b:~/projects$
```

Summary

In summary, this project aims to enhance the security of researcher2's project files. It involves a comprehensive examination of permissions for both visible and hidden files, adjusting access levels where necessary. By the end of the project, unauthorized write access to files, especially by other users, is removed, ensuring that only the researcher2 user has access to the drafts directory and its contents. The changes align with the principle of least privilege, contributing to a more secure file management system.