File Permissions in Linux

Project Description

The research team at my organization needs to update the file permissions for certain files and directories within the projects directory. These permissions do not currently reflect the level of authorization that should be given. Checking and updating these permissions will help keep the system secure. To complete this task, I performed the following:

- Checked file and directory details.
- Changed file permissions to align with organizational policies.
- Modified permissions on hidden files to ensure appropriate access.
- Updated directory permissions to restrict unauthorized access.

Step 1: Check File and Directory Details

Command and Output

I used the `ls -la` command to check the permissions for all files, including hidden files, in the `/home/researcher2/projects` directory. The `-la` options display a detailed listing with permissions and include hidden files.

```
researcher2@cb418bbe1486:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jan  4 01:06 .
drwxr-xr-x 3 researcher2 research_team 4096 Jan  4 01:51 ..
-rw--w---- 1 researcher2 research_team   46 Jan  4 01:06 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jan  4 01:06 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Jan  4 01:06 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Jan  4 01:06 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jan  4 01:06 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jan  4 01:06 project_t.txt
researcher2@cb418bbe1486:~/projects$ ls -la
```

Step 2: Describe the Permissions String

The permissions for `project_t.txt` are `-rw-rw-r--`. This 10-character string can be deconstructed as follows:

1. `-`: This is a regular file.
2. `rw-`: User (owner) has read and write permissions.
3. `rw-`: Group has read and write permissions.
4. `r--`: Others (all other users) have read-only permissions.

Step 3: Change File Permissions

To align with the organization's policy that no files should have write permissions for the owner

```
researcher2@cb418bbe1486:~/projects$ chmod o-w project_k.txt
researcher2@cb418bbe1486:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jan  4 01:06 .
drwxr-xr-x 3 researcher2 research_team 4096 Jan  4 01:51 ..
-rw--w---- 1 researcher2 research_team   46 Jan  4 01:06 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jan  4 01:06 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Jan  4 01:06 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Jan  4 01:06 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jan  4 01:06 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jan  4 01:06 project_t.txt
researcher2@cb418bbe1486:~/projects$ 
```

Step 4: Change File Permissions on a Hidden File

The hidden file .project_x.txt is archived and should not allow any write permissions. The user and group should only have read permissions.

```
researcher2@cb418bbe1486:~/projects$ chmod u-w,g-w,g+r .project_x.txt
researcher2@cb418bbe1486:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jan  4 01:06 .
drwxr-xr-x 3 researcher2 research_team 4096 Jan  4 01:51 ..
-r--r----- 1 researcher2 research_team   46 Jan  4 01:06 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jan  4 01:06 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Jan  4 01:06 project_k.txt
-rw------- 1 researcher2 research_team   46 Jan  4 01:06 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jan  4 01:06 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jan  4 01:06 project_t.txt
researcher2@cb418bbe1486:~/projects$ 
```

Step 5: Change Directory Permissions

The drafts directory should only allow access to the researcher2 user. All other permissions, including execute, were removed from the group and others.

```
researcher2@cb418bbe1486:~/projects$ chmod g-x drafts
researcher2@cb418bbe1486:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jan  4 01:06 .
drwxr-xr-x 3 researcher2 research_team 4096 Jan  4 01:51 ..
-r--r----- 1 researcher2 research_team   46 Jan  4 01:06 .project_x.txt
drwx------ 2 researcher2 research_team 4096 Jan  4 01:06 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Jan  4 01:06 project_k.txt
-rw------- 1 researcher2 research_team   46 Jan  4 01:06 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jan  4 01:06 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jan  4 01:06 project_t.txt
researcher2@cb418bbe1486:~/projects$ 
```

Summary

I changed multiple permissions to match the level of authorization required for files and directories in the /home/researcher2/projects directory. Using the ls -la command, I checked the permissions, then adjusted them using the chmod command. These changes ensure the organization's security policies are upheld.