

File permissions in Linux

Project description

Investigating and updating file permissions and to determine if the permissions match the authorization that should be given.

Check file and directory details

Used command `ls -la` to check permission of all files in the projects directory including hidden files

```
researcher2@b487c8f03c6d:~$ cd projects
researcher2@b487c8f03c6d:~/projects$ ls -l
total 20
drwx--x--- 2 researcher2 research_team 4096 Nov  8 22:55 drafts
-rw-rw-rw- 1 researcher2 research_team  46 Nov  8 22:55 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Nov  8 22:55 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov  8 22:55 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov  8 22:55 project_t.txt
researcher2@b487c8f03c6d:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Nov  8 22:55 .
drwxr-xr-x 3 researcher2 research_team 4096 Nov  8 23:22 ..
-rw--w---- 1 researcher2 research_team  46 Nov  8 22:55 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Nov  8 22:55 drafts
-rw-rw-rw- 1 researcher2 research_team  46 Nov  8 22:55 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Nov  8 22:55 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov  8 22:55 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov  8 22:55 project_t.txt
researcher2@b487c8f03c6d:~/projects$
```

Describe the permissions string

Permission string example chosen: `.project_k.txt`

The permissions string `rw-rw-rw-` can be broken down as follows:

- **First character:** There is no `d`, meaning this is a **file** (not a directory).
- **User (Owner) Permissions:** `rw-`
 - **r** (read): The owner can read the file.
 - **w** (write): The owner can write (modify) the file.
 - **-** (no execute): The owner does not have execute permission.

- **Group Permissions:** **rw-**
 - **r** (read): Group members can read the file.
 - **w** (write): Group members can write (modify) the file.
 - **-** (no execute): Group members do not have execute permission.
- **Other Permissions:** **rw-**
 - **r** (read): Others can read the file.
 - **w** (write): Others can write (modify) the file.
 - **-** (no execute): Others do not have execute permission.

Change file permissions

The organization does not allow others to have write access to any files requiring us to remove the write permission for user, group and other. Used `chmod a-w project_k.txt` to remove write permissions for all three at once.

```
researcher2@b487c8f03c6d:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Nov  8 22:55 .
drwxr-xr-x 3 researcher2 research_team 4096 Nov  8 23:22 ..
-rw--w---- 1 researcher2 research_team  46 Nov  8 22:55 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Nov  8 22:55 drafts
-rw-rw-rw- 1 researcher2 research_team  46 Nov  8 22:55 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Nov  8 22:55 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov  8 22:55 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov  8 22:55 project_t.txt
researcher2@b487c8f03c6d:~/projects$ chmod a-w project_k.txt
researcher2@b487c8f03c6d:~/projects$
researcher2@b487c8f03c6d:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Nov  8 22:55 .
drwxr-xr-x 3 researcher2 research_team 4096 Nov  8 23:22 ..
-rw--w---- 1 researcher2 research_team  46 Nov  8 22:55 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Nov  8 22:55 drafts
-r--r--r-- 1 researcher2 research_team  46 Nov  8 22:55 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Nov  8 22:55 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov  8 22:55 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov  8 22:55 project_t.txt
researcher2@b487c8f03c6d:~/projects$
```

Change file permissions on a hidden file

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 user and group both had write permissions. Only user had the read permission. Commands to remove write for all and add read permission for group were executed as seen below in the attached screen shot.

```

drwxr-xr-x 3 researcher2 research_team 4096 Nov  8 22:55 .
drwxr-xr-x 3 researcher2 research_team 4096 Nov  8 23:22 ..
-rw--w---- 1 researcher2 research_team  46 Nov  8 22:55 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Nov  8 22:55 drafts
-r--r--r-- 1 researcher2 research_team  46 Nov  8 22:55 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Nov  8 22:55 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov  8 22:55 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov  8 22:55 project_t.txt
researcher2@b487c8f03c6d:~/projects$ chmod a-w .project_x.txt
researcher2@b487c8f03c6d:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Nov  8 22:55 .
drwxr-xr-x 3 researcher2 research_team 4096 Nov  8 23:22 ..
-r----- 1 researcher2 research_team  46 Nov  8 22:55 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Nov  8 22:55 drafts
-r--r--r-- 1 researcher2 research_team  46 Nov  8 22:55 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Nov  8 22:55 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov  8 22:55 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov  8 22:55 project_t.txt
researcher2@b487c8f03c6d:~/projects$ chmod g+r .project_x.txt
researcher2@b487c8f03c6d:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Nov  8 22:55 .
drwxr-xr-x 3 researcher2 research_team 4096 Nov  8 23:22 ..
-r--r----- 1 researcher2 research_team  46 Nov  8 22:55 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Nov  8 22:55 drafts
-r--r--r-- 1 researcher2 research_team  46 Nov  8 22:55 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Nov  8 22:55 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov  8 22:55 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov  8 22:55 project_t.txt
researcher2@b487c8f03c6d:~/projects$ █

```

Change directory permissions

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.

Group currently has execute permission which must be removed. See screenshot below for command used to remove execute for group and confirmation that it has been removed.

```
researcher2@b487c8f03c6d:~/projects$ ls -l
total 20
drwx--x--- 2 researcher2 research_team 4096 Nov  8 22:55 drafts
-r--r--r-- 1 researcher2 research_team  46 Nov  8 22:55 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Nov  8 22:55 project_m.txt
-rw-rw-r--  1 researcher2 research_team  46 Nov  8 22:55 project_r.txt
-rw-rw-r--  1 researcher2 research_team  46 Nov  8 22:55 project_t.txt
researcher2@b487c8f03c6d:~/projects$ chmod g-x drafts
researcher2@b487c8f03c6d:~/projects$ ls -l
total 20
drwx----- 2 researcher2 research_team 4096 Nov  8 22:55 drafts
-r--r--r-- 1 researcher2 research_team  46 Nov  8 22:55 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Nov  8 22:55 project_m.txt
-rw-rw-r--  1 researcher2 research_team  46 Nov  8 22:55 project_r.txt
-rw-rw-r--  1 researcher2 research_team  46 Nov  8 22:55 project_t.txt
researcher2@b487c8f03c6d:~/projects$
```

Summary

The process began with checking current file permissions using the `ls -la` command to display detailed file and directory information. Several permission modifications were made, including removing write access for others on specific files and setting the hidden file `.project_x.txt` to be read-only for user and group. Finally, the `drafts` directory permissions were restricted to allow access only to `researcher2` (user), ensuring sensitive research data remains secure. These changes align with the organization's security policies and maintain appropriate access controls for different users and groups.