File permissions in Linux

Project description

The goal of this project was to demonstrate a basic understanding of the Linux kernel and Bash, and implement this understanding to navigate and change permissions on directories and files within a Linux shell using basic Bash commands.

Check file and directory details

The first command I entered was the `pwd` command to check which print the directory I was working in.

```
researcher2@b78c0a034001:~$ pwd
/home/researcher2
```

Next, to change the working directory to the `projects` directory, I used the `cd projects` command to change the directory to `projects`, followed by a `ls -la` command to view the permissions on all directories and files under the `projects` directory.

```
researcher2@b78c0a034001:~$ cd projects
researcher2@b78c0a034001:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jun 28 17:35 .
drwxr-xr-x 3 researcher2 research_team 4096 Jun 28 18:26 ..
-rw--w---- 1 researcher2 research_team   46 Jun 28 17:35 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jun 28 17:35 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Jun 28 17:35 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Jun 28 17:35 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun 28 17:35 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun 28 17:35 project_t.txt
researcher2@b78c0a034001:~/projects$
```

Describe the permissions string

The permissions strings suggest the following permissions for the files under `projects`:

- `project_k.txt (drwx--x---)`
    - User = read, write,
    - Group = read, write

    - Other = read, write
- `project_m.txt (-rw-rw-rw-)`
    - User = read, write
    - Group = read
    - Other = none
- `project_r.txt (-rw-rw-r--)`
    - User= read, write
    - Group = read, write
    - Other = read
- `project_t.txt (-rw-rw-r--)`
    - User = read, write
    - Group = read, write
    - Other = read
- `.project_x.txt (-rw--w----)`
    - User = read, write
    - Group = write
    - Other = none

Change file permissions

I used the `chmod o-w project_k.txt` command to change the permissions on `project_k.txt` so the owner type "other" does not have write permissions. Next, I used the `chmod g-r project_m.txt` so the owner type "group" does not have read permissions.

```
researcher2@b78c0a034001:~/projects$ chmod o-w project_k.txt
researcher2@b78c0a034001:~/projects$ chmod g-r project_m.txt
```

This was reflected in the directory upon using the `ls -la` command.

```
-rw-rw-r-- 1 researcher2 research_team   46 Jun 28 17:35 project_k.txt
-rw------- 1 researcher2 research_team   46 Jun 28 17:35 project_m.txt
```

Change file permissions on a hidden file

To change the permissions on a hidden file, namely `.project_x.t` such that the user and group owner types have only read permissions, I used the `chmod g+r,u-w,g-w .project_x.txt` command. This was reflected in the directory upon using the `ls -la` command.

```
researcher2@b78c0a034001:~/projects$ chmod g+r,u-w,g-w .project_x.txt
researcher2@b78c0a034001:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jun 28 17:35 .
drwxr-xr-x 3 researcher2 research_team 4096 Jun 28 18:26 ..
-r--r----- 1 researcher2 research_team   46 Jun 28 17:35 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jun 28 17:35 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Jun 28 17:35 project_k.txt
-rw------- 1 researcher2 research_team   46 Jun 28 17:35 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun 28 17:35 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun 28 17:35 project_t.txt
researcher2@b78c0a034001:~/projects$
```

Change directory permissions

Lastly, I was supposed to remove the execute permission for the group owner type from the `drafts` subdirectory under the `projects` directory using the `chmod g-x drafts` command. This was reflected in the directory using the `ls -la` command.

```
researcher2@b78c0a034001:~/projects$ chmod g-x drafts
researcher2@b78c0a034001:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jun 28 17:35 .
drwxr-xr-x 3 researcher2 research_team 4096 Jun 28 18:26 ..
-r--r----- 1 researcher2 research_team   46 Jun 28 17:35 .project_x.txt
drwx------ 2 researcher2 research_team 4096 Jun 28 17:35 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Jun 28 17:35 project_k.txt
-rw------- 1 researcher2 research_team   46 Jun 28 17:35 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun 28 17:35 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jun 28 17:35 project_t.txt
researcher2@b78c0a034001:~/projects$
```

Summary

A precursor to understanding file permissions in Linux is to understand basic directory and file navigation, and understanding the basics of how operating systems store files and data. Additionally, the knowledge of commands such as `grep`, `find`, `cat`, `cd`, `pwd`, and `ls` was required to fully understand the scope of this project.