File permissions in Linux

Project description

Frequently, directory and file permissions are not current with what is necessary for the security of an organization. We'll be checking the `projects` directory for permissions, and use the `chmod` command as needed to modify them.

Check file and directory details

```
researcher2@a1bf08e00b3c:~$ cd /home/researcher2/projects
researcher2@a1bf08e00b3c:~/projects$ ls -l
total 20
drwx--x--- 2 researcher2 research_team 4096 Aug 26 19:31 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Aug 26 19:31 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Aug 26 19:31 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 26 19:31 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 26 19:31 project_t.txt
researcher2@a1bf08e00b3c:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug 26 19:31 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug 26 20:05 ..
-rw--w---- 1 researcher2 research_team   46 Aug 26 19:31 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug 26 19:31 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Aug 26 19:31 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Aug 26 19:31 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 26 19:31 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 26 19:31 project_t.txt
researcher2@a1bf08e00b3c:~/projects$
```

First, we'll use `cd` to navigate to the `projects` directory. We can use `ls -l` to list the permissions of the contents of the directory. Using `ls -la` will reveal hidden files like `.project_x.txt`

Describe the permissions string

The permissions string lists 10 characters:

The first letter in the string determines if the permissions are for a file or a directory. `-` will indicate a file, while `d` will indicate a directory.

Permissions are listed by three letters: `r` for read, `w` for write, and `x` for execute.

Letters 2, 3, and 4 will be the permissions for the user. Letters 5, 6, and 7 will be the permissions for the group. Letters 8, 9, and 10 will be for other: anyone else who is not user or group.

Change file permissions

```
researcher2@a1bf08e00b3c:~/projects$ chmod o-w project_k.txt
researcher2@a1bf08e00b3c:~/projects$ chmod g-r project_m.txt
researcher2@a1bf08e00b3c:~/projects$ chmod u=r,g=r .project_x.txt
researcher2@a1bf08e00b3c:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug 26 19:31 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug 26 20:05 ..
-r--r----- 1 researcher2 research_team   46 Aug 26 19:31 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug 26 19:31 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Aug 26 19:31 project_k.txt
-rw------- 1 researcher2 research_team   46 Aug 26 19:31 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 26 19:31 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 26 19:31 project_t.txt
researcher2@a1bf08e00b3c:~/projects$
```

We need to change the permissions of `project_k.txt` so that the owner type of other doesn't have write permissions, so that the group user type doesn't have read permissions for `project_m.txt`, and so the `.project_x,txt` hidden file's only permissions are read in the user and group owner types. This is accomplished by 3 commands:

```
chmod o-w project_k.txt
chmod g-r project_m.txt
chmod u=r,g=r .project_x.txt
```

Change directory permissions

```
researcher2@a1bf08e00b3c:~/projects$ chmod g-x /home/researcher2/projects/drafts
researcher2@a1bf08e00b3c:~/projects$ ls -l
total 20
drwx------ 2 researcher2 research_team 4096 Aug 26 19:31 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Aug 26 19:31 project_k.txt
-rw------- 1 researcher2 research_team   46 Aug 26 19:31 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 26 19:31 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 26 19:31 project_t.txt
researcher2@a1bf08e00b3c:~/projects$
```

`chmod` can be used to change directory permissions in the same way it can be used to change file permissions. We'll take away the group user types execute permissions with the following command:

```
chmod g-x /home/researcher2/projects/drafts
```

Summary

In this project I changed the permissions for multiple files and directories to stay compliant with the level of authorization required by the organization. The first step in this is using `ls -la` to list the permissions in the directory, and then using `chmod` to modify those permissions.