

File permissions in Linux

Project description

The security team professional needs to ensure that users on the team are authorized with the appropriate permissions. In this case I need to redefine the permissions within the projects directory. The current permissions don't reflect the level of permissions that the user and groups needs to have so, it's necessary to change it by using the commands of Linux.

Check file and directory details

```
researcher2@b4f8b2332d44:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Nov 28 01:25 .
drwxr-xr-x 3 researcher2 research_team 4096 Nov 28 02:10 ..
-rw--w---- 1 researcher2 research_team  46 Nov 28 01:25 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Nov 28 01:25 drafts
-rw-rw-rw- 1 researcher2 research_team  46 Nov 28 01:25 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Nov 28 01:25 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov 28 01:25 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov 28 01:25 project_t.txt
researcher2@b4f8b2332d44:~/projects$
```

This code demonstrates how I used the Linux commands to know the content of projects (in this case), we need to determine the existing permissions set for the directory.

The first line displays the command that I entered, the one below is the display of the output.

The output displays the list of all the contents of the projects directory. In this case I used the `ls -la` command to display a detailed listing of the file contents that also returned hidden files. The output indicates that there is one hidden file (named `.project_x.txt`) and that there is an directory called `drafts` and 5 files more.

Describe the permissions string

```
drwxr-xr-x 3
drwxr-xr-x 3
-rw--w---- 1
drwx--x--- 2
-rw-rw-rw- 1
-rw-r----- 1
-rw-rw-r-- 1
-rw-rw-r-- 1
```

The permissions string are the 10 character strings that can be seen in the screenshot. This strings permissions determine who is authorized to access the file and their specific permissions.

The first character is either a – or a d, this indicates the file type(if is a directory = d , if is a regular file -)

The second and four character indicates the permission. If is read (r) , write(w) and execute (x). if there is a – it means that that permission is not granted for the user.

The 5th and 7th character indicates the permission. If is read (r) , write(w) and execute (x). if there is a – it means that that permission is not granted for the group.

The 8th and 10th characters indicates the permission. If is read (r) , write(w) and execute (x). if there is a – it means that that permission is not granted for all the others users on the system apart from the group and user.

An example of this is for example in the file project_m.txt, we can see that the user have permission to read and write. The group have permission just to read. Other users don't have permissions

Change file permissions

The organization determined that other should not have the write permission to any of their files. To comply this, I referred to the file permissions that I previously returned. In this case I determined that project_k.txt must have the write access removed for other:

```
researcher2@b4f8b2332d44:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Nov 28 01:25 .
drwxr-xr-x 3 researcher2 research_team 4096 Nov 28 02:10 ..
-rw--w---- 1 researcher2 research_team  46 Nov 28 01:25 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Nov 28 01:25 drafts
-rw-rw-rw- 1 researcher2 research_team  46 Nov 28 01:25 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Nov 28 01:25 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov 28 01:25 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov 28 01:25 project_t.txt
researcher2@b4f8b2332d44:~/projects$ chmod o-w project_k.txt
researcher2@b4f8b2332d44:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Nov 28 01:25 .
drwxr-xr-x 3 researcher2 research_team 4096 Nov 28 02:10 ..
-rw--w---- 1 researcher2 research_team  46 Nov 28 01:25 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Nov 28 01:25 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Nov 28 01:25 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Nov 28 01:25 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov 28 01:25 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov 28 01:25 project_t.txt
researcher2@b4f8b2332d44:~/projects$ █
```

In the screenshot we can see that I used the chmod commando because it helps me to change the permissions on files and directories. The first argument indicates what permissions should be changed , the second argument specifies the file.

Change file permissions on a hidden file

To change the file permissions on a hidden file I used the command ls -la. With this command I can watch the hidden files and the normal files. The research of the organization team archived project_x.txt. They don't want anyone to have write access to the project(but the user and group can read)

The following code demonstrates how I used the Linux commands to change permissions:

```
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Nov 28 01:25 .
drwxr-xr-x 3 researcher2 research_team 4096 Nov 28 02:10 ..
-rw--w---- 1 researcher2 research_team  46 Nov 28 01:25 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Nov 28 01:25 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Nov 28 01:25 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Nov 28 01:25 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov 28 01:25 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov 28 01:25 project_t.txt
researcher2@b4f8b2332d44:~/projects$ chmod u-w,g-w,g+r .project_x.txt
researcher2@b4f8b2332d44:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Nov 28 01:25 .
drwxr-xr-x 3 researcher2 research_team 4096 Nov 28 02:10 ..
-r--r----- 1 researcher2 research_team  46 Nov 28 01:25 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Nov 28 01:25 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Nov 28 01:25 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Nov 28 01:25 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov 28 01:25 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov 28 01:25 project_t.txt
researcher2@b4f8b2332d44:~/projects$
```

The first lines of the screenshot display the commands I entered, and the other lines display the output. I know that .project_x.txt is a hidden file. In the screenshot we can see when I removed the write permissions from the user and group, and also added read permissions to the group. I remove the write permissions with u-w. Then removed write permissions from group g-w and added the permissions to the group g-r

Change directory permissions

My organization wants that researcher2 user to have access to the drafts (just that access) and its contents.

The code demonstrates how I used Linux commands to change permissions:

```
researcher2@b4f8b2332d44:~/projects$ chmod g-x drafts
researcher2@b4f8b2332d44:~/projects$ la -ls
-bash: la: command not found
researcher2@b4f8b2332d44:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Nov 28 01:25 .
drwxr-xr-x 3 researcher2 research_team 4096 Nov 28 02:10 ..
-r--r----- 1 researcher2 research_team  46 Nov 28 01:25 .project_x.txt
drwx----- 2 researcher2 research_team 4096 Nov 28 01:25 drafts
-rw-rw-r-- 1 researcher2 research_team  46 Nov 28 01:25 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Nov 28 01:25 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov 28 01:25 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Nov 28 01:25 project_t.txt
researcher2@b4f8b2332d44:~/projects$
```

We can see that I used the chmod command to remove the access. The researcher2 user already had execute permissions, so they didn't need to be added

Summary

I changed multiple permissions taking in consideration the instructions that my organizations wanted for the files and directories in the projects directory. The first step was using ls -la to check the permissions. Then I used the chmod command to change the permissions on files and directories