File permissions in Linux

Project description

You are a security professional at a large organization. You mainly work with their research team. Part of your job is to ensure users on this team are authorized with the appropriate permissions. This helps keep the system secure.

Your task is to examine existing permissions on the file system. You'll need to determine if the permissions match the authorization that should be given. If they do not match, you'll need to modify the permissions to authorize the appropriate users and remove any unauthorized access.

Check file and directory details

```
researcher2@9f4ecd923204:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Oct 28 18:58 .
drwxr-xr-x 3 researcher2 research_team 4096 Oct 28 19:35 ..
-rw--w---- 1 researcher2 research_team   46 Oct 28 18:58 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Oct 28 18:58 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Oct 28 18:58 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Oct 28 18:58 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Oct 28 18:58 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Oct 28 18:58 project_t.txt
```

Describe the permissions string

Discussing the "drafts" permission string:

- "d" indicates that there is directory permission
- "rwx" indicates that the user has read, write, and execute permission
- "--x" indicates that the group has execute permission, but not read or write permission
- "---" indicates that other has no permission to read, write, or execute

Change file permissions

The organization does not allow others to have write access to any files. As such, “project_k.txt” will need to have its’ permissions modified.

```
researcher2@9f4ecd923204:~/projects$ chmod o-w project_k.txt
researcher2@9f4ecd923204:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Oct 28 18:58 .
drwxr-xr-x 3 researcher2 research_team 4096 Oct 28 19:35 ..
-rw--w---- 1 researcher2 research_team   46 Oct 28 18:58 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Oct 28 18:58 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Oct 28 18:58 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Oct 28 18:58 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Oct 28 18:58 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Oct 28 18:58 project_t.txt
```

Using the “chmod o-w project_k.txt” command removed the write permission on the “project_k.txt” file.

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.

```
researcher2@9f4ecd923204:~/projects$ chmod u-w,g-w,g+r .project_x.txt
researcher2@9f4ecd923204:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Oct 28 18:58 .
drwxr-xr-x 3 researcher2 research_team 4096 Oct 28 19:35 ..
-r--r----- 1 researcher2 research_team   46 Oct 28 18:58 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Oct 28 18:58 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Oct 28 18:58 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Oct 28 18:58 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Oct 28 18:58 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Oct 28 18:58 project_t.txt
```

Using the command “chmod u-w,g-w,g+r .project_x.txt”, the permission has been adjusted to remove write permissions for all and to ensure read permission was available for the user and group.

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. Use a Linux command to modify the permissions accordingly.

```
researcher2@9f4ecd923204:~$ chmod g=---,o=--- projects
researcher2@9f4ecd923204:~$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Oct 28 19:35 .
drwxr-xr-x 1 root        root          4096 Oct 28 18:58 ..
-rw------- 1 researcher2 research_team  701 Oct 28 20:05 .bash_history
-rw-r--r-- 1 researcher2 research_team  220 Apr 18  2019 .bash_logout
-rw-r--r-- 1 researcher2 research_team 3574 Oct 28 18:58 .bashrc
-rw-r--r-- 1 researcher2 research_team 3574 Oct 28 18:58 .profile
drwx------ 3 researcher2 research_team 4096 Oct 28 18:58 projects
```

Using the “chmod g=---,o=--- projects” command, all permissions were removed for the group and others.

Summary

In summation, I was able to adjust the permissions of the individual files as well as specific directories to ensure users on this team are authorized with the appropriate permissions. This was accomplished using the “chmod” command to change the user, group, and other permissions, using the ls -la command to check the file permissions on file permissions (including hidden files and directories), and the knowledge of how to read the 10-character string that represents file permissions.