File permissions in Linux

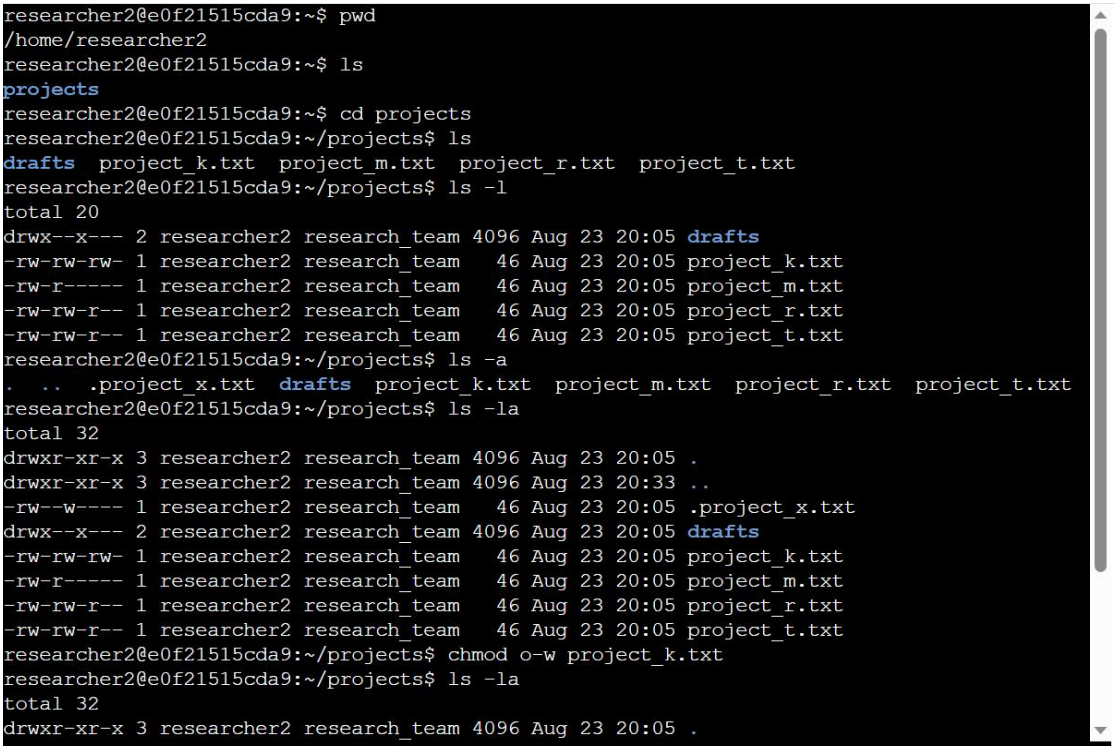
Project description

In this project, I worked as a security professional for a large organization's research team. The main objective was to ensure proper authorization and security by examining and modifying file and directory permissions using Linux commands. I evaluated existing permissions, made necessary adjustments, and ensured that only authorized users had access to sensitive files and directories.

Check file and directory details

I examined the permissions and ownership details of files and directories within the /home/researcher2/projects directory. This involved using the "ls –la" command to display comprehensive information about each file and directory, including the owner, group, and permissions. By carefully analyzing the output, I assessed whether the current permissions matched the intended levels of access for users, groups, and others.

← Activity: Manage authorization



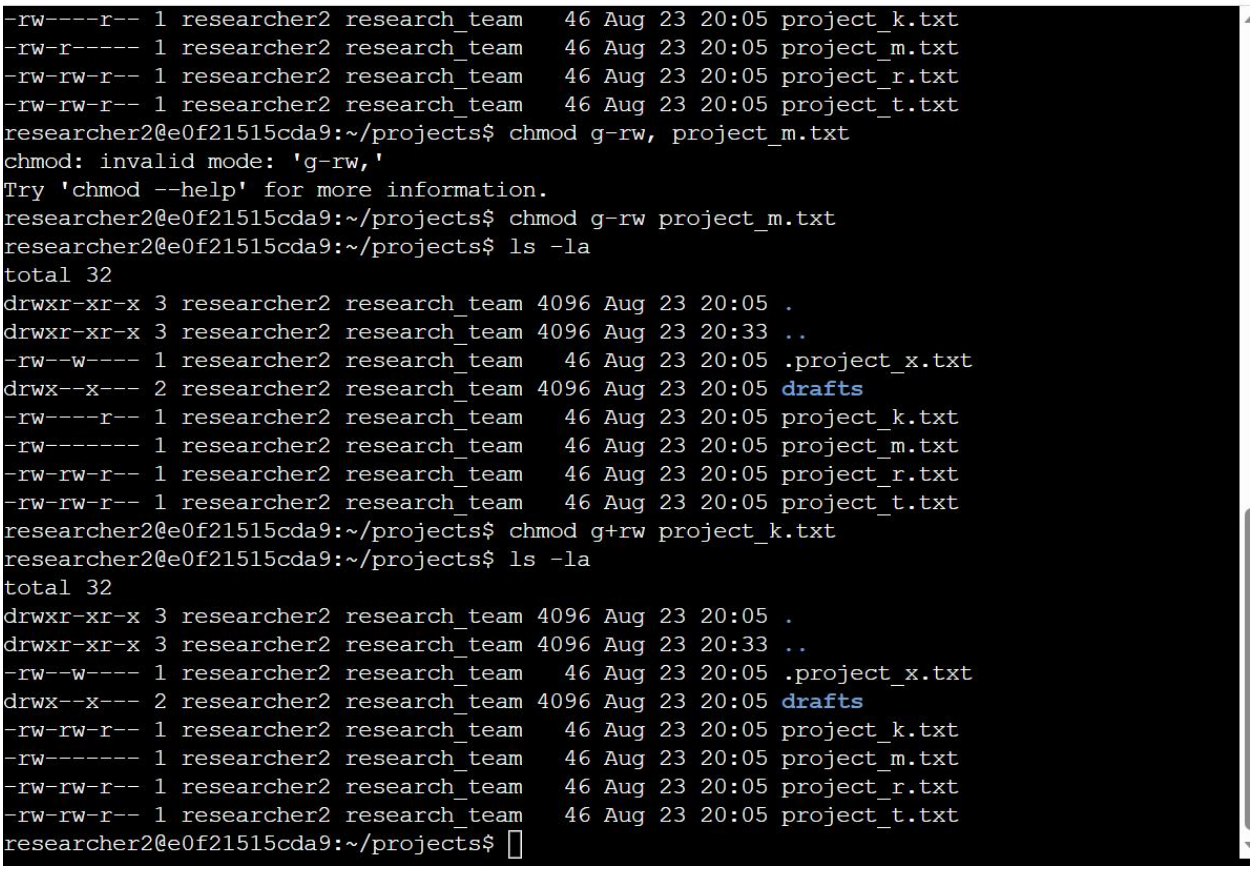
Describe the permissions string

The 10–character permissions string represents the authorization settings for a file or directory. It consists of three sections: the owner's permissions, the group's permissions, and others' permissions. Each section contains three characters that indicate read, write, and execute permissions. "r" stands for read, "w" stands for write, and "x" stands for execute. By interpreting this string, we can quickly grasp the level of access granted to different entities.

Change file permissions

After identifying a file with inappropriate permissions, such as ".project_x.txt," I used the "chmod" command to modify the permissions. For instance, I revoked the write permission from the group and others while retaining read permissions for both. This helped align the file's access with the organization's security requirements, ensuring that only authorized users could interact with it.

← Activity: Manage authorization



Change file permissions on a hidden file

In the case of ".project_x.txt," which had been archived as a hidden file, I applied the "chmod" command to adjust its permissions. My goal was to eliminate write permissions for all entities except the owner while preserving read permissions. By doing so, I successfully ensured that only the owner could modify the file, maintaining data integrity and security.

← Activity: Manage authorization

```
drwxr-xr-x 3 researcher2 research_team 4096 Aug 23 20:33 ..
-rw--w---- 1 researcher2 research_team   46 Aug 23 20:05 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug 23 20:05 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Aug 23 20:05 project_k.txt
-rw------- 1 researcher2 research_team   46 Aug 23 20:05 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 23 20:05 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 23 20:05 project_t.txt
researcher2@e0f21515cda9:~/projects$ chmod g-r,u-r .project_x.txt
researcher2@e0f21515cda9:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug 23 20:05 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug 23 20:33 ..
--w--w---- 1 researcher2 research_team   46 Aug 23 20:05 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug 23 20:05 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Aug 23 20:05 project_k.txt
-rw------- 1 researcher2 research_team   46 Aug 23 20:05 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 23 20:05 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 23 20:05 project_t.txt
researcher2@e0f21515cda9:~/projects$ chmod g+r,u+r,g-w,u-w .project_x.txt
researcher2@e0f21515cda9:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug 23 20:05 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug 23 20:33 ..
-r--r----- 1 researcher2 research_team   46 Aug 23 20:05 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug 23 20:05 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Aug 23 20:05 project_k.txt
-rw------- 1 researcher2 research_team   46 Aug 23 20:05 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 23 20:05 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 23 20:05 project_t.txt
researcher2@e0f21515cda9:~/projects$
```

Change directory permissions

To enhance security, I adjusted the permissions of the "drafts" directory within the /home/researcher2/projects directory. Using the "chmod" command, I restricted access to the directory by revoking execute permissions from the group and others. This configuration ensured that only the owner, researcher2, could navigate into the directory and access its contents. By implementing these changes, I fortified the organization's data against unauthorized access.

← Activity: Manage authorization

```
researcher2@e0f21515cda9:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug 23 20:05 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug 23 20:33 ..
-r--r----- 1 researcher2 research_team   46 Aug 23 20:05 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug 23 20:05 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Aug 23 20:05 project_k.txt
-rw------- 1 researcher2 research_team   46 Aug 23 20:05 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 23 20:05 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Aug 23 20:05 project_t.txt
researcher2@e0f21515cda9:~/projects$ pwd
/home/researcher2/projects
researcher2@e0f21515cda9:~/projects$ ls
drafts  project_k.txt  project_m.txt  project_r.txt  project_t.txt
researcher2@e0f21515cda9:~/projects$ cd drafts
researcher2@e0f21515cda9:~/projects/drafts$ pwd
/home/researcher2/projects/drafts
researcher2@e0f21515cda9:~/projects/drafts$ ls
researcher2@e0f21515cda9:~/projects/drafts$ ls -la
total 8
drwx--x--- 2 researcher2 research_team 4096 Aug 23 20:05 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug 23 20:05 ..
researcher2@e0f21515cda9:~/projects/drafts$ chmod g-x /home/reasearcher2/projects/drafts
chmod: cannot access '/home/reasearcher2/projects/drafts': No such file or directory
researcher2@e0f21515cda9:~/projects/drafts$ chmod g-x /home/researcher2/projects/drafts
researcher2@e0f21515cda9:~/projects/drafts$ ls -la
total 8
drwx------ 2 researcher2 research_team 4096 Aug 23 20:05 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug 23 20:05 ..
researcher2@e0f21515cda9:~/projects/drafts$
```

Summary

In this project, I demonstrated proficiency in managing file and directory permissions within a Linux environment. By using commands such as "ls -la" and "chmod," I assessed and modified permissions to align them with the organization's security requirements. I interpreted the 10-character permissions string to understand access levels for different entities. Additionally, I addressed specific scenarios, such as adjusting permissions for hidden files and directories and enhancing directory security. Through these actions, I contributed to maintaining data confidentiality, integrity, and availability for the research team, ultimately reinforcing the organization's cybersecurity measures.