Manage Authorization - Linux (Google Cybersecurity Analyst)

Activity overview

In this lab activity, you'll use Linux commands to configure authorization.

Authorization is the concept of granting access to specific resources in a system. It's important because without authorization any user could access and modify all files belonging to other users or system files. This would certainly be a security risk.

In Linux, file and directory permissions are used to specify who has access to specific files and directories. You'll explore file and directory permissions and change the ownership of a file and a directory to limit who can access them.

As a security analyst, setting appropriate access permissions is critical to protecting sensitive information and maintaining the overall security of a system.

Task 1. Check file and directory details

In this task, you must explore the permissions of the `projects` directory and the files it contains. The lab starts with `/home/researcher2` as the current working directory. This is because you're changing permissions for files and directories belonging to the `researcher2` user.

1. Navigate to the `projects` directory.
2. List the contents and permissions of the `projects` directory.

```
researcher2@f47eee21aeee:~/projects$ pwd
/home/researcher2/projects
researcher2@f47eee21aeee:~/projects$ ls -l
total 20
drwx--x--- 2 researcher2 research_team 4096 Feb  4 18:50 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Feb  4 18:50 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Feb  4 18:50 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Feb  4 18:50 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Feb  4 18:50 project_t.txt
researcher2@f47eee21aeee:~/projects$
```

```
-rw-rw-rw- 1 researcher2 research_team   46 Feb  4 18:50 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Feb  4 18:50 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Feb  4 18:50 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Feb  4 18:50 project_t.txt
researcher2@f47eee21aeee:~/projects$ ls -a
.  ..  .project_x.txt  drafts  project_k.txt  project_m.txt  project_r.txt  project_t.txt
researcher2@f47eee21aeee:~/projects$
```

3. Check whether any hidden files exist in the `projects` directory.

Which of these files is hidden in the projects directory?

- There are no hidden files
- .project_r.txt
- ✓ .project_x.txt
- .project_m.txt

Task 2. Change file permissions

In this task, you must determine whether any files have incorrect permissions and then change the permissions as needed. This action will remove unauthorized access and strengthen security on the system.

None of the files should allow the other users to write to files.

1. Check whether any files in the `projects` directory have write permissions for the owner type of other.

```
-rw-rw-rw- 1 researcher2 research_team   46 Feb  4 18:50 project_k.txt
```

3. The file `project_m.txt` is a restricted file and should not be readable or writable by the group or other; only the user should have these permissions on this file. List the contents and permissions of the current directory and check if the group has read or write permissions.

```
-rw-r----- 1 researcher2 research_team   46 Feb  4 18:50 project_m.txt
```

4. Use the `chmod` command to change permissions of the `project_m.txt` file so that the group doesn't have read or write permissions.

```
researcher2@f47eee21aeee:~/projects$ chmod g-r project_m.txt
researcher2@f47eee21aeee:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Feb  4 18:50 .
drwxr-xr-x 3 researcher2 research_team 4096 Feb  4 19:25 ..
-rw--w---- 1 researcher2 research_team   46 Feb  4 18:50 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Feb  4 18:50 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Feb  4 18:50 project_k.txt
-rw------- 1 researcher2 research_team   46 Feb  4 18:50 project_m.txt
```

Task 3. Change file permissions on a hidden file

In this task, you must determine if a hidden file has incorrect permissions and then change the permissions as needed. This action will further remove unauthorized access and strengthen security on the system.

The file `.project_x.txt` is a hidden file that has been archived and should not be written to by anyone. (The user and group should still be able to read this file.)

1. Check the permissions of the hidden file `.project_x.txt` and answer the question that follows.

```
-rw--w---- 1 researcher2 research_team   46 Feb  5 22:22 .project_x.txt
```

2. Change the permissions of the file `.project_x.txt` so that both the user and the group can read, but not write to, the file.

```
-r--r----- 1 researcher2 research_team   46 Feb  5 22:22 .project_x.txt
```

Task 4. Change directory permissions

In this task, you must change the permissions of a directory. First, you'll check the group permissions of the `/home/researcher2/projects/drafts` directory and then modify the permissions as required. (You should be in the `projects` directory while managing the permissions of its subdirectory `drafts`.)

Only the `researcher2` user should be allowed to access the `drafts` directory and its contents. (This means that only `researcher2` should have execute privileges.)

1. Check the permissions of the `drafts` directory and answer the following question.

```
researcher2@903900a94ce6:~/projects$ ls -l
total 20
drwx--x--- 2 researcher2 research_team 4096 Feb  5 22:22 drafts
```

2. Remove the execute permission for the group from the `drafts` directory.

```
drwx--x--- 2 researcher2 research_team 4096 Feb  5 22:22 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Feb  5 22:22 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Feb  5 22:22 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Feb  5 22:22 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Feb  5 22:22 project_t.txt
researcher2@903900a94ce6:~/projects$ chmod g-x drafts
researcher2@903900a94ce6:~/projects$ ls -l
total 20
drwx------ 2 researcher2 research_team 4096 Feb  5 22:22 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Feb  5 22:22 project_k.txt
```