

Changing File Permission

Project Assignment:

The research team at my organization needs to update the file permissions for certain files and directories within the `data_analysis` directory. The permissions currently set do not adequately reflect the desired level of authorization for users and groups interacting with these files, which could potentially compromise the security of sensitive data.

Desired Contents:

This document details the file structure of the `/home/researcher3/data_analysis` directory and the permissions of the files and subdirectory it contains.

Directory: `/home/researcher3/data_analysis`

- **Files:**
 - `analysis_p.txt`
 - **User:** read, write
 - **Group:** read, write
 - **Other:** read
 - `data_s.txt`
 - **User:** read, write
 - **Group:** read
 - **Other:** none
 - `report_q.txt`
 - **User:** read, write
 - **Group:** read, write
 - **Other:** read
 - `summary_u.txt`
 - **User:** read, write
 - **Group:** read, write
 - **Other:** read
 - `.hidden_v.txt`
 - **User:** read, write
 - **Group:** write
 - **Other:** none
- **Subdirectory:**
 - **Name:** `temp`
 - **Permissions:**
 - **User:** read, write, execute
 - **Group:** read, execute
 - **Other:** none

Solution:

1. Begin with making the directory of `data_analysis` using 'mkdir' and specifying the path of the folder.

```
(rafi@kali)-[~]
$ sudo mkdir /home/researcher3/data_analysis

(rafi@kali)-[~]
$ sudo mkdir -p /home/researcher3/data_analysis/temp
```

2. Use the `touch` command to create the files within the `data_analysis` directory. To create a hidden file, prefix the filename with a dot (.). For example:

```
(rafi@kali)-[~]
$ sudo touch /home/researcher3/data_analysis/analysis_p.txt
$ sudo touch /home/researcher3/data_analysis/data_s.txt
$ sudo touch /home/researcher3/data_analysis/report_q.txt
$ sudo touch /home/researcher3/data_analysis/summary_u.txt
$ sudo touch /home/researcher3/data_analysis/.hidden_v.txt
```

3. After creating the files, list them to verify their existence and view their default permissions with command `ls -la`

```
(rafi@kali)-[/home/researcher3/data_analysis]
$ ls
analysis_p.txt  data_s.txt  report_q.txt  summary_u.txt  temp

(rafi@kali)-[/home/researcher3/data_analysis]
$ ls -la
total 12
drwxr-xr-x 3 root root 4096 Jun  5 15:18 .
drwxr-xr-x 3 root root 4096 Jun  5 15:16 ..
-rw-r--r-- 1 root root    0 Jun  5 15:18 analysis_p.txt
-rw-r--r-- 1 root root    0 Jun  5 15:17 data_s.txt
-rw-r--r-- 1 root root    0 Jun  5 15:18 .hidden_v.txt
-rw-r--r-- 1 root root    0 Jun  5 15:17 report_q.txt
-rw-r--r-- 1 root root    0 Jun  5 15:18 summary_u.txt
drwxr-xr-x 2 root root 4096 Jun  5 15:16 temp
```

And here's the default permission setup.

4. Use the **chmod** command to change the permissions of the files. Permissions are controlled by a three-digit octal number, where each digit represents a different set of users:
- **First digit:** User (owner) permissions
 - **Second digit:** Group permissions
 - **Third digit:** Others' permissions

Explanation of Octal Numbers:

- **4:** Read - Permits reading the contents of the file.
- **2:** Write - Allows writing or modifying the file.
- **1:** Execute - Grants permission to execute or run the file as a program.
- These numbers can be added together to set multiple permissions:
 - **7** (4+2+1): Read, Write, and Execute

```
(rafiisy@kali)-[/home/researcher3/data_analysis]
$ sudo chmod 664 analysis_p.txt
[sudo] password for rafiisy:

(rafiisy@kali)-[/home/researcher3/data_analysis]
$ sudo chmod 640 data_s.txt

(rafiisy@kali)-[/home/researcher3/data_analysis]
$ sudo chmod 664 summary_u.txt
[sudo] password for rafiisy:

(rafiisy@kali)-[/home/researcher3/data_analysis]
$ sudo chmod 620 .hidden_v.txt
```

```
(rafiisy@kali)-[/home/researcher3/data_analysis]
$ ls -la
total 12
drwxr-xr-x 3 root root 4096 Jun 5 15:58 .
drwxr-xr-x 3 root root 4096 Jun 5 15:54 ..
-rw-rw-r-- 1 root root    0 Jun 5 15:58 analysis_p.txt
-rw-r----- 1 root root    0 Jun 5 15:58 data_s.txt
-rw--w----- 1 root root    0 Jun 5 15:58 .hidden_v.txt
-rw-r--r-- 1 root root    0 Jun 5 15:58 report_q.txt
-rw-rw-r-- 1 root root    0 Jun 5 15:58 summary_u.txt
drwxr-xr-x 2 root root 4096 Jun 5 15:55 temp
```

```
(rafisy@kali)-[/home/researcher3/data_analysis]
$ sudo chmod 750 temp

(rafisy@kali)-[/home/researcher3/data_analysis]
$ ls -la
total 12
drwxr-xr-x 3 root root 4096 Jun  5 15:58 .
drwxr-xr-x 3 root root 4096 Jun  5 15:54 ..
-rw-rw-r-- 1 root root    0 Jun  5 15:58 analysis_p.txt
-rw-r----- 1 root root    0 Jun  5 15:58 data_s.txt
-rw--w---- 1 root root    0 Jun  5 15:58 .hidden_v.txt
-rw-r--r-- 1 root root    0 Jun  5 15:58 report_q.txt
-rw-rw-r-- 1 root root    0 Jun  5 15:58 summary_u.txt
drwxr-x--- 2 root root 4096 Jun  5 15:55 temp
```

Conclusion:

The final setup of the `data_analysis` directory and its contents has been successfully completed. All files have been created and their permissions have been adjusted as required. This ensures that the correct level of access is maintained, enhancing the security and functionality of our system. We now have a robust structure in place, where permissions are meticulously tailored to meet our operational needs and security standards.