

CYSE 270: Linux System for Cybersecurity

Lab 6 – File Permission

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Task A: Get accounts and groups ready (70 points)

Step 1. Create three groups- **employee**, **payroll**, and **admin**. (You may refer to the slides under Module 2 – Group Management)

```
(niayaf@niayaf)-[~]
└─$ sudo groupadd employee

(niayaf@niayaf)-[~]
└─$ sudo groupadd payroll
[sudo] password for niayaf:

(niayaf@niayaf)-[~]
└─$ sudo groupadd admin
```

Step 2. Create three user accounts with a specified home directory for **Sophia**, **Olivia**, and **Emma**. Set the primary group for Sophia, Olivia, and Emma to "employee", "payroll", and "admin", respectively.

And change their login shell to /bin/bash. **Don't forget to set their passwords.**

```
(niayaf@niayaf)-[~]
└─$ sudo useradd Sophia

(niayaf@niayaf)-[~]
└─$ usermod -d /home/Sophia Sophia
usermod: no changes
```

```
(niayaf@niayaf)-[~]
└─$ sudo useradd -m Olivia
[sudo] password for niayaf:
```

```
(niayaf@niayaf)-[~]
└─$ sudo useradd -m Emma
```

```
(niayaf@niayaf)-[~]
└─$ sudo usermod -g employee Sophia

(niayaf@niayaf)-[~]
└─$ sudo usermod -g payroll Olivia

(niayaf@niayaf)-[~]
└─$ sudo usermod -g admin Emma
```

```
(niayaf@niayaf)-[~]
└─$ sudo usermod -s /bin/bash Sophia

(niayaf@niayaf)-[~]
└─$ sudo usermod -s /bin/bash Olivia

(niayaf@niayaf)-[~]
└─$ sudo usermod -s /bin/bash Emma
```

```
(niayaf@niayaf)-[~]
└─$ sudo passwd Sophia
New password:
Retype new password:
passwd: password updated successfully

(niayaf@niayaf)-[~]
└─$ sudo passwd Olivia
New password:
Retype new password:
passwd: password updated successfully

(niayaf@niayaf)-[~]
└─$ sudo passwd Emma
New password:
Retype new password:
passwd: password updated successfully
```

Step 3. Create a shared group called "your_midas" (replace it with your MIDAS name) and set this shared group as the above accounts' secondary group. After this step, remember to check each user's group profile.

```
(niayaf@niayaf)-[~]
└─$ sudo groupadd nfull005

(niayaf@niayaf)-[~]
└─$ sudo usermod -G nfull005 Sophia

(niayaf@niayaf)-[~]
└─$ sudo usermod -G nfull005 Olivia

(niayaf@niayaf)-[~]
└─$ sudo usermod -G nfull005 Emma
```

```
(niayaf@niayaf)-[~]
└─$ groups Sophia
Sophia : employee nfull005

(niayaf@niayaf)-[~]
└─$ groups Olivia
Olivia : payroll nfull005

(niayaf@niayaf)-[~]
└─$ groups Emma
Emma : admin nfull005
```

Step 4. Create a directory named `/home/cyse_project`, which is to be owned by the “your_midas” group (which is a shared group). **After this step, remember to check the permission of this shared directory.**

```
(niayaf@niayaf)-[~]
└─$ sudo mkdir /home/cyse_project

(niayaf@niayaf)-[~]
└─$ sudo chgrp nfull005 /home/cyse_project

(niayaf@niayaf)-[~]
└─$ ls -ld /home/cyse_project
drwxr-xr-x 2 root nfull005 4096 Oct 12 18:03 /home/cyse_project
```

Step 5. Change the permissions of the `/home/cyse_project` directory to “`rw-rwx---`” using the octal method so that only the project group members have access to this directory. **After this step, remember to check the permission of this shared directory.**

```
(niayaf@niayaf)-[~]
└─$ sudo chmod 770 /home/cyse_project

(niayaf@niayaf)-[~]
└─$ ls -ld /home/cyse_project
drwxrwx--- 2 root nfull005 4096 Oct 12 18:03 /home/cyse_project
```

Step 6. Switch to Sophia's account. Change the default permissions using octal method with `umask` command, to “`rw-r----`” for Sophia when she creates a file or directory. **Check the value of `umask`, and permission of a new file after this step.**

```
(niayaf@niayaf)-[~]
└─$ su Sophia
Password:
(Sophia@niayaf)-[/home/niayaf]
└─$ cd ~

(Sophia@niayaf)-[~]
└─$ pwd
/home/Sophia

(Sophia@niayaf)-[~]
└─$ umask 027

(Sophia@niayaf)-[~]
└─$ touch test.txt

(Sophia@niayaf)-[~]
└─$ ls -l test.txt
-rw-r----- 1 Sophia employee 0 Oct 12 19:14 test.txt

(Sophia@niayaf)-[~]
└─$ umask
0027
```

Step 7. Create a new file called "Sophia_homework" in the home directory of Sophia and put your name in the file as content. **After this step, remember to check the content and the permission of the new file.**

(ls -l Sophia_homework)

```
(Sophia@niayaf)-[~]
└─$ echo niaya > Sophia_homework.txt

(Sophia@niayaf)-[~]
└─$ ls -l Sophia_homework.txt
-rw-r----- 1 Sophia employee 6 Oct 12 19:19 Sophia_homework.txt

(Sophia@niayaf)-[~]
└─$ cat Sophia_homework.txt
niaya
```

Step 8. Copy "Sophia_homework" to the /home/cyse_project directory. **After this step, remember to check the permission of the file in the shared directory.**

```
(Sophia@niayaf)-[~]
└─$ cp Sophia_homework.txt /home/cyse_project/

(Sophia@niayaf)-[~]
└─$ ls -l Sophia_homework.txt
-rw-r----- 1 Sophia employee 6 Oct 12 19:19 Sophia_homework.txt

(Sophia@niayaf)-[~]
└─$ ls -l /home/cyse_project/Sophia_homework.txt
-rw-r----- 1 Sophia employee 6 Oct 12 19:21 /home/cyse_project/Sophia_homework.txt
```

Step 9. Switch to Emma's account. Try to read "Sophia_homework" in the /home/cyse_project Directory.

```
(niayaf@niayaf)-[~]
└─$ su Emma
Password:
(Emma@niayaf)-[/home/niayaf]
└─$ cd ~

(Emma@niayaf)-[~]
└─$ cat /home/cyse_project/Sophia_homework.txt
cat: /home/cyse_project/Sophia_homework.txt: Permission denied
```

Step 10. Exit out of Emma's account and Sophia's account.

```
(Emma@niayaf)-[~]
└─$ exit
exit

(niayaf@niayaf)-[~]
└─$ █
```

Task B: Set SGID permission (15 points)

Step 1. Switch to root or the regular user's account. To allow group members to access the files shared in the shared directory, you need to fix the sharing issue by setting the correct **SGID** group values to `/home/cyse_project` directory.

```
(niayaf@niayaf)-[~]
└─$ sudo chmod g+s /home/cyse_project/
[sudo] password for niayaf:

(niayaf@niayaf)-[~]
└─$ ls -ld /home/cyse_project
drwxrws— 2 root nfull005 4096 Oct 12 19:21 /home/cyse_project
```

Step 2. Switch to Sophia's account. Copy "Sophia_homework" to the `/home/cyse_project` directory as "Sophia_homework2".

```
(niayaf@niayaf)-[~]
└─$ su Sophia
Password:
(Sophia@niayaf)-[/home/niayaf]
└─$ cd ~

(Sophia@niayaf)-[~]
└─$ cp Sophia_homework.txt /home/cyse_project/Sophia_homework2.txt
```

Step 3. Switch to Emma's account. Try to read "Sophia_homework2" in the `/home/cyse_project` directory.

```
(niayaf@niayaf)-[~]
└─$ su Emma
Password:
(Emma@niayaf)-[/home/niayaf]
└─$ cd ~

(Emma@niayaf)-[~]
└─$ cat /home/cyse_project/Sophia_homework2.txt
niaya
```

Task C: Unset SGID permissions (15 points)

Step 1. Switch to root the regular user's account. To disallow group members to access the files in the shared folder, you need to fix the sharing issue by setting the correct **SGID** group values to `/home/cyse_project` directory to remove the group user read permission.

```
(niayaf@niayaf)-[~]
└─$ sudo chmod g-s /home/cyse_project

(niayaf@niayaf)-[~]
└─$ ls -ld /home/cyse_project
drwxrwx— 2 root nfull005 4096 Oct 12 19:44 /home/cyse_project
```

Step 2. Switch to Sophia's account. Copy "Sophia_homework" to the /home/cyse_project directory as "Sophia_homework3".

```
(niayaf@niayaf)-[~]
└─$ su Sophia
Password:
└─(Sophia@niayaf)-[/home/niayaf]
└─$ cd ~

└─(Sophia@niayaf)-[~]
└─$ cp Sophia_homework.txt /home/cyse_project/Sophia_homework3.txt
```

Step 3. Switch to Olivia's account. Try to read "Sophia_home3" in the /home/cyse_project directory.

```
(Sophia@niayaf)-[~]
└─$ exit
exit

└─(niayaf@niayaf)-[~]
└─$ su Olivia
Password:
└─(Olivia@niayaf)-[/home/niayaf]
└─$ cd ~

└─(Olivia@niayaf)-[~]
└─$ cat /home/cyse_project/Sophia_homework3.txt
cat: /home/cyse_project/Sophia_homework3.txt: Permission denied
```