

CYSE 270: Linux System for Cybersecurity

Christopher Hossele

Lab 6 – File Permission

CYSE 270: Linux System for Cybersecurity

You need to configure the system to allow three users to perform the shared folder actions. [Please submit the screenshot for all the steps in a word or pdf file](#)

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

Step 1. Create three groups- **employee**, **payroll**, and **admin**. (You may refer to the slides for week-4 – Group Management)

```
christopher@christopher-VirtualBox:~$ sudo groupadd Employee
[sudo] password for christopher:
christopher@christopher-VirtualBox:~$ sudo groupadd Payroll
christopher@christopher-VirtualBox:~$ 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.

```
christopher@christopher-VirtualBox:~$ sudo useradd -m -k /etc/skel sophia
christopher@christopher-VirtualBox:~$ sudo useradd -m -k /etc/skel emma
christopher@christopher-VirtualBox:~$ sudo useradd -m -k /etc/skel olivia
christopher@christopher-VirtualBox:~$ sudo passwd sophia
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: password updated successfully
christopher@christopher-VirtualBox:~$ sudo passwd emma
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: password updated successfully
christopher@christopher-VirtualBox:~$ sudo passwd olivia
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: password updated successfully
```

```
christopher@christopher-VirtualBox:~$ sudo usermod -s /bin/bash sophia
christopher@christopher-VirtualBox:~$ sudo usermod -s /bin/bash emma
christopher@christopher-VirtualBox:~$ sudo usermod -s /bin/bash olivia
```

```
christopher@christopher-VirtualBox:~$ sudo usermod -g Employee sophia
christopher@christopher-VirtualBox:~$ sudo usermod -g Payroll Emma
christopher@christopher-VirtualBox:~$ sudo usermod -g Admin Olivia
```

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.

```
christopher@christopher-VirtualBox:~$ sudo groupadd CHoss003
christopher@christopher-VirtualBox:~$ id sophia
uid=1023(sophia) gid=1027(Employee) groups=1027(Employee)
christopher@christopher-VirtualBox:~$ id emma
uid=1024(emma) gid=1031(emma) groups=1031(emma)
christopher@christopher-VirtualBox:~$ id olivia
uid=1025(olivia) gid=1029(Admin) groups=1029(Admin)
```

```
christopher@christopher-VirtualBox:~$ sudo usermod -aG CHoss003 sophia
christopher@christopher-VirtualBox:~$ sudo usermod -aG CHoss003 olivia
christopher@christopher-VirtualBox:~$ sudo usermod -aG CHoss003 emma
christopher@christopher-VirtualBox:~$ id sophia
uid=1023(sophia) gid=1027(Employee) groups=1027(Employee),1033(CHoss003)
christopher@christopher-VirtualBox:~$ id olivia
id: 'olivia': no such user
christopher@christopher-VirtualBox:~$ id olivia
uid=1025(olivia) gid=1029(Admin) groups=1029(Admin),1033(CHoss003)
christopher@christopher-VirtualBox:~$ id emma
uid=1024(emma) gid=1031(emma) groups=1031(emma),1033(CHoss003)
christopher@christopher-VirtualBox:~$
```

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.

```
christopher@christopher-VirtualBox:~$ sudo mkdir /home/Cyse_Project
christopher@christopher-VirtualBox:~$ ls -ld /home/Cyse_Project
drwxr-xr-x 2 root root 4096 Feb 27 23:00 /home/Cyse_Project
christopher@christopher-VirtualBox:~$ sudo chgrp CHoss003 /home/Cyse_Project
christopher@christopher-VirtualBox:~$ ls -ld /home/Cyse_Project
drwxr-xr-x 2 root CHoss003 4096 Feb 27 23:00 /home/Cyse_Project
christopher@christopher-VirtualBox:~$
```

Step 5. Change the permissions of the /home/cyse_project directory to "drwxrwx---" 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.**

```
christopher@christopher-VirtualBox:~$ sudo chmod 770 /home/Cyse_Project
christopher@christopher-VirtualBox:~$ ls -ld /home/Cyse_Project
drwxrwx--- 2 root CHoss003 4096 Feb 27 23:00 /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.**

```
christopher@christopher-VirtualBox:~$ su sophia
Password:
sophia@christopher-VirtualBox:/home/christopher$ pwd
/home/christopher
sophia@christopher-VirtualBox:/home/christopher$ cd
sophia@christopher-VirtualBox:~$ umask
0022
sophia@christopher-VirtualBox:~$ umask 027
sophia@christopher-VirtualBox:~$ 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)**

```
GNU nano 6.2                      Sophia_homework *
Christopher
```

```
sophia@christopher-VirtualBox:~$ touch Sophia_homework
sophia@christopher-VirtualBox:~$ nano Sophia_homework
sophia@christopher-VirtualBox:~$ cat Sophia_homework
Christopher
sophia@christopher-VirtualBox:~$
```

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@christopher-VirtualBox:~$ cp Sophia_homework /home/Cyse_Project
sophia@christopher-VirtualBox:~$ cd /home/Cyse_Project
sophia@christopher-VirtualBox:/home/Cyse_Project$ ls -l
total 4
-rw-r----- 1 sophia Employee 13 Feb 27 23:14 Sophia_homework
sophia@christopher-VirtualBox:/home/Cyse_Project$
```

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

```
sophia@christopher-VirtualBox:/home/Cyse_Project$ su emma
Password:
emma@christopher-VirtualBox:/home/Cyse_Project$ ls -l
total 4
-rw-r----- 1 sophia Employee 13 Feb 27 23:14 Sophia_homework
emma@christopher-VirtualBox:/home/Cyse_Project$ cat Sophia_homework
cat: Sophia_homework: Permission denied
emma@christopher-VirtualBox:/home/Cyse_Project$
```

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

```
emma@christopher-VirtualBox:/home/Cyse_Project$ exit
exit
sophia@christopher-VirtualBox:/home/Cyse_Project$ exit
exit
christopher@christopher-VirtualBox:~$ pwd
/home/christopher
```

Task B: Set SGID permission (15 points)

Step 1. Switch to root account. To allow group members to access this file, you need to fix the sharing issue by setting the correct **SGID** group values to **/home/cyse_project** directory, to give the group users read permission.

```
christopher@christopher-VirtualBox:~$ sudo chmod g+s /home/Cyse_Project
[sudo] password for christopher:
christopher@christopher-VirtualBox:~$ ls -ld /home/Cyse_Project
drwxrws--- 2 root CHoss003 4096 Feb 27 23:14 /home/Cyse_Project
```

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

```
christopher@christopher-VirtualBox:~$ su sophia
Password:
sophia@christopher-VirtualBox:/home/christopher$ pwd
/home/christopher
sophia@christopher-VirtualBox:/home/christopher$ cd
sophia@christopher-VirtualBox:~$ pwd
/home/sophia
sophia@christopher-VirtualBox:~$ cp Sophia_homework /home/Cyse_Project/sophia_homework2
sophia@christopher-VirtualBox:~$
```

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

```
sophia@christopher-VirtualBox:~$ su emma
Password:
emma@christopher-VirtualBox:/home/sophia$
emma@christopher-VirtualBox:/home/sophia$ cd /home/Cyse_Project
emma@christopher-VirtualBox:/home/Cyse_Project$ ls -l
total 8
-rw-r----- 1 sophia Employee 13 Feb 27 23:14 Sophia_homework
-rw-r----- 1 sophia CHoss003 13 Feb 27 23:22 sophia_homework2
emma@christopher-VirtualBox:/home/Cyse_Project$ cat sophia_homework2
Christopher
```

Task C: Unset SGID permissions (15 points)

Step 1. Switch to root 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.

```
emma@christopher-VirtualBox:/home/Cyse_Project$ exit
exit
sophia@christopher-VirtualBox:~$ exit
exit
christopher@christopher-VirtualBox:~$ sudo chmod g-s /home/Cyse_Project
```

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

```
christopher@christopher-VirtualBox:~$ su sophia
Password:
sophia@christopher-VirtualBox:/home/christopher$ cd
sophia@christopher-VirtualBox:~$ cp Sophia_homework /home/Cyse_Project/sophia_h
omework3
sophia@christopher-VirtualBox:~$ ls -l
total 4
-rw-r----- 1 sophia Employee 13 Feb 27 23:11 Sophia_homework
```

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

```
sophia@christopher-VirtualBox:~$ su olivia
Password:
olivia@christopher-VirtualBox:/home/sophia$ cd /home/Cyse_Project
olivia@christopher-VirtualBox:/home/Cyse_Project$ ls -l
total 12
-rw-r----- 1 sophia Employee 13 Feb 27 23:14 Sophia_homework
-rw-r----- 1 sophia CHoss003 13 Feb 27 23:22 sophia_homework2
-rw-r----- 1 sophia Employee 13 Feb 27 23:30 sophia_homework3
Trash olivia@christopher-VirtualBox:/home/Cyse_Project$ cat sophia_homework3
cat: sophia_homework3: Permission denied
```

Extra credit: Sticky Bit (10 points)

Step 1. Switch to Olivia' account. Delete "Sophia_homework" in the /home/cyse_project directory.

Step 2. Switch to root account. Set the sticky bit permission, to make files can only be removed by the owner of the file.

Step 3. Switch to Olivia' account. Try to delete "Sophia_homework3" in the /home/cyse_project directory. Can you delete it this time? Why?