

## **CYSE 270: Linux System for Cybersecurity**

### **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 under Module 2 – Group Management)

**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.**

**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.**

**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.**

**Step 5.** Change the permissions of the /home/cyse\_project directory to "**rw-rw-r--**" 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.**

**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.**

**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)**

**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.**

**Step 9.** Switch to Emma's account. Try to read "Sophia\_homework" in the /home/cyse\_project Directory.

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

### **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.

**Step 2.** Switch to Sophia's account. Copy "Sophia\_homework" to the /home/cyse\_project directory as "Sophia\_homework2".

**Step 3.** Switch to Emma's account. Try to read "Sophia\_homework2" in the /home/cyse\_project directory.

### **Task C: Unset SGID permissions (15 points)**

**Step 1.** Switch to 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.

**Step 2.** Switch to Sophia's account. Copy "Sophia\_homework" to the /home/cyse\_project directory as "Sophia\_homework3".

**Step 3.** Switch to Olivia's account. Try to read "Sophia\_home3" in the /home/cyse\_project directory.

### 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?

#### Step A1:

```
Kali GNU/Linux Rolling kali tty1

kali login: ava-mclaughlin
Password:
Linux kali 6.12.25-amd64 #1 SMP PREEMPT_DYNAMIC Kali 6.12.25-1kali1 (2025-04-30) x86_64

The programs included with the Kali GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Kali GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
(Message from Kali developers)

This is a minimal installation of Kali Linux, you likely
want to install supplementary tools. Learn how:
♦ https://www.kali.org/docs/troubleshooting/common-minimum-setup/

(Run: "touch ~/.hushlogin" to hide this message)
(ava-mclaughlin♦ kali)-[~]
$ sudo groupadd employee
[sudo] password for ava-mclaughlin:

(ava-mclaughlin♦ kali)-[~]
$ sudo groupadd payroll

(ava-mclaughlin♦ kali)-[~]
$ sudo groupadd admin

(ava-mclaughlin♦ kali)-[~]
$
```

**Step A2: Creating user accounts with home directories**

```
(ava-mclaughlin@kali)~$ sudo useradd -m Sophia
(ava-mclaughlin@kali)~$ sudo useradd -m Olivia
(ava-mclaughlin@kali)~$ sudo useradd -m Emma
```

**Step A2: Setting primary group & changing login shell**

```
(ava-mclaughlin@kali)~$ sudo usermod -g employee Sophia
(ava-mclaughlin@kali)~$ sudo usermod -g payroll Olivia
(ava-mclaughlin@kali)~$ sudo usermod -g admin Emma
(ava-mclaughlin@kali)~$ sudo usermod -s /bin/bash Sophia
(ava-mclaughlin@kali)~$ sudo usermod -s /bin/bash Olivia
(ava-mclaughlin@kali)~$ sudo usermod -s /bin/bash Emma
```

**Step A2: Setting passwords**

**Sophia's pw: Apple**

**Olivia's pw: Orange**

**Emma's pw: Banana**

```
(ava-mclaughlin@kali)-[~]
$ sudo passwd Sophia
New password:
Retype new password:
passwd: password updated successfully

(ava-mclaughlin@kali)-[~]
$ sudo passwd Olivia
New password:
Retype new password:
passwd: password updated successfully

(ava-mclaughlin@kali)-[~]
$ sudo passwd Emma
New password:
Retype new password:
passwd: password updated successfully
```

**Step A3:**

```
(ava-mclaughlin@kali)-[~]
$ sudo groupadd amcla007

(ava-mclaughlin@kali)-[~]
$ sudo usermod -aG amcla007 Sophia

(ava-mclaughlin@kali)-[~]
$ sudo usermod -aG amcla007 Olivia

(ava-mclaughlin@kali)-[~]
$ sudo usermod -aG amcla007 Emma

(ava-mclaughlin@kali)-[~]
$ id Sophia
uid=1008(Sophia) gid=1008(employee) groups=1008(employee),1014(amcla007)

(ava-mclaughlin@kali)-[~]
$ id Olivia
uid=1009(Olivia) gid=1009(payroll) groups=1009(payroll),1014(amcla007)

(ava-mclaughlin@kali)-[~]
$ id Emma
uid=1010(Emma) gid=1010(admin) groups=1010(admin),1014(amcla007)
```

**Step A4:**

```
(ava-mclaughlin@kali)-[~]
$ sudo mkdir /home/cyse_project

(ava-mclaughlin@kali)-[~]
$ sudo chown :amcla007 /home/cyse_project

(ava-mclaughlin@kali)-[~]
$ ls -ld /home/cyse_project
drwxr-xr-x 2 root amcla007 4096 Oct 12 19:55 /home/cyse_project
```

#### Step A5:

```
(ava-mclaughlin@kali)-[~]
$ sudo chmod 770 /home/cyse_project

(ava-mclaughlin@kali)-[~]
$ ls -ld /home/cyse_project
drwxrwx--- 2 root amcla007 4096 Oct 12 19:55 /home/cyse_project
```

#### Step A6:

```
(ava-mclaughlin@kali)-[~]
$ su - Sophia
Password:
(Message from Kali developers)

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want to install supplementary tools. Learn how:
♦ https://www.kali.org/docs/troubleshooting/common-minimum-setup/

(Run: "touch ~/.hushlogin" to hide this message)
(Sophia@kali)-[~]
$ umask 026

(Sophia@kali)-[~]
$ umask
0026

(Sophia@kali)-[~]
$ touch test

(Sophia@kali)-[~]
$ ls -l test
-rw-r----- 1 Sophia employee 0 Oct 12 20:11 test
```

Ava McLaughlin

**Step A7:**

```
(Sophia♦ kali)-[~]  
$ echo "Ava McLaughlin" > ~/Sophia_homework  
  
(Sophia♦ kali)-[~]  
$ cat ~/Sophia_homework  
Ava McLaughlin  
  
(Sophia♦ kali)-[~]  
$ ls -l Sophia_homework  
-rw-r----- 1 Sophia employee 15 Oct 12 20:19 Sophia_homework
```

**Step A8:**

```
(Sophia♦ kali)-[~]  
$ cp Sophia_homework /home/cyse_project  
  
(Sophia♦ kali)-[~]  
$ ls -l /home/cyse_project/Sophia_homework  
-rw-r----- 1 Sophia employee 15 Oct 12 20:25 /home/cyse_project/Sophia_homework
```

**Step A9:**

```
(Sophia♦ kali)-[~]  
$ su - Emma  
Password:  
(Message from Kali developers)  
  
This is a minimal installation of Kali Linux, you likely  
want to install supplementary tools. Learn how:  
♦ https://www.kali.org/docs/troubleshooting/common-minimum-setup/  
  
(Run: "touch ~/.hushlogin" to hide this message)  
(Emma♦ kali)-[~]  
$ cat /home/cyse_project/Sophia_homework  
cat: /home/cyse_project/Sophia_homework: Permission denied
```

**Step A10: Commands: exit > exit**



Ava McLaughlin

```
(ava-mclaughlin@kali)~  
$ _
```

Step B1:

```
(ava-mclaughlin@kali)~  
$ sudo chmod g+s /home/cyse_project  
[sudo] password for ava-mclaughlin:
```

Step B2:

```
(ava-mclaughlin@kali)~  
$ su - Sophia  
Password:  
(Message from Kali developers)  
  
This is a minimal installation of Kali Linux, you likely  
want to install supplementary tools. Learn how:  
♦ https://www.kali.org/docs/troubleshooting/common-minimum-setup/  
  
(Run: "touch ~/.hushlogin" to hide this message)
```

```
(Sophia@kali)~  
$ cp Sophia_homework /home/cyse_project/Sophia_homework2  
  
(Sophia@kali)~  
$
```

Step B3:

```
(Sophia@kali)-[~]
$ su - Emma
Password:
(Message from Kali developers)

This is a minimal installation of Kali Linux, you likely
want to install supplementary tools. Learn how:
♦ https://www.kali.org/docs/troubleshooting/common-minimum-setup/

(Run: "touch ~/.hushlogin" to hide this message)
(Emma@kali)-[~]
$ cat /home/cyse_project/Sophia_homework2
Ava McLaughlin
```

Step C1: **Commands used to switch to regular account: exit > exit**

```
(ava-mclaughlin@kali)-[~]
$ sudo chmod g-r /home/cyse_project
```

Step C2:

```
(ava-mclaughlin@kali)-[~]
$ su - Sophia
Password:
(Message from Kali developers)

This is a minimal installation of Kali Linux, you likely
want to install supplementary tools. Learn how:
♦ https://www.kali.org/docs/troubleshooting/common-minimum-setup/

(Run: "touch ~/.hushlogin" to hide this message)
(Sophia@kali)-[~]
$ cp Sophia_homework /home/cyse_project/Sophia_homework3
```

Step C3: **I'm sorry, I can't figure out why Olivia can still view it. I understand I will have points taken off.**

```
(ava-mclaughlin@kali)-[~]
$ su - Olivia
Password:
(Message from Kali developers)

This is a minimal installation of Kali Linux, you likely
want to install supplementary tools. Learn how:
♦ https://www.kali.org/docs/troubleshooting/common-minimum-setup/

(Run: "touch ~/.hushlogin" to hide this message)
(Olivia@kali)-[~]
$ cat /home/cyse_project/Sophia_homework3
Ava McLaughlin

(Olivia@kali)-[~]
$ ls -ld /home/cyse_project
drwx-ws--- 2 root amcla007 4096 Oct 12 22:02 /home/cyse_project
```

Extra credit step 1:

```
(Olivia@kali)-[~]
$ rm /home/cyse_project/Sophia_homework
rm: remove write-protected regular file '/home/cyse_project/Sophia_homework'? y
```

Extra credit step 2: **Commands used to return to regular user: exit > exit**

```
(ava-mclaughlin@kali)-[~]
$ sudo chmod +t /home/cyse_project
```

Extra credit step 3: **I cannot delete it this time because the Sticky Bit only allows the owner of a file/directory/the root to delete it.**

```
(ava-mclaughlin@kali)-[~]
$ su - Olivia
Password:
(Message from Kali developers)

This is a minimal installation of Kali Linux, you likely
want to install supplementary tools. Learn how:
♦ https://www.kali.org/docs/troubleshooting/common-minimum-setup/

—(Run: “touch ~/.hushlogin” to hide this message)
(Olivia@kali)-[~]
$ rm /home/cyse_project/Sophia_homework3
rm: remove write-protected regular file '/home/cyse_project/Sophia_homework3'? y
rm: cannot remove '/home/cyse_project/Sophia_homework3': Operation not permitted
```