



**Université:** Institut Universitaire des Sciences (IUS)

**Faculté:** Sciences Informatiques

**TD N°4 –: Systèmes**

**Nom & Prénom:** SAINT-JEAN Marc-Evenort

**Professeur:** Imaël SAINT AMOUR

**Niveau:** 3ème Année

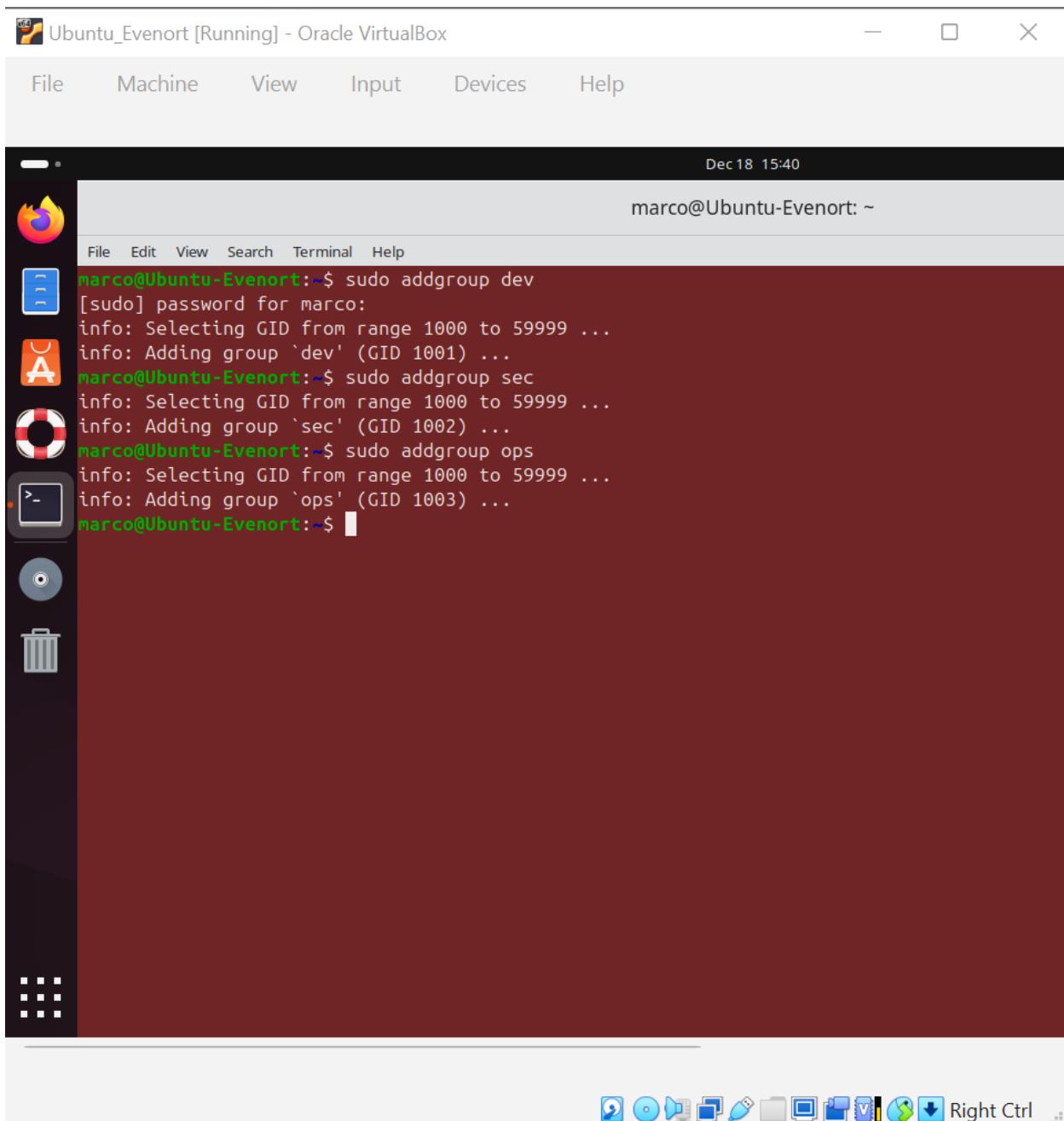
Date: le 21/Décembre/2025

## **Objectif de TD**

**L'objectif de ce TD est:**

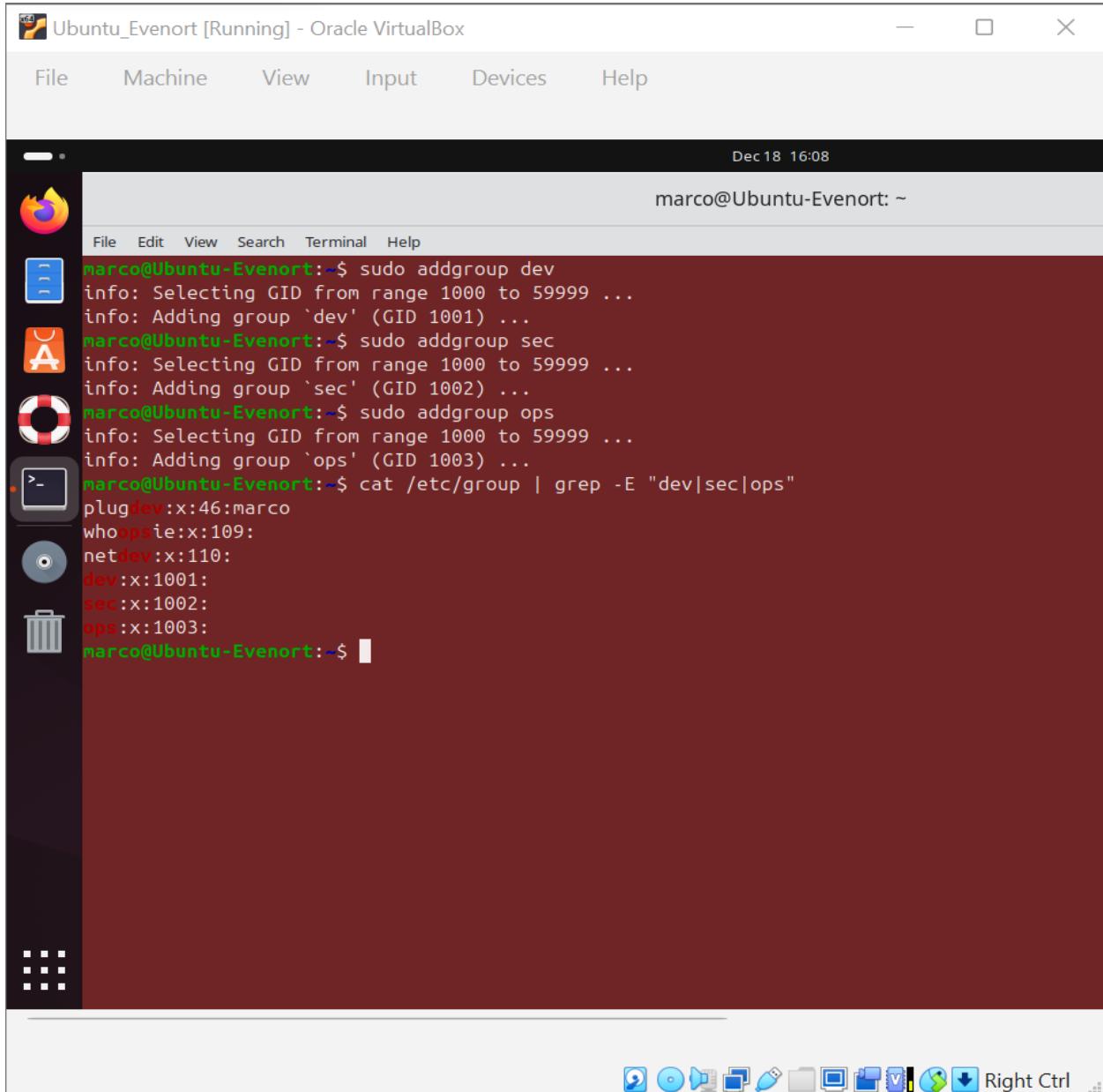
- 1- De mettre en place une politique de sécurité Linux pour un serveur de fichiers organisé par départements.
- 2- De créer les groupes et utilisateurs, de structurer l'arborescence des répertoires
- 3- De configurer les permissions afin d'assurer l'isolement des équipes.
- 4- Une collaboration contrôlée, en utilisant les permissions Linux, le SGID, le Sticky bit et les ACL.

# 1. Création des groupes



- Sur cette image, j'ai crée les groupes (dev,sec et ops)

## - Vérification:

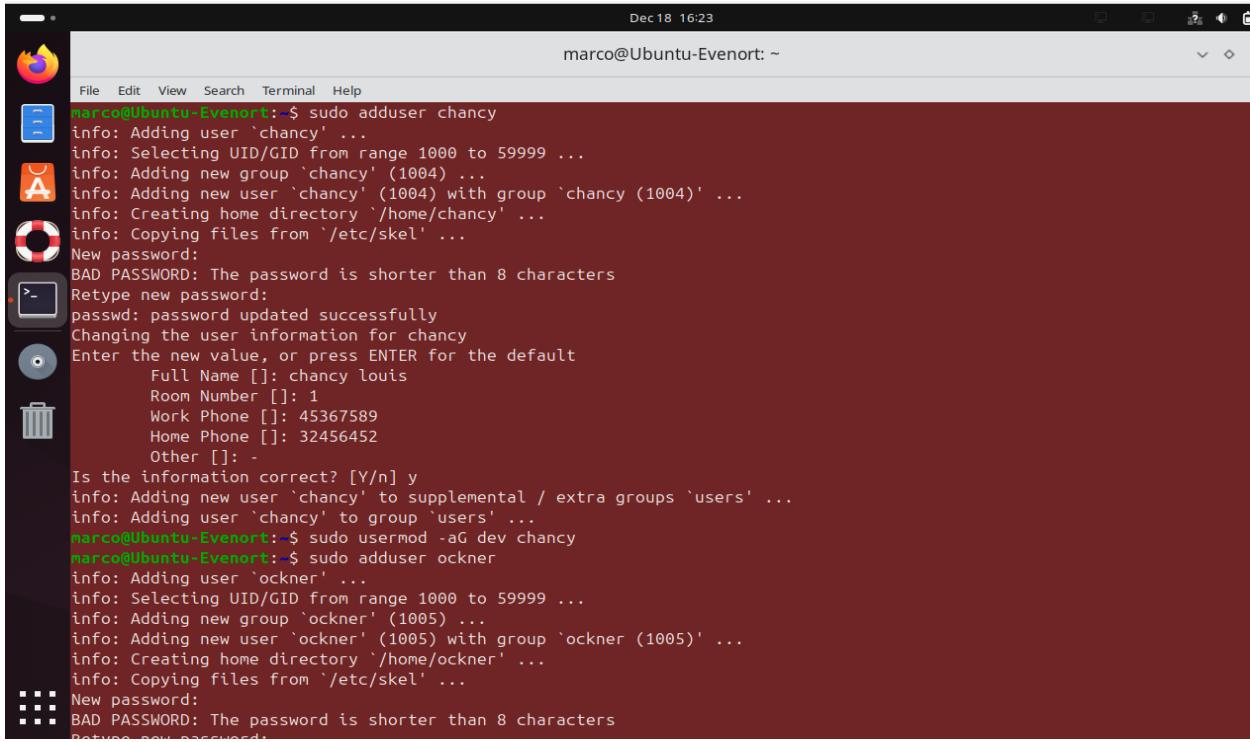


```
Ubuntu_Evenort [Running] - Oracle VirtualBox
File Machine View Input Devices Help
Dec 18 16:08
marco@Ubuntu-Evenort: ~
File Edit View Search Terminal Help
marco@Ubuntu-Evenort:~$ sudo addgroup dev
info: Selecting GID from range 1000 to 59999 ...
info: Adding group `dev' (GID 1001) ...
marco@Ubuntu-Evenort:~$ sudo addgroup sec
info: Selecting GID from range 1000 to 59999 ...
info: Adding group `sec' (GID 1002) ...
marco@Ubuntu-Evenort:~$ sudo addgroup ops
info: Selecting GID from range 1000 to 59999 ...
info: Adding group `ops' (GID 1003) ...
marco@Ubuntu-Evenort:~$ cat /etc/group | grep -E "dev|sec|ops"
plugdev:x:46:marco
whoopsie:x:109:
netdev:x:110:
dev:x:1001:
sec:x:1002:
ops:x:1003:
marco@Ubuntu-Evenort:~$
```

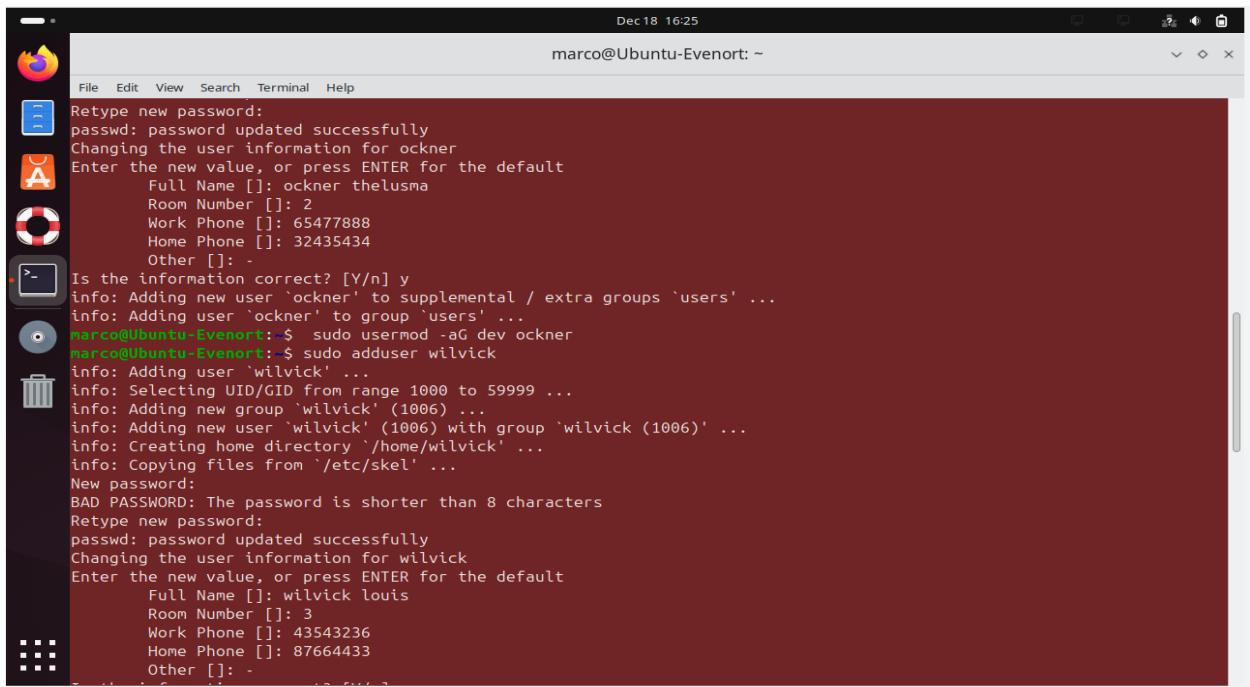
- Sur cette image, j'ai crée les groupes (dev,sec et ops) puis j'ai utilisé la commande **cat /etc/group** pour lister le contenu.

## 2. J'ai Crée les 15 utilisateurs

### a) En ajoutant dans les groups



```
Dec 18 16:23
marco@Ubuntu-Evenort:~$ sudo adduser chancy
info: Adding user 'chancy' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group 'chancy' (1004) ...
info: Adding new user 'chancy' (1004) with group 'chancy (1004)' ...
info: Creating home directory '/home/chancy' ...
info: Copying files from '/etc/skel' ...
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: password updated successfully
Changing the user information for chancy
Enter the new value, or press ENTER for the default
    Full Name []: chancy louis
    Room Number []: 1
    Work Phone []: 45367589
    Home Phone []: 32456452
    Other []:
Is the information correct? [Y/n] y
info: Adding new user 'chancy' to supplemental / extra groups 'users' ...
info: Adding user 'chancy' to group 'users' ...
marco@Ubuntu-Evenort:~$ sudo usermod -aG dev chancy
marco@Ubuntu-Evenort:~$ sudo adduser ockner
info: Adding user 'ockner' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group 'ockner' (1005) ...
info: Adding new user 'ockner' (1005) with group 'ockner (1005)' ...
info: Creating home directory '/home/ockner' ...
info: Copying files from '/etc/skel' ...
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
```



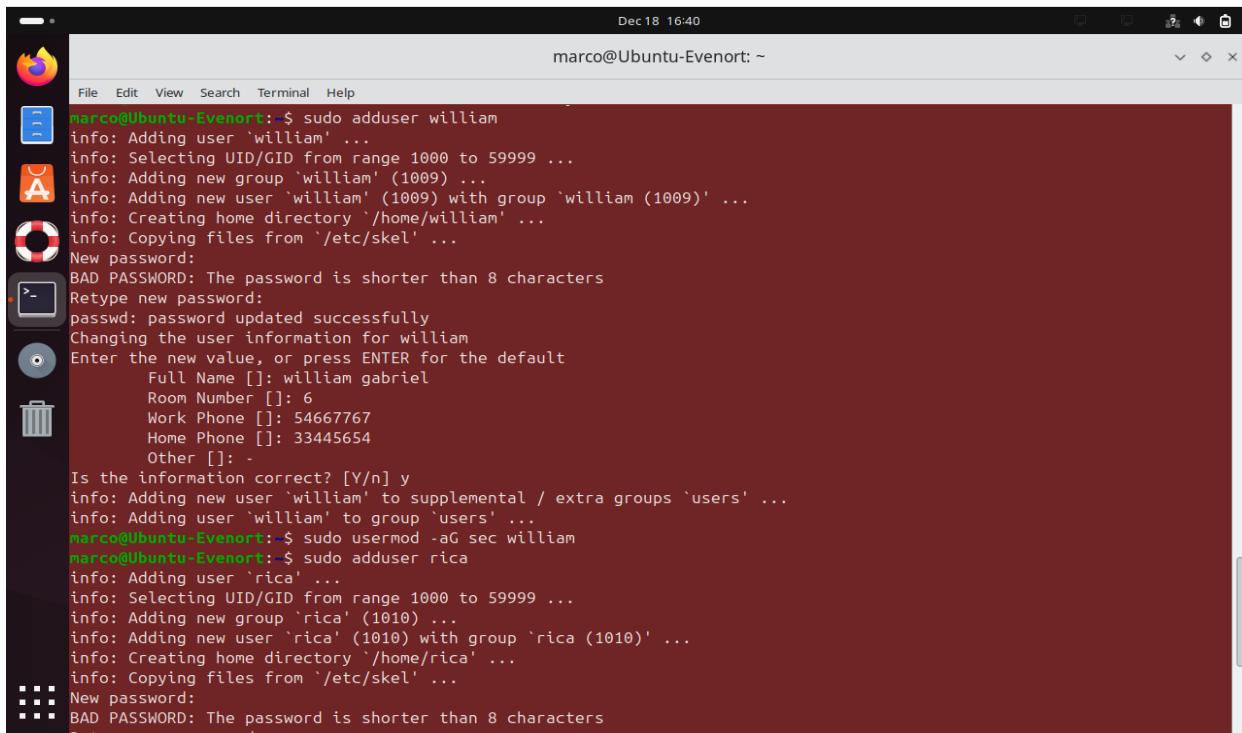
```
Dec 18 16:25
marco@Ubuntu-Evenort:~$ 
File Edit View Search Terminal Help
Retype new password:
passwd: password updated successfully
Changing the user information for ockner
Enter the new value, or press ENTER for the default
    Full Name []: ockner thelusma
    Room Number []: 2
    Work Phone []: 65477888
    Home Phone []: 32435434
    Other []:
Is the information correct? [Y/n] y
info: Adding new user 'ockner' to supplemental / extra groups 'users' ...
info: Adding user 'ockner' to group 'users' ...
marco@Ubuntu-Evenort:~$ sudo usermod -aG dev ockner
marco@Ubuntu-Evenort:~$ sudo adduser wilwick
info: Adding user 'wilwick' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group 'wilwick' (1006) ...
info: Adding new user 'wilwick' (1006) with group 'wilwick (1006)' ...
info: Creating home directory '/home/wilwick' ...
info: Copying files from '/etc/skel' ...
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: password updated successfully
Changing the user information for wilwick
Enter the new value, or press ENTER for the default
    Full Name []: wilwick louis
    Room Number []: 3
    Work Phone []: 43543236
    Home Phone []: 87664433
    Other []:
```

```
Dec 18 16:27  
marco@Ubuntu-Evenort: ~  
  
Is the information correct? [Y/n] y  
info: Adding new user 'wilvick' to supplemental / extra groups 'users' ...  
info: Adding user 'wilvick' to group 'users' ...  
marco@Ubuntu-Evenort: $ sudo usermod -aG dev wilvick  
marco@Ubuntu-Evenort: $ sudo adduser thiochemistry  
info: Adding user 'thiochemistry' ...  
info: Selecting UID/GID from range 1000 to 59999 ...  
info: Adding new group 'thiochemistry' (1007) ...  
info: Adding new user 'thiochemistry' (1007) with group 'thiochemistry (1007)' ...  
info: Creating home directory '/home/thiochemistry' ...  
info: Copying files from '/etc/skel' ...  
New password:  
BAD PASSWORD: The password is shorter than 8 characters  
Retype new password:  
passwd: password updated successfully  
Changing the user information for thiochemistry  
Enter the new value, or press ENTER for the default  
    Full Name []: thiochemistry jean  
    Room Number []: 4  
    Work Phone []: 56443327  
    Home Phone []: 32445566  
    Other []: -  
Is the information correct? [Y/n] y  
info: Adding new user 'thiochemistry' to supplemental / extra groups 'users' ...  
info: Adding user 'thiochemistry' to group 'users' ...  
marco@Ubuntu-Evenort: $ sudo usermod -aG dev thiochemistry  
marco@Ubuntu-Evenort: $ sudo adduser stanley jean  
fatal: The user 'stanley' does not exist.  
marco@Ubuntu-Evenort: $ sudo adduser stanley  
info: Adding user 'stanley' ...  
info: Selecting UID/GID from range 1000 to 59999 ...
```

```
Dec 18 16:28  
marco@Ubuntu-Evenort: ~  
  
Home Phone []: 32445566  
Other []: -  
Is the information correct? [Y/n] y  
info: Adding new user 'thiochemistry' to supplemental / extra groups 'users' ...  
info: Adding user 'thiochemistry' to group 'users' ...  
marco@Ubuntu-Evenort: $ sudo usermod -aG dev thiochemistry  
marco@Ubuntu-Evenort: $ sudo adduser stanley jean  
fatal: The user 'stanley' does not exist.  
marco@Ubuntu-Evenort: $ sudo adduser stanley  
info: Adding user 'stanley' ...  
info: Selecting UID/GID from range 1000 to 59999 ...  
info: Adding new group 'stanley' (1008) ...  
info: Adding new user 'stanley' (1008) with group 'stanley (1008)' ...  
info: Creating home directory '/home/stanley' ...  
info: Copying files from '/etc/skel' ...  
New password:  
BAD PASSWORD: The password is shorter than 8 characters  
Retype new password:  
passwd: password updated successfully  
Changing the user information for stanley  
Enter the new value, or press ENTER for the default  
    Full Name []: stanley jean  
    Room Number []: 5  
    Work Phone []: 56435477  
    Home Phone []: 55664347  
    Other []: -  
Is the information correct? [Y/n] y  
info: Adding new user 'stanley' to supplemental / extra groups 'users' ...  
info: Adding user 'stanley' to group 'users' ...  
marco@Ubuntu-Evenort: $ sudo usermod -aG dev stanley  
marco@Ubuntu-Evenort: $
```

- Sur ces images, il nous montrent les utilisateurs suivant au groupe **DEV** (vue de la page 5 à 6)

b)

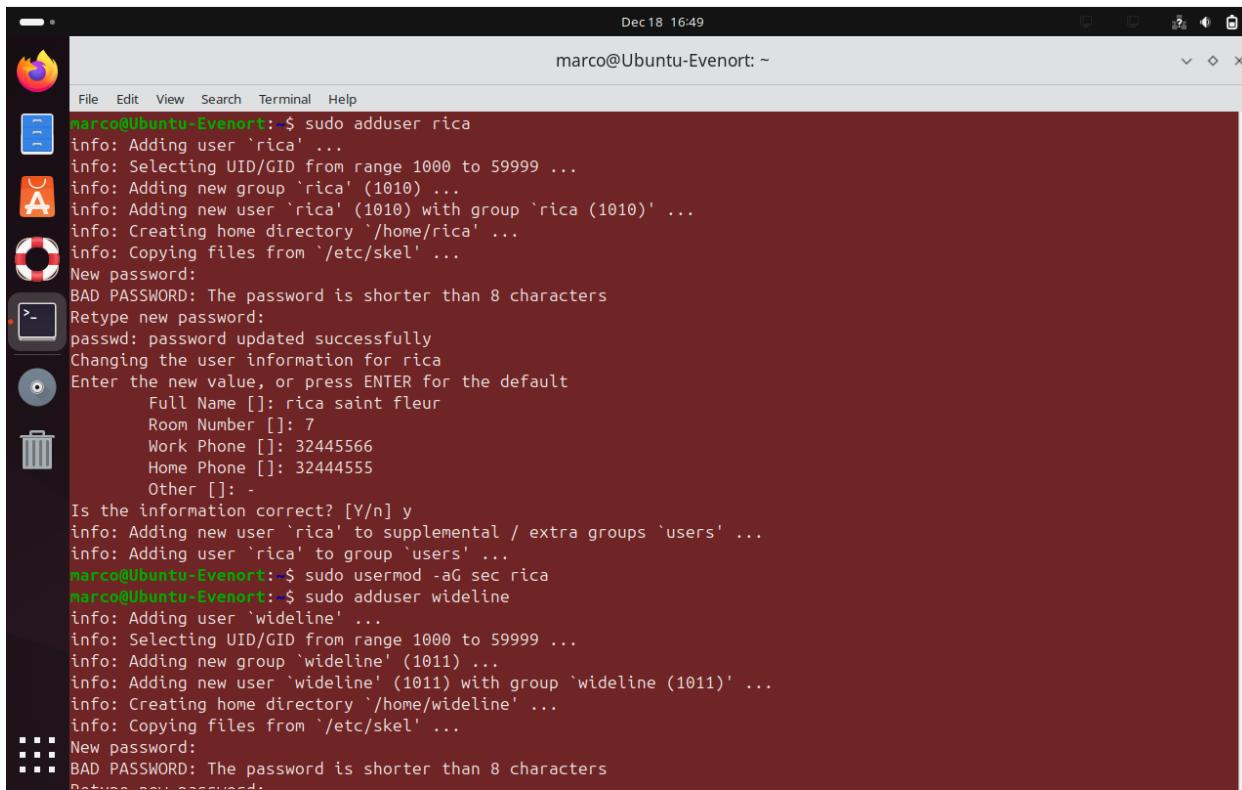


Dec 18 16:40  
marco@Ubuntu-Evenort: ~

```
marco@Ubuntu-Evenort: $ sudo adduser william
info: Adding user 'william' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group 'william' (1009) ...
info: Adding new user 'william' (1009) with group 'william (1009)' ...
info: Creating home directory '/home/william' ...
info: Copying files from '/etc/skel' ...

New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: password updated successfully
Changing the user information for william
Enter the new value, or press ENTER for the default
    Full Name []: william gabriel
    Room Number []: 6
    Work Phone []: 54667767
    Home Phone []: 33445654
    Other []: -
Is the information correct? [Y/n] y
info: Adding new user 'william' to supplemental / extra groups 'users' ...
info: Adding user 'william' to group 'users' ...
marco@Ubuntu-Evenort: $ sudo usermod -aG sec william
marco@Ubuntu-Evenort: $ sudo adduser rica
info: Adding user 'rica' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group 'rica' (1010) ...
info: Adding new user 'rica' (1010) with group 'rica (1010)' ...
info: Creating home directory '/home/rica' ...
info: Copying files from '/etc/skel' ...

New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
```

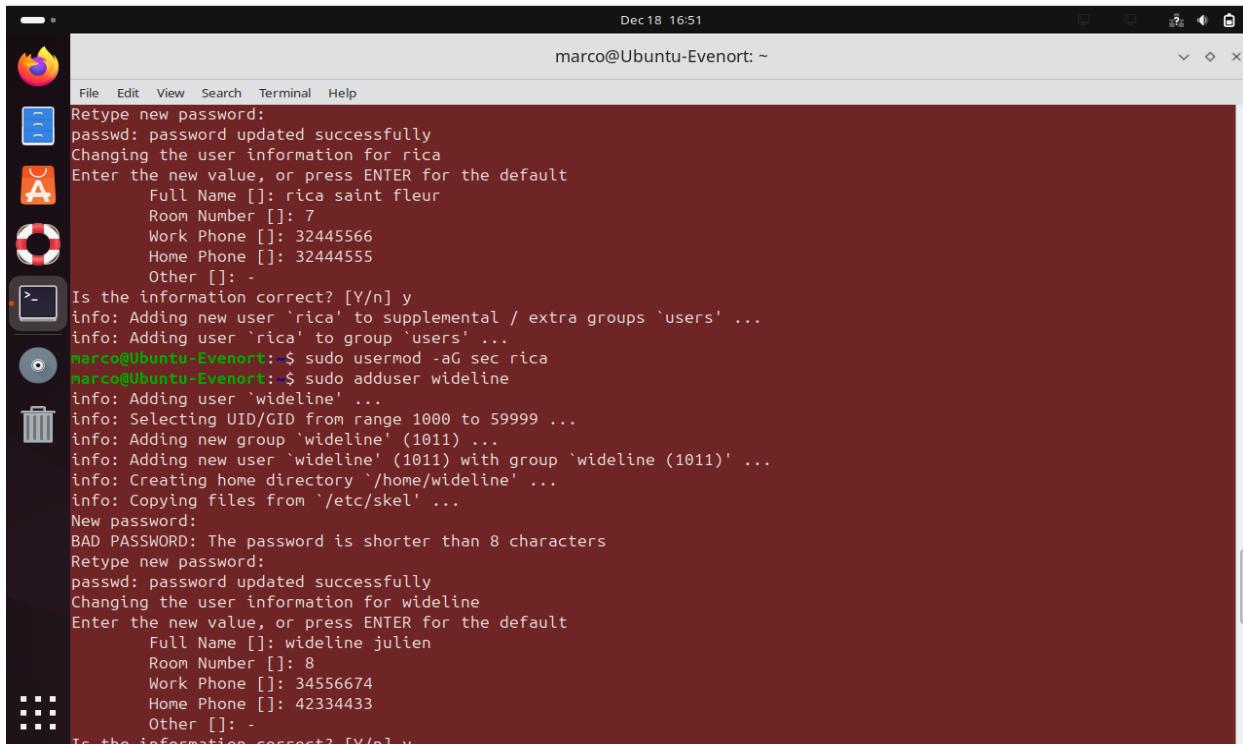


Dec 18 16:49  
marco@Ubuntu-Evenort: ~

```
marco@Ubuntu-Evenort: $ sudo adduser rica
info: Adding user 'rica' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group 'rica' (1010) ...
info: Adding new user 'rica' (1010) with group 'rica (1010)' ...
info: Creating home directory '/home/rica' ...
info: Copying files from '/etc/skel' ...

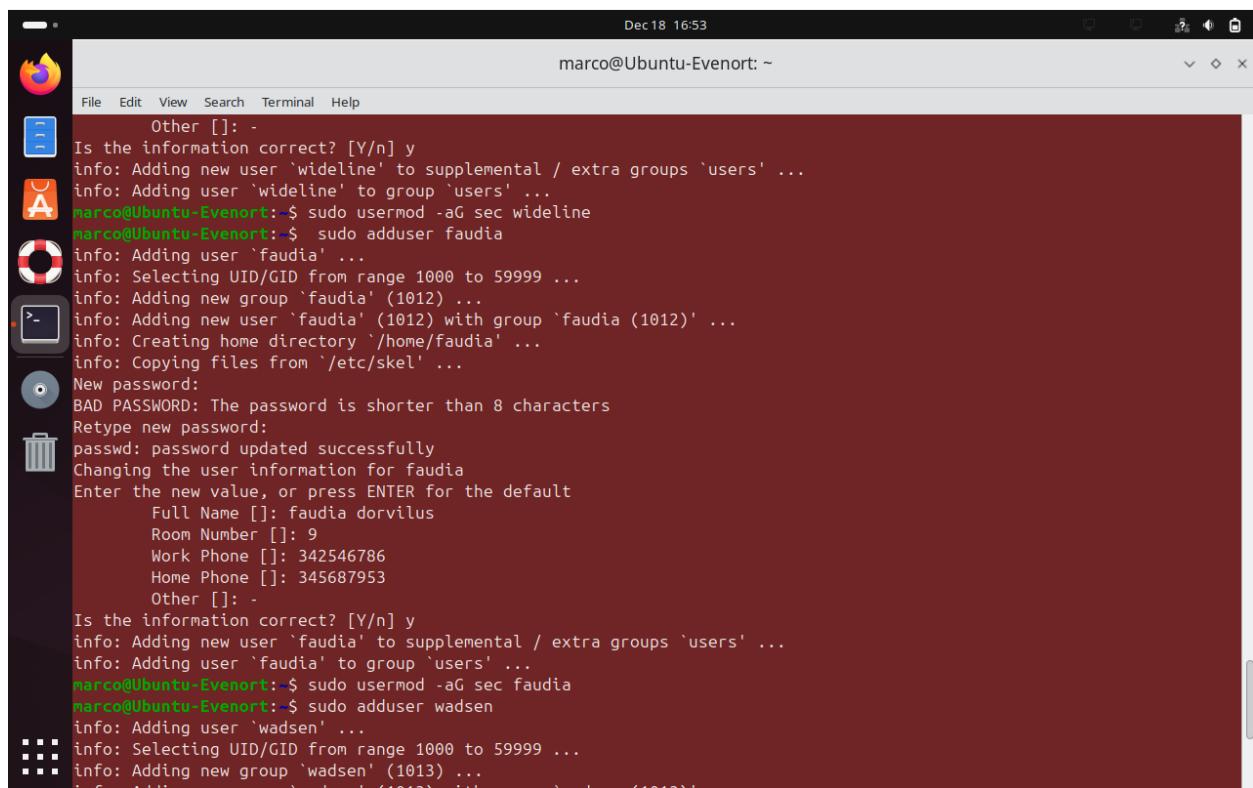
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: password updated successfully
Changing the user information for rica
Enter the new value, or press ENTER for the default
    Full Name []: rica saint fleur
    Room Number []: 7
    Work Phone []: 32445566
    Home Phone []: 32444555
    Other []: -
Is the information correct? [Y/n] y
info: Adding new user 'rica' to supplemental / extra groups 'users' ...
info: Adding user 'rica' to group 'users' ...
marco@Ubuntu-Evenort: $ sudo usermod -aG sec rica
marco@Ubuntu-Evenort: $ sudo adduser wideline
info: Adding user 'wideline' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group 'wideline' (1011) ...
info: Adding new user 'wideline' (1011) with group 'wideline (1011)' ...
info: Creating home directory '/home/wideline' ...
info: Copying files from '/etc/skel' ...

New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
```



Dec 18 16:51  
marco@Ubuntu-Evenort: ~

```
Retype new password:  
passwd: password updated successfully  
Changing the user information for rica  
Enter the new value, or press ENTER for the default  
    Full Name []: rica saint fleur  
    Room Number []: 7  
    Work Phone []: 32445566  
    Home Phone []: 32444555  
    Other []: -  
Is the information correct? [Y/n] y  
info: Adding new user 'rica' to supplemental / extra groups 'users' ...  
info: Adding user 'rica' to group 'users' ...  
marco@Ubuntu-Evenort: $ sudo usermod -aG sec rica  
marco@Ubuntu-Evenort: $ sudo adduser wideline  
info: Adding user 'wideline' ...  
info: Selecting UID/GID from range 1000 to 59999 ...  
info: Adding new group 'wideline' (1011) ...  
info: Adding new user 'wideline' (1011) with group 'wideline (1011)' ...  
info: Creating home directory '/home/wideline' ...  
info: Copying files from '/etc/skel' ...  
New password:  
BAD PASSWORD: The password is shorter than 8 characters  
Retype new password:  
passwd: password updated successfully  
Changing the user information for wideline  
Enter the new value, or press ENTER for the default  
    Full Name []: wideline julien  
    Room Number []: 8  
    Work Phone []: 34556674  
    Home Phone []: 42334433  
    Other []: -  
Is the information correct? [Y/n] y
```



Dec 18 16:53  
marco@Ubuntu-Evenort: ~

```
File Edit View Search Terminal Help  
Other []: -  
Is the information correct? [Y/n] y  
info: Adding new user 'wideline' to supplemental / extra groups 'users' ...  
info: Adding user 'wideline' to group 'users' ...  
marco@Ubuntu-Evenort: $ sudo usermod -aG sec wideline  
marco@Ubuntu-Evenort: $ sudo adduser faudia  
info: Adding user 'faudia' ...  
info: Selecting UID/GID from range 1000 to 59999 ...  
info: Adding new group 'faudia' (1012) ...  
info: Adding new user 'faudia' (1012) with group 'faudia (1012)' ...  
info: Creating home directory '/home/faudia' ...  
info: Copying files from '/etc/skel' ...  
New password:  
BAD PASSWORD: The password is shorter than 8 characters  
Retype new password:  
passwd: password updated successfully  
Changing the user information for faudia  
Enter the new value, or press ENTER for the default  
    Full Name []: faudia dorvilus  
    Room Number []: 9  
    Work Phone []: 342546786  
    Home Phone []: 345687953  
    Other []: -  
Is the information correct? [Y/n] y  
info: Adding new user 'faudia' to supplemental / extra groups 'users' ...  
info: Adding user 'faudia' to group 'users' ...  
marco@Ubuntu-Evenort: $ sudo usermod -aG sec faudia  
marco@Ubuntu-Evenort: $ sudo adduser wadsen  
info: Adding user 'wadsen' ...  
info: Selecting UID/GID from range 1000 to 59999 ...  
info: Adding new group 'wadsen' (1013) ...  
info: Adding new user 'wadsen' (1013) with group 'wadsen (1013)' ...  
info: Creating home directory '/home/wadsen' ...  
info: Copying files from '/etc/skel' ...
```

The screenshot shows a terminal window titled "marco@Ubuntu-Evenort: ~" running on an Ubuntu system. The terminal displays the following command-line session:

```
Room Number []: 9
Work Phone []: 342546786
Home Phone []: 345687953
Other []: -
Is the information correct? [Y/n] y
info: Adding new user 'faudia' to supplemental / extra groups 'users' ...
info: Adding user 'faudia' to group 'users' ...
marco@Ubuntu-Evenort: $ sudo usermod -aG sec faudia
marco@Ubuntu-Evenort: $ sudo adduser wadsen
info: Adding user 'wadsen' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group 'wadsen' (1013) ...
info: Adding new user 'wadsen' (1013) with group 'wadsen (1013)' ...
info: Creating home directory '/home/wadsen' ...
info: Copying files from '/etc/skel' ...
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: password updated successfully
Changing the user information for wadsen
Enter the new value, or press ENTER for the default
      Full Name []: wadsen duclos
      Room Number []: 10
      Work Phone []: 43556677
      Home Phone []: 54666666
      Other []: -
Is the information correct? [Y/n] y
info: Adding new user 'wadsen' to supplemental / extra groups 'users' ...
info: Adding user 'wadsen' to group 'users' ...
marco@Ubuntu-Evenort: $ sudo usermod -aG sec wadsen
marco@Ubuntu-Evenort: $
```

- Sur ces images, il nous montrent les utilisateurs suivant au groupe **SEC**
- (vue à la page 7 à 9).

c)

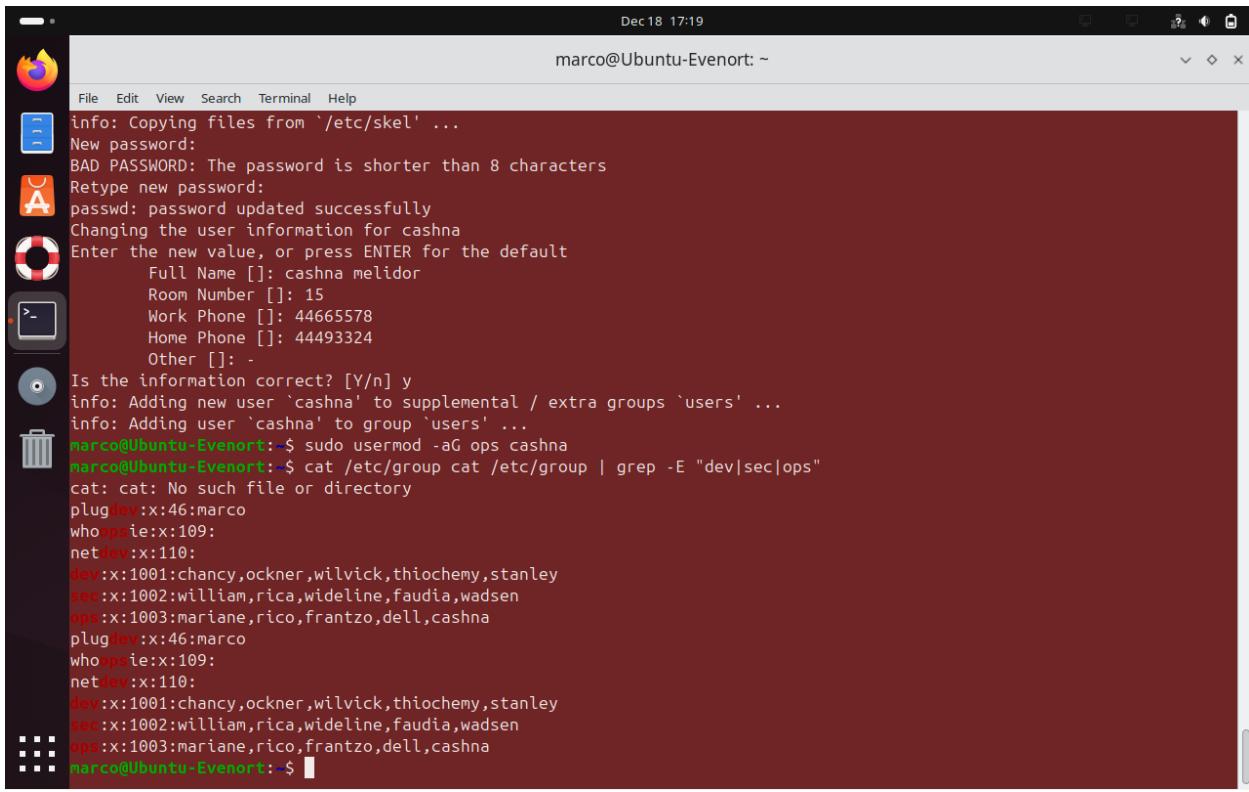
```
Dec 18 17:06
marco@Ubuntu-Evenort: ~
File Edit View Search Terminal Help
Marco@Ubuntu-Evenort:~$ sudo adduser mariane
info: Adding user 'mariane' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group 'mariane' (1014) ...
info: Adding new user 'mariane' (1014) with group 'mariane (1014)' ...
info: Creating home directory '/home/mariane' ...
info: Copying files from '/etc/skel' ...
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: password updated successfully
Changing the user information for mariane
Enter the new value, or press ENTER for the default
    Full Name []: mariane joachim
    Room Number []: 11
    Work Phone []: 54332233
    Home Phone []: 55443366
    Other []:
Is the information correct? [Y/n] y
info: Adding new user 'mariane' to supplemental / extra groups 'users' ...
info: Adding user 'mariane' to group 'users' ...
Marco@Ubuntu-Evenort:~$ sudo usermod -aG ops mariane
Marco@Ubuntu-Evenort:~$ sudo adduser rico
info: Adding user 'rico' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group 'rico' (1015) ...
info: Adding new user 'rico' (1015) with group 'rico (1015)' ...
info: Creating home directory '/home/rico' ...
info: Copying files from '/etc/skel' ...
New password:
BAD PASSWORD: The password is shorter than 8 characters
```

```
Dec 18 17:07
marco@Ubuntu-Evenort: ~
File Edit View Search Terminal Help
Retype new password:
passwd: password updated successfully
Changing the user information for rico
Enter the new value, or press ENTER for the default
    Full Name []: rico labranche
    Room Number []: 12
    Work Phone []: 55436677
    Home Phone []: 33444454
    Other []:
Is the information correct? [Y/n] y
info: Adding new user 'rico' to supplemental / extra groups 'users' ...
info: Adding user 'rico' to group 'users' ...
Marco@Ubuntu-Evenort:~$ sudo usermod -aG ops rico
Marco@Ubuntu-Evenort:~$ sudo adduser frantzo
info: Adding user 'frantzo' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group 'frantzo' (1016) ...
info: Adding new user 'frantzo' (1016) with group 'frantzo (1016)' ...
info: Creating home directory '/home/frantzo' ...
info: Copying files from '/etc/skel' ...
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: password updated successfully
Changing the user information for frantzo
Enter the new value, or press ENTER for the default
    Full Name []: frantzo julmiste
    Room Number []: 13
    Work Phone []: 44332265
    Home Phone []: 87665548
    Other []:
```

```
Dec 18 17:08
marco@Ubuntu-Evenort: ~
File Edit View Search Terminal Help
Is the information correct? [Y/n] y
info: Adding new user 'frantzo' to supplemental / extra groups 'users' ...
info: Adding user 'frantzo' to group 'users' ...
marco@Ubuntu-Evenort: $ sudo usermod -aG ops frantzo
marco@Ubuntu-Evenort: $ sudo adduser dell
info: Adding user 'dell' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group 'dell' (1017) ...
info: Adding new user 'dell' (1017) with group 'dell (1017)' ...
info: Creating home directory '/home/dell' ...
info: Copying files from '/etc/skel' ...
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: password updated successfully
Changing the user information for dell
Enter the new value, or press ENTER for the default
    Full Name []: dell calixte
    Room Number []: 14
    Work Phone []: 56443232
    Home Phone []: 55464327
    Other []:
Is the information correct? [Y/n] y
info: Adding new user 'dell' to supplemental / extra groups 'users' ...
info: Adding user 'dell' to group 'users' ...
marco@Ubuntu-Evenort: $ sudo usermod -aG ops dell
marco@Ubuntu-Evenort: $ sudo adduser cashna
info: Adding user 'cashna' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group 'cashna' (1018) ...
info: Adding new user 'cashna' (1018) with group 'cashna (1018)' ...
```

```
Dec 18 17:09
marco@Ubuntu-Evenort: ~
File Edit View Search Terminal Help
Room Number []: 14
Work Phone []: 56443232
Home Phone []: 55464327
Other []:
Is the information correct? [Y/n] y
info: Adding new user 'dell' to supplemental / extra groups 'users' ...
info: Adding user 'dell' to group 'users' ...
marco@Ubuntu-Evenort: $ sudo usermod -aG ops dell
marco@Ubuntu-Evenort: $ sudo adduser cashna
info: Adding user 'cashna' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group 'cashna' (1018) ...
info: Adding new user 'cashna' (1018) with group 'cashna (1018)' ...
info: Creating home directory '/home/cashna' ...
info: Copying files from '/etc/skel' ...
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: password updated successfully
Changing the user information for cashna
Enter the new value, or press ENTER for the default
    Full Name []: cashna melidor
    Room Number []: 15
    Work Phone []: 44665578
    Home Phone []: 44493324
    Other []:
Is the information correct? [Y/n] y
info: Adding new user 'cashna' to supplemental / extra groups 'users' ...
info: Adding user 'cashna' to group 'users' ...
marco@Ubuntu-Evenort: $ sudo usermod -aG ops cashna
marco@Ubuntu-Evenort: $
```

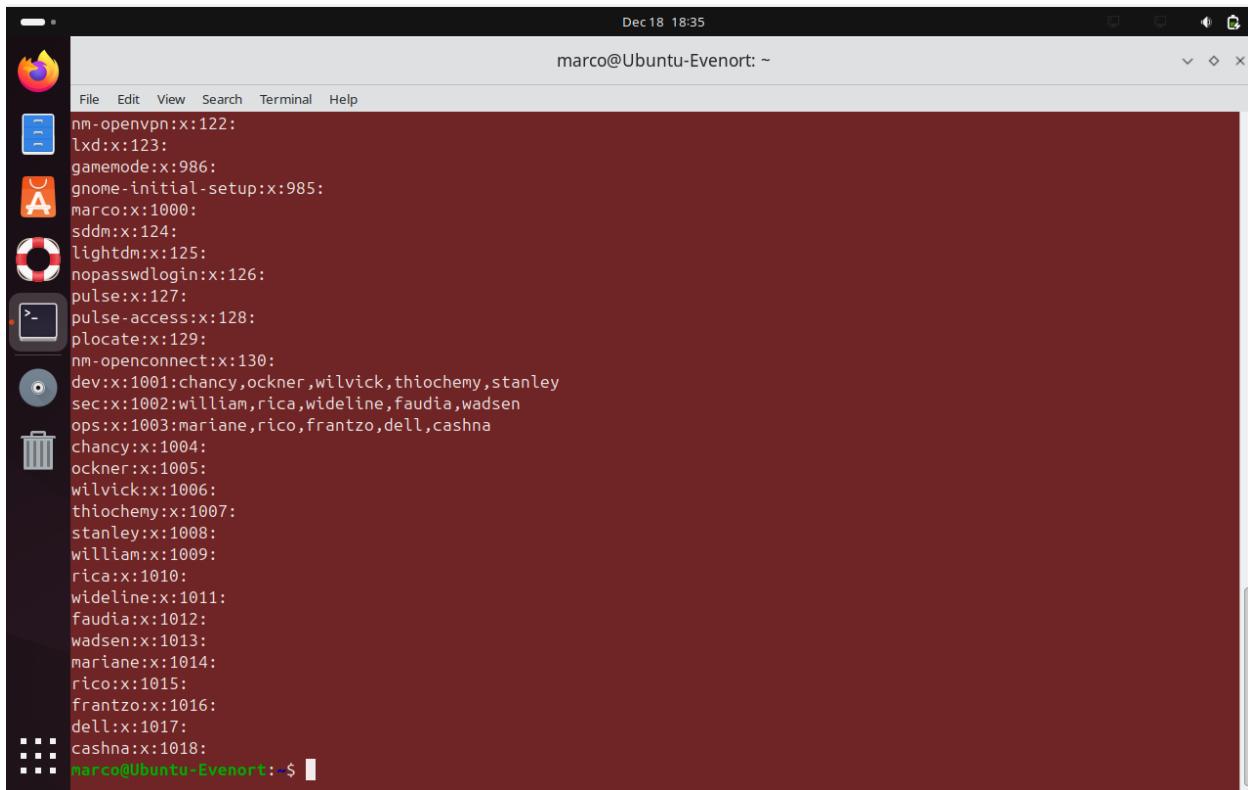
- Sur ces images, il nous montrent les utilisateurs suivant au groupe **OPS** (vue à la page 10 à 11).



The screenshot shows a terminal window titled "marco@Ubuntu-Evenort: ~". The terminal displays the following command-line session:

```
Dec 18 17:19
info: Copying files from '/etc/skel' ...
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: password updated successfully
Changing the user information for cashna
Enter the new value, or press ENTER for the default
    Full Name []: cashna melidor
    Room Number []: 15
    Work Phone []: 44665578
    Home Phone []: 44493324
    Other []: -
Is the information correct? [Y/n] y
info: Adding new user 'cashna' to supplemental / extra groups 'users' ...
info: Adding user 'cashna' to group 'users' ...
marco@Ubuntu-Evenort:~$ sudo usermod -aG ops cashna
marco@Ubuntu-Evenort:~$ cat /etc/group cat /etc/group | grep -E "dev|sec|ops"
cat: cat: No such file or directory
plugdev:x:46:marco
whoopie:x:109:
netdev:x:110:
dev:x:1001:chancy,ockner,wilvick,thiochemy,stanley
sec:x:1002:william,rica,wideline,faudia,wadsen
ops:x:1003:mariane,rico,frantzo,dell,cashna
plugdev:x:46:marco
whoopie:x:109:
netdev:x:110:
dev:x:1001:chancy,ockner,wilvick,thiochemy,stanley
sec:x:1002:william,rica,wideline,faudia,wadsen
ops:x:1003:mariane,rico,frantzo,dell,cashna
marco@Ubuntu-Evenort:~$
```

- Sur cette image, j'ai fait la vérification en utilisant la commande habituelle **cat /etc/group | grep -E “dev|sec|ops”**.



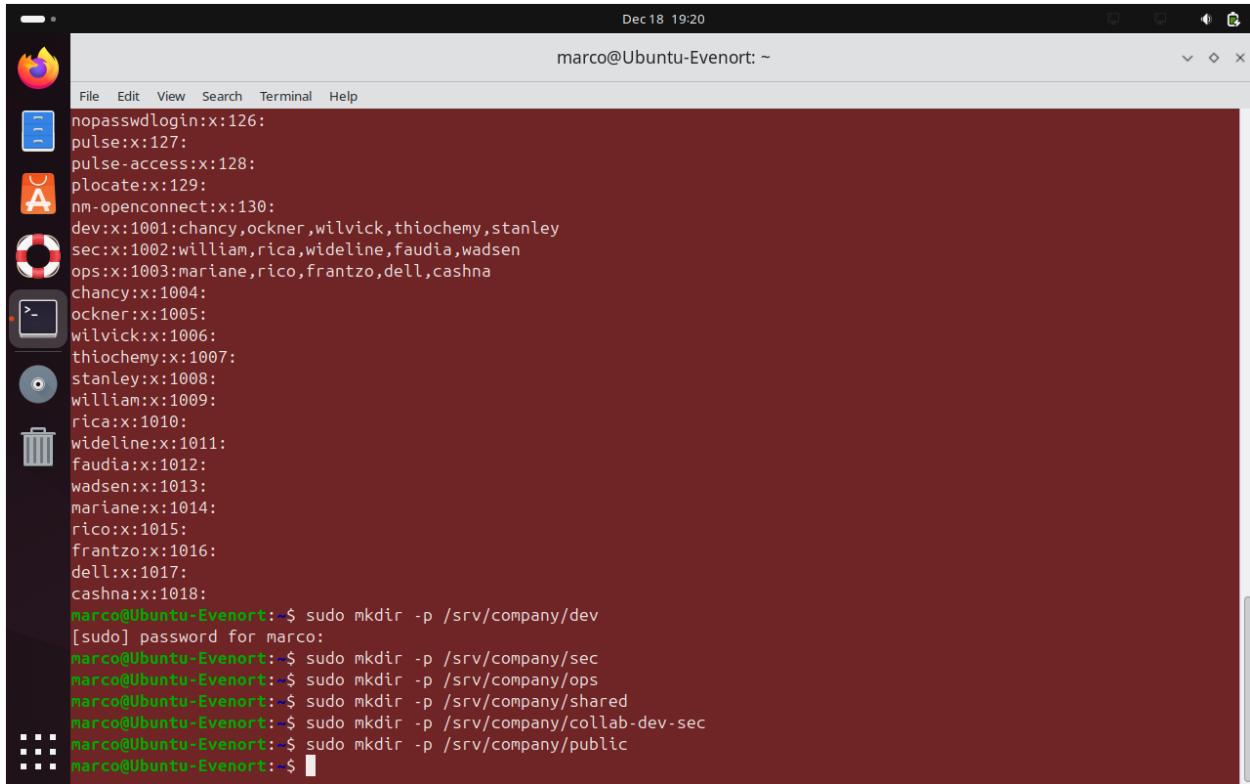
The screenshot shows a terminal window titled "marco@Ubuntu-Evenort: ~". The terminal displays a list of user entries, each consisting of a group name followed by a colon, a user ID, and a list of user names separated by commas. The groups listed are dev, sec, and ops. The output is as follows:

```
nm-openvpn:x:122:  
lxd:x:123:  
gamemode:x:986:  
gnome-initial-setup:x:985:  
marco:x:1000:  
sddm:x:124:  
lightdm:x:125:  
nopasswdlogin:x:126:  
pulse:x::127:  
pulse-access:x:128:  
plocate:x:129:  
nm-openconnect:x:130:  
dev:x:1001:chancy,ockner,wilwick,thiochemy,stanley  
sec:x:1002:william,rica,wideline,faudia,wadsen  
ops:x:1003:mariane,rico,frantzo,dell,cashna  
chancy:x:1004:  
ockner:x:1005:  
wilwick:x:1006:  
thiochemy:x:1007:  
stanley:x:1008:  
william::x:1009:  
rica:x:1010:  
wideline::x:1011:  
faudia:x:1012:  
wadsen:x:1013:  
mariane:x:1014:  
rico:x:1015:  
frantzo::x:1016:  
dell:x:1017:  
cashna:x:1018:  
Marco@Ubuntu-Evenort:~$
```

- Dans cette image, j'ai listé les groupes (**dev, sec et ops**)

### 3. Mise en place de l'arborescence

- J'ai Crée les 6 répertoires du schéma.

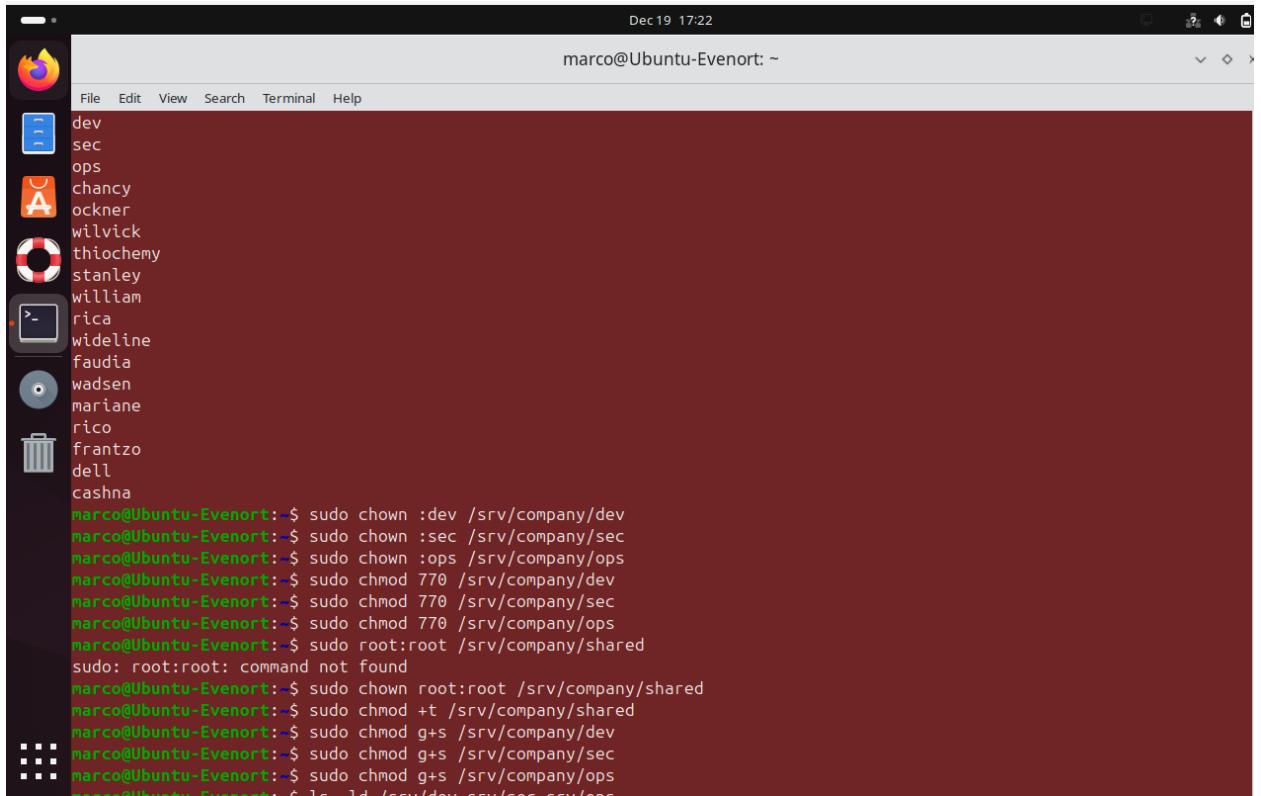


The screenshot shows a terminal window on an Ubuntu system. The title bar indicates it's running on 'Ubuntu-Evenort' at 19:20. The terminal window displays the command history and the execution of the 'sudo mkdir -p' command to create six new directories under '/srv/company'. The user 'marco' is performing the actions.

```
Dec 18 19:20
marco@Ubuntu-Evenort: ~
File Edit View Search Terminal Help
nopasswdlogin:x:126:
pulse:x:127:
pulse-access:x:128:
plocate:x:129:
nm-openconnect:x:130:
dev:x:1001:chancy,ockner,wilwick,thiochemy,stanley
sec:x:1002:william,rica,wideline,faudia,wadsen
ops:x:1003:mariane,rico,frantzo,dell,cashna
chancy:x:1004:
ockner:x:1005:
wilwick:x:1006:
thiochemy:x:1007:
stanley:x:1008:
william:x:1009:
rica::x:1010:
wideline:x:1011:
faudia:x:1012:
wadsen:x:1013:
mariane:x:1014:
rico:x:1015:
frantzo:x:1016:
dell:x:1017:
cashna:x:1018:
Marco@Ubuntu-Evenort:~$ sudo mkdir -p /srv/company/dev
[sudo] password for marco:
Marco@Ubuntu-Evenort:~$ sudo mkdir -p /srv/company/sec
Marco@Ubuntu-Evenort:~$ sudo mkdir -p /srv/company/ops
Marco@Ubuntu-Evenort:~$ sudo mkdir -p /srv/company/shared
Marco@Ubuntu-Evenort:~$ sudo mkdir -p /srv/company/collab-dev-sec
Marco@Ubuntu-Evenort:~$ sudo mkdir -p /srv/company/public
Marco@Ubuntu-Evenort:~$
```

- Ici cette image nous montre la mise en place de l'arborescence c'est-à-dire les six (6) répertoires créés.

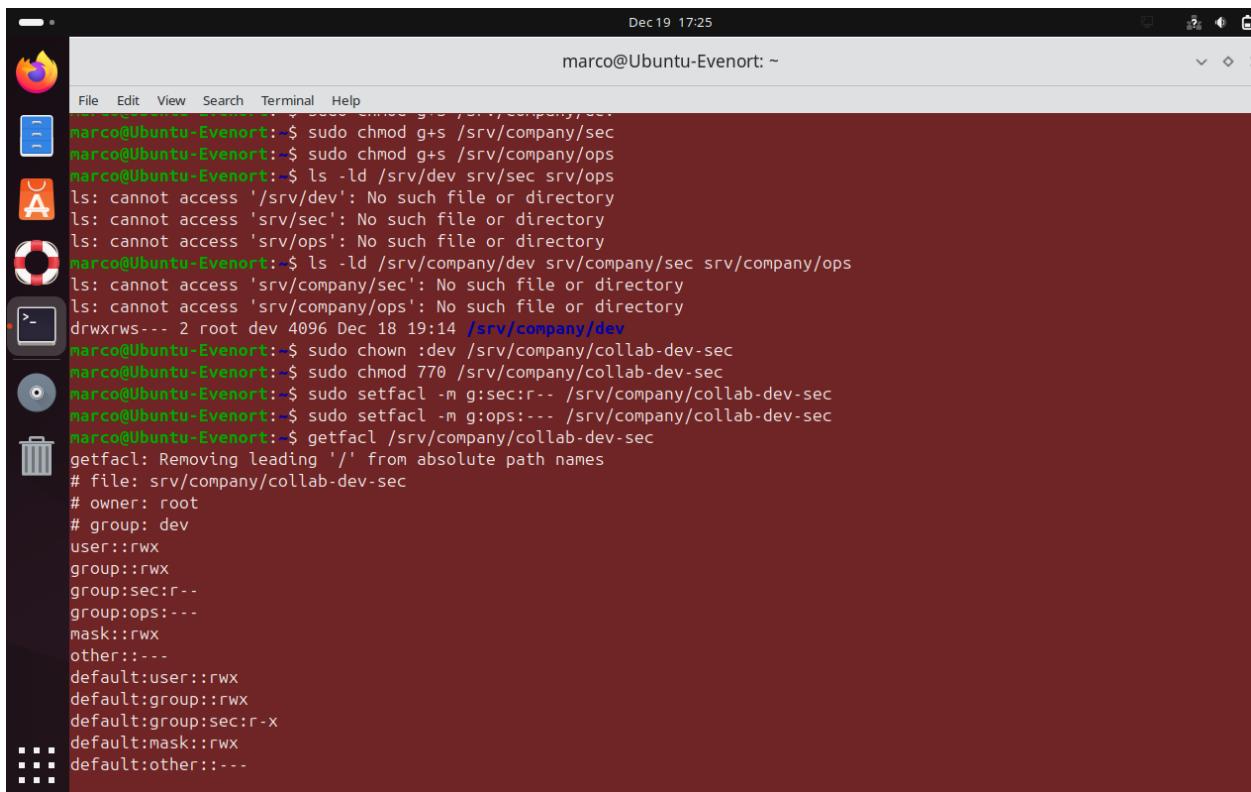
## 4. Configuration des permissions



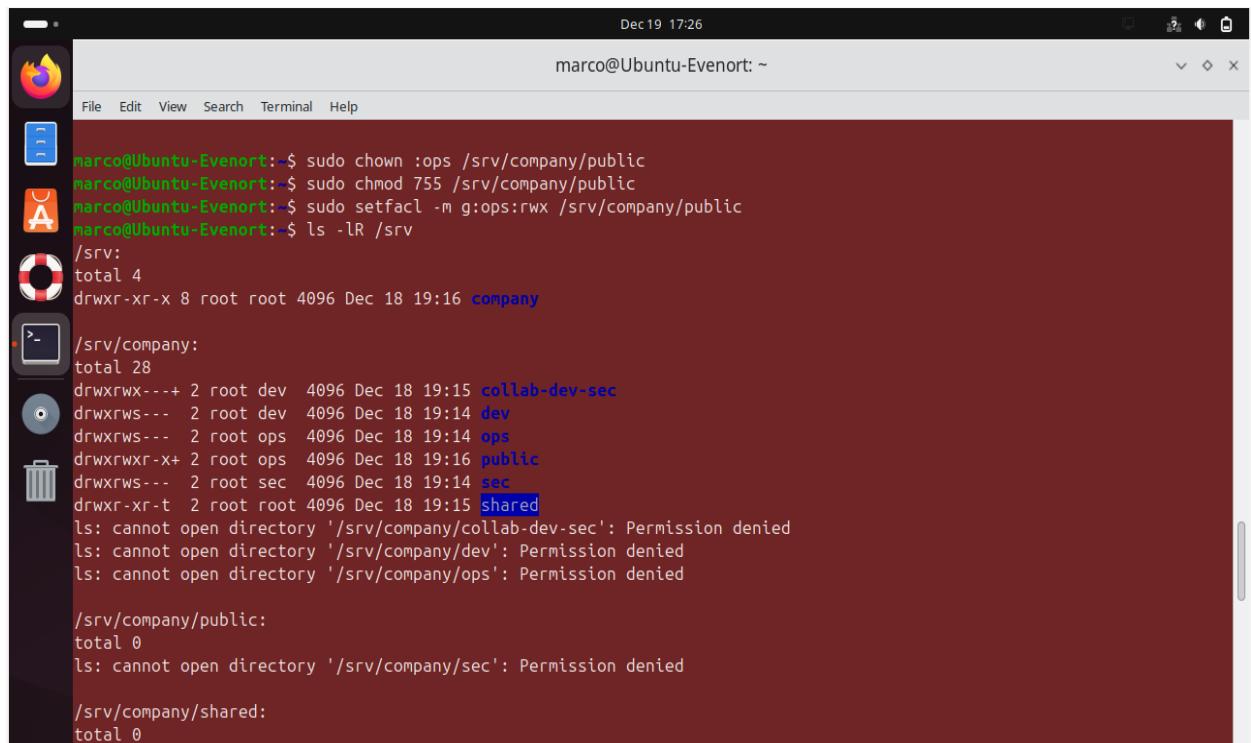
The screenshot shows a terminal window on a Linux desktop environment. The terminal title is "marco@Ubuntu-Evenort: ~". The window contains a list of users and a series of command-line entries:

```
File Edit View Search Terminal Help
dev
sec
ops
chancy
ockner
wilwick
thiochemy
stanley
william
rica
wideline
faudia
wadsen
mariane
rico
frantzo
dell
cashna
marco@Ubuntu-Evenort:~$ sudo chown :dev /srv/company/dev
marco@Ubuntu-Evenort:~$ sudo chown :sec /srv/company/sec
marco@Ubuntu-Evenort:~$ sudo chown :ops /srv/company/ops
marco@Ubuntu-Evenort:~$ sudo chmod 770 /srv/company/dev
marco@Ubuntu-Evenort:~$ sudo chmod 770 /srv/company/sec
marco@Ubuntu-Evenort:~$ sudo chmod 770 /srv/company/ops
marco@Ubuntu-Evenort:~$ sudo root:root /srv/company/shared
sudo: root:root: command not found
marco@Ubuntu-Evenort:~$ sudo chown root:root /srv/company/shared
marco@Ubuntu-Evenort:~$ sudo chmod +t /srv/company/shared
marco@Ubuntu-Evenort:~$ sudo chmod g+s /srv/company/dev
marco@Ubuntu-Evenort:~$ sudo chmod g+s /srv/company/sec
marco@Ubuntu-Evenort:~$ sudo chmod g+s /srv/company/ops
marco@Ubuntu-Evenort:~$ ls -ld /srv/company/sec/ops
```

- Sur cette image, j'ai donné la permission avec les différentes groupes (dev, sec et ops).

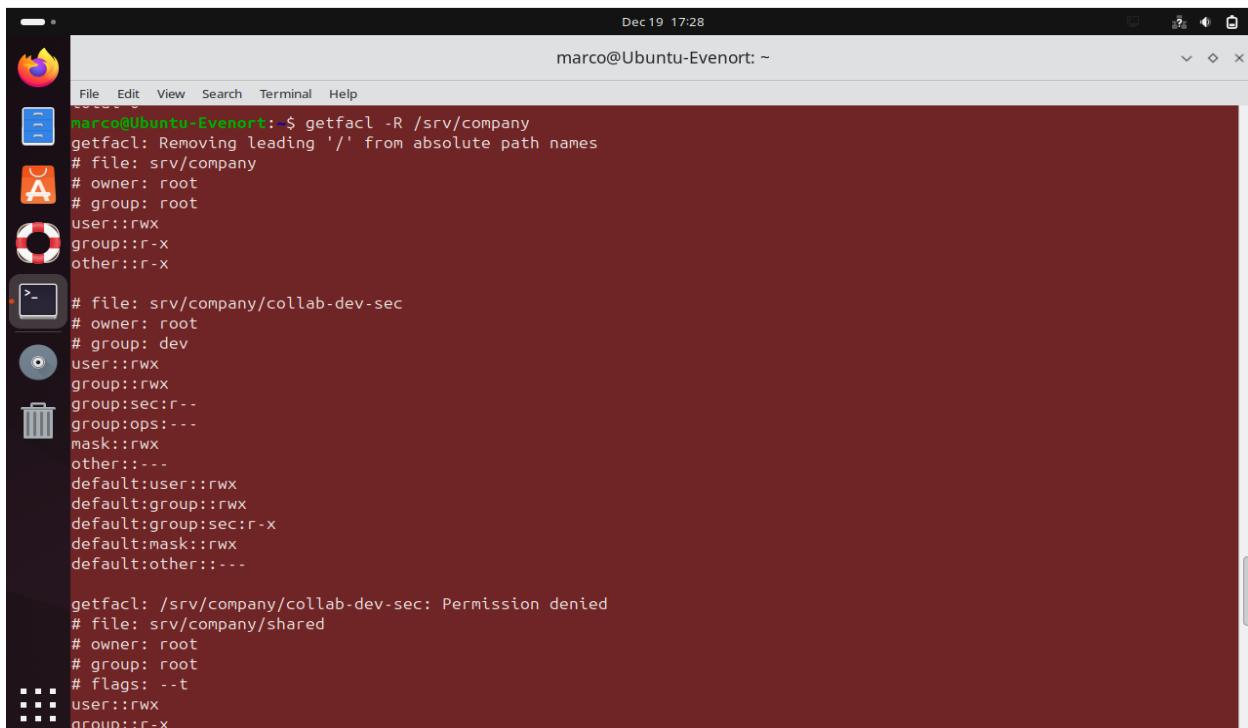


```
Dec 19 17:25
marco@Ubuntu-Evenort: ~
File Edit View Search Terminal Help
Marco@Ubuntu-Evenort:~$ sudo chmod g+s /srv/company/sec
Marco@Ubuntu-Evenort:~$ sudo chmod g+s /srv/company/ops
Marco@Ubuntu-Evenort:~$ ls -ld /srv/dev srv/sec srv/ops
ls: cannot access '/srv/dev': No such file or directory
ls: cannot access 'srv/sec': No such file or directory
ls: cannot access 'srv/ops': No such file or directory
Marco@Ubuntu-Evenort:~$ ls -ld /srv/company/dev srv/company/sec srv/company/ops
ls: cannot access 'srv/company/sec': No such file or directory
ls: cannot access 'srv/company/ops': No such file or directory
drwxrws--- 2 root dev 4096 Dec 18 19:14 /srv/company/dev
Marco@Ubuntu-Evenort:~$ sudo chown :dev /srv/company/collab-dev-sec
Marco@Ubuntu-Evenort:~$ sudo chmod 770 /srv/company/collab-dev-sec
Marco@Ubuntu-Evenort:~$ sudo setfacl -m g:sec:r-- /srv/company/collab-dev-sec
Marco@Ubuntu-Evenort:~$ sudo setfacl -m g:ops:--- /srv/company/collab-dev-sec
Marco@Ubuntu-Evenort:~$ getfacl /srv/company/collab-dev-sec
getfacl: Removing leading '/' from absolute path names
# file: srv/company/collab-dev-sec
# owner: root
# group: dev
user::rwx
group::rwx
group:sec:r--
group:ops:---
mask::rwx
other::---
default:user::rwx
default:group::rwx
default:group:sec:r-x
default:mask::rwx
default:other::---
```

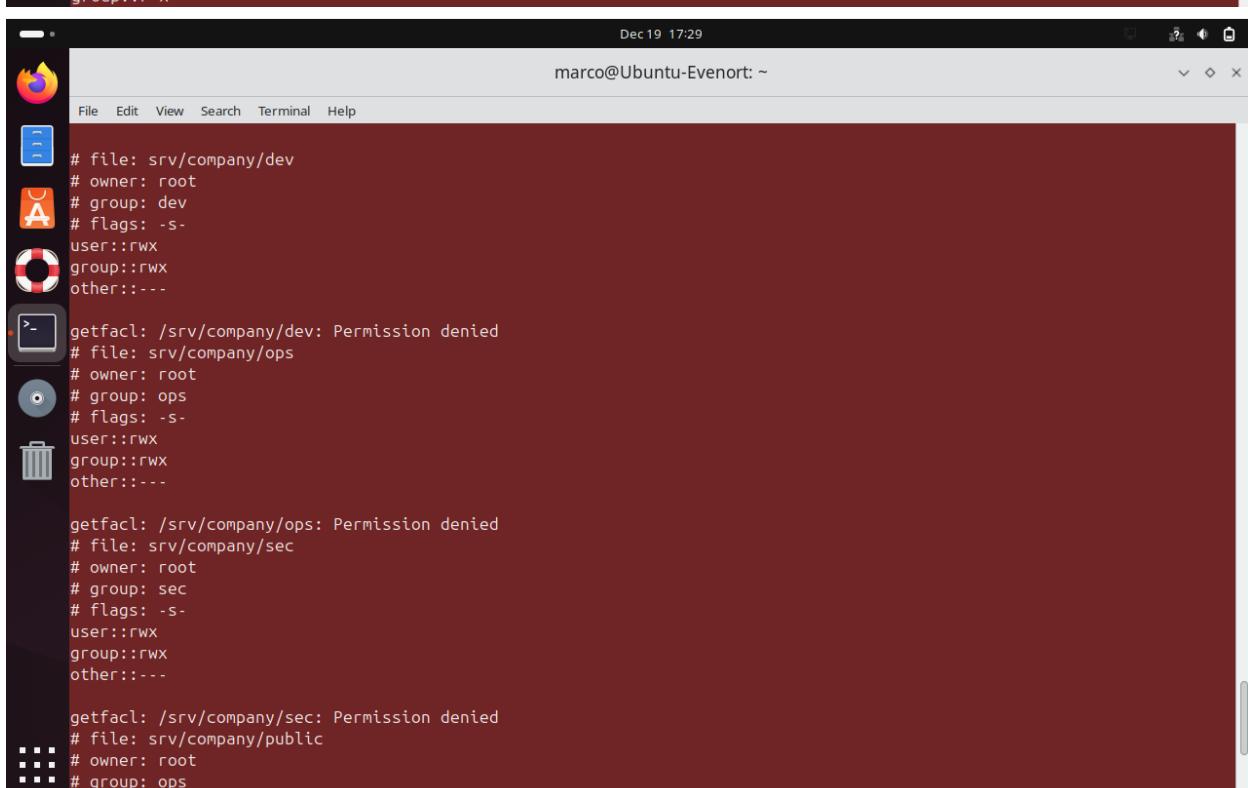


```
Dec 19 17:26
marco@Ubuntu-Evenort: ~
File Edit View Search Terminal Help
Marco@Ubuntu-Evenort:~$ sudo chown :ops /srv/company/public
Marco@Ubuntu-Evenort:~$ sudo chmod 755 /srv/company/public
Marco@Ubuntu-Evenort:~$ sudo setfacl -m g:ops:rwx /srv/company/public
Marco@Ubuntu-Evenort:~$ ls -lr /srv
/srv:
total 4
drwxr-xr-x 8 root root 4096 Dec 18 19:16 company
/srv/company:
total 28
drwxrwx---+ 2 root dev 4096 Dec 18 19:15 collab-dev-sec
drwxrws--- 2 root dev 4096 Dec 18 19:14 dev
drwxrws--- 2 root ops 4096 Dec 18 19:14 ops
drwxrwxr-x+ 2 root ops 4096 Dec 18 19:16 public
drwxrws--- 2 root sec 4096 Dec 18 19:14 sec
drwxr-xr-t 2 root root 4096 Dec 18 19:15 shared
ls: cannot open directory '/srv/company/collab-dev-sec': Permission denied
ls: cannot open directory '/srv/company/dev': Permission denied
ls: cannot open directory '/srv/company/ops': Permission denied
/srv/company/public:
total 0
ls: cannot open directory '/srv/company/sec': Permission denied
/srv/company/shared:
total 0
```

- Sur ces deux images, j'ai réalisé un audit en listant toutes les permissions de **/srv**.

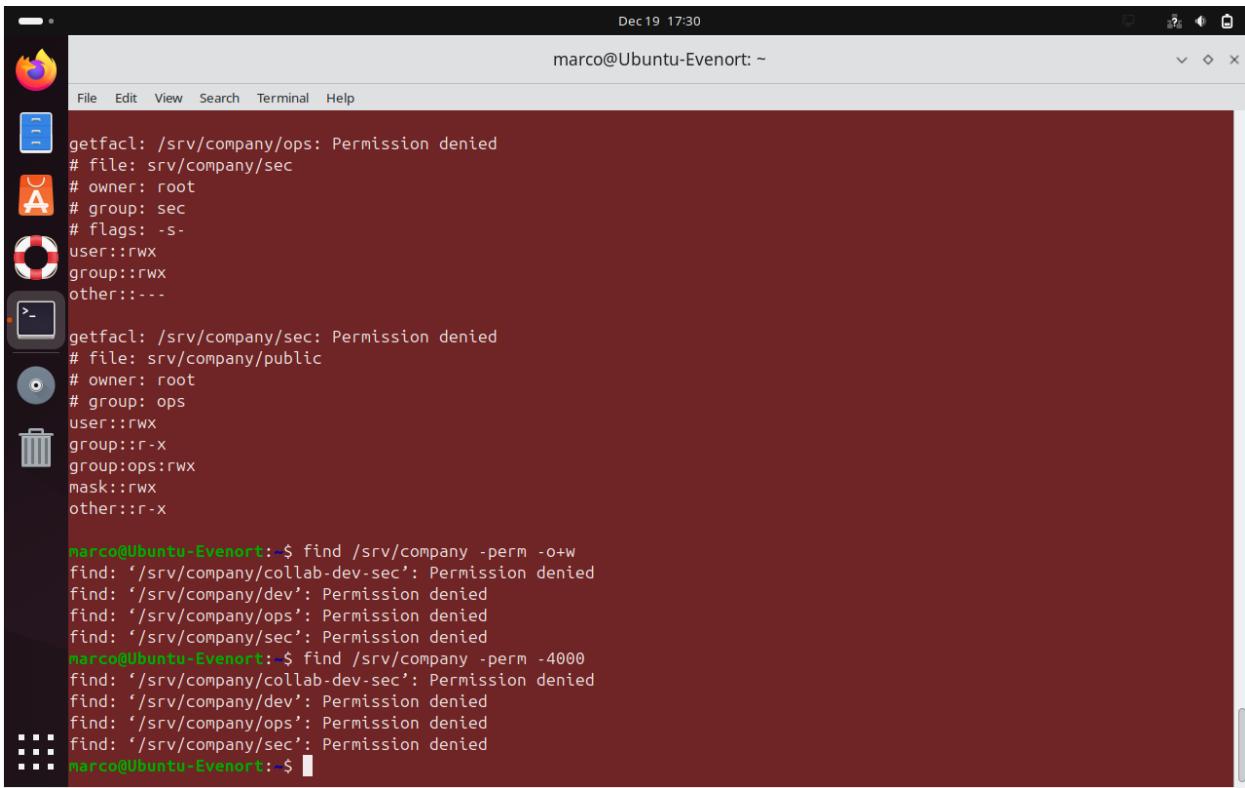


```
Dec 19 17:28
marco@Ubuntu-Evenort: ~
File Edit View Search Terminal Help
[Icons] marco@Ubuntu-Evenort:~$ getfacl -R /srv/company
getfacl: Removing leading '/' from absolute path names
# file: srv/company
# owner: root
# group: root
user::rwx
group::r-x
other::r-x
# file: srv/company/collab-dev-sec
# owner: root
# group: dev
user::rwx
group::rwx
group::sec:r--
group::ops:---
mask::rwx
other::---
default:user::rwx
default:group::rwx
default:group::sec:r-x
default:mask::rwx
default:other:---
getfacl: /srv/company/collab-dev-sec: Permission denied
# file: srv/company/shared
# owner: root
# group: root
# flags: --t
user::rwx
group::r-x
getfacl: /srv/company/shared: Permission denied
# file: srv/company/dev
# owner: root
# group: dev
# flags: -s-
user::rwx
group::rwx
other::---
getfacl: /srv/company/dev: Permission denied
# file: srv/company/ops
# owner: root
# group: ops
# flags: -s-
user::rwx
group::rwx
other::---
getfacl: /srv/company/ops: Permission denied
# file: srv/company/sec
# owner: root
# group: sec
# flags: -s-
user::rwx
group::rwx
other::---
getfacl: /srv/company/sec: Permission denied
# file: srv/company/public
# owner: root
# group: ops
getfacl: /srv/company/public: Permission denied
```



```
Dec 19 17:29
marco@Ubuntu-Evenort: ~
File Edit View Search Terminal Help
[Icons] marco@Ubuntu-Evenort:~$ getfacl -R /srv/company
getfacl: Removing leading '/' from absolute path names
# file: srv/company/dev
# owner: root
# group: dev
# flags: -s-
user::rwx
group::rwx
other::---
getfacl: /srv/company/dev: Permission denied
# file: srv/company/ops
# owner: root
# group: ops
# flags: -s-
user::rwx
group::rwx
other::---
getfacl: /srv/company/ops: Permission denied
# file: srv/company/sec
# owner: root
# group: sec
# flags: -s-
user::rwx
group::rwx
other::---
getfacl: /srv/company/sec: Permission denied
# file: srv/company/public
# owner: root
# group: ops
getfacl: /srv/company/public: Permission denied
```

- Sur ces deux images, j'ai utilisé la commande **getfacl -R /srv/company** pour faire la vérification.



The screenshot shows a terminal window titled "marco@Ubuntu-Evenort: ~". The terminal displays the output of several commands used to analyze file permissions. The commands include "getfacl" and "find" with various options like "-perm" and "-o+w". The output shows multiple instances of "Permission denied" for files and directories under "/srv/company", indicating potential security issues.

```
Dec 19 17:30
marco@Ubuntu-Evenort: ~
File Edit View Search Terminal Help
getfacl: /srv/company/ops: Permission denied
# file: srv/company/sec
# owner: root
# group: sec
# flags: -s-
user::rwx
group::rwx
other::---
getfacl: /srv/company/sec: Permission denied
# file: srv/company/public
# owner: root
# group: ops
user::rwx
group::r-x
group:ops:rwx
mask::rwx
other::r-x
marco@Ubuntu-Evenort: $ find /srv/company -perm -o+w
find: '/srv/company/collab-dev-sec': Permission denied
find: '/srv/company/dev': Permission denied
find: '/srv/company/ops': Permission denied
find: '/srv/company/sec': Permission denied
marco@Ubuntu-Evenort: $ find /srv/company -perm -4000
find: '/srv/company/collab-dev-sec': Permission denied
find: '/srv/company/dev': Permission denied
find: '/srv/company/ops': Permission denied
find: '/srv/company/sec': Permission denied
marco@Ubuntu-Evenort: $
```

- Sur cette image, j'ai détecté les fichiers trop permissifs en vérifiant aussi les dossiers avec SUID/SGID/Sticky Bit.

## **Conclusion**

Ce TD a permis de mettre en pratique les mécanismes de sécurité des fichiers sous Linux dans un contexte professionnel. Malgré certaines difficultés rencontrées, notamment dans la compréhension et la configuration du SGID, du sticky bit et des ACL, les objectifs ont pu être atteints. Les tests réalisés et l'audit final ont confirmé le bon fonctionnement des permissions mises en place. Ce travail a ainsi contribué à renforcer la compréhension de la gestion des droits et de la sécurité sous Linux.