

Linux User Management Exercise (Ubuntu)

Scenario Overview

You work at a small company that needs to onboard two new developers, set up a special group for them, give one of them sudo privileges, and set an account expiration date for an intern. You will also remove an old user who left the company. Along the way, you will verify each change by checking relevant files and directories.

Goals

- Create a new group named webdev
- Add two new users (alice and bob) to that group
- Grant alice sudo privileges
- Create an intern user intern01 whose account expires on **December 31, 2025**
- Remove an old user frank
- Verify all changes at each step



Step-by-Step Instructions with Explanations

1. Gain Elevated Privileges

Most user management commands require **superuser (root)** privileges.

Option A – Use sudo before each command

`sudo <command>`

Option B – Switch to root shell temporarily

`Linux:~$ sudo -i`

`sudo`: Executes a command with elevated (root) privileges

`sudo -i`: Starts a new login shell as the root user

```
[tiago-paquete@tiago-paquete-Linux:~$ sudo -i
[sudo] password for tiago-paquete:
root@tiago-paquete-Linux:~#
```

To exit the root shell:

`Linux:~$ exit`

```
[tiago-paquete@tiago-paquete-Linux:~$ sudo -i
[sudo] password for tiago-paquete:
root@tiago-paquete-Linux:~# exit
logout
tiago-paquete@tiago-paquete-Linux:~$
```

2. Create the Group webdev

Linux:~\$ **sudo groupadd webdev**

groupadd: Creates a new group

webdev: The name of the new group

Verify

Linux:~\$ **grep webdev /etc/group**

Checks if webdev exists in the group file

```
tiago-paquete@tiago-paquete-Linux:~$ sudo groupadd webdev
tiago-paquete@tiago-paquete-Linux:~$ grep webdev /etc/group
webdev:x:1001:
```

This line has **four fields** separated by colons ::

Field	Value	Meaning
1	webdev	Group name
2	x	Placeholder for group password (rarely used, typically just x)
3	1001	Group ID (GID) – a unique identifier for the group
4	(empty)	List of group members (none yet)

3. Create User alice

Linux:~\$ **sudo useradd -m -s /bin/bash alice**

-m: Creates a home directory (/home/alice)
-s /bin/bash: Sets Bash as the default login shell

```
tiago-paquete@tiago-paquete-Linux:~$ sudo useradd -m -s /bin/bash alice
tiago-paquete@tiago-paquete-Linux:~$ sudo passwd alice
New password:
Retype new password:
passwd: password updated successfully
tiago-paquete@tiago-paquete-Linux:~$ █
```

Linux:~\$ **sudo passwd Alice**

Sets a password for the user alice.

Note:

Linux usernames are **case-sensitive**.

If you create the user as Alice (with a capital **A**) but try to set the password for alice (lowercase **a**):

```
tiago-paquete@tiago-paquete-Linux:~$ sudo useradd -m -s /bin/bash Alice
tiago-paquete@tiago-paquete-Linux:~$ sudo passwd alice
passwd: user 'alice' does not exist
```

Linux:~\$ **sudo usermod -aG webdev Alice**

usermod: Modifies an existing user

-aG: Adds the user to the specified group without removing other group memberships

```
tiago-paquete@tiago-paquete-Linux:~$ sudo usermod -aG webdev alice
tiago-paquete@tiago-paquete-Linux:~$ █
```

Verify

Linux:~\$ **grep alice /etc/passwd**

Shows user account details

```
tiago-paquete@tiago-paquete-Linux:~$ grep alice /etc/passwd
alice:x:1001:1002::/home/alice:/bin/bash
tiago-paquete@tiago-paquete-Linux:~$
```

Field	Value	Description
1	alice	Username
2	x	Placeholder for the password (actual password is stored in /etc/shadow)
3	1001	UID (User ID)
4	1002	GID (Group ID – primary group for alice)
5	(empty)	User description or full name (GECOS field – optional)
6	/home/alice	Home directory path
7	/bin/bash	Default login shell

Linux:~\$ grep alice /etc/shadow

Displays encrypted password and expiration info (no actual password)

```
tiago-paquete@tiago-paquete-Linux:~$ sudo grep alice /etc/shadow
alice:$y$j9T$3pf18MjUTd1WBvEwM4y.y0$RQdz0DTxz.B64wbs79lPCiPzMa3uKRu020/z.DFV8j2:20192:0:99999:7:::
```

Note:

Each line in /etc/shadow represents one user and contains 9 colon-separated

fields:

username:password:lastchg:min:max:warn:inactive:expire:reserved

Field Position	Value	Meaning
1	alice	Username
2	\$y\$j9T\$...	Encrypted password (hash)

3	20192	Date of last password change (days since Jan 1, 1970)
4	0	Minimum days before password change allowed
5	99999	Maximum days password is valid (effectively never expires)
6	7	Warning period (user gets a warning 7 days before password expires)
7	(empty)	Inactive period (no value set = no auto-disable after expiry)
8	(empty)	Account expiration date (no value set = account never expires)
9	(empty)	Reserved for future use

Linux:~\$ grep webdev /etc/group

Confirms that alice is in the webdev group

```
tiago-paquete@tiago-paquete-Linux:~$ grep alice /etc/group
webdev:x:1001:alice
alice:x:1002:
tiago-paquete@tiago-paquete-Linux:~$
```

webdev:x:1001:alice

Field	Meaning
webdev	Name of the group
x	Placeholder (group passwords are rarely used)
1001	GID (Group ID)
alice	Member(s) of the group (in this case, alice)

Interpretation: alice is a member of the webdev group as a secondary group.

alice:x:1002:

Field	Meaning
alice	Name of the group
x	Placeholder
1002	GID
(empty)	No additional members listed

Interpretation: This is the primary group for the user alice. When a user is created, a primary group with the same name is often created automatically.

Linux:~\$ ls -ld /home/alice

ls: List directory contents
-l: Long listing format (shows detailed info)
-d: Lists the directory itself (not its contents)
/home/alice: The home directory of the user alice

Checks if the home directory exists and is correctly owned

```
tiago-paquete@tiago-paquete-Linux:~$ ls -ld /home/alice
drwxr-x--- 2 alice alice 4096 Apr 14 19:31 /home/alice
tiago-paquete@tiago-paquete-Linux:~$ █
```

Field	Value	Description
d	d	This is a directory
rwxr-x---	Permissions	Owner can read/write/execute, group can read/execute, others get nothing
2	Link count	Number of hard links to this directory (usually 2)
alice	Owner	User who owns the directory
alice	Group	Group that owns the directory
4096	Size	Size of the directory in bytes (usually 4096 for empty dirs)
Apr 14 19:31	Timestamp	Last modification date/time
/home/alice	Path	The path to the directory

4. Grant alice Sudo Privileges

Ubuntu uses the sudo group (not wheel).

```
Linux:~$ sudo usermod -aG sudo Alice
```

Adds alice to the sudo group, enabling administrative privileges

```
[tiago-paquete@tiago-paquete-Linux:~$ sudo usermod -aG sudo alice  
[sudo] password for tiago-paquete:  
tiago-paquete@tiago-paquete-Linux:~$ █
```

Verify

```
Linux:~$ groups Alice
```

Displays all groups that alice belongs to

```
[tiago-paquete@tiago-paquete-Linux:~$ groups alice  
alice : alice sudo webdev  
tiago-paquete@tiago-paquete-Linux:~$ █
```

Optional: Test sudo Access

```
Linux:~$ su - alice  
Linux:~$ sudo whoami
```

If prompted for a password and the result is root, the setup works

```
[tiago-paquete@tiago-paquete-Linux:~$ su - alice  
Password:  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
  
[alice@tiago-paquete-Linux:~$ sudo whoami  
[sudo] password for alice:  
root  
alice@tiago-paquete-Linux:~$ █
```

5. Create User bob (No Sudo Access)

```
Linux:~$ sudo useradd -m -s /bin/bash bob
Linux:~$ sudo passwd bob
Linux:~$ sudo usermod -aG webdev bob
```

Just like alice, except no sudo group membership

```
[tiago-paquete@tiago-paquete-Linux:~$ sudo useradd -m -s /bin/bash bob
[sudo] password for tiago-paquete:
[tiago-paquete@tiago-paquete-Linux:~$ sudo passwd bob
New password:
Retype new password:
passwd: password updated successfully

[tiago-paquete@tiago-paquete-Linux:~$ sudo usermod -aG webdev bob
```

Verify

```
Linux:~$ grep bob /etc/passwd
Linux:~$ grep bob /etc/shadow
Linux:~$ groups bob
```

```
[tiago-paquete@tiago-paquete-Linux:~$ sudo grep bob /etc/passwd
bob:x:1002:1003:~/home/bob:/bin/bash
[tiago-paquete@tiago-paquete-Linux:~$ sudo grep bob /etc/shadow
bob:$y$j9T$TMtYhKD.IpNVrsqtuPfYW.$Bp4zNrQhv8lvVtYrviTP4W5wenEd02.sPGa6W9XhQ89:20192:0:99999:7:::
[tiago-paquete@tiago-paquete-Linux:~$ groups bob
bob : bob webdev
tiago-paquete@tiago-paquete-Linux:~$ █
```

6. Create Intern Account intern01 with Expiration Date

```
Linux:~$ sudo useradd -m -s /bin/bash intern01
Linux:~$ sudo passwd intern01
Linux:~$ sudo usermod -e 2025-12-31 intern01
```

-e YYYY-MM-DD: Sets the expiration date of the account
usermod: A command used to modify an existing user

Note:

This command sets the expiration date of the user account intern01 to December 31, 2025. After this date, the user will no longer be able to log in.

It does **not delete the account**, just disables login access after that date.

```
[tiago-paquete@tiago-paquete-Linux:~$ sudo useradd -m -s /bin/bash intern01
[tiago-paquete@tiago-paquete-Linux:~$ sudo passwd intern01
New password:
Retype new password:
passwd: password updated successfully
[tiago-paquete@tiago-paquete-Linux:~$ sudo usermod -e 2025-12-31 intern01
[tiago-paquete@tiago-paquete-Linux:~$ █
```

Verify

```
Linux:~$ grep intern01 /etc/passwd
Linux:~$ grep intern01 /etc/shadow
Linux:~$ groups intern01
```

```
[tiago-paquete@tiago-paquete-Linux:~$ sudo grep intern01 /etc/passwd
intern01:x:1003:1004::/home/intern01:/bin/bash
[tiago-paquete@tiago-paquete-Linux:~$ sudo grep intern01 /etc/shadow
intern01:$y$j9T$0Z2c6Lfg7kntJA5aaREKc/$0sEQ30lgOUOcGJNP01fXrbAAUkiexCLLcvmg4qQofR/:20192:0:99999:7::20453:
[tiago-paquete@tiago-paquete-Linux:~$ groups intern01
intern01 : intern01
[tiago-paquete@tiago-paquete-Linux:~$ █
```

```
Linux:~$ sudo chage -l intern01
```

Lists password and account expiration info

Part	Meaning
sudo	Runs the command with superuser (root) privileges, required to view or modify user account details

chage	Short for change age , a Linux command used to manage password and account expiration policies
-l	Stands for list – it lists current settings for the user
intern01	The username of the account you want to check

This command **displays the account aging information** for the user intern01.

It tells:

- When the password was last changed
- When the password will expire (if applicable)
- When the account itself will expire
- And other related settings

```

[tiago-paquete@tiago-paquete-Linux:~$ sudo chage -l intern01
Last password change                                : Apr 14, 2025
Password expires                                     : never
Password inactive                                    : never
Account expires                                      : Dec 31, 2025
Minimum number of days between password change      : 0
Maximum number of days between password change      : 99999
Number of days of warning before password expires   : 7
tiago-paquete@tiago-paquete-Linux:~$ █

```

7. Remove User frank

Linux:~\$ grep frank /etc/passwd

Checks if frank exists

Linux:~\$ sudo userdel -r frank

userdel: Deletes a user

-r: Removes the home directory and mail spool

```
[tiago-paquete@tiago-paquete-Linux:~$ sudo grep frank /etc/passwd
frank:x:1004:1005:~/home/frank:/bin/bash
[tiago-paquete@tiago-paquete-Linux:~$ sudo userdel -r frank
userdel: frank mail spool (/var/mail/frank) not found
[tiago-paquete@tiago-paquete-Linux:~$ sudo grep frank /etc/passwd
tiago-paquete@tiago-paquete-Linux:~$
```

Verify

Linux:~\$ grep frank /etc/passwd

Linux:~\$ ls -ld /home/frank

If no output appears, the deletion succeeded

```
[tiago-paquete@tiago-paquete-Linux:~$ grep frank /etc/passwd
[tiago-paquete@tiago-paquete-Linux:~$ ls -ld /home/frank
ls: cannot access '/home/frank': No such file or directory
tiago-paquete@tiago-paquete-Linux:~$
```

8. Final Verification Steps

List All Users

```
Linux:~$ cut -d: -f1 /etc/passwd | tail -n 3
```

This command is made up of **two parts piped together** (`|`), and it outputs the **last 3 usernames** listed in the `/etc/passwd` file.

Command breakdown:

```
cut -d: -f1 /etc/passwd
```

cut: Extracts sections from lines of input

-d: Uses colon (`:`) as the delimiter (because `/etc/passwd` fields are colon-separated)

-f1: Selects the first field only (which is the username)

/etc/passwd: File that contains all local user accounts

Result: A list of all usernames on the system

```
tail -n 3
```

tail: Displays the end of a file or stream

-n 3: Shows the last 3 lines

Result: Displays the last 3 usernames from the list provided by the first command

Check Group Membership

```
Linux:~$ grep webdev /etc/group
```

```
Linux:~$ groups alice
```

```
Linux:~$ groups bob
```

```
Linux:~$ groups intern01
```

```
[tiago-paquete@tiago-paquete-Linux:~$ grep webdev /etc/group  
webdev:x:1001:alice,bob
```

```
[tiago-paquete@tiago-paquete-Linux:~$ groups alice  
alice : alice sudo webdev
```

```
[tiago-paquete@tiago-paquete-Linux:~$ groups bob  
bob : bob webdev
```

```
[tiago-paquete@tiago-paquete-Linux:~$ groups intern01  
intern01 : intern01
```

```
tiago-paquete@tiago-paquete-Linux:~$ █
```

View sudo/auth logs (Ubuntu uses /var/log/auth.log)

Linux:~\$ sudo grep alice /var/log/auth.log

Displays sudo or authentication events for alice

Example:

2025-04-14T19:23:12.171866+02:00 (...) ; COMMAND=/usr/bin/passwd alice

Summary of Commands and Explanations

Command	Description
sudo groupadd webdev	Create the webdev group
sudo useradd -m -s /bin/bash <user>	Create a user with home dir and Bash shell
sudo passwd <user>	Set user password
sudo usermod -aG <group> <user>	Add user to group
sudo usermod -e <date> <user>	Set account expiration date
sudo userdel -r <user>	Delete user and remove their home dir
grep <term> <file>	Search system files for user/group
groups <user>	List group memberships
sudo chage -l <user>	Show password/account aging info
cut -d: -f1 /etc/passwd	List all usernames
sudo grep <user> /var/log/auth.log	View authentication or sudo logs