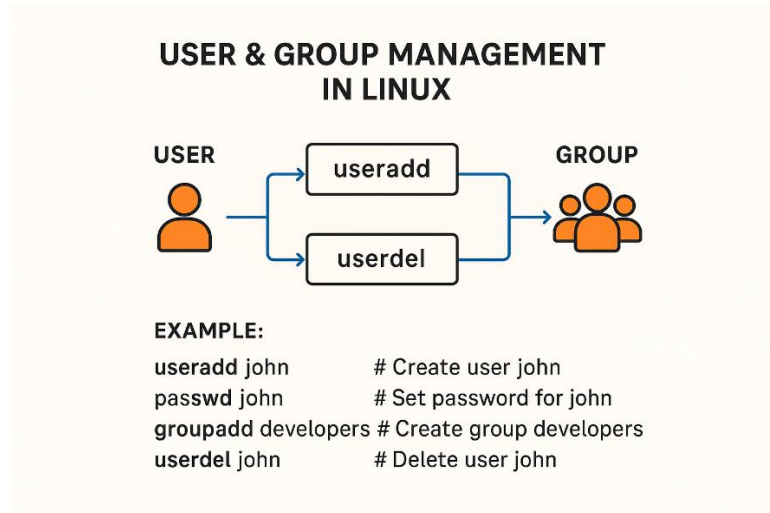


Module: 4_Linux server - Manage user and Groups and working with file systems

1. Manage users and groups with commands like useradd, userdel, groupadd, and passwd

Ans:



User Management

Add a User

```
sudo useradd username
```

Creates a new user.

Use -m to create the home directory:

```
sudo useradd -m username
```

Set Password for a User

```
sudo passwd username
```

Prompts you to enter a new password.

Delete a User

```
sudo userdel username
```

Deletes the user (but not the home directory).

To remove the home directory as well:

```
sudo userdel -r username
```

Modify a User (e.g., change username or home dir)

```
sudo usermod -l newname oldname # change username
```

```
sudo usermod -d /new/home/dir username # change home directory
```

Group Management

Add a Group

```
sudo groupadd groupname
```

Delete a Group

```
sudo groupdel groupname
```

Add User to a Group

```
sudo usermod -aG groupname username
```

The -aG means "append to group" – important to avoid overwriting existing groups.

Check Group Membership

```
groups username
```

Example: Create a New User and Assign to a Group

```
sudo useradd -m alice  
sudo passwd alice  
sudo groupadd developers  
sudo usermod -aG developers alice
```

2. Explain different file system types in Linux?

Ans:

A **file system** is like the rules or method that Linux uses to **organize and store files** on a disk (like our hard drive or USB stick). Think of it like a library system that knows where every book (file) is placed and how to access it.

1. **ext2 (Second Extended File System)**

- Old Linux file system.
- No journaling (so recovery after crash is slow).
- Rarely used today.

2. **ext3 (Third Extended File System)**

- Improved version of ext2.
- Has **journaling** → keeps track of changes, so recovery after crash is faster.

3. **ext4 (Fourth Extended File System)**

- Most common in Linux today.
- Faster, supports very large files and partitions.
- Backward compatible with ext2 and ext3.

4. **XFS**

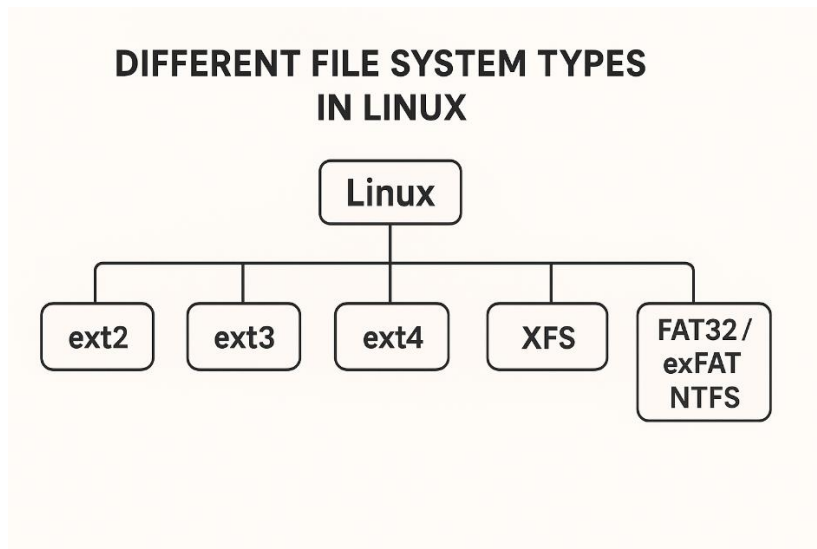
- High-performance file system.
- Good for servers with large data (databases, big storage).

5. **Btrfs (B-tree File System)**

- Modern Linux file system.
- Supports snapshots, error detection, and repair.
- Designed for advanced storage management.

6. **FAT32 / exFAT / NTFS**

- File systems from Windows.
- Linux can read/write them (used for USB drives, external disks).






3. Explain File Permission groups in Linux?

Ans: In Linux, **every file and folder** has permissions that decide **who can access it** and **how**.

- **User = file owner**
- **Group = team members**
- **Others = rest of the world**

Permissions are divided into **3 groups**:

1. **User (u)** 
 - The **owner** of the file.
 - Example: If you create a file, *you* are the user.
2. **Group (g)** 
 - A group of users who share access.
 - Example: If you're in a "developers" group, all developers may share file access.
3. **Others (o)** 
 - Everyone else on the system who is **not the owner** or in the group.

Types of Permissions

- **Read (r)** → View file contents / list folder.
- **Write (w)** → Modify file / add or remove files in a folder.
- **Execute (x)** → Run file as a program / enter a folder.

Example

Run command:

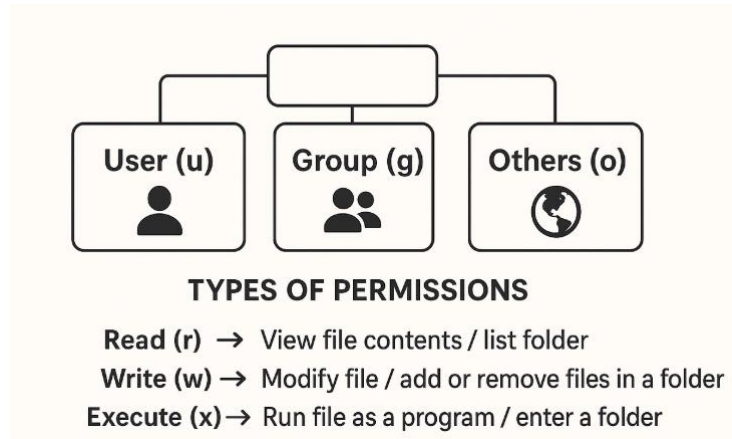
```
ls -l
```

Output example:

```
-rwxr-xr-- 1 user group file.txt
```

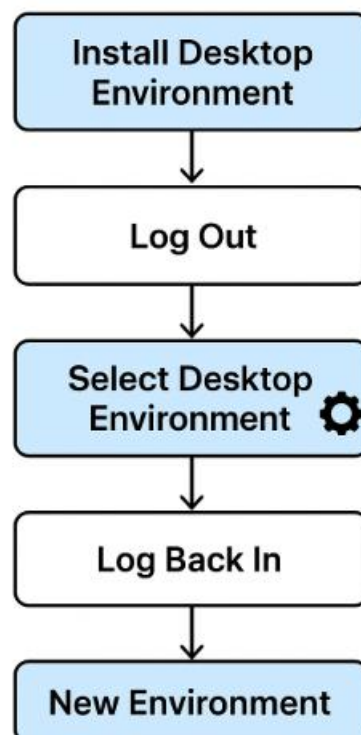
Breakdown:

- **User (u): rwx** → Owner can read, write, execute.
- **Group (g): r-x** → Group can read, execute.
- **Others (o): r--** → Others can only read.



4. How do you switch from one desktop environment to another, such as switching from KDE to Gnome?

Ans:




- ☐ **Install the Desktop Environment** (if not already installed)

```

sudo apt install ubuntu-gnome-desktop # For GNOME
sudo apt install kubuntu-desktop      # For KDE
  
```

- ☐ **Log Out** of your current session.
- ☐ **At the Login Screen (Display Manager)** →

- Look for a **gear icon**  or **session menu**.
 - It lets you pick between **KDE, GNOME, XFCE, etc.**
- ☐ **Select the Environment** you want (e.g., GNOME).
- ☐ **Log Back In** → Now you'll be using the selected desktop.

5. What are the kinds of permissions under Linux?

Ans:

- ☐ **Read (r)** → Permission to view the contents of a file or list a directory's contents.
- File: allows opening and reading the file.
 - Directory: allows listing files inside it.
- ☐ **Write (w)** → Permission to modify or delete a file, or add/remove files inside a directory.
- File: allows editing or changing file content.
 - Directory: allows creating, deleting, or renaming files in it.
- ☐ **Execute (x)** → Permission to run a file as a program/script, or to enter a directory.
- File: allows executing the file (if it's a program/script).
 - Directory: allows entering the directory (cd into it).

Permission Groups

Permissions apply to **three categories of users**:

1. **Owner (u)** → The user who created the file.
2. **Group (g)** → Users who are members of the file's group.
3. **Others (o)** → All other users on the system.

Example (using `ls -l`):

```
-rwxr-xr--
```

Breakdown:

- - → File type (file, directory, link, etc.)
- rwx → Owner has **read, write, execute**
- r-x → Group has **read, execute**
- r-- → Others have **read only**

Summary Table

Permission	Symbol	File Meaning	Directory Meaning
Read	r	Open/view contents	List directory contents
Write	w	Modify file content	Add/remove files inside directory
Execute	x	Run file as program	Enter (cd) into directory

6. What are the different modes when using vi editor?

Ans:

Command Mode (Normal Mode)

- This is the **default mode** when you open a file in vi.
- In this mode, you can **navigate, delete, copy, paste, or search** text.
- You **cannot directly type text** here.
- Example commands: dd (delete a line), yy (copy a line), p (paste).

Insert Mode

- This mode is used for **typing or inserting text** into the file.
- To enter Insert Mode from Command Mode, press:
 - i → insert at cursor
 - a → insert after cursor
 - o → open a new line below
- To go back to Command Mode, press Esc.

Ex Mode (Last Line Mode / Command-Line Mode)

- This mode is used for **saving, quitting, or executing advanced commands**.
- You enter this mode by pressing : in Command Mode.
- Common commands:
 - :w → save file
 - :q → quit vi
 - :wq → save and quit

Command Mode = navigation & editing, Insert Mode = typing, Ex Mode = save & quit commands.