Learning the Linux Filesystem

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1. Welcome to the World of Linux Files

Hello! Today, we're going to explore one of the most important parts of Linux: **the filesystem**.

Think of your computer as a **giant library**:

- Each shelf is a **directory** (or folder).
- Each book is a **file**.
- The **filesystem** is the map that tells you where every book is stored.

In Linux, **everything** is a file — not just documents and pictures, but even your keyboard, mouse, and programs!

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2. The Big Map — `/` (Root Directory)

In Linux, the entire filesystem starts from one main place: `/`
This slash is called **root**. It's like the "city center" of your computer.

Here's a simple map of the most important places:

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/
├── bin    → Basic programs (tools you always need)
├── etc    → System settings (configuration files)
├── home   → Personal space for each user
├── tmp    → Temporary files (disappear after restart)
├── var    → Changing data (logs, caches)
├── usr    → Extra programs and files
├── dev    → Devices (keyboard, hard drive, etc.)
└── proc   → Info about running programs
```

> 💡 **Remember: In Linux, directory names are case-sensitive. `/Home` is not the same as `/home`.**

3. Moving Around the Filesystem

To explore Linux, you use the **Terminal**.
The Terminal is like a magic door — you type commands and it shows you results.

Commands to move around

- `pwd` — Show where you are (print working directory).
- `ls` — List files and folders in the current place.
- `cd folder_name` — Go into a folder.
- `cd ..` — Go up one level.
- `cd /path/to/place` — Go directly to a location.

Try it!

1. Open Terminal.
2. Type:

   pwd

   ls /

   cd /home

   pwd

   cd ..

   pwd
3. Look at the output — can you see where you are at each step?

4. Looking Inside Files

Some files are text files that you can read in the Terminal.

Useful commands

- `cat file.txt` — Show the whole file.
- `less file.txt` — Scroll through the file (press `q` to quit).
- `file something` — Tell what type of file it is.

Try it!

- Go to `/etc`:

  cd /etc

  ls

  cat hostname

- Did you see your computer's hostname?

5. Creating and Removing Files & Folders

⚠️ **Warning:** Only create and delete files in your **home folder** for now.
This keeps the system safe.

Creating

- `mkdir folder_name` — Make a folder.
- `touch file.txt` — Make a blank file.
- `echo "text" > file.txt` — Make a file with text.

Removing

- `rm file.txt` — Delete a file.
- `rm -r folder_name` — Delete a folder and its contents.

Try it!

cd ~

mkdir playground

cd playground

touch hello.txt

echo "I am learning Linux!" > hello.txt

cat hello.txt

rm hello.txt

6. Understanding Paths

A **path** tells Linux where something is.

Absolute path — The full address from `/`:

/home/toan/playground/hello.txt

Relative path — From where you are now:

If you're in `/home/toan`, the same file can be:

playground/hello.txt

Try it!

- Draw a "map" of your home folder on paper.
- Mark where you are.
- Write one **absolute** and one **relative** path for the same file.

7. Fun Treasure Hunt

Your mission: Create a "treasure map" on your computer.

1. Go to `/tmp`:

   cd /tmp

2. Make a folder called `treasure_chest`:

   mkdir treasure_chest

   cd treasure_chest

3. Make a file called `map.txt` with the text:

   echo "X marks the spot!" > map.txt

4. Read the map:

   cat map.txt

8. Quick Recap

- **Filesystem** = map of where files are stored.
- `/` is the root (starting point).
- You move with `cd`, see where you are with `pwd`, and list with `ls`.
- You can make files/folders with `touch`/`mkdir` and remove them with `rm`.
- Paths can be **absolute** or **relative**.

9. Challenge Yourself

1. Find the `passwd` file in `/etc` (it's not a password list — it's a list of users!).
2. Go to your home folder and create a directory named `projects`.
3. Inside `projects`, create a file named `my_notes.txt` with your favorite Linux command written inside.
4. Read your file to check if it worked.