

Day1

Refreshing package lists and upgrade the system.

```
tosson@LAPTOP-8TFQP2MT: ~$ sudo apt update
[sudo] password for tosson:
Hit:1 http://archive.ubuntu.com/ubuntu noble InRelease
Get:2 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:3 http://archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:4 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [21.6 kB]
Get:5 http://archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:6 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [52.3 kB]
Get:7 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Components [212 B]
Get:8 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Components [212 B]
Get:9 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [1379 kB]
Get:10 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 Components [175 kB]
Get:11 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 Packages [1473 kB]
Get:12 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 Components [377 kB]
Get:13 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Components [212 B]
Get:14 http://archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Components [940 B]
Get:15 http://archive.ubuntu.com/ubuntu noble-backports/main amd64 Components [7084 B]
Get:16 http://archive.ubuntu.com/ubuntu noble-backports/universe amd64 Components [19.2 kB]
Get:17 http://archive.ubuntu.com/ubuntu noble-backports/restricted amd64 Components [216 B]
Get:18 http://archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 Components [212 B]
Fetched 3884 kB in 3s (1493 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
2 packages can be upgraded. Run 'apt list --upgradable' to see them.
tosson@LAPTOP-8TFQP2MT: ~$ sudo apt upgrade
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
The following packages were automatically installed and are no longer required:
  libdrm-nouveau2 libdrm-radeon1 libgl1-amber-dri libglapi-mesa libllvm17t64 libxcb-dri2-0
Use 'sudo apt autoremove' to remove them.
The following packages have been kept back:
  libgl1-amber-dri libglapi-mesa
0 upgraded, 0 newly installed, 0 to remove and 2 not upgraded.
tosson@LAPTOP-8TFQP2MT: ~$
```

Verifying system details: kernel version, user, time

```
tosson@LAPTOP-8TFQP2MT: ~$ sudo apt upgrade
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
The following packages were automatically installed and are no longer required:
  libdrm-nouveau2 libdrm-radeon1 libgl1-amber-dri libglapi-mesa libllvm17t64 libxcb-dri2-0
Use 'sudo apt autoremove' to remove them.
The following packages have been kept back:
  libgl1-amber-dri libglapi-mesa
0 upgraded, 0 newly installed, 0 to remove and 2 not upgraded.
tosson@LAPTOP-8TFQP2MT: ~$ uname -r
6.6.87.2-microsoft-standard-WSL2
tosson@LAPTOP-8TFQP2MT: ~$ whoami
tosson
tosson@LAPTOP-8TFQP2MT: ~$ date
Sun Aug 31 13:31:54 EEST 2025
tosson@LAPTOP-8TFQP2MT: ~$
```

Creating /home//iot_logger with subdirectories: logs, scripts, data

```
tosson@LAPTOP-8TFQP2MT: x + v
6.6.87.2-microsoft-standard-WSL2
tosson@LAPTOP-8TFQP2MT:~$ whoami
tosson
tosson@LAPTOP-8TFQP2MT:~$ date
Sun Aug 31 13:31:54 EEST 2025
tosson@LAPTOP-8TFQP2MT:~$ cd ~
tosson@LAPTOP-8TFQP2MT:~$ mkdir iot_logger
tosson@LAPTOP-8TFQP2MT:~$ cd iot_logger
tosson@LAPTOP-8TFQP2MT:~/iot_logger$ mkdir logs
tosson@LAPTOP-8TFQP2MT:~/iot_logger$ mkdir scripts
tosson@LAPTOP-8TFQP2MT:~/iot_logger$ mkdir data
tosson@LAPTOP-8TFQP2MT:~/iot_logger$ tree
.
├── data
├── logs
└── scripts

4 directories, 0 files
tosson@LAPTOP-8TFQP2MT:~/iot_logger$ |
```

Linux architecture layers

1-USER

2-Shell (Shell & Command Compiler & Interpreter System Libraries)

3-Kernel

Signal Terminal Processing Terminal Driver

File System Disk & Tape Drive

* CPU Scheduling Virtual Memory

4-Hardware

Terminal Controller (Terminal)

Device Controller (Disk & Tape)

* Memory Controller (Physical Memory)

the purpose of: /, /bin, /sbin, /usr, /etc, /var.

{/}: Root for any directory or file on the system

{/bin}: show Executable programs that are available for any user (main programs)

{/sbin}: Executable programs like (/bin) , but it requires system administration to run it

{/usr}: additional programs which are not executable like bin

{/etc}: it opens configuration files for system & programs

{/var}: contain files with variable names

Why does Linux treat everything as a file? Explain the difference between a program and a process

1-Linux or Unix deal with everything as a file as they Believe it make it easier , Flexible and comfortable for both users and developers

2-program is a static thing on your device while process the dynamic tool which make the program do some operations and do its purpose