

Name: Harshita Singh

Class: D10C

Roll : 66

## EXPERIMENT 1

**AIM:** Create and run virtual machine on Hosted Hypervisor like virtual Box

### Difference between Linux and Windows

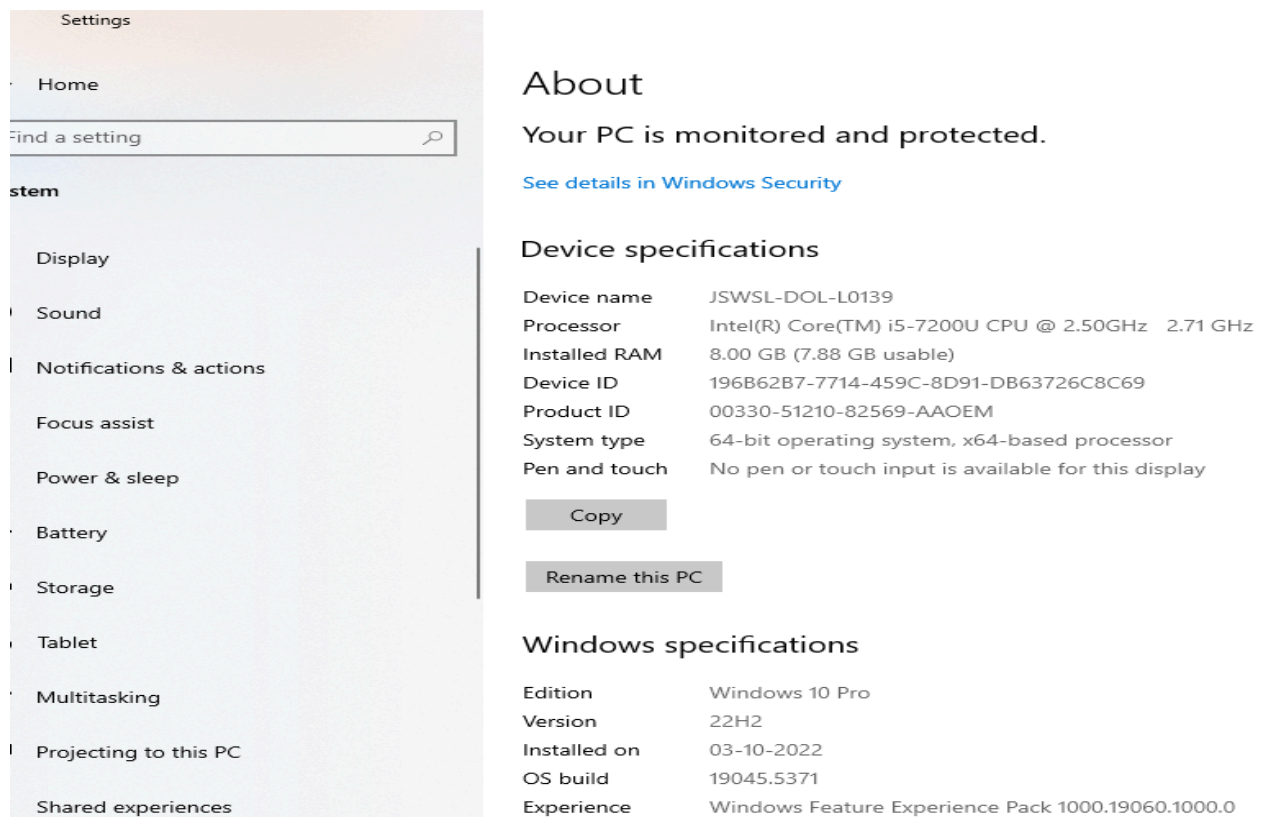
#### 1. System Information

##### Windows:

Windows provides detailed system information, including device name, OS version, processor specs, and RAM (both total and usable). It also displays system type (e.g., 64-bit), product ID, and additional details like installation date and experience pack.

##### Ubuntu:

Ubuntu presents a minimalistic system information panel, showing OS version, processor, memory, and disk capacity. It lacks detailed identifiers like product ID but offers a "System Details" section for further exploration.

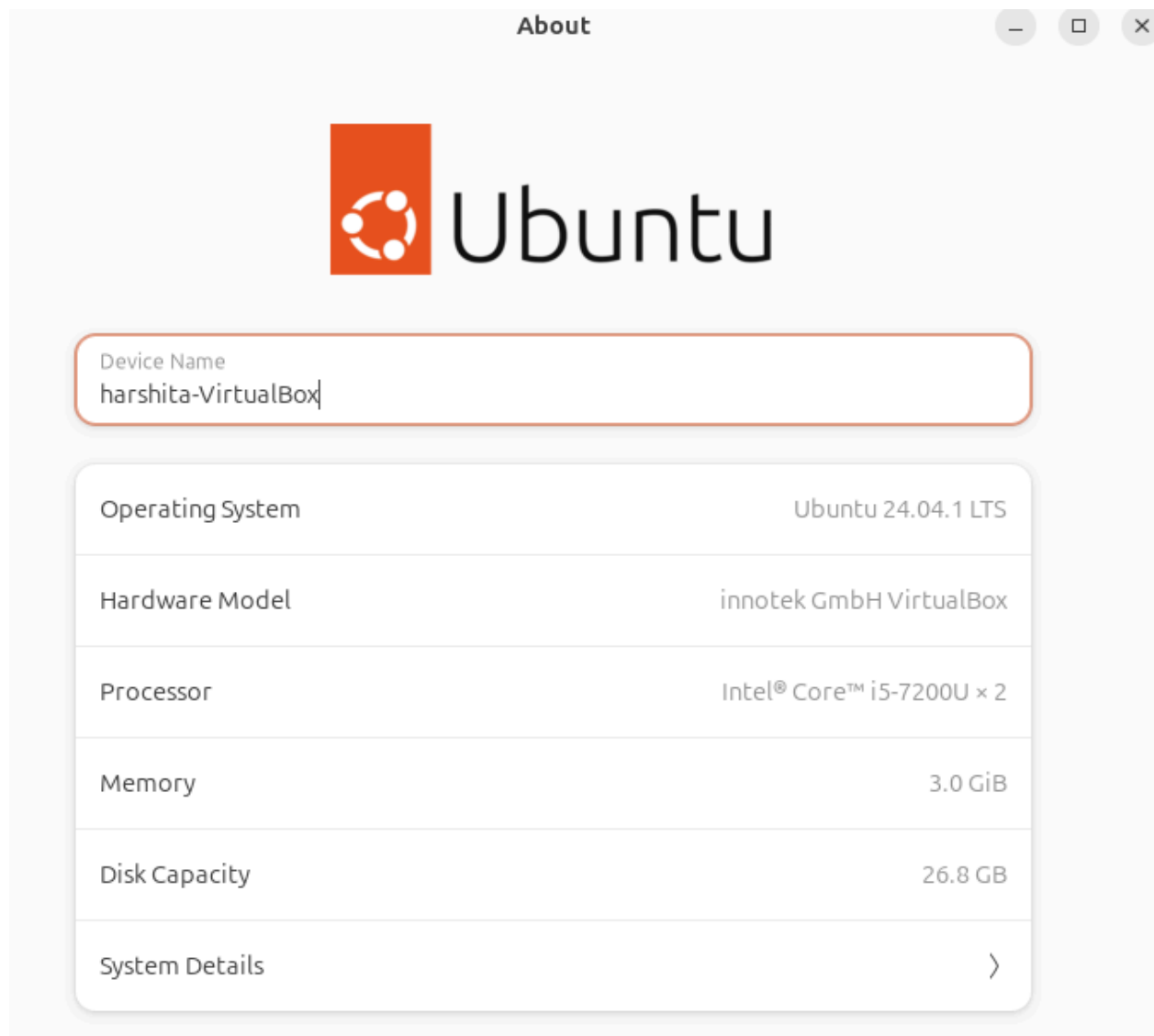


The image shows a screenshot of the Windows Settings application, specifically the 'About' page. On the left, a sidebar lists various settings categories: Settings, Home, Find a setting, System, Display, Sound, Notifications & actions, Focus assist, Power & sleep, Battery, Storage, Tablet, Multitasking, Projecting to this PC, and Shared experiences. The main content area is titled 'About' and includes the text 'Your PC is monitored and protected.' with a link to 'See details in Windows Security'. Below this, the 'Device specifications' section lists the following information: Device name (JSWSL-DOL-L0139), Processor (Intel(R) Core(TM) i5-7200U CPU @ 2.50GHz 2.71 GHz), Installed RAM (8.00 GB (7.88 GB usable)), Device ID (196B62B7-7714-459C-8D91-DB63726C8C69), Product ID (00330-51210-82569-AAOEM), System type (64-bit operating system, x64-based processor), and Pen and touch (No pen or touch input is available for this display). There are 'Copy' and 'Rename this PC' buttons below the specifications. The 'Windows specifications' section at the bottom lists: Edition (Windows 10 Pro), Version (22H2), Installed on (03-10-2022), OS build (19045.5371), and Experience (Windows Feature Experience Pack 1000.19060.1000.0).

Device specifications	
Device name	JSWSL-DOL-L0139
Processor	Intel(R) Core(TM) i5-7200U CPU @ 2.50GHz 2.71 GHz
Installed RAM	8.00 GB (7.88 GB usable)
Device ID	196B62B7-7714-459C-8D91-DB63726C8C69
Product ID	00330-51210-82569-AAOEM
System type	64-bit operating system, x64-based processor
Pen and touch	No pen or touch input is available for this display

Windows specifications	
Edition	Windows 10 Pro
Version	22H2
Installed on	03-10-2022
OS build	19045.5371
Experience	Windows Feature Experience Pack 1000.19060.1000.0



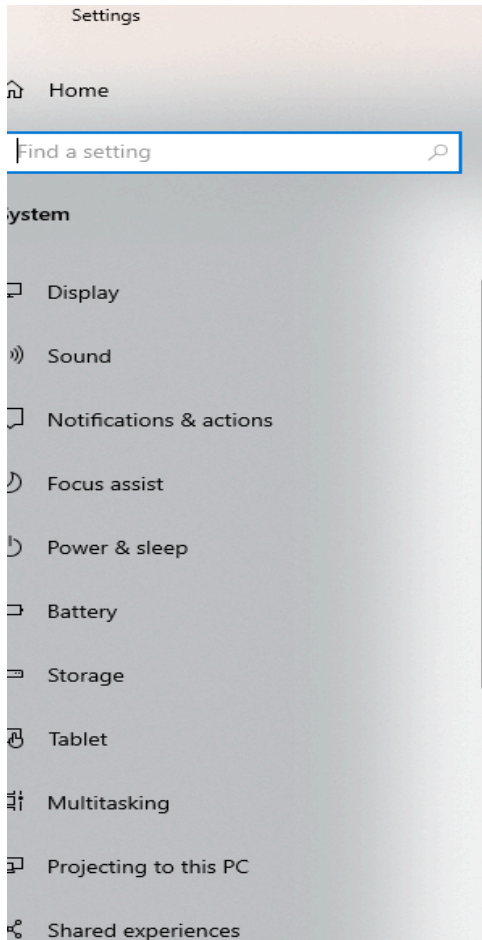
## 2. Display

### Windows:

- Graphics Support: Windows supports a wide range of graphics cards (NVIDIA, AMD, Intel) and provides automatic driver installation. It offers built-in support for 2D and 3D graphics rendering.
- Display Settings: Windows includes a graphical user interface to adjust display settings, resolution, multiple monitors, and color calibration through the Display Settings menu.

### Ubuntu:

- Graphics Support: Ubuntu generally supports NVIDIA, AMD, and Intel graphics out of the box, but sometimes additional drivers need to be installed for optimal performance (especially proprietary drivers for NVIDIA graphics).
- Display Settings: You can configure displays through Settings > Displays. However, advanced display settings might require using terminal commands or installing proprietary drivers.



## Display

### Brightness and color

Change brightness for the built-in display



Night light



[Night light settings](#)

### Windows HD Color

Get a brighter and more vibrant picture for videos, games and apps that support HDR.

[Windows HD Color settings](#)

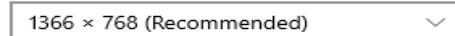
### Scale and layout

Change the size of text, apps, and other items

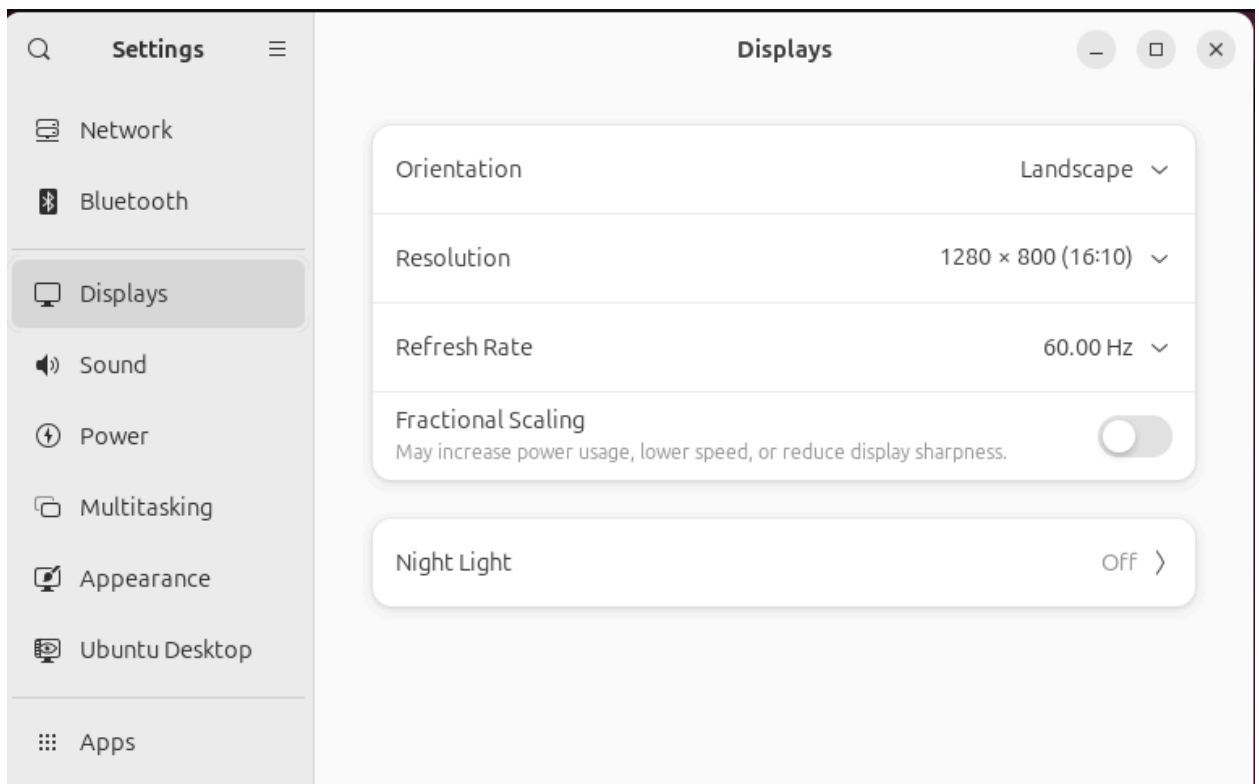


[Advanced scaling settings](#)

Display resolution



Display orientation

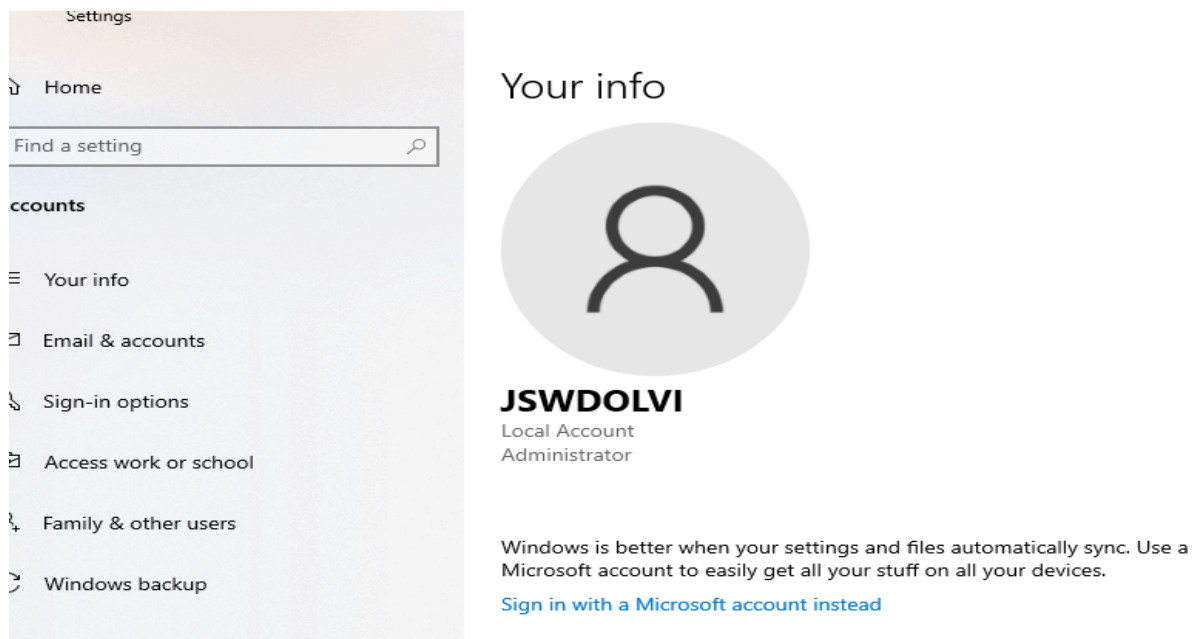


### 3. User Management

Windows and Linux handle users and permissions differently.

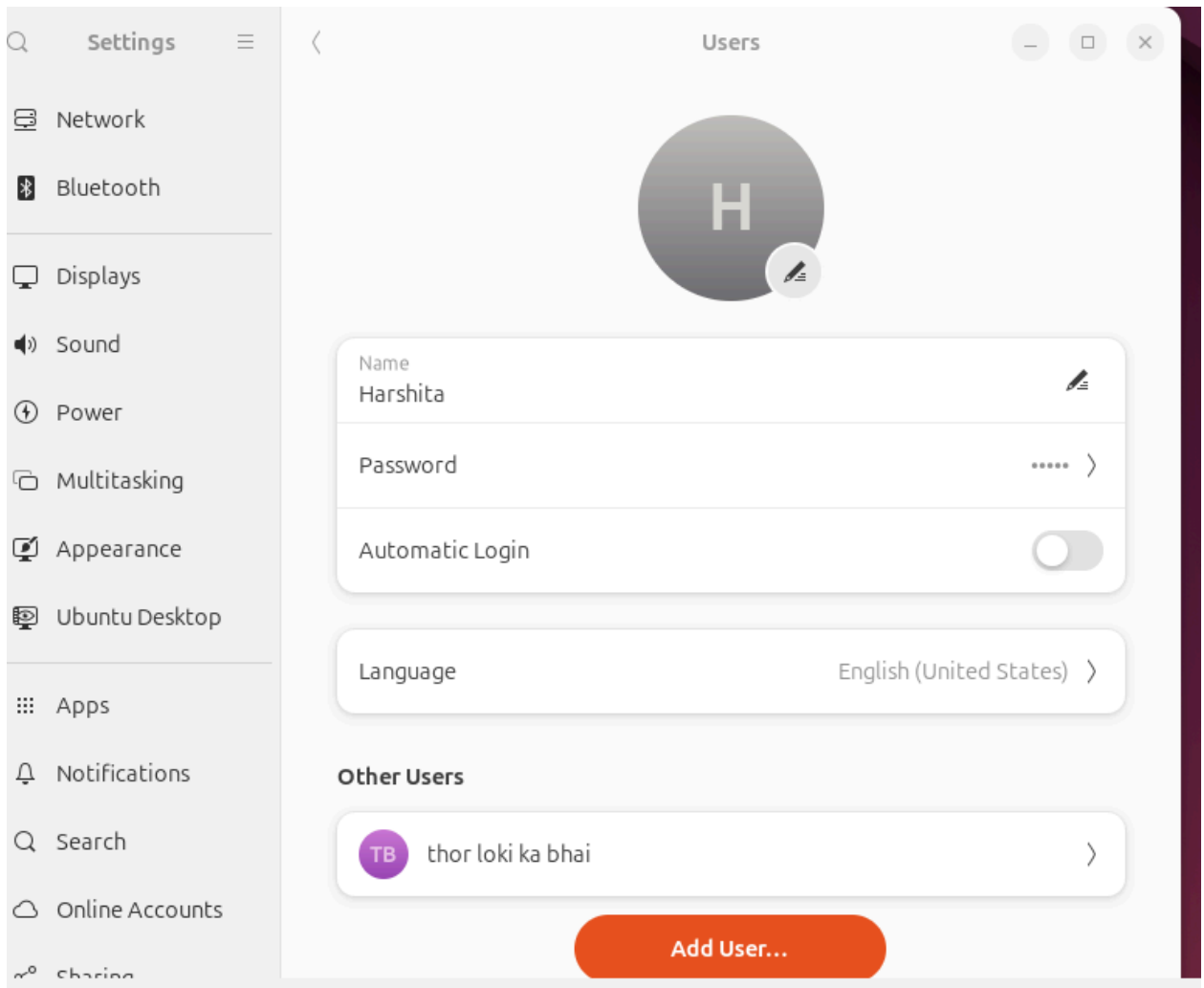
#### Windows:

- Uses a **hierarchical user system** with different permission levels:
  1. **Administrator**: Has full control over the system, can install software, modify system files, and manage user accounts.
  2. **Standard User**: Can run programs but cannot install or modify system settings.
  3. **Guest User**: Has very limited access.
- Uses **User Account Control (UAC)** to restrict unauthorized changes.
- Stores user data in `C:\Users\Username\`.



#### Linux:

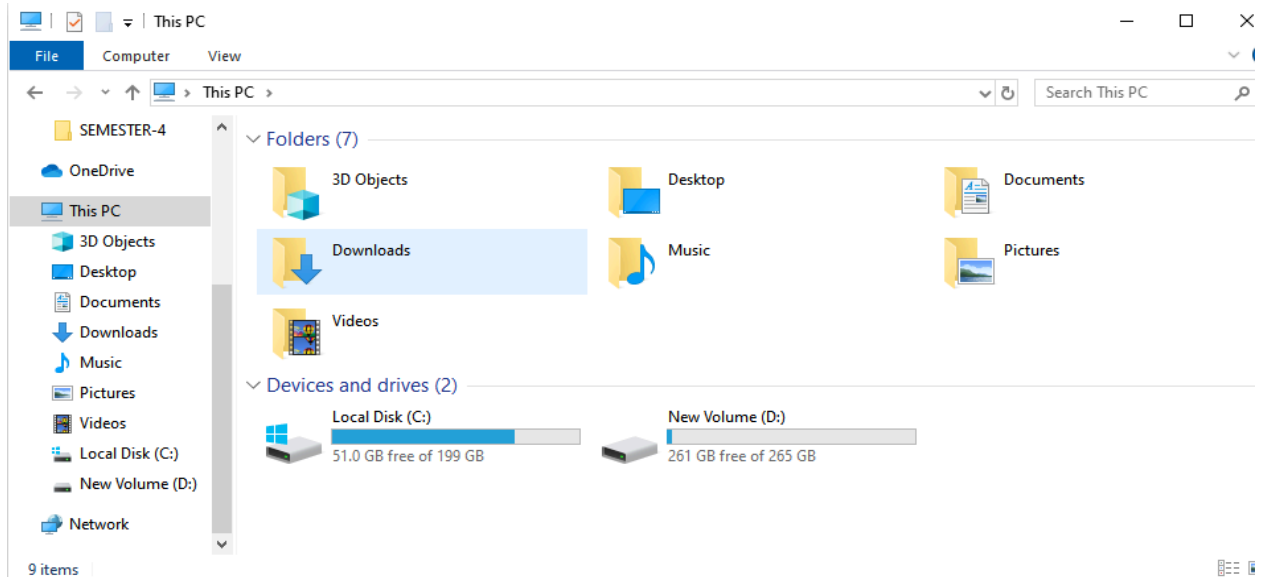
- Linux is a **multi-user** system by design, making it ideal for server environments.
- Users are classified as:
  1. **Root User (Superuser)**: Has full system access (`sudo` is used to execute commands as root).
  2. **Normal Users**: Limited access; they cannot modify system files.
  3. **Service Accounts**: Used by system processes (e.g., `www-data` for web servers).
- User permissions are managed using **Ownership and Group Permissions** (Read, Write, Execute).



## 4. File System

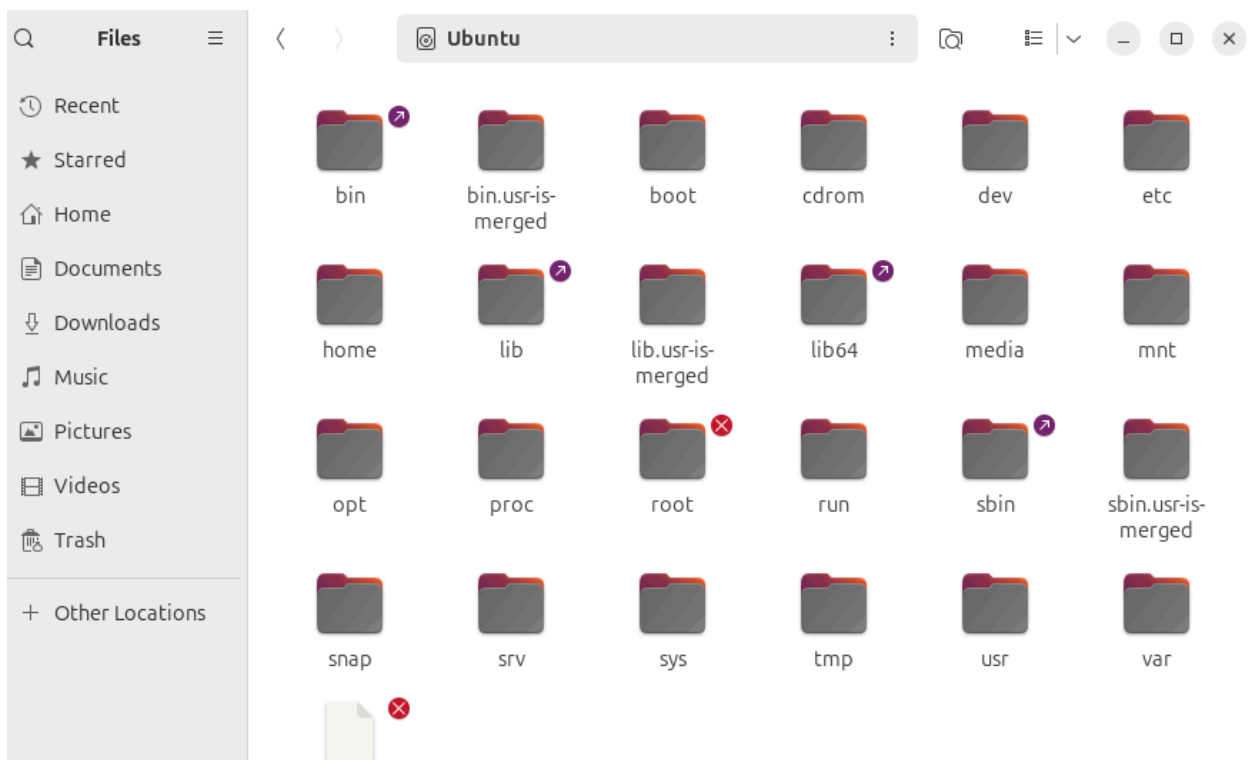
### Windows:

- Uses **NTFS (New Technology File System)** by default, but also supports **FAT32** and **exFAT**.
- Files and folders follow a **drive-based hierarchy**, meaning each storage device gets a drive letter (e.g., **C:\**, **D:\**).
- File paths use **backslashes (\)** (e.g., **C:\Users\Documents\file.txt**).
- Supports file attributes like **Read-only**, **Hidden**, **System**, but lacks advanced permission controls.



## Linux:

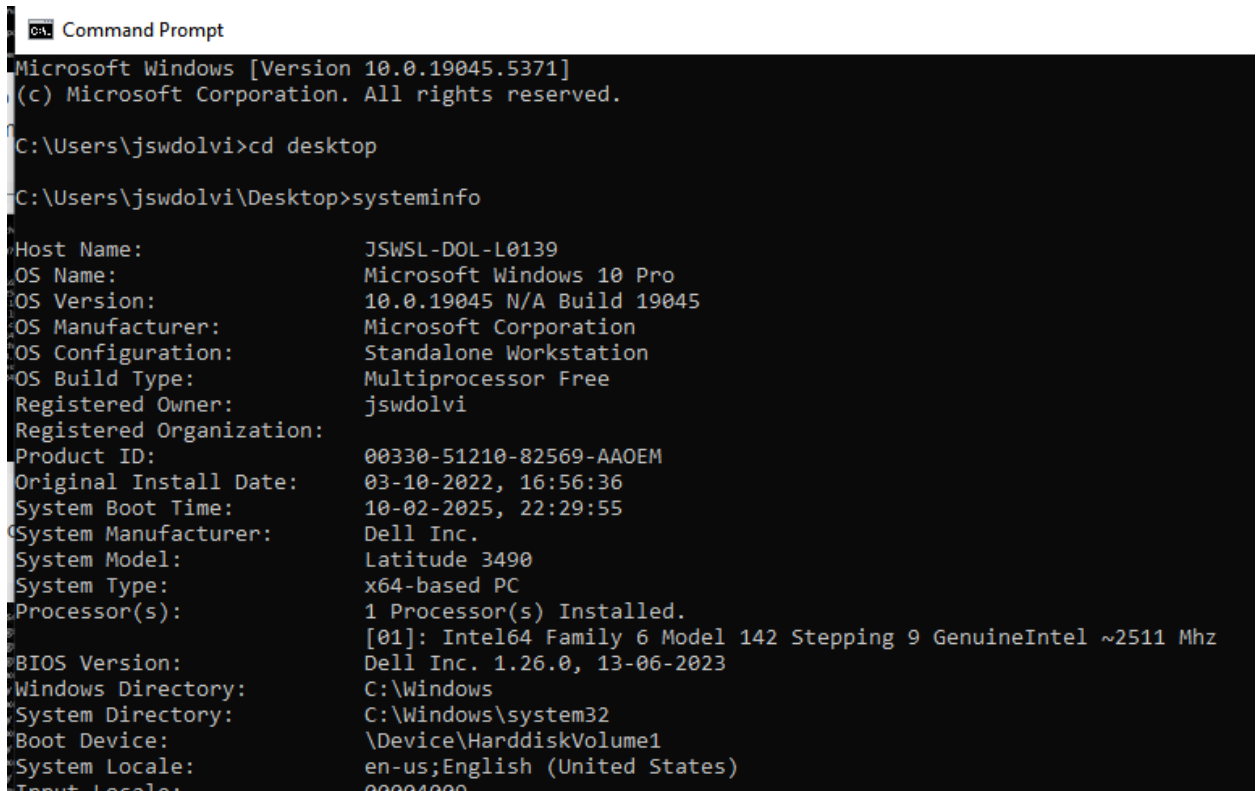
- Uses file systems like **EXT4 (most common)**, **XFS**, **Btrfs**, **ZFS**.
- Follows a **single-root directory structure**, where everything starts from **/** (root directory).
- No drive letters; instead, storage devices are **mounted** as directories (**/mnt** or **/media**).
- File paths use **forward slashes (/)** (e.g., **/home/user/file.txt**).
- Uses an advanced **permission system** (**rwX** - Read, Write, Execute) and Access Control Lists (ACLs) for fine-grained control.



## 5. Command Line Interface (CLI)

### Windows:

- Provides **Command Prompt (cmd.exe)** and **PowerShell**.
- Limited in functionality compared to Linux but improved with PowerShell (supports scripting and automation).
- CLI is not as commonly used for system administration.

A screenshot of a Windows Command Prompt window. The title bar reads "Command Prompt". The text inside shows the Windows version (10.0.19045.5371) and copyright notice. The user navigates to the desktop directory and runs the 'systeminfo' command, which displays detailed system information including host name, OS details, hardware configuration, and BIOS information.

```
Microsoft Windows [Version 10.0.19045.5371]
(c) Microsoft Corporation. All rights reserved.

C:\Users\jswdolvi>cd desktop

C:\Users\jswdolvi\Desktop>systeminfo

Host Name:                JSWSL-DOL-L0139
OS Name:                  Microsoft Windows 10 Pro
OS Version:               10.0.19045 N/A Build 19045
OS Manufacturer:         Microsoft Corporation
OS Configuration:        Standalone Workstation
OS Build Type:             Multiprocessor Free
Registered Owner:         jswdolvi
Registered Organization:
Product ID:                00330-51210-82569-AAOEM
Original Install Date:     03-10-2022, 16:56:36
System Boot Time:          10-02-2025, 22:29:55
System Manufacturer:      Dell Inc.
System Model:              Latitude 3490
System Type:               x64-based PC
Processor(s):              1 Processor(s) Installed.
                           [01]: Intel64 Family 6 Model 142 Stepping 9 GenuineIntel ~2511 Mhz
BIOS Version:              Dell Inc. 1.26.0, 13-06-2023
Windows Directory:         C:\Windows
System Directory:          C:\Windows\system32
Boot Device:               \Device\HarddiskVolume1
System Locale:              en-us;English (United States)
Input Locale:               00000409
```

### Linux:

- CLI is a **core component** of Linux, often preferred over GUI.
- Popular shells include **Bash, Zsh, Fish**.
- Powerful tools like **grep, awk, sed, cron, systemctl** allow advanced scripting and automation.

```
harshita@harshita-VirtualBox: ~  
harshita@harshita-VirtualBox:~$ pwd  
/home/harshita  
harshita@harshita-VirtualBox:~$ pstree  
systemd--ModemManager--3*[{ModemManager}]  
--NetworkManager--3*[{NetworkManager}]  
--accounts-daemon--3*[{accounts-daemon}]  
--avahi-daemon--avahi-daemon  
--boltd--3*[{boltd}]  
--colord--3*[{colord}]  
--cron  
--cups-browsed--3*[{cups-browsed}]  
--cupsd--dbus  
--dbus-daemon  
--fwupd--5*[{fwupd}]  
--gdm3--gdm-session-wor--gdm-wayland-ses--gnome-session-b--3*[{gnom+  
--3*[{gdm3}]--3*[{gdm-session-wor}]--3*[{gdm-wayland-ses}]  
--gnome-remote-de--3*[{gnome-remote-de}]  
--2*[{kerneloops}]
```

## 6. Security & Permissions

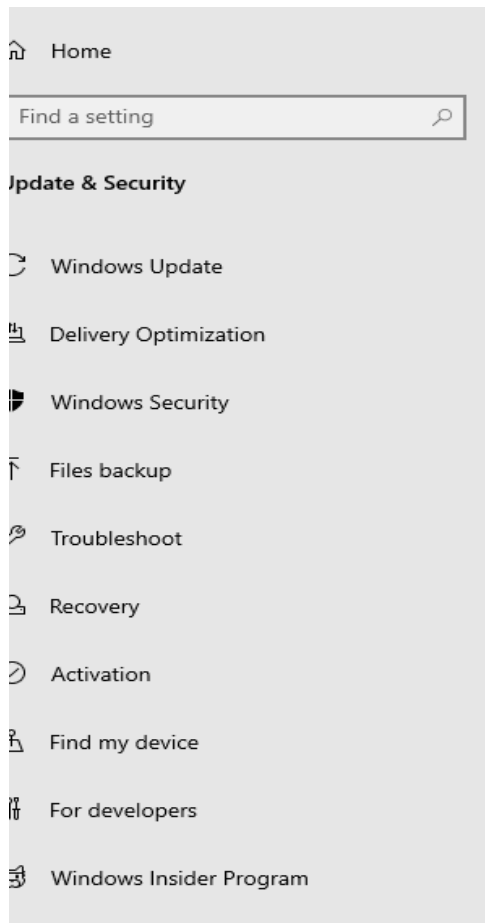
### Windows:

- More **vulnerable to malware** due to its popularity.
- Uses **UAC (User Account Control)** to limit administrative actions.
- Has **Windows Defender** and third-party antivirus software for protection.

### Linux:

- More **secure by design** due to user permission models.
- Uses **sudo** to prevent unauthorized modifications.
- Less prone to viruses (malware needs **root privileges**, making it harder to execute).
- Open-source nature allows quick detection and fixing of vulnerabilities.












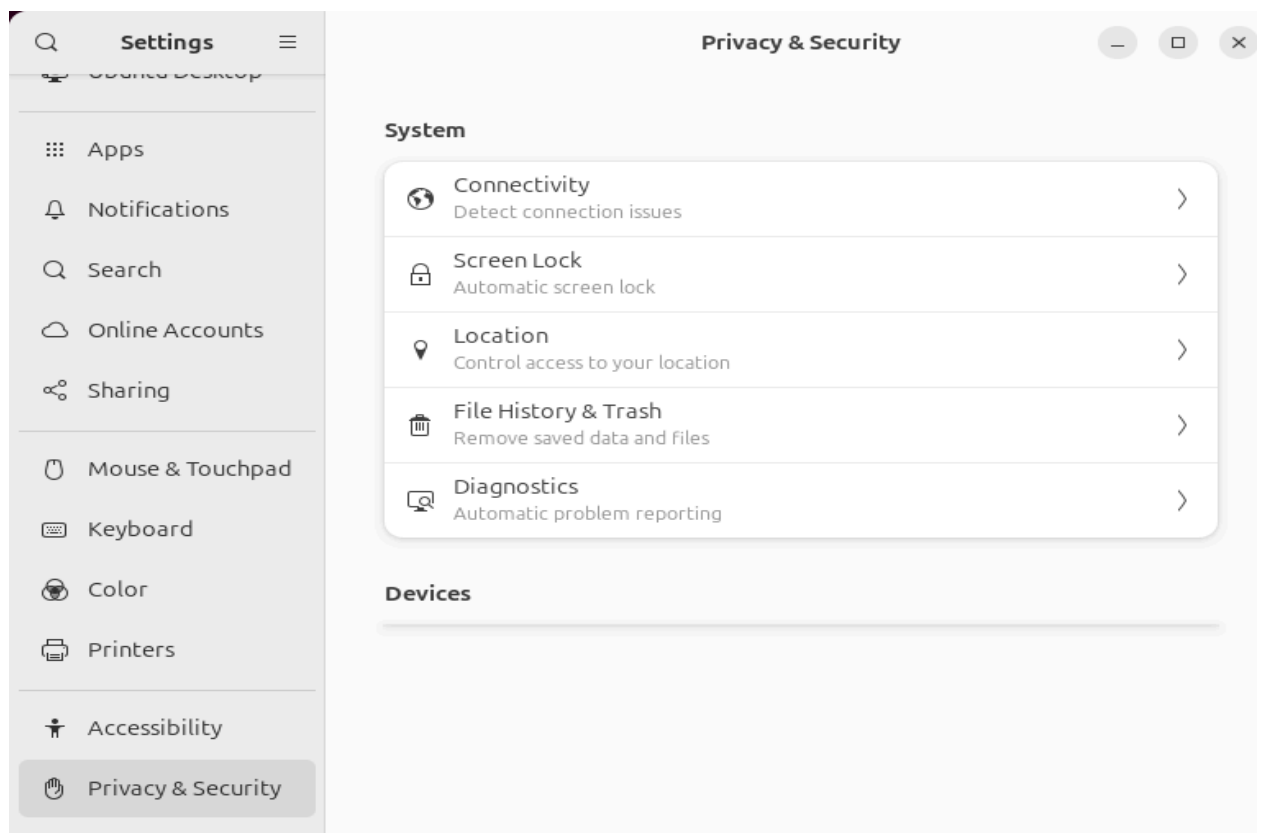
## Windows Security

Windows Security is your home to view and manage the security and health of your device.

[Open Windows Security](#)

### Protection areas

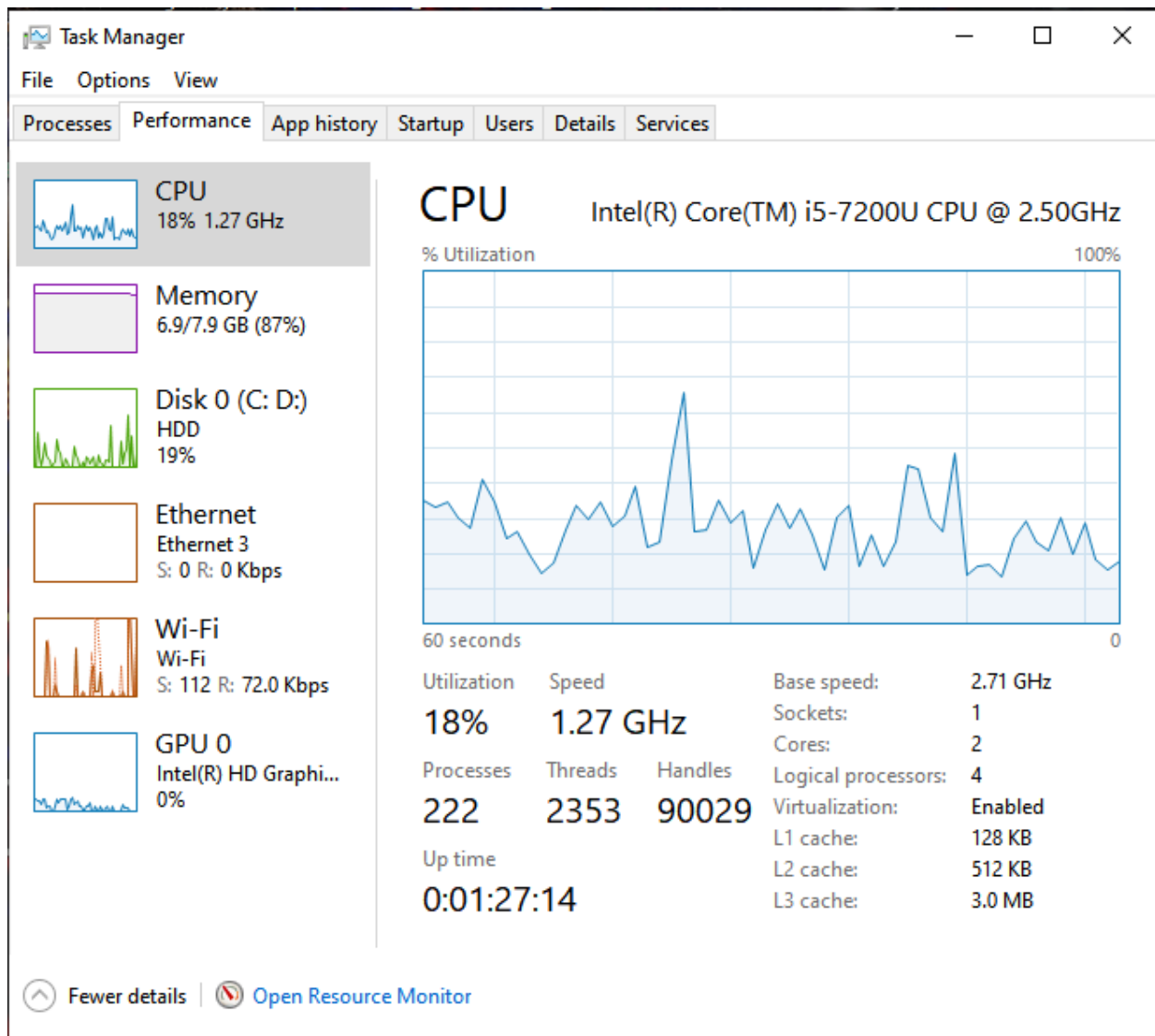
-  **Virus & threat protection**  
Actions recommended.
-  **Account protection**  
Actions recommended.
-  **Firewall & network protection**  
No actions needed.
-  **App & browser control**  
No actions needed.
-  **Device security**  
No actions needed.
-  **Device performance & health**  
Reports on the health of your device.
-  **Family options**  
Manage how your family uses their devices.



## 7. Performance & System Requirements

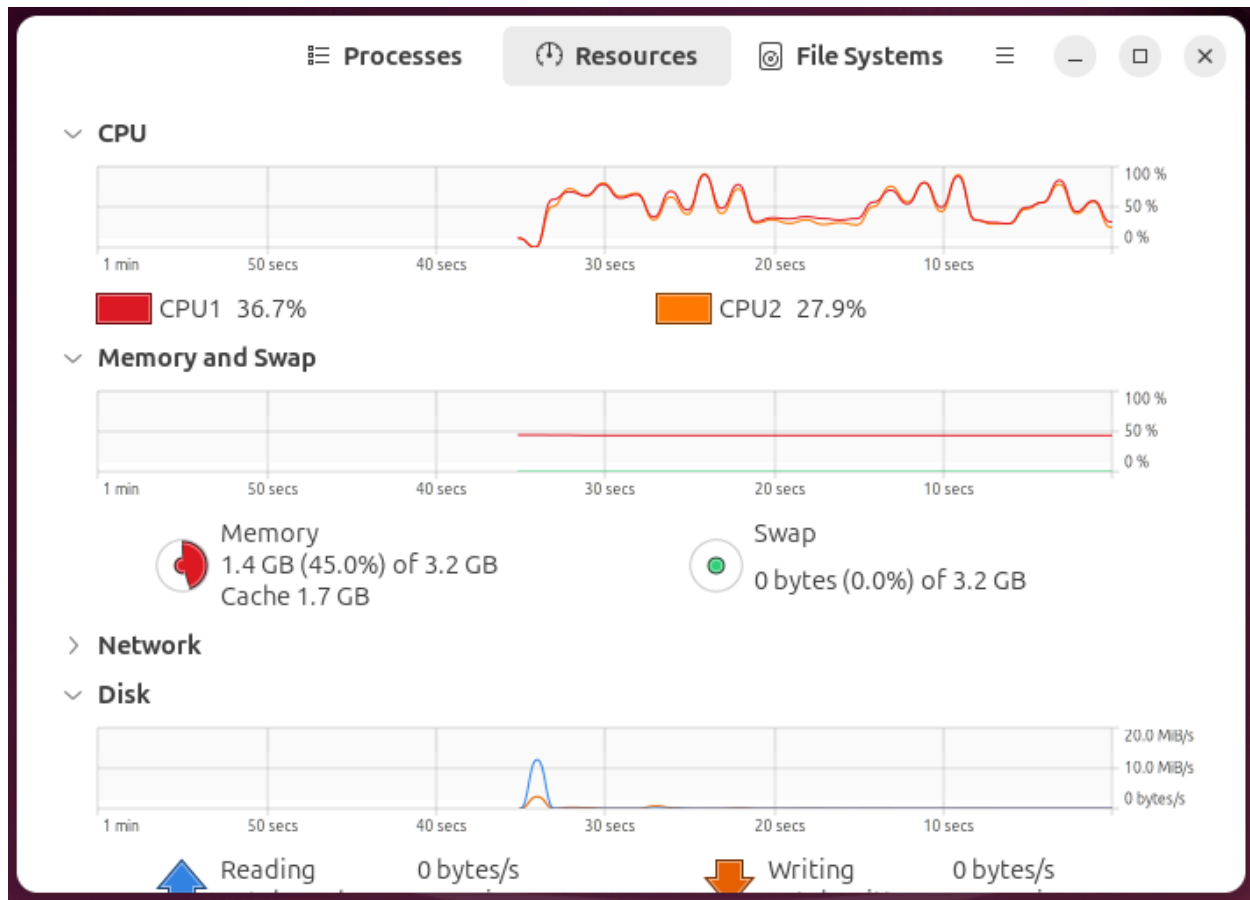
## Windows:

- Consumes more **RAM and CPU** due to background processes and GUI-heavy design.
- Requires frequent reboots after updates.
- Slower on older hardware.



## Linux:

- Can run on **low-end hardware** (lightweight distros like Lubuntu, Puppy Linux).
- More efficient memory and CPU usage.
- Does not require reboots for most updates.



## 8. System Updates

### Windows:

- Windows updates are **automatic** and often **forced**.
- Updates are managed via **Windows Update**, which can cause performance issues.
- Often requires **system reboots** after updates.

### Linux:

- Updates are **optional** and can be installed via **package managers** (`apt upgrade`).
- Most updates **do not** require a reboot (except for kernel updates).
- Security patches are delivered quickly due to community-driven development.

## 9. Customization & Flexibility

### Windows:

- Limited customization (can change wallpapers, themes, but deeper UI changes are restricted).
- Uses the **same desktop environment** (Explorer.exe) with minor variations.

### Linux:

- Highly customizable; users can choose from different **desktop environments** (GNOME, KDE, XFCE, Cinnamon, etc.).
- The look and feel of the system can be completely changed, even down to the **kernel level**.

## 10. Settings & Configuration

### Windows:

- Uses a **GUI-based** approach for system settings.
- Configuration is stored in the **Windows Registry**, a centralized database for system settings.
- Has multiple configuration tools:
  - **Control Panel** (legacy settings).
  - **Settings App** (modernized interface).
  - **Group Policy Editor (gpedit.msc)** for advanced configurations.

### Linux:

- Configuration is mostly **file-based** (stored in `/etc/`).
- Users can modify system settings using text-based configuration files (e.g., `/etc/fstab` for mounting, `/etc/hosts` for networking).
- No registry; instead, each application stores its settings in text files (like `.conf` files).
- Can be configured using both CLI (`nano`, `vim`) and GUI tools (e.g., GNOME Settings, KDE System Settings).

## 11. Software Management

### Windows:

- Applications are installed using `.exe` or `.msi` installers.
- Software is managed via:
  - **Microsoft Store** (limited selection).
  - **Manual installation from third-party sources** (which can be risky).
  - **Chocolatey or Winget** (package managers for advanced users).
- Software often stores data in **Program Files** (`C:\Program Files\`) and the **Registry**.

### Linux:

- Uses **package managers** to install and update software:
  - `apt` (Debian/Ubuntu)
  - `dnf` (Fedora)
  - `pacman` (Arch Linux)
  - `snappy` and `flatpak` (universal package formats)
- Software is stored in well-defined locations (`/usr/bin`, `/etc`, `/var`).