4ITRC2 Operating System Lab

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Lab Assignment 1

Aim: To install and study Ubuntu OS .

To perform: Install VMware or Virtual Box and Ubuntu over Windows OS .

To Submit: Study of Ubuntu OS .

Study of Ubuntu OS

1. Introduction

Linux and Ubuntu Overview:

Linux is an open-source, Unix-like operating system kernel originally created by Linus Torvalds in 1991. It is widely known for its stability, security, and flexibility. The term "Linux" often refers to the whole operating system, which includes the kernel and a set of software built around it. Linux is used in everything from personal computers and servers to mobile devices and embedded systems. It offers a robust and customizable environment, making it highly preferred for software developers, system administrators, and tech enthusiasts.

Ubuntu is a popular, user-friendly distribution (or "distro") of Linux, first released in 2004 by Mark Shuttleworth's company, Canonical Ltd. The name "Ubuntu" comes from a Southern African philosophy meaning "humanity towards others," emphasizing the open-source community's values of collaboration and sharing.

Ubuntu is one of the most well-known Linux distributions, offering a polished and easy-to-use interface, a wide range of software, and an active community. It is designed to be a great choice for both beginners and advanced users, providing a desktop environment suitable for daily tasks, development, and productivity.

Versions of Ubuntu:

Ubuntu releases a new version every six months, with Long-Term Support (LTS) releases every two years. LTS versions are supported for 5 years, while regular releases receive support for 9 months.

LTS Versions: These are stable releases intended for long-term use, ideal for enterprises, servers, or anyone who values reliability. Examples include:

Ubuntu 18.04 LTS (Bionic Beaver)

Ubuntu 20.04 LTS (Focal Fossa)

Ubuntu 22.04 LTS (Jammy Jellyfish)

Regular Releases: These versions are released every six months and come with the latest software and features. Examples include:

Ubuntu 20.10 (Groovy Gorilla)

Ubuntu 21.04 (Hirsute Hippo)

History of Ubuntu:

Ubuntu was founded in 2004 by South African entrepreneur Mark Shuttleworth, with the goal of providing a free, user-friendly, and easily accessible Linux distribution. Ubuntu quickly became popular due to its ease of use, extensive documentation, and large community. The initial focus was on making Linux more accessible to non-technical users, which it achieved by offering an intuitive graphical interface, streamlined installation, and access to thousands of

software applications via its package manager.

The success of Ubuntu has helped increase the overall adoption of Linux on desktops, and it has become the preferred Linux distribution for many, including developers, students, and businesses.

2. Features of Ubuntu

Ubuntu is known for its simplicity, security, and versatility. Below are some of its key features:

User-Friendly Interface: Ubuntu provides a clean, modern desktop environment (GNOME by default), designed to be simple and intuitive for both beginners and experienced users. The system is highly customizable, allowing users to change the look and feel according to their preferences.

Software Management: Ubuntu comes with access to a large library of software through its package manager (APT), the Ubuntu Software Center, and Snap packages. Users can install, update, and remove software easily through both the graphical interface and the command line.

Security: Ubuntu has a strong emphasis on security, incorporating features like:

AppArmor: Mandatory access control for applications to limit their access to system resources.

Automatic Security Updates: Ensures the system remains up to date with the latest patches and security fixes.

Firewall (UFW): Ubuntu has a built-in firewall, easily configurable through the command line or graphical interface.

Long-Term Support (LTS): LTS versions of Ubuntu receive updates for 5 years, making them ideal for businesses and users who need a stable and reliable system over an extended period.

Open Source: Ubuntu is open-source software, meaning its source code is freely available to anyone. Users can modify, distribute, and contribute to its development. This fosters a vibrant community of developers, contributors, and users.
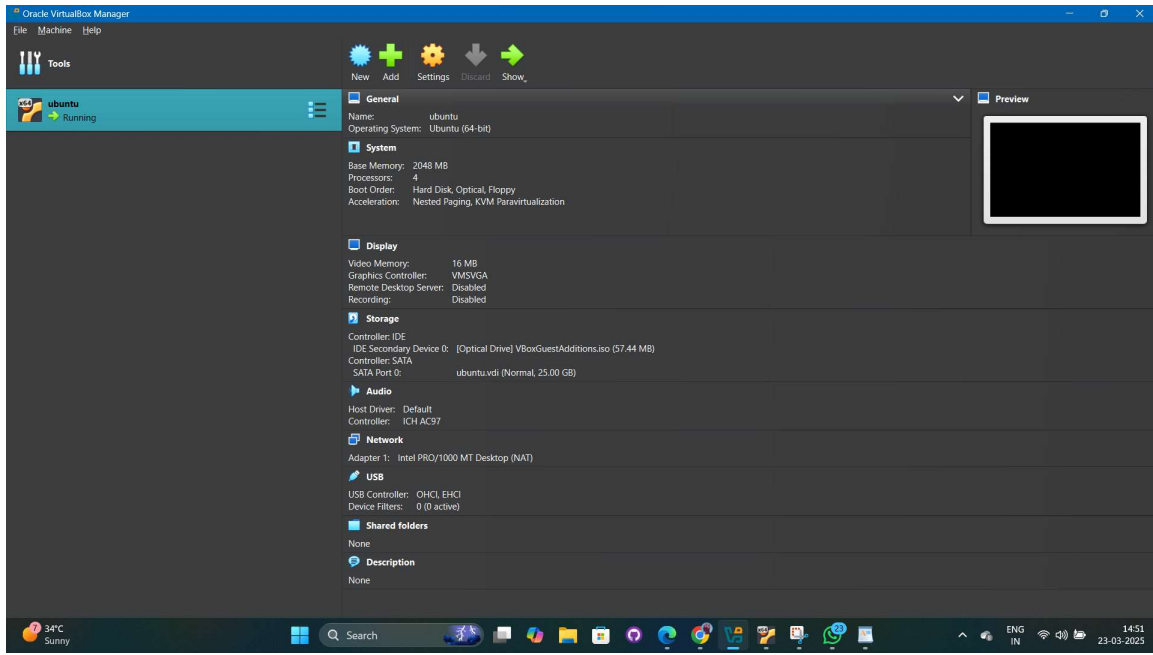
Pre-installed Software: Ubuntu comes with a range of pre-installed software like the Firefox web browser, LibreOffice suite, Rhythmbox music player, Thunderbird email client, and the Terminal for command-line operations. Additionally, many applications are available for download through the Software Center.

Compatibility: Ubuntu supports a wide range of hardware devices, from older machines to modern ones, and includes the latest kernel updates, ensuring support for the latest hardware.

Customizability: Ubuntu is highly customizable, allowing users to change the appearance, install different desktop environments (e.g., KDE, Xfce), and adjust system settings according to their needs.

Cloud Integration: Ubuntu offers excellent support for cloud services, including integration with Amazon Web Services (AWS) and Microsoft Azure. It is also widely used for cloud-based server environments, such as on virtual machines or containers.

3.Installing Ubuntu

4. Difference Between Ubuntu and Windows OS

Ubuntu and Windows are both popular operating systems, but they have significant differences in terms of functionality, design, and usage. Here's a comparison of the two:

Aspect	Ubuntu	Windows
Type	Open-source, Linux-based OS	Proprietary, closed-source OS developed by Microsoft
Cost	Free, open-source	Paid (Windows 10/11 requires a license)
User Interface	GNOME desktop environment (default), customizable	Windows desktop environment (Start Menu, taskbar, etc.)
Software Management	Uses APT (Advanced Package Tool) for installing software; Snap packages	Uses Windows Store and executable files (.exe) for software installation
File System	Ext4 file system (default), supports other formats like NTFS, FAT	NTFS file system (default)
Security	Built-in firewall, frequent updates, AppArmor, SELinux, and user privilege restrictions	Built-in firewall, but more vulnerable to malware; requires third-party antivirus tools
Compatibility	Works on a wide range of hardware but may require drivers for some devic⬇	Broad compatibility with most hardware, especially for gaming and multimedia

Key Differences:

Cost and Licensing: Ubuntu is free and open-source, while Windows is a paid proprietary operating system that requires a license.

User Interface: Ubuntu uses the GNOME desktop environment by default, which is minimalist and easy to use for Linux enthusiasts. Windows, on the other hand, has a more traditional desktop with a Start Menu, taskbar, and File Explorer.

Software Management: Ubuntu relies heavily on package managers like APT and Snap for installing software, while Windows typically uses executable files (.exe) and the Microsoft Store for app installation.

Security: Ubuntu is considered more secure out-of-the-box due to its permission-based system, regular security updates, and strong user account restrictions. Windows is prone to malware

attacks and often requires third-party antivirus software to ensure protection.

Customization: Ubuntu allows extensive customization of the OS and desktop environment, whereas Windows offers fewer customization options but is still user-friendly.

System Resources: Ubuntu is generally lighter on system resources and works well on older or low-powered hardware. Windows tends to be more resource-intensive, requiring more powerful hardware for smooth operation, especially for newer versions.

Software Availability: Windows has a larger selection of commercial and proprietary software, particularly for gaming, multimedia, and business applications. Ubuntu, being open-source, has a wide selection of free software, but some popular commercial apps like Adobe Creative Suite or Microsoft Office are not natively available.

Conclusion

In conclusion, Ubuntu offers a powerful, secure, and customizable alternative to Windows OS. It is especially ideal for developers, those who prefer open-source software, and users seeking a lightweight and secure operating system. Windows, on the other hand, is preferred for its vast software ecosystem, ease of use, and broad compatibility with hardware. Understanding the differences between Ubuntu and Windows can help users choose the best OS for their needs based on factors like cost, security, customization, and software compatibility.