**Operating System Lab**

**(4ITRC2)**

**IT IV Semester**

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**Information Technology - B**

*Submitted to*

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**Session JAN-APRIL, 2025**

**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** is an open-source kernel that serves as the foundation for a wide range of operating systems known as Linux distributions (distros). Unlike proprietary operating systems such as Windows and macOS, Linux is developed collaboratively by a global community of developers. It is known for its stability, security, and flexibility. The Linux kernel was created by Linus Torvalds in 1991, and it has since evolved into a core component of many operating systems used in servers, desktops, and embedded systems worldwide.

**Ubuntu** is one of the most popular Linux distributions, developed and maintained by Canonical Ltd. First released in 2004, Ubuntu is designed to be user-friendly, making it an excellent choice for beginners looking to explore the world of Linux. Ubuntu provides a smooth desktop experience while also being a powerful server OS.

Ubuntu is built on Debian, one of the oldest and most respected Linux distributions. Over the years, Ubuntu has evolved through various versions, with regular releases every six months. The releases are named after animals (e.g., "Bionic Beaver," "Focal Fossa"), and each version gets five years of support (LTS - Long Term Support) or nine months for regular versions.

**2. Features of Ubuntu**

* **User-Friendly Interface**: Ubuntu provides a graphical user interface (GUI) that is intuitive and easy to use. The default desktop environment is GNOME, which offers a clean, modern interface, suitable for beginners and experienced users alike.
* **Software Center**: Ubuntu offers a central hub for installing and managing software through the Ubuntu Software Center, making it easy to find and install applications.
* **Security**: Ubuntu is known for its strong security features. It uses regular security updates and has built-in tools such as AppArmor and UFW (Uncomplicated Firewall) to ensure that the system is secure.
* **Open Source**: As an open-source operating system, Ubuntu provides transparency and allows users to modify and distribute the code freely. This makes it a popular choice for developers and those who prefer open ecosystems.
* **Package Management**: Ubuntu uses the APT (Advanced Package Tool) for package management, which makes installing, updating, and removing software packages very straightforward. It also supports .deb packages and Snap packages.
* **Stability and Performance**: Ubuntu is known for its reliability and performance, even on older hardware. Its long-term support releases are particularly stable, making them ideal for both personal and professional use.
* **Community Support**: Ubuntu has a large, active community and extensive documentation available online. This community-driven support ensures that users can find solutions to problems easily and interact with others in forums, mailing lists, and chat rooms.
* **Customization**: Ubuntu allows users to personalize their desktops, choose from a variety of desktop environments, and customize settings to suit their needs.
* **Pre-installed Software**: Ubuntu comes with essential software pre-installed, such as a web browser (Firefox), office suite (LibreOffice), media player (Rhythmbox), and image viewer (Eye of GNOME).
* **Multimedia Support**: Ubuntu supports a wide range of multimedia formats out of the box, including MP3, DVD, and video playback.
* **Cloud Integration**: Ubuntu is widely used for cloud computing and server applications. It has robust support for containerization with Docker and Kubernetes, making it an excellent choice for cloud-based solutions.

**3. Difference Between Ubuntu and Windows OS**

| **Feature** | **Ubuntu OS** | **Windows OS** |
| --- | --- | --- |
| **Source Code** | Open-source, free to use, modify, and distribute. | Proprietary, closed-source, requires purchase. |
| **Cost** | Free and open-source. | Commercial license with a cost for the OS. |
| **User Interface** | GNOME (default), customizable with different environments. | Windows Desktop Environment, not customizable. |
| **Software Availability** | Software is primarily available through package management systems like APT. | Software is available through .exe installers and the Microsoft Store. |
| **Security** | High security with regular patches and updates. | Security patches released regularly, but higher risk of malware due to popularity. |
| **Performance** | Lightweight and more resource-efficient. | Heavier on system resources, especially for older hardware. |
| **Updates** | Regular updates; users can upgrade to new versions freely. | Updates are automatic and can be intrusive at times. |
| **Customizability** | Highly customizable; users can modify the OS as they like. | Limited customizability of the OS and UI. |
| **Market Usage** | Popular for development, servers, and personal use. | Dominant in business, personal, and gaming environments. |
| **Command-Line Interface (CLI)** | Strong CLI support with powerful terminal tools. | Command prompt available but less integrated into the OS. |
| **File System** | Uses ext4, Btrfs, and other Linux file systems. | Uses NTFS and FAT32 file systems. |
| **Gaming** | Gaming support is growing, but Windows is still the dominant platform. | Superior support for gaming with DirectX and a vast library of games. |