**Study of Ubuntu OS**

**1. Introduction**

Linux is an open-source operating system based on the Unix architecture. It was created by Linus Torvalds in 1991 and has since evolved into a powerful, secure, and widely used OS. Linux is known for its stability, flexibility, and use in servers, cloud computing, and embedded systems.

Ubuntu is a popular Linux distribution developed by Canonical Ltd. It was first released in 2004 and is based on Debian. Ubuntu is known for its user-friendliness, making Linux accessible to beginners while being powerful enough for advanced users. It comes in different versions, including:

* Ubuntu Desktop – For personal computers
* Ubuntu Server – For enterprise and cloud computing
* Ubuntu Core – For IoT and embedded systems

**Ubuntu Versions & History**

Ubuntu follows a six-month release cycle, with Long-Term Support (LTS) versions released every two years. LTS versions receive updates for five years, while non-LTS versions are supported for nine months.

Some major Ubuntu releases:

* Ubuntu 4.10 (Warty Warthog) – First official release (2004)
* Ubuntu 10.04 LTS (Lucid Lynx) – First widely adopted LTS version (2010)
* Ubuntu 16.04 LTS (Xenial Xerus) – Major improvements in performance and security (2016)
* Ubuntu 22.04 LTS (Jammy Jellyfish) – Latest LTS release with enhanced UI and security features (2022)

**2. Features of Ubuntu**

Ubuntu offers a range of features that make it a powerful operating system:

* **Open-Source and Free**: Ubuntu is completely free to use and distribute, with open-source licensing allowing customization.
* **User-Friendly Interface**: The GNOME desktop environment provides an intuitive experience with a modern look and feel.
* **Security and Stability**: Built-in security features like App Armor and automatic updates ensure a secure computing environment.
* **Software Support**: Ubuntu comes pre-installed with essential software like LibreOffice, Firefox, and Thunderbird and provides access to thousands of applications via the Snap Store and APT package manager.
* **Frequent Updates**: Regular updates improve security, performance, and compatibility with new hardware.
* **Customization**: Ubuntu allows users to modify the system extensively, from changing the desktop environment to optimizing system settings.
* **Resource Efficiency**: Ubuntu can run smoothly on older hardware and low-resource environments, making it ideal for a wide range of devices.
* **Cloud and Server Support**: Ubuntu Server is widely used in cloud computing, supporting platforms like AWS, Azure, and Google Cloud.

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

Ubuntu and Windows OS serve different user needs and have distinct characteristics.

One major difference is cost. Ubuntu is completely free and open-source, whereas Windows OS requires a paid license. Ubuntu is known for its customizable user interface, primarily using the GNOME desktop environment, while Windows has a standardized GUI with limited customization options.

Security is another key distinction. Ubuntu is considered more secure due to its strict user permissions and lower vulnerability to malware. In contrast, Windows is more prone to viruses and requires additional security measures such as antivirus software.

Regarding software availability, Windows supports a vast range of proprietary and commercial applications, making it a preferred choice for businesses and gamers. Ubuntu, on the other hand, relies on open-source software, with applications managed through APT and Snap package managers. While Ubuntu has improved its gaming support with tools like Steam and Proton, Windows remains the dominant platform for gaming due to its compatibility with DirectX and a broader game library.

Performance-wise, Ubuntu is lightweight and runs efficiently even on older hardware, whereas Windows tends to consume more system resources. Ubuntu also allows extensive customization, from changing the desktop environment to modifying system behavior, while Windows offers limited customization options.

In terms of file systems, Ubuntu primarily uses EXT4, ZFS, and other Linux-compatible formats, whereas Windows relies on NTFS and FAT32. Additionally, Ubuntu is widely used in cloud computing and server environments, with strong support for AWS, Google Cloud, and Azure, while Windows is more commonly found in enterprise environments with software like Microsoft Office and Active Directory.

Overall, Ubuntu is an excellent choice for users who prioritize open-source software, security, and system control, while Windows remains the go-to OS for mainstream software compatibility, gaming, and business applications.