# **ASSIGMENT .1**

**Study of Ubuntu OS**

**Aim:** To install and study Ubuntu OS.

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

**. Introduction** Linux is an open-source, Unix-like operating system kernel that serves as the foundation for many distributions (distros). One of the most popular Linux-based operating systems is Ubuntu, developed and maintained by Canonical Ltd.

Ubuntu was first released on October 20, 2004, by Mark Shuttleworth and the Ubuntu Foundation. It is based on Debian, another Linux distribution, but aims to provide a more user-friendly experience. Ubuntu is widely used in personal computing, cloud computing, and server environments due to its reliability, security, and extensive support community.

**Ubuntu Versions**

Ubuntu follows a predictable release cycle:

* **Long-Term Support (LTS) Releases**: Released every two years, LTS versions receive five years of official support, including security updates and patches. Some notable LTS versions include:
  + Ubuntu 18.04 LTS (Bionic Beaver)
  + Ubuntu 20.04 LTS (Focal Fossa)
  + Ubuntu 22.04 LTS (Jammy Jellyfish)
* **Interim Releases**: Released every six months, these versions offer newer features but only receive support for nine months. Examples include:
  + Ubuntu 21.04 (Hirsute Hippo)
  + Ubuntu 21.10 (Impish Indri)

Ubuntu is available in multiple flavors to cater to different user preferences:

* **Ubuntu Desktop**: Designed for general users with a graphical user interface (GUI) using GNOME.
* **Ubuntu Server**: Optimized for servers and data centre.
* **Ubuntu Core**: A minimal version for IoT and embedded devices.
* **Kubuntu, Xubuntu, Lubuntu**: Variants with different desktop environments such as KDE, XFCE, and LXQt for performance and usability preferences.

**2. Features of Ubuntu** Ubuntu offers several key features that make it a preferred choice for developers, businesses, and casual users:

**1. Open-Source and Free**

Ubuntu is completely free to use, modify, and distribute. Users can access the source code, customize it, and contribute to its development.

**2. Regular Updates and Security Patches**

Canonical ensures Ubuntu remains secure and up to date with frequent software updates and long-term security support for LTS versions.

**3. User-Friendly Interface**

Ubuntu uses the **GNOME desktop environment** by default, offering an intuitive and modern interface. Alternative desktop environments like KDE (Kubuntu), XFCE (Xubuntu), and LXQt (Lubuntu) provide more options based on user needs.

**4. High Security**

* **Built-in Firewall (UFW)**: Enhances system security by controlling network traffic.
* **Automatic Security Updates**: Ensures vulnerabilities are patched quickly.
* **AppArmor and SELinux**: Implement security policies to restrict unauthorized access.
* **Less Prone to Malware**: Unlike Windows, Ubuntu is less targeted by viruses and malware.

**5. Extensive Software Support**

* **Ubuntu Software Center**: Provides access to thousands of free and open-source applications.
* **Snap and Flatpak Support**: Enables easy installation of modern software packages.
* **Development Tools**: Pre-installed support for programming languages like Python, C++, Java, and Ruby.

**6. Performance and Efficiency**

* Ubuntu is optimized for speed and resource efficiency, making it suitable for both modern and older hardware.
* It supports multiple CPU architectures, including x86, ARM, and PowerPC.

**7. Customization and Flexibility**

* Users can choose from multiple desktop environments.
* Extensive theme and UI customization options.
* Terminal-based system control for advanced users.

**8. Cloud and Server Compatibility**

* Ubuntu is widely used in **cloud computing** with support for Amazon Web Services (AWS), Google Cloud, and Microsoft Azure.
* Ubuntu Server is a preferred choice for enterprise deployments, web hosting, and containerized applications (Docker, Kubernetes).

**3. Difference Between Ubuntu and Windows OS** Ubuntu and Windows are two widely used operating systems with significant differences:

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| **Feature** | **Ubuntu** | **Windows OS** |
| **Cost** | Free and open-source | Paid license required |
| **Customization** | Highly customizable | Limited customization options |
| **Security** | More secure, less prone to malware | Vulnerable to viruses and malware |
| **User Interface** | GNOME, KDE, XFCE, etc. | Windows Explorer (taskbar, Start menu) |
| **Software Availability** | Uses open-source software; limited commercial support | Extensive commercial software support |
| **Performance** | Optimized for stability and efficiency | Can be resource-intensive |
| **Updates** | Frequent updates, user-controlled | Automatic updates, sometimes intrusive |
| **Compatibility** | Best for developers and servers | Preferred for general users and gaming |
| **File System** | Uses ext4, Btrfs, ZFS | Uses NTFS, FAT32 |
| **Gaming Support** | Limited native support, requires Steam Proton | DirectX support, best for gaming |
| **Technical Support** | Community-driven (forums, documentation) | Official Microsoft support |

**Key Differences Explained:**

1. **Ease of Use**: Windows is more user-friendly for non-technical users, whereas Ubuntu may require some learning, especially for terminal commands.
2. **Software Compatibility**: Windows supports more commercial software and games, while Ubuntu relies on open-source alternatives.
3. **Security**: Ubuntu is generally more secure due to its permission-based system, fewer targeted attacks, and strong firewall settings.
4. **Updates & Performance**: Ubuntu gives users more control over updates, while Windows enforces automatic updates, sometimes causing system slowdowns.
5. **Development & Server Usage**: Ubuntu is preferred in programming, web development, and server management due to its Linux-based environment.