**Lab Assignment 1: Installation and Study of Ubuntu OS**

**Aim:**  
The goal of this lab is to install and explore the Ubuntu Operating System (OS).

**To Perform:**

* First, install a virtualization tool like VMware or VirtualBox on your Windows OS.
* Then, install Ubuntu OS within the virtual machine created using either VMware or VirtualBox.

**To Submit:**  
Prepare a report on your study of Ubuntu OS, covering the following topics:

**1. Introduction**

**About Linux and Ubuntu:**

Linux is an open-source, Unix-like operating system kernel created by Linus Torvalds in 1991. Unlike proprietary operating systems like Windows or macOS, Linux is free to use, modify, and distribute, which makes it highly flexible and popular for developers, server administrators, and tech enthusiasts. Linux is known for its stability, security, and ability to run on a wide variety of hardware.

Ubuntu is a user-friendly distribution (or "distro") built on top of Linux. It aims to make Linux accessible to everyone, from beginners to experienced users. It is one of the most popular Linux distributions worldwide, with a large community supporting it. Ubuntu is maintained by Canonical Ltd. and was first released in 2004.

**Ubuntu Versions:**

Ubuntu follows a predictable release cycle. New versions are released every six months, while Long-Term Support (LTS) releases are made every two years and are supported for five years. Some of the key versions include:

* **Ubuntu 16.04 LTS (Xenial Xerus)** – Released in April 2016.
* **Ubuntu 18.04 LTS (Bionic Beaver)** – Released in April 2018.
* **Ubuntu 20.04 LTS (Focal Fossa)** – Released in April 2020.
* **Ubuntu 22.04 LTS (Jammy Jellyfish)** – Released in April 2022.

Each Ubuntu version comes with a unique code name, typically named after an animal, with LTS versions being ideal for long-term stability.

**History of Ubuntu:**

Ubuntu was created with the mission to make Linux easier for everyday users. Before Ubuntu, Linux distros were often seen as complex and difficult for the average user. Ubuntu changed that by providing a simple, accessible experience for users new to Linux while maintaining all the flexibility and power that Linux is known for. Since its release in 2004, Ubuntu has grown to be one of the most widely used Linux distributions, both for desktop and server environments.

**2. Features of Ubuntu**

* **Free and Open-Source:** Ubuntu is completely free to use. It’s an open-source operating system, meaning that anyone can access its code, make improvements, and distribute it.
* **User-Friendly Interface:** Ubuntu’s default desktop environment is GNOME, which is simple, modern, and easy to navigate. It's designed to be intuitive for users of all experience levels.
* **Security:** Ubuntu comes with built-in security features, such as a firewall that is enabled by default and regular security updates. Ubuntu also uses AppArmor, a security module that restricts program capabilities to prevent unauthorized access.
* **Software Management:** Ubuntu offers a package management system called APT (Advanced Package Tool) to install and manage software. The Ubuntu Software Center provides an easy-to-use graphical interface to browse, install, and update software.
* **Long-Term Support (LTS):** Ubuntu LTS releases are supported for five years, making them ideal for businesses, servers, and anyone who needs a stable system for the long haul.
* **Hardware Compatibility:** Ubuntu is compatible with a wide range of hardware, including both newer and older systems. It also has good support for peripherals such as printers, cameras, and Wi-Fi adapters.
* **Virtualization Support:** Ubuntu works well in a virtual machine, which is perfect for running Ubuntu alongside Windows or testing it without making changes to your primary OS.
* **Community and Documentation:** One of Ubuntu’s greatest strengths is its large and active community. If you ever run into trouble, there are forums, blogs, and official documentation to help you solve any issues you encounter.

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

| **Feature** | **Ubuntu** | **Windows** |
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| **Cost** | Free (Open-source) | Paid (Requires purchase, e.g., Windows 10 license) |
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| **User Interface** | GNOME desktop environment (can be customized) | Windows Desktop (Proprietary, less customizable) |
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| **File System** | Ext4 (default) | NTFS, FAT32 |
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| **Software Management** | APT, Ubuntu Software Center | Microsoft Store, .exe installers |
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| **System Updates** | Regular updates via APT and Software Updater | Windows Update for OS and software updates |
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| **Hardware Compatibility** | Works on a wide range of hardware, including older systems | Excellent hardware support, especially with proprietary drivers |
| **Command Line Usage** | Terminal is commonly used for tasks | Command Prompt or PowerShell, though less frequently used |
| **System Resources** | Lightweight and more efficient on older hardware | Requires more system resources, especially on newer versions |
| **Customization** | Highly customizable, from UI to system settings | Limited customization unless using third-party software |
| **Software Support** | Increasing number of open-source and some commercial apps | Wide range of commercial applications and games |
|  |  |  |
| **Performance** | Typically faster on older hardware | Can slow down on older hardware |
| **Gaming** | Limited, but Steam and Wine help run many games | Excellent native support for games and commercial software |
| **Cost** | Free | Requires purchase for the full version |

**Conclusion**

Ubuntu is a powerful, flexible, and open-source operating system that is suitable for both beginners and advanced users. It offers an excellent alternative to proprietary operating systems like Windows, with the added benefit of being free and open-source. Ubuntu's user-friendly interface, strong security features, and excellent community support make it an ideal choice for those looking to explore the world of Linux. Whether you're looking for a stable desktop OS or a powerful server solution, Ubuntu provides a reliable and efficient environment for both personal and professional use.