**LAB ASSIGNMENT – 01   
OPERATING SYSTEM**

**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**

**1. Introduction**

* **Linux:** Linux is an open-source, Unix-like operating system kernel. It's the core component of many operating systems, including Android and various server distributions. Developed by Linus Torvalds in 1991, Linux is known for its stability, security, and flexibility. Its open-source nature allows for community-driven development and customization.
* **Ubuntu:** Ubuntu is a popular Linux distribution based on Debian. It's designed to be user-friendly and accessible, making it a great choice for beginners and experienced users alike. Ubuntu is known for its focus on ease of use, regular releases, and strong community support.
* **Versions:** Ubuntu follows a predictable release cycle, with new versions released every six months. Long-Term Support (LTS) versions are released every two years, providing five years of free security and maintenance updates. Examples of recent versions include:
  + Ubuntu 20.04 LTS (Focal Fossa)
  + Ubuntu 22.04 LTS (Jammy Jellyfish)
  + Ubuntu 23.10 (Mantic Minotaur)
  + Ubuntu 24.04 LTS (Noble Numbat)
* **History:** Ubuntu was first released in October 2004 by Canonical Ltd., a company founded by Mark Shuttleworth. Its goal was to create a user-friendly Linux distribution that was easy to install and use. Ubuntu quickly gained popularity due to its focus on usability and its commitment to open-source principles.

**2. Features of Ubuntu**

* **User-Friendly Interface:** Ubuntu's GNOME desktop environment is intuitive and easy to navigate, making it accessible to users with varying levels of technical expertise.
* **Open Source and Free:** Ubuntu is free to download, use, and distribute. Its open-source nature allows for community contributions and customization.
* **Software Center:** The Ubuntu Software Center provides a convenient way to install and manage applications, with a wide range of software available.
* **Strong Security:** Linux-based systems like Ubuntu are known for their robust security features, including built-in firewalls and regular security updates.
* **Customization:** Ubuntu offers extensive customization options, allowing users to personalize their desktop environment, themes, and applications.
* **Large Community Support:** Ubuntu has a vibrant and active community that provides support, documentation, and troubleshooting assistance.
* **Regular Updates:** Ubuntu releases new versions every six months, ensuring that users have access to the latest features and security patches. LTS releases provide extended support for long-term stability.
* **Versatility:** Ubuntu can be used for a wide range of purposes, including desktop computing, server administration, and software development.
* **Snap Packages:** Ubuntu utilizes snap packages, which are containerized software packages that include all their dependencies, simplifying installation and ensuring compatibility.
* **Livepatch:** Livepatch allows critical kernel security updates to be applied without requiring a system reboot, minimizing downtime.

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

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| **Feature** | **Ubuntu (Linux)** | **Windows OS** |
| **Cost** | Free and open-source | Typically requires a paid license |
| **Source Code** | Open-source, modifiable | Closed-source, proprietary |
| **Security** | Generally considered more secure | Vulnerable to viruses and malware |
| **Customization** | Highly customizable | Limited customization options |
| **Software** | Primarily open-source software, package managers | Wide range of commercial and proprietary software |
| **Command Line** | Powerful and versatile terminal | Command Prompt and PowerShell, but less versatile |
| **Hardware Support** | Wide range of hardware, but driver compatibility can vary | Excellent hardware compatibility |
| **Stability** | Highly stable, especially on servers | Can be prone to crashes and slowdowns |
| **File System** | Uses file systems like ext4, Btrfs | Uses NTFS file system |
| **User Base** | Strong in servers, developers, and enthusiasts | Dominant in desktop and gaming |
| **Updates** | updates through package managers, and full os updates every 6 months. LTS versions every 2 years. | Windows update system. |
| **Openness** | Very open. | Closed. |

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**Installation Process (Briefly)**

1. **Download Ubuntu ISO:** Download the Ubuntu ISO image from the official Ubuntu website.
2. **Install Virtualization Software:** Install either VMware Workstation Player (free for personal use) or VirtualBox (free and open-source).
3. **Create a Virtual Machine:** Create a new virtual machine in your chosen virtualization software, specifying the Ubuntu ISO image as the boot device.
4. **Install Ubuntu:** Start the virtual machine and follow the on-screen instructions to install Ubuntu.
5. **Update and Configure:** After installation, update the system and configure it to your preferences.