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

**Introduction**

Linux

Linux is an open-source, Unix-like operating system kernel created by Linus Torvalds in 1991. It is the foundation for many operating systems (distributions or "distros") like Ubuntu, Fedora, Debian, etc. Linux is known for its stability, security, and flexibility, making it a popular choice for servers, desktops, and embedded systems. It is distributed under the GNU General Public License (GPL), meaning anyone can use, modify, and distribute it freely.

Ubuntu

Ubuntu is one of the most popular Linux distributions, based on Debian. It is developed and maintained by Canonical Ltd., a company founded by Mark Shuttleworth. Ubuntu is designed to be user-friendly, making it a great choice for beginners transitioning from Windows or macOS. It is available in multiple editions, including Ubuntu Desktop, Ubuntu Server, and Ubuntu Core (for IoT devices).

Versions of Ubuntu

Ubuntu releases new versions every six months (e.g., Ubuntu 22.10 "Kinetic Kettle"). LTS (Long-Term Support) versions are released every two years (e.g., Ubuntu 22.04 LTS "Jammy Jellyfish") and are supported for five years. Each release has a codename, usually an adjective and an animal (e.g., "Focal Fossa," "Bionic Beaver").

History of Ubuntu

Ubuntu was first released in October 2004. The name "Ubuntu" comes from an African philosophy meaning "humanity to others" or "I am because we are." It quickly gained popularity due to its ease of use, regular updates, and strong community support.

**Features of Ubuntu**

1. Open Source

Ubuntu is free to download, use, and distribute. The source code is available for anyone to modify, making it highly customizable.

2. User-Friendly Interface

Ubuntu uses the GNOME desktop environment by default, which is intuitive and easy to navigate. It also supports other desktop environments like KDE Plasma, XFCE, and LXDE.

3. Software Management

Ubuntu comes with the Ubuntu Software Center, which allows users to easily install, update, and remove software. It supports APT (Advanced Package Tool), a powerful package management system for installing software from the command line.

4. Security

Ubuntu has a built-in firewall (UFW) and AppArmor for application-level security. Regular security updates are provided to protect against vulnerabilities.

5. Customizability

Users can customize the look and feel of Ubuntu by changing themes, icons, and wallpapers. Advanced users can modify the system at a deeper level, including the kernel.

6. Community and Support

Ubuntu has a large and active community that provides support through forums, blogs, and documentation. Official support is also available from Canonical for enterprise users.

7. Compatibility

Ubuntu supports a wide range of hardware, from older machines to the latest devices. It also supports a variety of file systems, including ext4, NTFS, and FAT32.

8. Performance

Ubuntu is lightweight and optimized for performance, making it suitable for both older and newer hardware. It consumes fewer system resources compared to Windows, resulting in faster boot times and smoother performance.

**Difference Between Ubuntu and Windows OS**

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| **Parameter** | **Ubuntu** | **Windows** |
| Cost | Free and open-source; No licensing fees. | Paid (except for some versions like Windows 10/11 in S mode). Licensing fees apply for most versions. |
| User Interface | It uses the GNOME desktop environment by default, which is highly customizable. | It has a consistent interface across versions but is less customizable. |
| Software Availability | It relies on open-source software and Linux-based applications. Some proprietary software may not be available. | It supports a wide range of proprietary software, including Microsoft Office, Adobe Suite, and games. |
| Security | Less prone to viruses and malware due to its Unix-like architecture and smaller user base. | More vulnerable to viruses and malware, requiring antivirus software for protection. |
| Customizability | Highly customizable at both the user and system levels. | Limited customization options, especially at system level. |
| Performance | Lightweight and optimized for performance, even on older hardware. | Can be resource-intensive, especially on older machines. |
| Support | Community-driven support with extensive documentation and forums. | Official support from Microsoft, along with paid support options. |
| File System | Uses the ext4 file system by default, which is optimized for Linux. | Uses the NTFS file system, which is optimized for Windows. |