Choosing the Right Linux Environment !!

Desktops:

- Individual use and personal computing
- User-friendly Graphical User Interface (GUI)
- Web browsing, document editing, multimedia
- Found on laptops and workstations

Servers:

- Serve applications and data to multiple clients
- Typically headless, managed via CLI
- Web hosting, file serving, database management
- Efficiency and reliability emphasized

Lets Install Ubunt 22.04 Lts

1. Download ISO: Get the Ubuntu 22.04 LTS ISO from the Ubuntu website.
2. Create Bootable USB: Use tools like Rufus or Etcher to create a bootable USB drive with the ISO.
3. Boot from USB: Restart your computer, access BIOS/UEFI, and set the system to boot from the USB.
4. Start Installation: Select Install Ubuntu from the boot menu.
5. Choose Language & Keyboard: Set your language and keyboard layout, then continue.
6. Installation Type:
    - Select Normal or Minimal Installation.
    - Choose to erase the disk or manually partition.
7. Set Time Zone: Select your time zone and continue.
8. Create User: Set your username and password.
9. Install: Begin installation and wait for it to complete.
10. Reboot: Remove the USB and restart the system.

What is LVM?

LVM stands for **Logical Volume Manager**, a system used in Linux for managing disk storage.
It allows more flexible disk management by abstracting physical storage devices into logical volumes rather than using fixed disk partitions.

Key Concepts of LVM:

- Physical Volumes (PV): Actual disks or partitions (e.g., /dev/sda1) used by LVM.
- Volume Groups (VG): A collection of physical volumes combined into a pool of storage.
- Logical Volumes (LV): Storage volumes created from the volume group, acting like dynamic partitions.

Why is LVM Important?

Flexible Storage Management: Easily resize logical volumes without unmounting or rebooting, allowing for quick adjustments.

Dynamic Volume Expansion: Add physical volumes to existing groups, enabling seamless storage expansion as needs grow.

Snapshot Capabilities: Take point-in-time snapshots for backups and recovery, especially useful for databases and virtual machines.

Disk Mirroring and Striping: Supports RAID-like features for performance (striping) and reliability (mirroring).

Easier Disk Replacement: Replace failing disks or migrate data without downtime, maintaining system availability.

Efficient Space Usage: Dynamically allocate space to volumes, reducing waste compared to traditional partitioning.

Package Management Distribution

Linux package is a bundle of files and resources that contains a specific software or application.

Package management systems simplify the installation, upgrading, and removal of software packages.

Popular package management systems in Linux Bistro:

Advanced Package Tool (APT): Debian (Ubuntu,Linux Mint,Kali Linux)

Yellowdog Updater Modified (YUM)/DNF: Fedora (RHEL,CentOS,Rocky Linux)

Pacman: Arch Linux (Manjaro, EndeavourOS, ArcoLinux)

Zypper: openSUSE

Homebrew: macOS

APT Vs APT GET and DPKG

apt-get (Advanced Package Tool Get)

- An older, command-line package management tool for Debian-based systems.
- Widely used and stable but lacks modern features like progress indicators and parallel downloading.
- Commonly used commands include apt-get install, apt-get remove, and apt-get update.

apt (Advanced Package Tool)

- A higher-level package management tool that simplifies the installation & management of software.
- Provides a user-friendly interface with built-in progress indicators and better output formatting.
- Supports features like automatic dependency resolution and parallel downloading.
- Includes commands like apt install, apt remove, and apt update

dpkg (Debian Package)

- A lower-level package management tool used to install, remove, and manage .deb packages directly.
- Does not handle dependencies automatically; users must manage dependencies manually.
- Used for specific tasks like installing a package from a file (e.g., dpkg -i package.deb).

Introduction to Shell

A shell is a command-line interface that enables users to interact with an operating system by executing commands.

It acts as an intermediary between the user and the system, translating commands into action.

Here are some common shell types used in Linux and Unix-like operating systems:

1. Bash (Bourne Again SHell)

2. Sh (Bourne Shell)

3. Zsh (Z Shell)

4. Fish (Friendly Interactive SHell)

You can determine which shell you are currently using in Linux

`echo $SHELL`

Tools for remote login and management in Linux

- OpenSSH
- PuTTY
- MobaXterm
- TigerVNC
- Terminator
- Cockpit
- Ansible
- RDP (with xrdp)
- VNC (e.g., TightVNC, RealVNC)
- Webmin

Remote login into Linux Machine

SSH (Secure Shell)

A cryptographic network protocol for secure remote access and management of devices over unsecured networks.

Key Features

- Encryption: Secures data transmission to prevent eavesdropping and attacks.
- Authentication: Supports password and public key authentication for secure logins.
- Port Forwarding: Allows secure tunneling of other protocols.
- File Transfer: Enables secure file transfers using SCP and SFTP.
- Session Management: Maintains active sessions even during temporary network issues.

Components

- SSH Client: Initiates the connection to the SSH server.
- SSH Server: Receives requests from the client and manages user sessions.

SSH key-based authentication for a custom host

Steps to Configure SSH Key-Based Authentication

- Step 1: Generate SSH Key Pair
- Step 2: Copy Public Key to Remote Host
- Step 3: Test SSH Connection
- Step 4: Optional Create SSH Config File
- Step 5: Connect Using SSH Config

Thank You

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