**SIDDAGANGA INSTITUTE OF TECHNOLOGY TUMKUR**

(An Autonomous Institution Affiliated to Visvesvaraya Technological University, Belagavi)

 B.H. Road, Tumakuru-572 103, Karnataka, INDIA

**SUBJECT** **NAME** : OPERATING SYSYEMS **SUBJECT** **CODE** : S3CCSI01

**TOPIC** : COURSE RELATED TO BRIEF INTRODUCTION OF OPERATING **SYSTEM** **RESOURCE** : CISCO NETWORKING ACADEMY

**DONE BY:**

**NAME**: **Keerthi Patil**

**USN: 1SI23CI018**

**BRANCH: CSE – AIML**

**COURSE COMPLETION CERTIFICATE :**

A certificate of course completion

Description automatically generated

**MODULES :**









## **MODULE 1:**

### **WINDOWS OPERATING SYSTEM**

1.Features of windows operating system

2.Windows history

3.Windows architecture and operations

4.Windows configuration and monitoring

5.Windows security

#### **1.1 Features of windows operating system**

**1. Multitasking:**Allows users to run multiple programs or apps simultaneously, such as watching a video while drafting a document.

**2. User-Friendly Interface:**  
Features an intuitive graphical interface with icons, windows, and menus, making it accessible even for non-technical users.

**3. Enhanced Security:**Safeguards user data with features like strong password protection, firewalls, and encryption, ensuring defense against viruses and hackers.

**4. Efficient File Management:**Simplifies the organization, storage, and retrieval of files through tools like folders, drives, and advanced search functionality.

**5. Robust Networking Capabilities:**Enables seamless internet and system connectivity for data sharing and resource access.

### **WINDOWS HISTORY :**

1. **Windows 1.0 (1985):**The first version introduced a graphical user interface with basic tools like a calculator and calendar. It was simple and ran on top of MS-DOS.
2. **Windows 95 (1995):**A significant upgrade that introduced the Start Menu and Taskbar, transforming multitasking and making computers more accessible.
3. **Windows XP (2001):**Praised for its stability and user-friendly interface, it became one of the most widely used Windows versions for years.
4. **Windows 7 (2009):**Known for improved performance, a polished interface, and sleek design, it gained popularity among personal and business users alike.
5. **Windows 10 (2015):**Unified design for various devices like PCs, tablets, and smartphones, with regular updates and features like Cortana, the virtual assistant.
6. **Windows 11 (2021):**A modern redesign featuring a centered Start Menu, enhanced multitasking, and integrated productivity tools like Microsoft Teams.

### **WINDOWS ARCHITECTURE AND OPERATIONS**

**Layered Architecture:** Windows is organized into layers:

**Kernel:** Acts as the heart of Windows, handling tasks like process management, memory management, and hardware communication.

**File System:** Uses NTFS (New Technology File System), which ensures secure storage and supports large files and drives.

**Process Management:** Windows manages multiple programs simultaneously using multitasking, allowing users to run several applications at once.

**Device Drivers:** Specialized software connects the OS to hardware like printers, keyboards, and graphics cards, ensuring smooth communication.

**Security and Networking:** Includes features like user authentication, firewalls, and internet protocols to ensure secure and efficient network operations

##### **WINDOWS CONFIGURATION AND MONITORING**

**Control Panel and Settings:** Centralized interface for configuring system settings such as display, sound, network, and user accounts.

**Device Manager:** Manage and configure hardware devices, update drivers, and troubleshoot hardware issues.

**Task Manager:** Monitor running applications, processes, and resource usage (CPU, memory, network) and end unresponsive tasks.

**Event Viewer:** Log and review system events, errors, and warnings to monitor and troubleshoot issues.

**System Configuration (msconfig):** Manage startup programs, boot settings, and system services for better performance.

**Performance Monitor:** Analyze system performance metrics like CPU usage, disk activity, and network throughput to identify and resolve bottlenecks.

##### **WINDOWS SECURITY**

**Windows Defender:** Integrated antivirus and anti-malware tool that safeguards your system against viruses, spyware, ransomware, and other threats.

**Firewall Protection:** Monitors and controls network traffic with Windows Firewall, blocking unauthorized access and ensuring secure communication.

**User Account Control (UAC):** Enhances security by requiring permission or administrator credentials for system changes.

**BitLocker Encryption:** Secures your data by encrypting drives, protecting it from unauthorized access if the device is lost or stolen.

**Windows Updates:** Keeps your system secure and up-to-date with the latest patches, features, and vulnerability fixes.

**Secure Sign-In Options:** Provides safer login methods, including PIN, biometrics (Windows Hello), and two-factor authentication.

##### **LAB PROGRAMS:**

**Lab 1 - Exploring Processes, Threads, Handles, and Windows Registry**

**Lab 2 - Create User Accounts**

**Lab 3 - Using Windows PowerShell Lab 4 - Windows Task Manager**

**Lab 5 - Monitor and Manage System Resources in Windows**

## **MODULE 2**

### **LINUX OVERVIEW :**

Introduction Linux basics

Working in Linux shell Linux servers and clients

Basic server and administration

Linux file system Working with Linux GUI Working on a linux host

Summary

##### **LINUX BASICS:**

Linux is a **fast, reliable, and lightweight open-source operating system** that requires minimal hardware resources to run.

It is highly customizable, making it versatile for a wide range of applications, from personal desktops to enterprise servers and embedded systems.

Linux is particularly well-suited for network-based environments, offering robust performance and security.

The **Linux kernel**, the core of the operating system, is distributed by various organizations along with unique tools and software packages, resulting in multiple distributions (distros) tailored for specific use cases.

Linux's open-source nature encourages collaboration and innovation, making it a cornerstone of modern computing.

Its security, flexibility, and scalability have established it as a leading choice for developers, system administrators, and cybersecurity professionals.

Let me know if you’d like further tweaks!

##### **WORKING IN LINUX SHELL:**

In Linux, users can interact with the operating system through either a **Graphical User Interface (GUI)** or a **Command-Line Interface (CLI)**, often referred to as the **shell**.

While the GUI provides a more user-friendly, visual approach, the CLI is powerful and widely used for more efficient, flexible control over the system, especially for system administrators and developers.

Knowing at least the **basic Linux commands**, especially those for **file and directory manipulation** and **text file handling**, is crucial for effective system administration and development.

Advanced users often use combinations of commands with pipes (|) and redirection (>, >>) to create powerful workflows, automating tasks and enhancing productivity.

The **CLI** offers much more flexibility and control compared to a GUI, making it an essential skill for anyone working with Linux.

Whether you're a beginner or an advanced user, mastering the command line is vital to fully harness the power of Linux.

##### **LINUX SERVERS AND CLIENTS :**

Servers are specialized computers or systems that run software designed to provide services to client computers over a network.

These services can be either external or internal in nature. External services provide clients with access to resources such as files, emails, web pages, and databases upon request.

Internal services handle tasks like log management, memory management, disk scanning, or security monitoring, ensuring the smooth operation of the server.

To enable a server to handle multiple services simultaneously, **ports** are used. A port is a designated network endpoint that listens for incoming requests from client systems.

Ports allow servers to differentiate between different types of services and ensure that each service receives the appropriate requests.

These client-server interactions are foundational to network communications, allowing clients to access and interact with various services hosted on remote servers.

Understanding how ports and services work is essential for configuring, securing, and troubleshooting networked systems.

##### **BASIC SERVER ADMINISTRATION :**

In Linux, servers are managed by using configuration files. Various settings can be modified and saved in configuration files.

When a service is started, it looks at its configuration file(s) to know how it should run. There is no rule for the way configuration files are written.

Configuration file formatting depends on the creator of the server software. Linux devices should be secured by using proven methods to protect the device and administrative access. This is known as hardening devices.

One way to harden a device is to maintain passwords, configure enhanced login features, and implement secure remote login with SSH. It is also very important to keep the operating system up to date.

Other ways to harden a device are to force periodic password changes, enforce strong passwords, and to prevent reuse of passwords. Finally, Linux clients and servers use logfiles to record the operation of the system and important events.

A number of different logfiles are maintained including application logs, event logs, service logs, and system logs. Server logs record activities that are conducted by remote users who access system services.

It is important to know the location of different logs in the Linux file system so that they can be accessed and monitored for problems

##### **WORKING WITH LINUX GUI:**

The X Windows, or X11, system is a basic software framework that includes functions for creating, controlling, and configuring a windows GUI in a point-and-click interface.

Different vendors use the X Windows system to create different windows manager GUIs for Linux. Examples of windows managers are Gnome and KDE.

The Ubuntu Linux distribution uses Gnome 3 by default.

The Gnome 3 desktop consists of the Apps Menu, Ubuntu Dock, Top Bar, Calendar and System Message tray, the Activities area, and the Status Menu.

##### **WORKING ON A LINUX HOST:**

In order to install applications on Linux hosts, programs called package managers are used. Packages are software applications and all of their supporting files.

Package managers are extremely helpful for installing complex software applications from centralized package repositories that are accessible over the internet. Different Linux distributions use different package managers.

For example, Arch Linux uses pacman, Debian uses dpkg as the base package manager and apt to communicate with dpkg. Ubuntu also uses apt.

Package manager CLI commands are used to install, remove, and update software packages. Upgrade commands upgrade all currently installed packages.

Package management can also be performed in a GUI.

##### **LINUX FILE SYSTEM:**

Linux supports a variety of **file systems**, each offering different advantages in terms of speed, flexibility, security, size, structure, and logic.

Common file systems supported by Linux include **ext2**, **ext3**, **ext4**, **NFS**, and **CDFS**. These file systems are typically mounted on disk **partitions**, allowing access through **mount points**, which are directories in the system.

For example, in **Windows**, drive letters (e.g., C: or D:) serve as mounting points.

To view the currently mounted file systems and their details, the **mount** command can be used. The **root file system**, symbolized by the **"/"** (slash), is the central directory that contains all other files and directories by default.

**Hard links** allow multiple file names to refer to the same data in the file system. These links create an additional name for a file, but both names point to the same underlying data.

When a change is made to a hard-linked file, the changes are reflected in the original file as well. Hard links can be created using the **ln** command.

File permissions are a powerful feature of the Linux file system, providing fine-grained control over access. However, these permissions are enforced strictly, and only the **root user** (superuser) has the ability to override them.

Therefore, **root access** should be tightly controlled, as it grants unrestricted access to the entire system.

### **COMPARISION BETWEEN WINDOWS AND LINUX**

**LAB PROGRAMS:**

Lab 1 - Working with Text Files in the CLI Lab 2 - Getting Familiar with the Linux Shell

Lab 3 - Use a Port Scanner to Detect Open Ports Lab 4 - Linux Servers

Lab 5 - Locating Log Files

Lab 6 - Navigating the Linux Filesystem and Permission Settings Lab 7 - Configure Security Features in Windows and Linux

# **MODULE 3**

### **MOBILE DEVICE CONNECTIVITY:**

**Introduction**

**Wireless and cellular data network Bluetooth**

**Email Configuration**

**Mobile Device Synchronisation**.

**Wireless and Cellular data network:**

Topic Objective: Explain how to configure wireless and cellular data settings.

#### **Bluetooth:**

Topic Objective: how to pair Bluetooth devices

#### **Email Configuration:**

Topic Objective: Explain how to configure email settings.

#### **Mobile Device Synchronisation:**

Topic Objective: Explain how to synchronize data.

# **MODULE 4:**

### **MOBILE OPERATING SYSTEMS AND SECURITY**

**Introduction Android vs IOS**

**Mobile touch interfaces Common mobile device features Passcode Locks**

**Cloud enabled services for mobile devices Mobile device software security**

#### **Android vs IOS**

Topic Objective: Compare the Android and iOS operating systems.

#### **Mobile touch interfaces**

Topic Objective: Describe the features of the Android and iOS touch interfaces.

#### **Mobile touch Interfaces**

Topic Objective: Describing the operating system features that are common among mobile devices.

#### **Passcode Locks**

Topic Objective: Explain how to configure various types of passcode locks.

#### **Cloud enabled services for mobile devices**

Topic Objective: Describe Cloud-enabled services for mobile devices.

#### **Mobile device software security**

Topic Objective: Describe software security for mobile devices.

**COMPARISION BETWEEN ANDROID AND IOS**

