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1. What is OS and its Key Features?

An operating system (OS) is the core software that manages a computer’s hardware and software resources, acting as a bridge between the user and the machine. It ensures everything runs smoothly and efficiently.

Key features include:

* **Process Management**: Handles running applications, allowing multitasking without conflicts.
* **Memory Management**: Allocates and manages memory for programs to run effectively.
* **File Management**: Organizes files and folders, making it easy to store, access, and manage data.
* **Device Management**: Controls hardware like printers, keyboards, and drives using drivers.
* **Security**: Protects data by managing user access and permissions.
* **User Interface**: Provides a way to interact with the system, either through a graphical interface (GUI) or command line (CLI).
* **Networking**: Enables devices to connect and communicate over network

1. Types of Operating system?

Here are the main types of operating systems:

* **Batch OS**: Processes tasks in batches without user interaction.
* **Time-Sharing OS**: Allows multiple users to share resources simultaneously.
* **Distributed OS**: Manages networked computers as a single system.
* **Network OS**: Supports file and printer sharing over networks.
* **Real-Time OS (RTOS)**: Processes data instantly for time-sensitive tasks.
* **Mobile OS**: Designed for smartphones and tablets (e.g., Android, iOS).
* **Embedded OS**: Runs on specialized devices like IoT or smartwatches.
* **Multitasking OS**: Runs multiple apps at once (e.g., Windows, macOS).
* **Single-User, Single-Task OS**: Handles one task at a time for one user.
* **Single-User, Multitasking OS**: Supports one user running multiple tasks.

1. Explain the term 'multitasking' in operating systems?

Multitasking in operating systems is the ability to run multiple tasks or apps at the same time on a single CPU. The OS switches between tasks so quickly that it feels like they’re all running simultaneously. For example, you can browse the web, listen to music, and download files at once without issues. It’s a key feature of modern OSs like Windows, macOS, and Linux, making computers efficient and user-friendly.

1. What is VMware Workstation Pro and why we use it?

**VMware Workstation Pro** is a powerful virtualization software that allows you to create and run multiple virtual machines (VMs) on a single physical computer. Each VM acts like a separate computer with its own operating system (OS), applications, and resources, even though they all share the same hardware.

**Why:**

* **Run Multiple OSs Simultaneously**: You can run Windows, Linux, macOS, or other OSs on the same machine without needing separate hardware.
* **Testing and Development**: It’s ideal for developers and testers to experiment with different software, configurations, or OS versions in isolated environments.
* **Training and Education**: Useful for learning new systems or software without risking the main system.
* **Legacy Software Support**: Run older applications that only work on specific OS versions.
* **Resource Efficiency**: Maximizes hardware usage by running multiple systems on one machine.
* **Snapshot Feature**: Save the state of a VM at any point and revert back if something goes wrong, making it safe for experimentation.

1. What is the difference between VMware Workstation and VMware vSphere?

**VMware Workstation** and **VMware vSphere** are both virtualization tools but serve different purposes:

### ****VMware Workstation****:

* **Purpose**: For individual or small-scale use.
* **Environment**: Runs on a single computer (desktop/laptop).
* **Use Case**: Developers or testers running multiple OSs or testing software in isolated environments.
* **Features**: Snapshots, cloning, and running multiple VMs simultaneously.

### ****VMware vSphere****:

* **Purpose**: For enterprise-level virtualization and data center management.
* **Environment**: Manages multiple servers and large-scale infrastructures.
* **Use Case**: Organizations virtualizing servers, ensuring high availability, scalability, and disaster recovery.
* **Features**: Centralized management, load balancing, and automated failover.

### ****Key Difference****:

* **Workstation**: For personal or small-scale use on one machine.
* **vSphere**: For businesses managing complex, large-scale IT operations.