Installing Operating Systems

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Lesson Plan

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▶ Selecting an OS

▶ Types of Installations

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▶ Types of Device Drivers

▶ Virtual Device Drivers

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Preparation to Install

Before selecting the operating system to install following decisions must be taken...

▶ Upgrade or a Fresh Installation

▶ Physical Computer or Virtual Machine (VM)

▶ Client or Server (Computer's Role)

▶ Few Computers or Hundreds of Computers

▶ Environment Eg: Network Environment

Selecting an OS

▶ Considering the extensive range of OS available in the market, it is essential to understand the unique needs of the device.

▶ Doing this enhances the working experience on a computer and boosts productivity.

▶ A sound operating system will always impact everything running on a device. Without the right OS, hardware is of no value, no matter how advanced it is.

▶ So, choose the OS as per user requirements.

Selecting an OS

Check for Hardware Configuration or Setup of the Computer

- CPU Architecture and Speed

- RAM Speed

- Free Disk Space

- Network Connection

- Etc.

▶ Existing computer hardware should be compatible with the minimum requirements for the operating system. Otherwise, the hardware should be upgraded to match the OS requirements.

▶ Also ensure the existing software operating correctly.

Selecting an OS

Consider the Basic Design of the Computer

▶ Eg: HP, IBM, or an Apple Computer

▶ Operating system should be compatible with the type of computer.

▶ Also look for the applications intended to install on the computer.

Selecting an OS Cont.

OS should have the Power to Manage the Memory

▶ Memory management is an important consideration when selecting an operating system.

▶ A powerful operating system is capable of handling and managing integral memory. It keeps track of every memory location, regardless of whether it is assigned to a process or is free. As a result, the data imported from secondary memory to main memory is accurate, available, and consistent. There are various operating systems on the market today notorious for memory hogs. So, hunt for software that handles memory flawlessly.

Selecting an OS Cont.

Robust & Stable OS

▶ This is one of the most crucial factors when buying an OS.

▶ If the computer often uses to access the Internet, for business purposes, or play games, it requires an OS that is reliable and dependable.

▶ OS should efficiently handle all its functions without crashing.

▶ With an unstable operating system, the system will require to be rebooted constantly.

Selecting an OS Cont.

Choose OS that meets all Board Support Package (BSP) Requirements

▶ Operating systems are software that performs all the basic tasks, including all fundamental functions, managing files, memory, processes, input and output, and peripheral devices like printers and disc drives.

▶ BSP is something that made it all possible.

▶ If the selected OS does not support BSP, it's not worth buying one.

Selecting an OS Cont.

Avoid Memory Leak

▶ A memory leak is a bug that can impair the overall functionality of an operating system and a specific program on a computer.

▶ In the worst-case scenario, the computer's operating system crashes due to the vast data storage.

▶ To avoid such a thing, users should look for an operating system that is free of all memory leaks. This will enhance the overall working experience on a computer.

Selecting an OS Cont.

Good Memory-Sharing Capabilities

▶ Good memory-sharing capabilities make transferring data easier between various computer processes through modules and scripts.

▶ Also, this process makes communication faster and easier than any other message-sending module.

▶ If the selected operating system lacks good memory sharing, it can delay other processes and give rise to various problems for users and computers.

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Selecting an OS Cont.

Check all Safety Requirements

▶ This is the thing that saves the computer and data from threats like hacking, fraud, and scamming.

▶ Linux and Mac operating systems are thought to be the safest for business, online banking, and storing sensitive data. Those reduce the possibility of hacking, duplicity, and fraud.

▶ Windows has fewer security safeguards, which increases the likelihood that hackers will succeed in breaking into the machine.

Selecting an OS Cont.

Security

▶ All operating systems are susceptible to viruses, but as Windows has a significant market share, it is targeted by the most viruses.

▶ In contrast, Linux-based operating systems like Ubuntu or Debian are the least receptive.

▶ Macs are also vulnerable to ransomware explicitly created for Macs.

Selecting an OS Cont.

Cost & Support

▶ There is a common belief that the more you pay for an OS, the better support and experience you will get.

▶ This is not always correct as sometimes users can get the best experience at the lowest price. That too with reliable, lightweight, and very good memory management.

Look for the Updated Version OS

▶ Even if the operating system is unfamiliar, it is better to look for the recently updated operating system.

Types of Installations

Clean Install

▶ A completely new installation of an operating system or application on a computer.

▶ In a clean install of an OS, the hard disk is formatted and completely erased. Installing an OS on a new computer or installing an application for the first time is automatically a clean install.

▶ In some cases, a clean install is not necessary when upgrading your operating system. It is much easier and safer to perform a standard "Upgrade and Install," which simply upgrades the necessary files and leaves the user files in place.

Types of Installations Cont.

Clean Install Cont.

▶ However, sometimes an OS upgrade is not possible because important files have become lost or corrupted. In this case, a clean install may be the only option.

▶ Some users may also prefer to perform a clean install so that no lingering problems from the previous OS will affect the newly installed operating system.

▶ Windows, Mac OS X, and Linux allow you to perform a clean install when upgrading the operating system.

▶ The installer will give you the choice between a standard upgrade (typically the default option) and a clean installation near the beginning of the installation process.

Types of Installations Cont.

Repair Install

▶ If the installed OS is acting up or misbehaving, it is possible to perform a reinstallation of the same OS that keeps all files, documents, data, settings, and apps intact.

▶ Reinstalling does not format your PC and can be used to correct problems with missing DLL errors, failed System File Checker (SFC) scans, the Start Menu doesn't work, and more.

Types of Installations Cont.

In-Place Upgrade

▶ The installation of an operating system or application on the computer without removing the older version first and without saving any data beyond normal precautions.

▶ In-place installations of operating systems have a tendency to cause problems, especially if the new version is very different from the previous one.

▶ For example, in-place upgrades are recommended when migrating from Windows Vista to Windows 7, but not from Windows XP. In that case, a "Clean Install" is recommended, whereby all user data must be saved externally and restored after the installation, and all applications must be re-installed.

Types of Installations Cont.

Unattended Installations

▶ An Unattended Installation is an automated installation technology that you can use to install with no user intervention.

▶ Unattended installation is typically used during large-scale rollouts when it would be too slow and costly to have administrators or technicians interactively install the Operating System / Software on individual computers.

Types of Installations Cont.

Multi-boot

▶ Dual-boot is a term used to describe a computer that utilises two operating systems.

▶ For example, with a dual-boot you could have Windows 10 and Linux on the same machine. The concept of installing more than two operating systems is referred to as a multi-boot.

▶ The interest in dual-booting exists because there isn't a one-size-fits-all solution to operating systems. While any modern OS will cover the average person's day-to-day computer needs, for those who need to use specialised programs or want to try more experimental operating systems without sacrificing their computer usability, dual-booting offers a flexible solution.

Types of Installations Cont.

Remote / Network Installation

▶ Remote / Network Installation is an easy-to-use network application designed for centralised software management and audit across a Network.

▶ The program allows you to audit software installed on remote PCs across your network and deploy software automatically on remote PCs.

▶ The program deploys software in parallel on remote PCs, so users can deploy within a few minutes across the entire network.

Device Drivers

▶ A device driver is a computer program that operates or controls a particular type of device that is attached to a computer.

▶ A driver provides a software interface to hardware devices, enabling operating systems and other computer programs to access hardware functions without needing to know precise details about the hardware being used.

▶ Device drivers are essential for a computer system to work properly because, without a device driver, the particular hardware fails to work accordingly, which means it fails in doing the function/action it was created to do.

Device Drivers Cont.
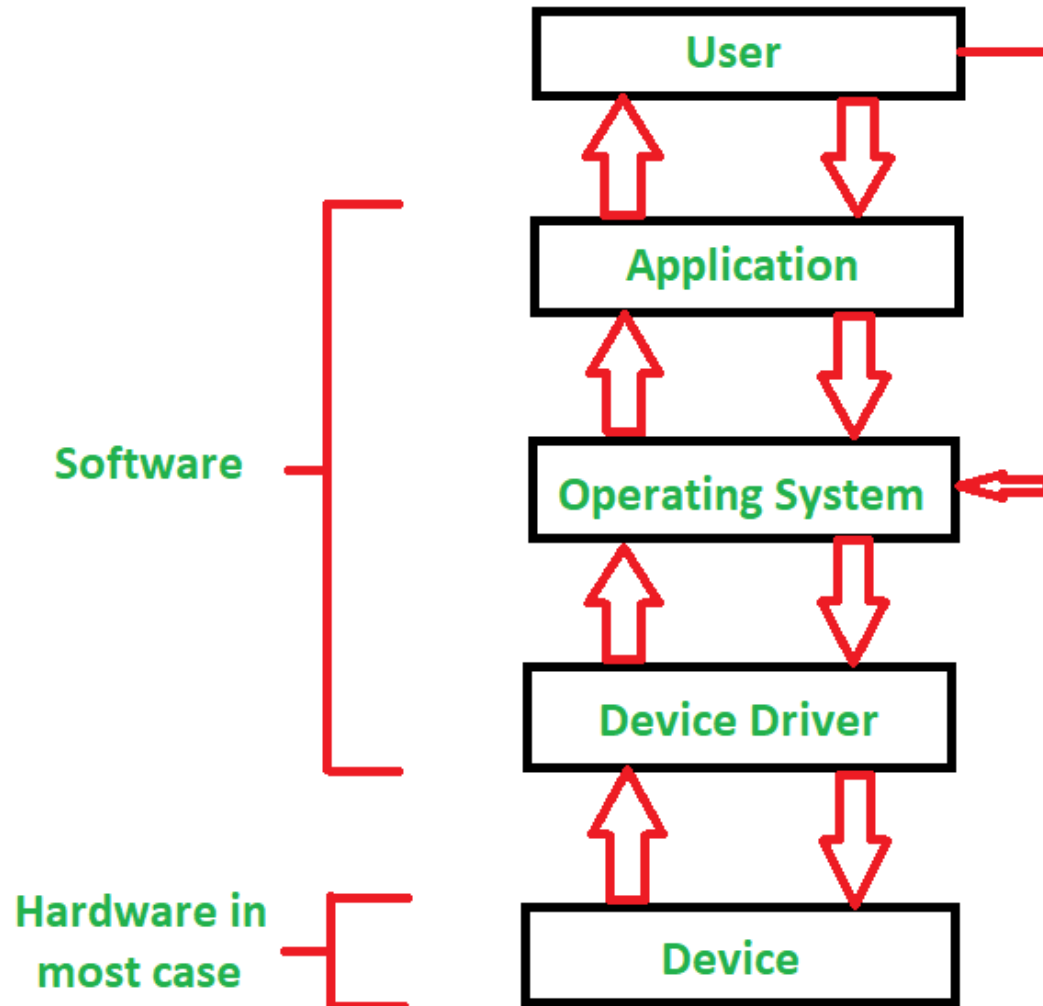
Device Drivers Cont.

- Hardware devices that are unknown by the operating system or have features unknown by the operating system all require drivers.

  Eg: Card Reader, Controller, Modem, Motherboard Chipset, Network Card, Printer, Scanner, Sound Card, Tape Drive, USB Devices, Video Card, etc.

- Modern operating systems have many generic drivers that allow hardware to work at a basic level without needing drivers or software. But if that device has features unknown to the operating system, it will not work without drivers.

  Eg: CPU, Disc Drive, Fan, Hard Drive, Heat Sink, Joystick, Keyboard, Mouse, Monitor, Power Supply, RAM, Speakers, UPS, etc.

Types of Device Drivers

▶ **Kernel-Mode Device Drivers**

This Kernel-Mode device driver includes some generic hardware that loads with the operating system as part of the OS these are BIOS, motherboard, processor, and some other hardware that are part of kernel software. These include the minimum system requirement device drivers for each operating system.

▶ **User-Mode Device Drivers**

Other than the devices which are brought by the kernel for working the system the user also brings some devices for use during the use of a system that devices need device drivers to function those drivers fall under the User-Mode device driver. For example, the user needs any plug-and-play action that comes under this.

Virtual Device Drivers

▶ There are also Virtual Device Drivers (VxD), which manage the virtual machine/device.

▶ Sometimes we use the same hardware virtually at that time virtual driver controls/manages the data flow from the different applications used by different users to the same hardware.

▶ In Microsoft Windows, a device driver is controlled by the Operating System's Virtual Device Driver Manager (VDDM) and is shared by the applications running within that kernel.

Q&A

- Time for your questions and queries …

Thank you!