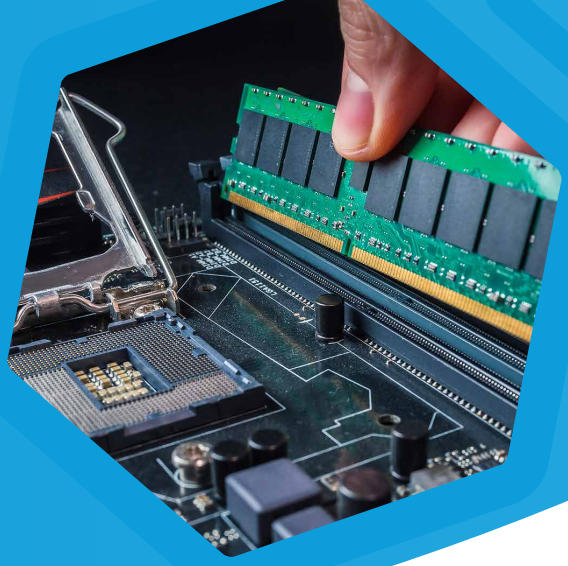

IT Fundamentals

Unit - Hardware

Lesson 3.1.2 - Types of Operating Systems

IT Fundamentals Objectives (FC0-U61)

Objective 3.1 - Explain the purpose of operating systems

- Types of OS
  - Mobile device OS
  - Workstation OS
  - Server OS
  - Embedded OS
    - Firmware
  - Hypervisor (Type 1)

Grade Level(s)

8, 9

Cyber Connections

- **Hardware & Software**

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Teacher Notes:

Types of Operating Systems

There are many different operating systems for different types of devices and purposes. Lesson 3.1.1, Purpose of Operating Systems, covered the main function of operating systems. This lesson deals with the different types of Operating Systems. While most seem trivial, like mobile device OS, workstation OS, and server OS, others might be a little harder to understand, like an Embedded OS or Hypervisor.

Mobile Device OS

Mobile device operating systems are obviously designed for smartphones, but they also are the operating systems for smartwatches (or other wearable devices) and tablets. This does not include laptops, as most laptops use the same operating systems as desktop computers. The three main operating systems for mobile devices are iOS (Apple devices), Android (Google devices), and the lesser used Windows.

Workstation OS

A ***workstation operating system,*** or a desktop operating station, is typically what runs a desktop computer or laptop. These operating systems manage the hardware and software for the computer system. The three most popular workstation operating systems are Windows (Microsoft), macOS (Apple), and the many Linux distros (open-sourced).

Server OS

Server operating systems are operating systems that control servers. These servers comply to requests from other machines on the network. For example, a print server can get printer requests from workstations in an office and then will send the jobs to a printer. A communication server can control messages sent between employee's workstations in an office space. Other types of servers are mail servers, database servers, computing servers, web servers, application servers, file servers, etc. The two main server operating systems are Linux and Windows Server.

Teacher Notes:

Embedded OS and Firmware

An ***embedded operating system*** is a specialized operating system that is designed to run a certain task for a device and should be very reliable. This does not include desktop computer operating systems. An example of an embedded operating system is one that controls an ATM. This operating system controls the processor, memory, and input/output devices of the ATM, while being a part of the larger bank network. Another example is the operating system for an elevator. This operating system controls all of the parts of the elevator and makes sure it is running properly.

Firmware is the software that controls specific hardware devices connected to a system. Typically, firmware is read-only because it is specific to a certain device. For example, a traffic light's firmware does not need to update because the traffic light will never change. The traffic control center might update their systems, but the traffic light will stay the same so the firmware should never need to be updated. An embedded operating system can be an example of firmware.

Hypervisors

A ***hypervisor*** is also known as a virtual machine monitor. These operating systems control virtual machines, a lot of times more than one at a time. The machine that controls all the other virtual machines is known as the host machine while the others that are being controlled are known as guests. A ***type I*** hypervisor runs on one machine and controls different virtual machines on that system while a type II hypervisor is hosted and not ran directly on that machine.