Firmware

Chapter 5

CompTIA A+ (220-110x)
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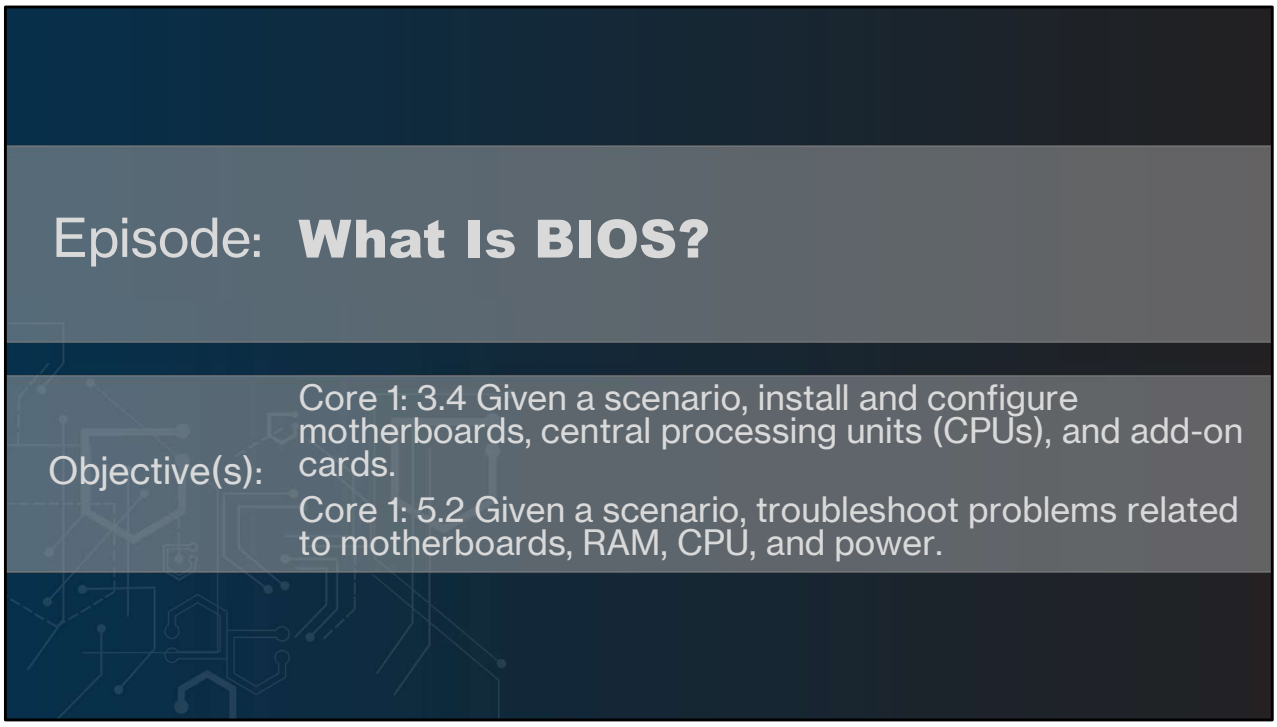
Episode: What Is BIOS?
Objective(s):
Core 1: 3.4 Given a scenario, install and configure motherboards, central processing units (CPUs), and add-on cards.
Core 1: 5.2 Given a scenario, troubleshoot problems related to motherboards, RAM, CPU, and power.

Episode Description

Basic Input/Output Services (BIOS) is code (firmware) built into every motherboard to give the CPU basic communication with the hardware attached to the motherboard. BIOS is a critical part of the PC and a good tech needs to understand its function.

Key Terms

- 2:15 - Objective term - Basic input/output services (BIOS)
- 2:18 - BIOS programs are code
- 3:49 - Backup BIOS
- 4:54 - Objective term - Power-On Self-Test (POST)
- 5:02 - System Setup (CMOS)

Quick Review

- BIOS programming enables interaction with motherboard before OS loads
- BIOS is stored in nonvolatile media, thus called firmware
- POST routines are built into firmware
- The System Setup utility is also part of the firmware


Episode: POST
Objective(s): Core 1: 5.2 Given a scenario, troubleshoot problems related to motherboards, RAM, CPU, and power.

Episode Description

The Power-On Self-Test takes place every time a system starts. POST checks the system and communicates any problems it finds to the user.

Key Terms

- 0:37 - Power On Self Test (POST)
- 1:22 - Objective term - Power-on self-test (POST) beep
- 2:34 - Beep codes
- 3:03 - “No RAM” beep codes will repeat until you power down system
- 4:54 - POST card

Quick Review

- POST runs at boot, requesting devices to self-check
- POST errors manifest as specific beep codes or display (text) codes
- POST cards enable testing of "dead" computers

Episode: **System Setup**

Objective(s):

Core 1: 2.6 Given a scenario, configure a workstation to meet best practices for security.

Core 1: 3.4 Given a scenario, install and configure motherboards, central processing units (CPUs), and add-on cards.

Episode Description

A small system-setup program built into the motherboard firmware enables techs to configure low-level features and options for the system's hardware. A good tech needs to know how to access and use system setup on any computer.

Key Terms

- 0:53 - Objective term - Unified Extensible Firmware Interface (UEFI)
- 1:41 - System setup
- 3:39 - Objective term - Boot password
- 5:44 - Objective term - USB permissions
- 6:32 - Objective term - Boot options

Quick Review

- UEFI replaces traditional 16-bit BIOS in modern systems
- The System Setup enables custom information about changeable devices
- System Setup enables changes to CPU frequencies, RAM timings, BIOS passwords, boot options, and more

Episode: **Troubleshooting Firmware**

Objective(s): Core 1: 5.2 Given a scenario, troubleshoot problems related to motherboards, RAM, CPU, and power.

Episode Description

A system's BIOS is robust and rarely causes trouble, but when it does a good tech must be ready to troubleshoot. Understanding a few simple tricks can make troubleshooting easier.

Key Terms

- 1:07 - Programmable Read-Only Memory (PROM)
- 1:54 - Single flash ROM chip
- 2:20 - Objective term - Real-time Clock (RTC)
- 3:08 - CMOS battery
- 8:20 - Flashing the ROM updates the firmware on flash chip

Key Terms

- 8:49 - PROTIP: When flashing your firmware, make sure you have good power.
- 8:56 - PROTIP: Make sure you have a complete copy of a flash update.
- 9:35 - PROTIP: Don't flash BIOS just because there's an update. Read what the changes are and make an informed decision.

Quick Review

- The real-time clock battery keeps system time without external power
- System Setup allows for changes; exit without saving is an option
- Reset System Setup for defaults
- Flash the ROM chip to update firmware