Power Supplies

Chapter 7

Episode: **The Power Supply**

Objective(s):
Core 1: 3.1 Explain basic cable types and their connectors, features, and purposes.

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

Core 1: 3.5 Given a scenario, install or replace the appropriate power supply.

Episode Description

A PC power supply takes AC power from the grid and transforms it into DC voltage the system needs to run. This episode explores modular and non-modular power supplies.

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Key Terms

- 1:09 - Objective term - European outlets run 230 volts of AC power (VAC)
- 1:09 - Objective term - North American outlets run 120 volts of AC power (VAC)
- 2:07 - Power supplies are step-down transformers that convert AC power to DC power
- 2:25 - ATX main power connector
- 2:30 - Original ATX power supplies had a 20-pin main power connector

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Key Terms

- 2:37 - Modern power supplies need more power, so a 4-pin (P4) connector was added
- 2:54 - Objective term - 12 volt, 5 volt, 3.3 volt
- 3:32 - ATX12V
- 4:54 - Objective term - Molex
- 5:13 - Mini connector
- 5:55 - Objective term - SATA power connector
- 6:06 - Objective term - PCIe power connector
- 6:57 - Objective term - Modular power supply

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Quick Review

- Power supplies transform AC power from the wall outlet to DC power for the computer
- The main power connectors for the motherboard are the 20-pin ATX and the 4-pin P4
- Molex and SATA connectors are for peripherals and drives

Episode: **Choosing a Power Supply**

Objective(s): Core 1: 3.5 Given a scenario, install or replace the appropriate power supply.

Episode Description

Power supplies come in a dizzying array of power ratings, sizes, and efficiencies. A good tech understands these factors to make sure a system has the power it needs.

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Key Terms

- 0:24 - volts x amps = watts
- 1:06 - Objective term - Wattage rating
- 4:47 - 80 Plus rating system
- 6:16 - Objective term - Modular vs. solder (non-modular)

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Quick Review

- Get a PSU with a little more wattage than your system needs
- Shop for higher-efficiency power supplies
- Modular power supplies cut down on cable clutter

Episode: **Cooling Your System**

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

Core 2: 4.5 Summarize environmental impacts and local environmental controls.

Episode Description

Previously we discussed the types of heat sinks, fans, and liquid cooling that are used to lower component and system temperatures. Now we will look at keeping your system cool through even the most difficult of tasks.

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Key Terms

- 1:27 - The purpose of fans is to intake cool air and exhaust hot air
- 2:01 - Objective term - Compressed/ canned air
- 2:52 - Objective term - Fan settings in the BIOS

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Quick Review

- You can maximize the airflow in your PC by practicing proper cable management and regular cleanings
- Use canned air or a PC blower instead of a vacuum when cleaning out a PC
- A motherboard's BIOS may have custom fan settings and temperature alerts

Episode: Installing and Troubleshooting a PSU

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

Core 1: 3.5 Given a scenario, install or replace the appropriate power supply.

Core 1: 5.1 Given a scenario, apply the best practice methodology to resolve problems.

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

Core 2: 4.4 Given a scenario, use common safety procedures.

Episode Description

Knowing how to install and troubleshoot errors with power supplies is essential. While it is generally a simple process, there are some things to look out for. Let's go through installing and troubleshooting a PSU together.

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Key Terms

- 0:37 - Objective term - Non-modular power supply
- 0:53 - Objective term - Always disconnect the power before installing a PSU
- 1:46 - Objective term - Modular power supply
- 2:07 - Objective term - Motherboard power connectors have unique shapes to help orient the power cable
- 2:23 - 24-pin power cable

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Key Terms

- 2:36 - CPU power
- 3:57 - Objective term - Front panel connectors/ headers
- 4:16 - Objective term - Practice proper power handling
- 4:29 - Power supply tester
- 5:46 - Objective term - Step 1: Identify the problem

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CompTIA

Key Terms

- 5:46 - Objective term - Step 2: Establish a theory of probable cause
- 6:07 - Objective term - Step 3: Test the theory to determine the cause
- 6:07 - Objective term - Step 4: Establish a plan of action to resolve the problem and implement the solution

Key Terms

- 6:58 - Objective term - Step 5: Verify full system functionality and, if applicable, implement preventive measures
- 7:25 - Objective term - Step 6: Document the findings, actions, and outcomes
- 7:48 - Objective term - No power can be a symptom of a dead PSU
- 8:00 - Objective term - Random rebooting, error code beeps, and locking up can also be a symptom of PSU issues

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Quick Review

- Always double check cables connections when building your PC
- If a PSU has died out, your system will not boot up and the PSU fan will not spin
- PSU problems can present themselves in a variety of ways ranging from random rebooting to complete system lockups