Objectives

- In this session, you will learn to:
 - Test and troubleshoot power supplies.
 - Test and troubleshoot memory.
 - Test and troubleshoot CPUs.
 - Test and troubleshoot system boards.

Troubleshoot Power Supplies

Before troubleshooting power supplies, you need to understand the following:

- Common power problems
- Common power supply issues

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Common Power Problems

Following are the various common power problems:

- Line noise
- Power sag
- Brownouts
- Frequency variations
- Overvoltage
- Power failure

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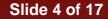
Session 7

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Common Power Supply Issues

- Following are the various common power supply problems:
 - Fan doesn't work.
 - Computer won't start.
 - Noise coming from power supply.

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Power Supply Wire Color Conventions

- The Power Supply wire color conventions are:
 - Yellow wire +12 (Disk drive motor, fans. Cooling Systems, & system bus slots)
 - Blue wire -12 (Some types of serial port circuits, and early PROM)
 - Orange +3.3 (Most newer CPUs, some types of system memory and AGP Video cards)
 - Red wire +5 (Motherboards, Baby AT, and earlier CPUs, and many motherboards components)
 - White wire -5 (ISA bus cards and early PROMs)
 - Black 0 (Ground)
 - Motor +/-12
 - Circuitry +/-5

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Testing Power Supply

- To test the Power Supply:
 - Locate a spare Molex connector, and remove it from the bundle if necessary so that
 - Measure the 5 volt output from the power supply using a multimeter
 - Measure the 12 volt output from the power supply using a multimeter

Activity 7-4

Activity on Troubleshooting Power Supplies

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Troubleshoot Memory

- Before troubleshooting memory, you need to understand the following:
 - Error checking
 - Common memory issues

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Error Checking

- Following are the error-checking mechanisms, which helps save the data used in memory modules:
 - The *Parity* is an error correction method that is used for electronic communications.
 - The Error Correction Code (ECC) is an error correction method that uses several bits for error-checking.

Common Memory Issues

Following are the common memory issues:

- Computer crashes
- Application data is corrupted.
- Memory errors displayed
- Computer seems to boot, but screen is blank
- Computer won't boot, and beep codes are heard
- New memory not recognized by the system

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Troubleshooting Memory Issues

- Some common steps to troubleshoot memory issues:
 - Perform a virus scan. Viruses can cause symptoms that mimic those of a memory problem.
 - Verify that the correct memory modules were installed in the system. Verify this with the system documentation.
 - Verify that the memory was installed and configured properly.
 - Try swapping the memory between slots.
 - Check for BIOS upgrades. If there are known problems, then a fix has probably been issued.

Troubleshoot CPUs

Following are the common CPUs issues:

- Overheating
- Chip creep
- Failure

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Troubleshoot CPUs

- To troubleshoot Overheating problems with CPUs
 - Verify that the air vents in the computer chassis are not blocked.
 - Move the system further from the wall if airflow is not sufficient.
 - Use compressed air to remove dust and dirt from fan components and the CPU heatsink.
 - Verify that the fan blades are turning freely; remove debris or obstructions.
 - Make sure the heat sink is securely clipped to the CPU.
 - If a cooling component has failed, replace it.
 - Configure the processor to eliminate overclocking.

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Troubleshoot CPUs (contd.)

- To troubleshoot chip creep problems with CPUs
 - Reseat the processor
- If a processor has failed, replace the processor

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Troubleshoot System Boards

Following are the common system board issues:

- Computer viruses
- Loose connections
- Out-of-date BIOS
- CMOS battery failure
- Overheating
- Electrical short-circuits
- Physical damage

Troubleshoot System Boards

- To troubleshoot system board problems:
 - If the computer displays error messages, research the messages to determine a possible cause.
 - Eliminate problems with all other system components.
 - Perform a virus scan.
 - Reseat all components on the system board, including both cables and connector pins.
 - Update the system BIOS.
 - Update device drivers.
 - Replace the CMOS battery.

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Summary

- In this session, you learned that:
 - There are various common power problems, such as line noise, power sag, brownouts, and frequency variations.
 - Common power supply issues are fan doesn't work, computer won't start and noise coming from power supply.
 - Parity and ECC are the error checking mechanism.
 - Computer crashes, memory errors display, and computer seems to boot, but screen is blank are common memory issues.
 - Overheating, chip creep, and failure are the common CPU issues.
 - Computer viruses, loose connections, out-of-date BIOS, and CMOS battery failure are the common system board issues.

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