# 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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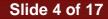
Session 7

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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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