Infomation Technology Essentials

COMP106

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Chapter 7

Troubleshooting System Components

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

Common Power Problems

- Following are the various common power problems:
  - Line noise
  - Power sag
  - Brownouts
  - Frequency variations
  - Overvoltage
  - Power failure

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.

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

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

Troubleshoot Memory

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

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

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

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.

Troubleshoot CPUs (contd.)

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

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.

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.