Chapter 4: Overview of Preventive Maintenance

IT Essentials v6.0

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Chapter 4 - Sections & Objectives

- 4.1 Preventive Maintenance
  - Explain why preventive maintenance must be performed on personal computers.
- 4.2 Troubleshooting Process
  - Explain how to troubleshoot computer problems.
- 4.3 Chapter Summary

4.1 Preventive Maintenance

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PC Preventive Maintenance Overview

- Benefits of Preventive Maintenance
  - Reduces potential hardware and software problems, computer downtime and repair costs by:
    - Improving data protection
    - Extending the life of the components
    - Improving equipment stability
- Preventive Maintenance Tasks
  - Hardware tasks include:
    - remove dust from fans, power supply, internal components and peripherals, clean the mouse, keyboard, and display, check for and secure any loose cables.
  - Software tasks include:
    - review and install appropriate OS, security and driver updates, regularly update virus definition files, regularly scan for virus and spyware, remove unwanted programs, regularly scan hard drive for errors.

PC Preventive Maintenance Overview (Cont.)

- Clean the Case and Internal Components
  - Dust or dirt can accumulate inside the computer.
  - Accumulated dirt and dust block airflow inside the case.
  - Use a low-air-flow ESD vacuum cleaner
  - Make sure to keep the following internal components clean: Heat sink and fan assembly, RAM, adapter cards, motherboard, fans, power supply and internal drives.
- Inspect Internal Components
  - Examine the computer on a regular schedule.
  - The main components to inspect are: CPU heat sink and fan assembly, RAM, storage devices, adapter cards, screws, cables, power devices, keyboard and mouse.

PC Preventive Maintenance Overview (Cont.)

- Environmental Concerns
  - Computers should not be operated in harsh environmental conditions.
  - Due to their mobile nature, laptops are subject to various environmental conditions.
- Guidelines to help ensure optimal computer operating performance include:
  - Do not obstruct vents or airflow to the internal components.
  - Keep the room temperature between 45 to 90 degrees Fahrenheit (7 to 32 degrees Celsius).
  - Keep the humidity level between 10 and 80 percent.

4.2 Troubleshooting Process

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Troubleshooting Process Steps

- Introduction to Troubleshooting
  - Requires an organized and logical approach to problems.
  - Eliminates variables and identifies causes of problems in a systematic order.
  - Troubleshooting skills get better with experience.
  - Before troubleshooting, protect user data.
- Identify the Problem
  - Ask the customer questions and be respectful.
  - Use both open-ended and closed-ended questions.
  - Listen to beep codes.
  - Use BIOS or UEFI to identify POST problems.
  - Use Event Viewer, Device Manager, Task Manager and other diagnostics tools to help identifying the problem.

Troubleshooting Process Steps (Cont.)

- Establish a Theory of Probable Cause
  - Create a list of the most common reasons for the error.
  - List the easiest or most obvious causes at the top and more complex causes at the bottom.
  - Research the symptoms.
- Test the Theory to Determine Cause
  - Test your theories one at a time.
  - If none of the theories can be confirmed, create new ones.
- Establish a Plan of Action to Resolve the Problem and Implement the Solution
  - Write down a plan to solve the identified problem.
  - May require simple or complex procedures.

Troubleshooting Process Steps (Cont.)

- Verify Full System Functionality and, if applicable, Implement Preventive Measures
  - The troubleshooting process is not over until full system functionality is confirmed.
  - If the system is working properly, implement preventive measures if needed.
- Document Findings, Actions and Outcomes
  - Explain the problem to the customer, both verbally and in writing.
  - The customer should try to reproduce the problem after the solution has been implemented.
  - Document the entire process for future reference.

Common Problems and Solutions

- PC Common Problems and Solutions
  - Computer problems can be attributed to hardware, software, networks, or some combination of the three.
  - Common PC hardware problems include:
    - Storage device problems
    - Motherboard and internal components problems
    - Power supply problems
    - CPU and memory problems

Identify the Problem
The computer will not boot or it locks up.
The CPU fan is making an unusual noise.
The computer reboots without warning, locks up, or displays error messages.
After upgrading from a single core CPU to a dual core CPU, the computer runs more slowly and only shows one CPU graph in the Task Manager.
A CPU will not install onto the motherboard.
The computer does not recognize the RAM that was added.

4.3 Chapter Summary

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Summary

This chapter discussed the concepts of preventive maintenance and the troubleshooting process.

- Regular preventive maintenance reduces hardware and software problems.
- Before beginning any repair, back up the data on a computer.
- The troubleshooting process is a guideline to help you solve computer problems in an efficient manner.
- Document everything that you try, even if it fails. The documentation that you create is a useful resource for you and other technicians.