

Module 14

Troubleshooting Hardware

Objectives

1. 4.2 Troubleshooting Hardware
2. 4.3 Troubleshooting Hard Drives
3. 4.8 Troubleshooting Laptops
4. 4.9 Troubleshooting Printers

TROUBLESHOOTING HARDWARE

Proper Cleaning Procedures

1. Follow proper cleaning procedures for each component:
 - A. Keyboard
 - B. Ventilation/fans
 - C. LCD display
 - D. Touch pad/mouse
 - E. Floppy drive
 - F. Optical disk drive
 - G. CD or DVD disc
2. CAUTION:
 - A. Use products specifically designed for cleaning LCD displays
 - B. Use a soft, lint-free cloth with an approved cleaning solution to avoid damaging surfaces.
 - C. Apply the cleaning solution to the lint-free cloth, not directly to the computer.
 - D. Use a cleaning disk for optical drives
 - E. When cleaning CDs, wipe the disc from the center outward
 - F. Use an approved vacuum

Hardware Problems

1. Unexpected Shutdowns - Computer turns off without warning:

A. Heat related issues:

- Verify all fans are working
- Clean the inside of the computer
- Verify the processor heatsink is properly connected
- Reapply thermal compound

B. Issue with operating system:

- Reboot the computer into the BIOS and let the computer sit
 - If the computer turns off, then it is a hardware problem
 - If the computer does not turn off, you are likely experiencing an issue with the operating system

Hardware Problems

2. Hardware issue on boot – Common error messages comes when you're trying to boot up your computer:

- A. Check and remove any floppy disks or other peripheral that may have boot privileges
- B. Listen for beep codes

Hardware Problems

3. Continuous Reboots – Usually a software problem

A. Have you install or upgrade anything?
Changed out any hardware?

B. Hit F8 at start and boot in Safe Mode

- If it runs then it is most likely a driver problem

C. Hit F8 at start and run “Last known Good”

D. Run System Restore

Hardware Problems

4. Intermittent Device Failure

- A. Heat problems: A component is getting too hot and overheating
- B. Power problems: The PSU is supplying too little or too much power, or cannot maintain a constant supply
- C. Firmware Problem or Configuration: The Operating System or device drivers do not correctly support a component
- D. Motherboard problems: A motherboard component that communicates with the other components is damaged or misbehaving
- E. Manufacturing Defect: A particular sub-part of a component is faulty but the PC functions normally until that area is accessed

Hardware Problems

5. **BIOS Errors** – System clock resets to earlier time or CMOS configuration not found: Battery needs to be replaced
6. **No Power** – Environmental issues, loose cable, bad surge protector or UPS, power supply malfunction: Check, clean, or replace power supply
 - **Noises** – Hear any abnormal noises coming from your computer: fan failure
7. **Fans Spins but No Power to Devices** – Power supply is not producing adequate voltage, CPU issue, Motherboard issue, cable unplugged
8. **Smoke or Burning Smell** – Power supply going out, card not properly seated, dust buildup

Blue Screen Of Death (BSOD)

1. Also known as STOP Error or visual fault error
2. Displayed by the operating system upon encountering a critical error that causes the system to crash
3. Can be related to hardware, updates and drivers, causing the computer to stop responding in order to prevent damage to the hardware or data.
4. Not enough free space available on the primary partition
5. The screen presents information for diagnostic purposes
6. Solutions:
 - A. Undo your last procedure
 - B. Free up space on the primary partition
 - C. Undo driver updates and check for new updates
 - D. Scan for viruses
 - E. Apply or remove recent Windows Updates
 - F. Check the System and Application logs in Event Viewer
 - G. Perform diagnostic tests on all hardware

```
***STOP: 0x000000D1 (0x00000000, 0xF73120AE, 0xC0000008, 0xC0000000)
A problem has been detected and Windows has been shut down to prevent damage
to your computer.
DRIVER_IRQL_NOT_LESS_OR_EQUAL

If this is the first time you've seen this Stop error screen, restart your
computer. If this screen appears again, follow these steps:

Check to make sure any new hardware or software is properly installed. If this is a
new installation, ask your hardware or software manufacturer for any Windows updates
you might need.

If problems continue, disable or remove any newly installed hardware or software.
Disable BIOS memory options such as caching or shadowing. If you need to use Safe
Mode to remove or disable components, restart your computer, press F8 to select
Advanced Startup Options, and then select Safe Mode.

*** WXYZ.SYS - Address F73120AE base at C0000000, DateStamp 36b072a3

Kernel Debugger Using: COM2 (Port 0x2f8, Baud Rate 19200)
Beginning dump of physical memory
Physical memory dump complete. Contact your system administrator or
technical support group.
```

Visual Fault Error

Tools

Use a paper clip to eject a CD that is inoperable or dead.



CD/DVD Removal

Tools

1. Multimeter – Used to troubleshoot electrical problems



Multimeter

2. Power Supply Tester – Automatically check for bad voltages or test manually using a multimeter



Power Supply Tester

3. POST Card – Displays error codes generated during POST



POST Card

TROUBLESHOOTING HARD DRIVES

Hard Drive Problems

- 1. Read/Write Failure** – Occurs when a hard drive malfunctions and the stored information cannot be accessed
 - A. Solution – Replace the drive
- 2. Slow Performance** – Caused by a system configuration factor
 - A. Solution:
 - Run diagnostics utility
 - Defragment the drive
 - Remove other devices on cable
 - Update IDE/ATA controller driver
 - Upgrade the drive

Hard Drive Problems

3. Loud Clicking Noises – Hard drive failure imminent

A. Solution – Replace the drive

4. Failure at Boot – Computer fails to start up

A. Solution:

- Incorrect boot sequence
- Check the BIOS to ensure that the drive is recognized correctly at startup.
- Physically check all cabling
- Move the drive to another computer and do a thorough scan
- Check the BIOS settings for S.M.A.R.T drive reporting
- Restore the boot sector
- Replace the drive

Tools

1. **CHKDSK** – Displays the file system integrity status
2. **Format** – Prepares a data storage device for initial use
3. **FDISK** – DOS and Windows 9x formatting command
4. **File Recover Software** – Allows you to find and recover deleted files regardless of their type

TROUBLESHOOTING LAPTOPS

Display Problems

- 1. No Display** – Same as desktop
 - A. Solution** – Wrong resolution; Safe Mode and change. Wrong drive; update. Bad cable; replace. Bad video card; replace.
- 2. Dim** – Image is visible but hard to see
 - A. Solution** – Backlight has gone out; replace transformer. Bad cable; replace.
- 3. Flickering** – Image flashes
 - A. Solution** - The refresh rate is set too low, adjust. . Loose or damaged cable; replace. Bad or loose video card; replace or reseal. Wrong video driver; update. Power issue or faulty surge protector; plug directly into wall or replace surge protector.
- 4. Ghost Cursor** – Faint image visible, Artifacts, Burn-in
 - A. Solution** – Video card; replace. Loose or broken cable; replace. Pixel problem; run a third-party app like [JScreenFix](#).
- 5. Cannot Display to external monitor** – Laptop screen work but not external display
 - A. Solution** – Resolutions are not compatible; adjust. Laptop not set; adjust (fn+F5)

Keyboard Problems

- 1. Sticky Keys** – Contamination build-up or spill
 - A. Solution – Remove keys, clean with mild detergent (let dry thoroughly), clean keyboard with alcohol, replace keys.
- 2. Indicator Lights** – Absence of lights or not changing
 - A. Solution – Reboot. Set BIOS to turn on at startup.

Wireless Problems

- 1. Intermittent Wireless** – Wireless signal drops out frequently
 - A. Solution – Interference; Move the AP or laptop. Update wireless drivers. Change to managed by your wireless card's utility instead of the Windows utility or vice versa. Change the power management settings of your wireless adapter.
- 2. No Wireless Connectivity** – Can't find or connect to a wireless network
 - A. Solution – Get closer to the AP, restart the AP and laptop, update drivers, manually enter wireless settings
- 3. No Bluetooth** – Can't find or connect to a Bluetooth device
 - A. Solution – Turn on or update drivers

Power Problems

1. Battery Not Charging

A. Solution – Check external power. Check the connector. Bad external power supply; replace. Replace battery.

Disassembly Procedures

1. Proceed with caution!!!
 - A. Take pictures as you remove components
 - B. Document and label every screw and component you remove with its location
 - C. Organize Parts in the order they were removed
 - D. Manufacturer documentation will give you detail instruction on how to proceed
 - E. Use the right tools for the job

TROUBLESHOOTING PRINTERS

Printer Maintenance

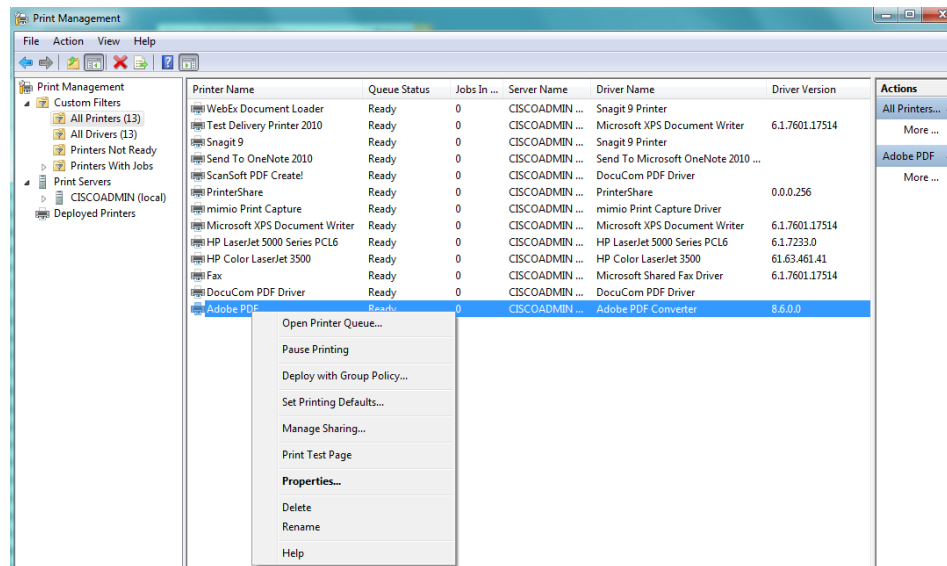
1. Procedures vary widely
2. Research printer documentation or manufacturer's Web site for specific maintenance tips
3. Keep consumables on hand
 - A. Maintenance Kit – Rollers, fuser, drum
4. Clean inside and outside of the printer
 - A. Toner Vacuum – Approved type only
 - B. Compressed Air – don't use around toner

Print Management

1. Can be accessed by:

A. Administrative Tools → Print Management

B. Printmanagement.msc from Run command



Print Management Window

Connectivity Problems

1. No Connectivity – Check power and cable
2. Garbled Characters – Check cable and drivers
3. Print Queue – restart queue or reboot
4. Low Memory – restart printer or add memory
5. Access Denied – Manage rights
6. Unable to install – Manage share
7. Error Codes – Consult manufacturer

Problems with Laser Printers

1. Poor quality or faded print
2. A portion of the page does not print
3. Streaks or vertical lines on page
4. Distorted or Ghost Image
5. Printer stays in warm-up mode
6. Toner not Fused to paper
7. Paper Jam or Paper Out message appears
8. Printing is slow

Problems with Ink-Jet Printers

1. Print quality is poor
2. Printing is intermittent or absent
3. Lines or dots are missing from the printed page
4. Ink streaks appear on the printed page

Problems with Dot-Matrix Printers

1. Print quality is poor
2. Print head moves back and forth but nothing prints

Problems Printing from Windows

1. Try to print a test page using the Printer window
2. Print queue or spool might be stalled
3. Reboot PC and verify that printer cable or cable connections are solid
4. Remove and reinstall printer driver
5. Try another printer driver
6. In BIOS/CMOS setup, check configuration of USB, serial, or parallel port that the printer is using
7. Disable bidirectional support for the printer

Problems Printing from Windows

8. Check resources assigned to printer port
9. Disable “Check Port State Before Printing”
10. Verify printer properties; lower the resolution
11. Disable printer spooling (if you can print from DOS but not from Windows)
12. Application may be incompatible with Windows (Windows 9x)
13. Bypass spooling by printing to a file
14. Try the printer on another PC

Summary

In this module we discussed:

1. Cleaning procedures
2. Hardware troubleshooting
3. Visual Fault Errors
4. Troubleshooting Tools
5. Hard drive troubleshooting and tools
6. Laptop troubleshooting
7. Printer troubleshooting