12.14.6 System Errors Facts

Errors, lockups, and system crashes are typically caused by the following:

- Software bugs (errors in an application, the operating system, or driver code)
- Corrupt or missing operating system files
- Incorrect, corrupt, or incompatible device drivers
- Overheated hardware
- Failing hardware (memory, hard disk, or other component)

A *Blue Screen of Death* (BSOD), also called a stop error, is an error that is so severe that Windows can no longer continue to function. When this type of error occurs, the system will stop and display a blue screen with information related to the error. On Mac OS, you may see the cursor turn into a pinwheel and you can't do anything. This is sometimes called the *Pinwheel of Death*.

When a problem occurs, use basic troubleshooting to identify and isolate the problem. With system errors, often the cause is difficult to locate. Use the following suggestions:

- Identify the conditions when the error occurs. Does the error happen only when running a specific program or accessing a particular hardware device? Does it happen only after running the system for a while? Identify running programs and loaded device drivers.
- Capture any error messages displayed. A smart phone is a great tool for doing this. Then, check Event Viewer for recent events. Use the internet to search for solutions based on the error.
  - The vendor's site will usually provide the best knowledge base. If you have the exact error message captured, search for the error message text.
  - If the vendor's site doesn't provide a solution, you may want to consider using Google to see if there are other recorded instances of your problem.
  - Windows Reporting is a feature that reports application errors to Microsoft. If known information about the problem you have experienced is available, you will receive a link to a web page that contains information about the problem.
- Start with recently installed or updated hardware or software. If necessary, remove the new component and see if the problem goes away.
- Update operating system files, applications, and device drivers that are related to the error condition.
- Inspect the system hardware.
  - Make sure that cables are plugged in, that there aren't any bent pins, and that cards are properly seated in expansion slots.
  - Look for worn or frayed cables that might be causing a short.
  - Check status lights on components that indicate whether the device is receiving power or functioning normally.
  - Check components for dark spots that might indicate electrical shorts.
  - Listen as the system is running. Can you hear the fans running? Are there any unusual sounds?
  - If you see smoke or smell something burning, shut off the system immediately to prevent damage or hazards.
  - Look for dust buildup on components. Clean components as necessary.
- Run utilities to diagnose hardware components.
  - Monitor the system temperature to ensure components are not overheating.
  - Use a memory tester to verify that the memory modules are functioning properly.
  - Use ScanDisk to check hard disks for bad clusters.
  - View S.M.A.R.T. data to see if hard disks are failing.
- When troubleshooting operating system problems, the system log files can be an invaluable resource for identifying exactly what happened. For example, Event Viewer displays messages generated by the Windows operating system and by applications running on the system. Each entry is categorized according to the severity of the issue it describes:
  - Information
  - Warning
  - Error
  - Audit success/failure
- Windows stores these messages in the following logs:
  - The Application log contains application-related events.
  - The Security log contains security-related events.
  - The Setup log contains events related to an application installation.
  - The System log contains system-related events, such as system modifications, malfunctions, and errors.

Be aware of the following common problems and causes:

- To prevent corrupt system files, ensure that users shut their systems down cleanly.
- Sometimes a system may seem to be locked up, but in reality the system is just running slowly. This condition may be

caused by several factors:
    - The processor is over-utilized. Give the system time to finish some tasks, or close unnecessary applications to see if the unresponsive program resumes.
    - The system is infected with malware. To prevent this, run full anti-malware scans on a regular basis.
    - The system has inadequate memory installed. If this is the case, add more memory to the system.
    - The system has inadequate video hardware. Avoid using integrated video adapters. A video adapter board with adequate video memory will perform much better.
    - The page file configuration has not been optimized. You can improve performance by moving the page file to a disk other than the system disk. Creating page files on multiple storage devices can also increase system performance.
    - The hard disk is overly full and heavily fragmented. Upgrade to a bigger disk and keep it defragged regularly.
    - There are unnecessary applications being loaded at system startup. Use Task Manager turn off startup applications that aren't used frequently. Uninstall applications on the system that aren't needed.
- If you have a specific application that stops responding, you can use Task Manager to end or stop the application. Be aware that you might lose any data generated by the application.
- Spontaneous reboot can be caused by a bad power supply, device driver, or an overheated CPU.
- Intermittent system crashes without any other apparent cause can be caused by overheated components.
- A noisy fan might be caused by something rubbing on the fan (such as a cable inside the case). If there is nothing touching the fan, then the bearings could be going bad. Replace the fan before it stops working.
- A clicking noise when reading or writing data from the hard disk is an early sign of a failing drive. Move data from the drive as soon as possible.
- A blue screen error that continually references the same memory address could indicate memory that is starting to fail.
- If an error message indicates that a DLL file associated with an application is corrupt or missing, do one of the following:
    - Manually copy a known-good copy of the DLL back into the appropriate location in the file system.
    - Repair the installation (if possible) using the application installer.
    - Uninstall the application and then reinstall it.
    - Restore the system to a prior restore point.
- If an error message indicates that an operating system DLL file is corrupt or missing, do one of the following:
    - Manually copy a known-good copy of the DLL back into the appropriate location in the file system.
    - Restore the system to a prior restore point.
    - Run the system file checker utility from the command prompt (run as Administrator). The command is **sfc /scannow**. This utility scans all system files and replaces missing, corrupt, or incorrect versions of these files.
