CMP 104 – COMPUTER SYSTEM DESIGN
(3 UNITS)

Module 8; Week 12

TOPIC 8: Advanced Operating System Troubleshooting

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Troubleshooting is a skill that is needed in all areas of problem-solving for computer hardware and software.

The operating system acts as an interface between hardware and applications, so a problem may not be in the operating system but may actually be caused by a fault in the hardware, application, or the operating system itself. Most computers are also connected to a network, so the problem can be caused by the interaction of the system and the network and other devices. This makes the resolving operating system issues a particularly difficult area of troubleshooting for computer technicians.

Six Steps for Troubleshooting Review

Remember to use the troubleshooting steps in Table 1 as a guide to help you diagnose and repair problems.

Table 1: Six Steps for Troubleshooting

Troubleshooting Steps	
Step 1	Identify the problem.
Step 2	Establish a theory of probable cause.
Step 3	Test your theories to determine the cause of the problem.
Step 4	Establish a plan of action to solve the problem and implement the solution.
Step 5	Verify full functionality and, if applicable, implement preventive measures.
Step 6	Document your findings, actions, and outcomes.

Apply Troubleshooting Process to Operating Systems

Operating system issues are not always obvious and easy to diagnose because the origin of the problem may be hardware or software incompatibilities, driver issues, problems inherent to the OS, or some other issue. The solution may not come easily, but with a practical, logical approach, finding it becomes easier. This is why the troubleshooting process is vital to guide in problem-solving.

Advanced Problems and Solutions for Operating Systems

Operating system problems can be attributed to hardware, software, networks, or some combination of the three. You will resolve some types of OS problems more often than others. A *stop error* is a hardware or software malfunction that causes the system to lock up. An example of this type of error is known as the ***blue screen of death (BSOD)*** and appears when the system is unable to recover from an error.

The Event Log and other diagnostic utilities are available to research a stop error or BSOD error. To prevent these types of errors, verify that the hardware and software drivers are compatible. In addition, install the latest patches and updates for Windows. When the system locks up during startup, the computer can automatically reboot. The reboot is caused by the ***auto-restart function*** in Windows and makes it difficult to see the error message.

The auto-restart function can be disabled in the Advanced Startup Options menu. Table 2 on pages 3-to-5 shows some advanced operating system problems, their probable causes and solutions.

Table 2: Advanced Problems and Solutions for Operating Systems

Identify the Problem	Probable Causes	Possible Solutions
The computer displays an "Invalid Boot Disk" error after POST.	■ Media that does not have an operating system is in a drive. ■ The boot order is not set correctly in the BIOS/UEFI settings. ■ The hard drive is not detected. ■ The hard drive does not have operation system installed. ■ MBR/GPT is corrupted. ■ The computer has a boot sector virus. ■ The hard drive is failing.	■ Remove all media from the drives. ■ Change the boot order in the BIOS/UEFI settings to start with the correct boot device. ■ Reconnect the hard drive cables. ■ Install an OS. ■ Use the *bootrec /fixmbr* command from the System Recovery Options of Windows 7 or Vista. ■ Run virus removal software. ■ Replace the hard drive.
The computer displays an "Inaccessible Boot Device" error after the POST.	■ A recently installed device driver is incompatible with the boot controller. ■ BOOTMGR is corrupted.	■ Use the last known good configuration to boot the computer. ■ Boot the computer in safe mode and load a restore point from before the installation of new hardware.
The computer displays a "BOOTMGR is missing" error after POST.	■ BOOTMGR is missing or damaged. ■ The boot order is not set correctly in the BIOS/UEFI settings. ■ The MBR/GPT is corrupted. ■ The hard drive is failing.	■ Restore BOOTMGR using the Windows Recovery Environment. ■ Change the boot order in the BIOS/UEFI settings to start with the correct boot device. ■ Run *chkdsk /F /R* from the recovery console.
A service failed to start when the computer booted.	■ A service failed to start when the computer booted. ■ The service is not enabled. ■ The service is set to Manual and the failed service requires another service to be enabled.	■ Enable the service. ■ Set the service to Automatic and re-enable the required service.

A device failed to start when the computer booted.	■ The device has been disabled in the BIOS settings. ■ The device has a conflict with a newly installed device. ■ The driver is corrupted.	■ Enable the device in the BIOS settings. ■ Remove the newly installed device. ■ Re-install or rollback the device driver.
A program listed in the registry is not found.	■ The uninstall program did not work correctly. ■ The hard drive has become corrupted. ■ The computer has a virus.	■ Re-install the program and run the un-install program again. ■ Run chkdsk /F /R to fix the hard drive file entries. ■ Scan for and remove the virus.
The computer continually restarts without displaying the desktop.	■ The computer is set to restart when there is a failure. ■ A startup file has become corrupted.	■ Press F8 to open the Advanced Options Menu and choose Disable automatic restart on system failure. ■ Run chkdsk /F /R from the Recovery Environment. ■ Run the Automatic Repair from the Recovery Environment in Windows 8.
The computer displays a black or blue screen of death (BSOD).	■ A driver is not compatible with the hardware. ■ There is a hardware failure.	■ Research STOP error and the name of the module that produced the error. ■ Replace any failing devices with known-good device.
The computer locks up without any error messages.	■ The CPU of FSB settings are incorrect on the motherboard or in the BIOS settings. ■ The computer is overheating. ■ An update has corrupted the operating system. ■ There is a hardware failure. ■ The computer has virus.	■ Check and reset the CPU and FSB settings. ■ Check and replace any cooling devices as necessary. ■ Uninstall the software update or perform a System Restore. ■ Run chkdsk /F /R from the Recovery Environment. ■ Replace any failing devices with known-good devices. ■ Scan for and remove the virus.

An application does not install.	The installation application is not compatible with the operating system.	Run the application under compatibility mode.
The search feature takes a long time to find results.	■ The index service is not running. ■ The index service is not indexing the correct locations.	■ Start the index services using services.msc. ■ Change the settings of the index service in the Advanced Options panel.
The computer is running slowly and has a delayed response.	■ A process is using most of the CPU resources.	■ Restart with services.msc. ■ If the process is not needed, end the process with Task Manager. ■ Restart the computer.
When you run a program, a missing or corrupt DLL message is displayed.	■ One of more programs using the DLL file was uninstalled and removed the DLL file that was needed by another program. ■ The DLL file was corrupted during a bad installation.	■ Reinstall the program that has the missing or corrupted DLL file. ■ Reinstall the application that uninstalled the DLL file. ■ Find a copy of the DLL file and reinstall it. ■ Boot the computer in Safe Mode and run sfc /scannow.
RAID is not detected during installation.	■ Windows does not include the proper drivers to recognize RAID. ■ RAID settings in BIOS/UEFI are incorrect.	■ Install the proper drivers ■ Change the settings in BIOS/ UEFI to enable RAID.
A system file is corrupted.	Computer was shut down improperly.	■ Repair your computer from the advanced startup options menu. ■ Boot the computer in Safe Mode and run sfc /scannow.
Computer boots to Safe Mode.	The computer has been configured to boot in Safe Mode.	Use msconfig to adjust the startup settings for the system.
A file fails to open.	■ The computer has a virus. ■ The file is corrupted. ■ The file type is not associated with any program.	■ Run virus removal software. ■ Restore the file from backup. ■ Choose a program to open the file type.