Lab 5

Troubleshooting Hardware Issues

This lab contains the following exercises and activities:

|  |  |
| --- | --- |
| Exercise 5.1 | Running the Memory Diagnostic Tool |
| Exercise 5.2 | Running Disk Tools |
| Exercise 5.3 | Working with Device Manager |
| Exercise 5.4 | Checking for Unsigned Drivers |
| Exercise 5.5 | Troubleshooting Hardware Problems |

BEFORE YOU BEGIN

The lab environment consists of student workstations connected to a local area network, along with a server that functions as the domain controller for a domain called contoso.com. The computers required for this lab are listed in Table 5-1.

Table 5-1

Computers required for Lab 5

|  |  |  |
| --- | --- | --- |
| Computer | Operating System | Computer Name |
| Server | Windows Server 2008 R2 | RWDC01 |
| Workstation 1 | Windows 7 Enterprise | NYC-CL1 |

|  |  |
| --- | --- |
| NOTE | In a classroom lab environment, there will be one classroom server and the students will have workstations named using consecutive numbers in place of the xx and yy variables. In a virtual lab environment, each student will have three virtual machines, named RWDC01, NYC-CL01, and NYC-CL02. |

In addition to the computers, you will also require the software listed in Table 5-2 to complete Lab 5.

Table 5-2

Software required for Lab 5

|  |  |
| --- | --- |
| Software | Location |
| Lab 5 student worksheet | Lab05\_worksheet.rtf (provided by instructor) |

Working with Lab Worksheets

Each lab in this manual requires that you answer questions, make screen shots, and perform other activities that you will document on a worksheet named for the lab, such as Lab05\_worksheet.rtf. Your instructor will provide you with access to the worksheets. It is recommended that you use a USB flash drive to store your worksheets, so you can submit them to your instructor for review. As you perform the exercises in each lab, open the appropriate worksheet file using WordPad, fill in the required information, and save the file to your flash drive.

SCENARIO

As a desktop technician at Contoso Ltd. you realize that hardware and software are tightly coupled together. Therefore, you need to determine whether problems are specific hardware problems, software problems, or a problem with a driver that allows the hardware to interface with the operating system and applications.

After completing this lab, you will be able to:

Run the Memory Diagnostic Tool

Run Disk Tools

Work with Device Manager

Check for Unsigned Drivers

Troubleshoot Hardware Problems

Estimated lab time: 75 minutes

|  |  |
| --- | --- |
| Exercise 5.1 | Running the Memory Diagnostic Tool |
| Overview | You have a computer that is running Windows 7. Unfortunately, the computer has stopped responding several times per day. Since power seems steady, you want to run the memory diagnostic tool. |
| Completion time | 15 minutes |

1. Turn on the NYC-CL1 workstation and Restart windows. While booting press **F8** before Windows loads. **Note**: You might need to press F8 repeatedly.

2. When the *Advanced Startup menu* appears, select the **Repair Your Computer** option and press the **Enter** key.

3. When the *System Recovery Options* dialog box appears, click the **Next** button.

4. Specify the username **Admin** and **Pa$$w0rd** password and click **OK**.

5. Click **Windows Memory Diagnostic**.

6. Select the **Restart Now and Check for Problems (Recommended)** option. The computer will automatically reboot and start the memory diagnostic. When the diagnostic tool is completed, it will reboot. The actual diagnostics will take some time to complete.

|  |  |
| --- | --- |
| Exercise 5.2 | Running Disk Tools |
| Overview | Now that the memory checks out okay, you want to check the disks. So you decide to run the disk tools to see if you can find a problem with the disks. |
| Completion time | 20 minutes |

1. Turn on the NYC-CL1 workstation and log on using the **contoso\Administrator** account and the password **Pa$$w0rd**.

2. Click the **Start** button and Select **Computer**.

3. Right-click the **C** drive and select **Properties**.

4. Click the **Tools** tab.

5. Click the **Check Now** button under *Error-checking*.

6. For sake of time, keep the default settings and click the **Start** button.

7. When a dialog box appears that says *Cannot check the disk while it is in use*, click the **Schedule Disk** **Check** button.

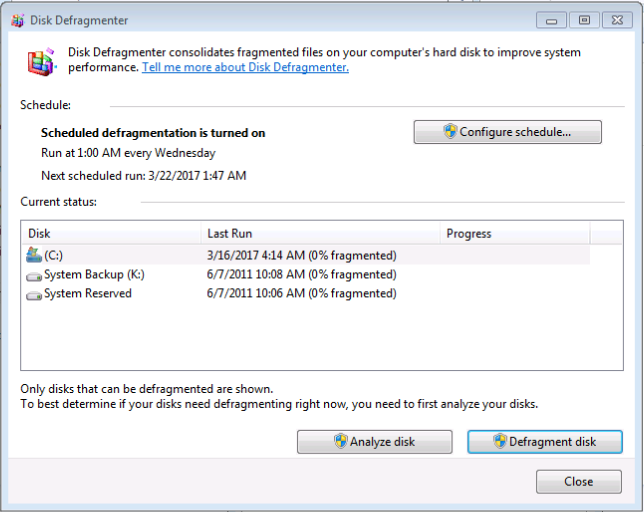
8. Close all dialog boxes and reboot Windows.

9. When the computer is done and reboots, log on using the **contoso\Administrator** account and the password **Pa$$w0rd**.

10. Click the **Start** button and Select **Computer**.

11. Right-click the **C** drive and select **Properties**.

12. Click the **Tools** tab.

13. Click the **Defragment now** button under *Defragmentation*.

14. Click the **Defragment disk** button.

15. Take a screen shot of the Disk Defragmenter session you created by pressing **Ctrl+Prt Scr**, and then paste the resulting image into the Lab05\_worksheet file in the page provided by pressing **Ctrl+V**.

|  |  |
| --- | --- |
| Exercise 5.3 | Working with Device Manager |
| Overview | Since you’ve installed Windows on this computer, you have never opened Device Manager to see if there are any problems with your drivers. You would also like to see what was detected in your system. |
| Completion time | 10 minutes |

1. Turn on the NYC-CL1 workstation and log on using the **contoso\Administrator** account and the password **Pa$$w0rd**.
2. Click the **Start** button and select **Devices and Printers**.

|  |  |
| --- | --- |
| Question 1 | What external devices do you have?  Fax and Microsoft XPS Document Writer |

1. Close **Devices and Printers**.
2. Click **Start** andRight-click **Compute**r and select **Properties**.
3. Click **Device Manager**.
4. Expand *Computer* and notice the drivers assigned to the computer.
5. Expand *Disk Drives*.

|  |  |
| --- | --- |
| Question 2 | What disk drive(s) do you have?  Virtual HD ATA Device |

1. Right-click the drive and select **Properties**.
2. Click the **Volumes** tab.
3. Click the **Populate** button. Notice the logical volumes that appear.
4. Click the **Driver** tab, Verify and click OK.

|  |  |
| --- | --- |
| Question 3 | Who is the provider and what is the driver date, the driver version, and the digital signer?  Provider – Microsoft  Driver Date – 6/21/2006  Driver Version – 6.1.7600.16385  Digital Signer – Microsoft Windows |

1. Expand *System devices*. Notice all of the drivers.
2. Expand *Network adapters*.
3. Right-click your network adapter and select **Disable**. Click on Yes to disable the network adapter

|  |  |
| --- | --- |
| Question 4 | What icon appeared for a disabled device  A black arrow |

1. Right-click your network adapter and select **Enable**.

|  |  |
| --- | --- |
| Exercise 5.4 | Checking for Unsigned Drivers |
| Overview | Microsoft started using unsigned drivers because third-party drivers were causing many problems. Signed drivers make sure that the driver has been thoroughly tested and includes a digital certificate showing where the driver came from and that it has not been altered. During this scenario, you are going to check for unsigned drivers. |
| Completion time | 10 minutes |

1. Click the **Start** button, click **All Programs**, click **Accessories**, right-click **Command prompt** and select **Run as administrator**.
2. At the command prompt, execute the following command:

**sigverif.exe**

1. Click the **Start** button. Once the File Signature Verification is completed Click OK.

|  |  |
| --- | --- |
| Question 5 | How many unsigned drivers did you find? What are they?  There was no unsigned drivers. |

1. Click the **Close** button to close the *Signature Verification Results* dialog box.
2. Close the File *Signature Verification* tool.
3. Back at the command prompt, execute the following command:

**driverquery /si >unsign.txt**

|  |  |
| --- | --- |
| Question 6 | By looking at the command prompt, in what folder is the unsign.txt file created?  C:\windows\system32 |

1. Click the **Start** button. Type **C:\windows\system32** in the *Search programs and files* text box and press the **Enter** key.
2. Double-click the **unsign** file.
3. Scroll through the text file and determine which files are signed and which files are not signed.
4. Close Notepad and the command prompt.

|  |  |
| --- | --- |
| Exercise 5.5 | Troubleshooting Hardware Problems |
| Overview | While this course is focused on configuring and troubleshooting Windows problems, Windows runs on hardware. And from time to time, hardware components fail. Therefore, besides making sure the correct driver is loaded and the correct software components are installed and enabled, you may need to troubleshoot and replace hardware components. |
| Completion time | 20 minutes |

|  |  |
| --- | --- |
| NOTE | Different from the other exercises, this exercise is a paper exercise in troubleshooting computer problems. |

**Scenario 1: Computer Will Not Boot**

1. You work for the Contoso Corporation. You get a call from a user saying that her computer will not turn on. For most users at your company running Windows 7, the standard computer is an OEM computer with a single dual-core processor, 4 GB of memory, a single network card, a DVD/Blu Ray player, and a Super VGA monitor.
2. Probably before you start troubleshooting, you should introduce yourself and assure the customer that you are there to help. Next you should get information on who the user is and how to contact that person. This may be as simple as getting the user’s name, possible email address, and phone number or phone extension.
3. So when talking with the user, you should let the user explain the problem and only ask questions initially for clarification. So up to this point, the user has said she came in as she does every morning and turned the power button to her computer on but nothing happened.
4. One question that is often overlooked that you should ask, “Were any changes made to the system recently, including moving furniture or computers in the office?” While it may or may not be relevant, the answer to the question can save you a lot of time in troubleshooting problems.

|  |  |
| --- | --- |
| Question 7 | So the user has said nothing has happened when she tried to turn the computer on. So far, you have no other information. Therefore, what clarification questions should you ask?  Does the computer make any noises at all or show any lights? |

1. So let’s say that the user says that she sees no lights on the computer or display, does not hear the fan run, and did not hear any beeps.

|  |  |
| --- | --- |
| Question 8 | What is the first obvious thing you should have the user check?  Is the computer plugged in with the power on? |

|  |  |
| --- | --- |
| Question 9 | Within the corporation, most computers are plugged into a surge protector. Therefore, what should you also have the user check?  Check the surge protector that the power hasn’t stopped. |

|  |  |
| --- | --- |
| Question 10 | Can you think of anything that you can have a user check?  If there is any damaged wires. |

1. At this point, you decided that there is not much more you can do for the user over the phone. So you decide to go pick up her computer. You get to her office and confirm that the computer will not boot and that it is connected properly.
2. When you get back to your cubicle, you connect her computer to your monitor, keyboard and mouse and you confirm that the computer still does not start.

|  |  |
| --- | --- |
| Question 11 | What should your next step be?  Check that all the components and cables are connected in the computer. |

1. You check that all connections and cables are present and connected properly.

|  |  |
| --- | --- |
| Question 12 | If all the connections are connected properly, which item most likely failed if you have no lights and no fan, and the computer provides no beeps and is a high-failure item?  Power supply |

|  |  |
| --- | --- |
| Question 13 | You made sure that your AC outlet is supplying power and that the power cable is connected properly to the computer and the internal cables are connected properly. Before you replace the power supply, what is an easy item that is overlooked on power supply that may cause the system from not powering on?  An extra power switch. |

1. So you replace the power supply and everything comes up fine.

|  |  |
| --- | --- |
| Question 14 | If the system still did not work, what are the two primary components that mostly cause the computer not to boot?  Faulty power cable and some power supplies have an extra power switch that people don’t know about. |

|  |  |
| --- | --- |
| Note: | Before you replace the power supply, you could also use a voltmeter or multimeter to measure the output of the power supply. |

**Scenario 2: Computer Keeps Rebooting**

1. You work for the Contoso Corporation. For most users at your company running Windows 7, the standard computer is an OEM computer with a single dual-core processor, 4 GB of memory, a single network card, a DVD/Blu Ray player, and a Super VGA monitor.
2. A user calls you and says that after turning on the computer, the computer reboots after 15 or 20 minutes. Since the computer is constantly rebooting, the user is not getting much work done.
3. So you ask, “Were any changes made to the system recently?” The user responds no. You also ask when the problems started occurring and if the user has seen any of this before. The user says it started this morning and the user has not seen the problem before.
4. Before you go to his office, what should you instruct that user to try?

|  |  |
| --- | --- |
| Question 15 | When a computer reboots randomly after a certain amount of time, what usually causes this type of behavior?  Overheating |

|  |  |
| --- | --- |
| Question 16 | Assuming that a component (such as a fan) has not failed, what could you check externally that might cause a system to overheat?  The environment the computer is in e.g. crammed or close to heating. |

|  |  |
| --- | --- |
| Question 17 | Before you go to her office, what should you instruct the user to do that might cause this type of problem?  Open windows and get air flow to the room. |

1. You go to his office and retrieve his computer to take back to your office so that you can troubleshoot the problem.

|  |  |
| --- | --- |
| Question 18 | Before checking for hardware problems, what kind of software problems can cause a computer to reboot randomly?  Virus. |

|  |  |
| --- | --- |
| Question 19 | When a computer reboots randomly after a certain amount of time, generally, what would cause this type of behavior?  Overheating. |

|  |  |
| --- | --- |
| Question 20 | Before opening the computer, what is the first thing you should check that may cause a computer to overheat?  Check that airflow can get through the computer. |

1. You then open the computer up. You decide to check all of the connections on the inside of the computer and all looks good.

|  |  |
| --- | --- |
| Question 21 | When first looking inside the computer and even before checking the actual connections, what should you check that might contribute to a system overheating?  Check that the fan isn’t covered up with dust. |

|  |  |
| --- | --- |
| Question 22 | What failure of an internal component would normally cause a system to overheat if it isn’t the power supply fan?  CPU or CPU Fan. |

|  |  |
| --- | --- |
| Question 23 | What four main components, if faulty, could cause the system to reboot randomly?  Processor, Motherboard, RAM and Power Supply. |