Troubleshooting Windows

Chapter 19

Overview

- **In this chapter, you will learn how to**
  - Troubleshoot Windows boot problems
  - Troubleshoot Windows GUI problems
  - Troubleshoot Windows application problems

Failure to Boot

Failure to Boot: Hardware or Configuration

- **Determine the symptoms:**
  - Blank screen/error messages
  - Sounds/smells (clicking hard drive, burning components)
  - Hardware issue: troubleshoot and repair/replace

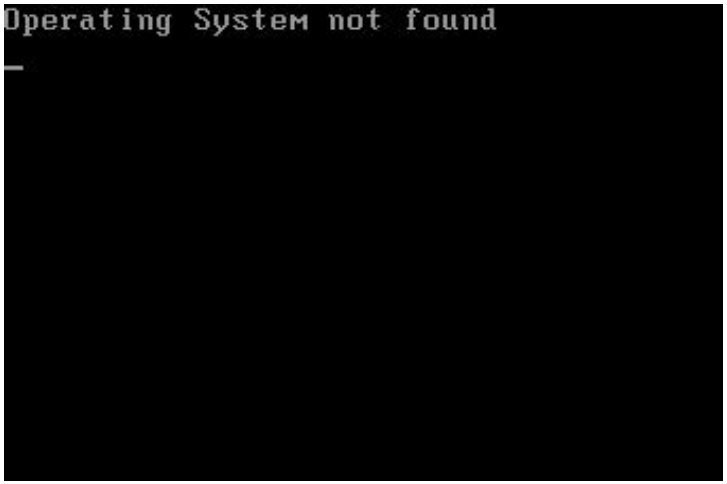

Figure 1: If you see this screen, the problem is with hardware. Windows hasn't even started trying to boot.

Failure to Boot: Hardware or Configuration *(continued)*

Figure 2: Scary error

Failure to Boot: Windows XP

- This failure occurs in the moments between the time POST ends and the Loading Windows screen appears.
- For Windows XP to start loading the main operating system, the critical system files ntldr, ntdetect.com, and boot.ini must reside in the root directory of the C: drive, and boot.ini must point to the Windows boot files.

Failure to Boot: Windows XP *(continued)*

- **Common error messages that appear during this process include:**
  - No Boot Device Present
  - NTLDR Bad or Missing
  - Invalid BOOT.INI
- **If you get one of these error messages, you have 3 possibilities to get back up and running:**
  - You first should attempt to repair.
  - If that fails, try to restore a backup of Windows.
  - If restore is either not available or fails, your only recourse is to rebuild.

Failure to Boot: Windows XP *(continued)*

- **Attempt to repair by using the Recovery Console**
  - The Recovery Console provides a command-line interface for working with Windows before the GUI starts.
  - Boot from the installation CD-ROM. You have three options from the initial screen: set up Windows XP, repair using the Recovery Console, and quit Setup.
  - Press R to start the Recovery Console.
  - If you had previously installed the Recovery Console on your hard drive, you may be able to boot from it as well.

Failure to Boot: Windows XP *(continued)*

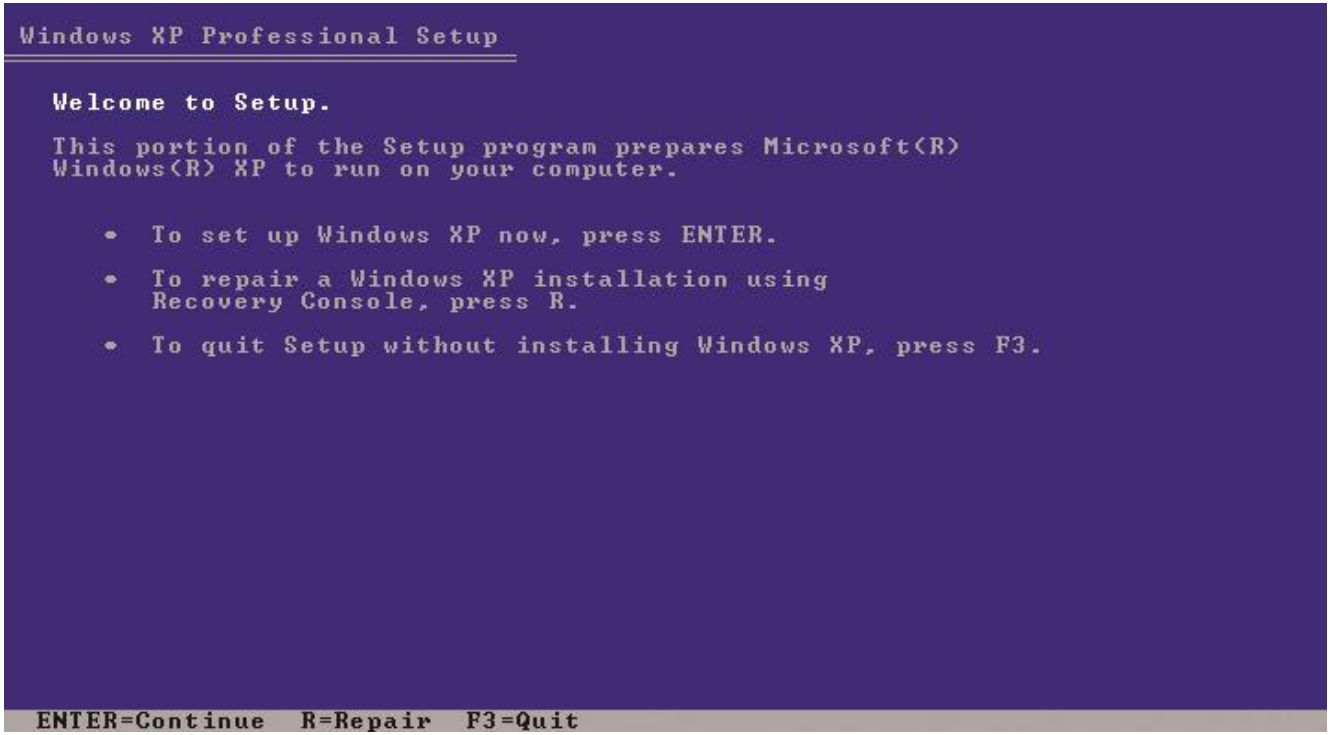

Figure 3: Initial Windows XP Setup screen

Failure to Boot: Windows XP *(continued)*

- **Attempt to repair by using the Recovery Console (continued)**
  - Once the Recovery Console starts, follow the instructions for logging on to a Windows installation on your computer (if there is only one installation of Windows XP on your computer, type the number 1 at the prompt and press the ENTER key) and enter the administrator password.
  - At the prompt, use the Recovery Console commands to repair problems and solve issues.

Failure to Boot: Windows XP *(continued)*

Command	Description
attrib	Changes attributes of selected file or folder
cd (or chdir)	Displays current directory or changes directories
chkdsk	Runs CheckDisk utility
cls	Clears screen
copy	Copies from removable media to system folders on hard disk. No wildcards
del (or delete)	Deletes service or folder
dir	Lists contents of selected directory on system partition only
disable	Disables service or driver
diskpart	Creates/deletes partitions
enable	Enables service or driver
extract	Extracts components from .cab files
fixboot	Writes new partition boot sector on system partition
fixmbr	Writes new master boot record (MBR) for partition boot sector
format	Formats selected disk
listsvc	Lists all services on system
logon	Enables you to choose which Windows installation to log on to if you have more than one
map	Displays current drive letter mappings
md (or mkdir)	Creates a directory
more (or type)	Displays contents of a text file
rd (or rmdir)	Removes a directory
ren (or rename)	Renames a single file
systemroot	Makes current directory system root of drive you're logged on to
type	Displays contents of a text file

Table 1: Common Recovery Console Commands

Failure to Boot: Windows XP *(continued)*

- **Attempt to repair by using the Recovery Console (continued)**
  - Use the Recovery Console to manually restore Registries, stop problem services, rebuild partitions (other than the system partition), and use the EXPAND program to extract copies of corrupted files from an optical disc or floppy disk.
  - The Recovery Console also works great for fixing three items: repairing the MBR, reinstalling the boot files, and rebuilding boot.ini.
  - A bad boot sector usually shows up as a No Boot Device Present error—use the fixmbr command to fix the master boot record.

Failure to Boot: Windows XP *(continued)*

- **Attempt to repair by using the Recovery Console (continued)**
  - Missing system files are usually indicated by the error NTLDR Bad or Missing—copy these files from the source CD/DVD to the system within the Recovery Console.
  - If the boot.ini file is gone or corrupted, run this command from the Recovery Console: bootcfg /rebuild
  - If the Recovery Console fixes the problem, do a thorough backup as soon as possible.

Failure to Boot: Windows XP *(continued)*

- **Attempt to restore**
  - If you have good backups, you can attempt to restore to an earlier, working copy of Windows.
  - If you use the Automated System Recovery (ASR) backup, this will restore your system to a previously installed state, but you should use it as a last resort—you lose everything on the system that was installed or added after you created the ASR disk.

Failure to Boot: Windows XP *(continued)*

- **Rebuild**
  - You could simply reboot to the Windows CD-ROM and install right on top of the existing system, but that's usually not the optimal solution.
  - Swap the C: drive for a blank hard drive and install a clean version of Windows. Then copy files and settings back over later.
  - Most OEM systems come with a Recovery CD, which is actually a pointer to a recovery partition. The Recovery CD is a CD-ROM that you boot to and run. The recovery partition is a hidden partition on the hard drive that you activate at boot by holding down a key combination specific to the manufacturer of that system.

Failure to Boot: Windows Vista and Windows 7

- Two critical boot files risk corruption in Windows Vista and Windows 7, bootmgr and bcd, both of which you can fix with one tool, bcdedit. You can use this tool in the Windows Recovery Environment.

Failure to Boot: Windows Vista and Windows 7 *(continued)*

- **WinPE and the death of the Recovery Console**
  - With Windows Vista, Microsoft upgraded the installation environment from the 16-bit text mode environment used in every previous version of Windows to 32- and 64-bit.
  - This enabled the Windows installation process to go graphical and support features such as a mouse pointer and clickable elements rather than rely on command-line tools.
  - Microsoft calls the installation environment the Windows Preinstallation Environment (WinPE or Windows PE).

Failure to Boot: Windows Vista and Windows 7 *(continued)*

- **WinPE and the death of the Recovery Console (continued)**
  - With Windows PE, you can boot directly to the Windows DVD. This loads a limited-function graphical operating system that contains both troubleshooting and diagnostic tools, along with installation options.
  - When you access Windows PE and opt for the troubleshooting and repair features, you open a special set of tools called the Windows Recovery Environment (WinRE or Windows RE).

Failure to Boot: Windows Vista and Windows 7 *(continued)*

- **Enter Windows RE**
  - Windows Recovery Environment not only replaces the Recovery Console, it improves it.
  - WinRE includes an impressive, powerful set of both automated and manual utilities that collectively diagnoses and fixes all but the most serious Windows boot problems.

Failure to Boot: Windows Vista and Windows 7 *(continued)*

- **In Windows 7, you can access WinRE in three ways:**
  - First, you can boot from the Windows installation media and select Repair.
  - Second, you can use the Repair Your Computer option on the Advanced Boot Options (F8) menu.
  - Third, you can create a system repair disc before you have problems. Go to Control Panel | System and Security | Backup and Restore and select Create a system repair disc.
  - Accessing it from the Windows installation media is the preferred way, because your hard drive may be inaccessible.

Failure to Boot: Windows Vista and Windows 7 *(continued)*

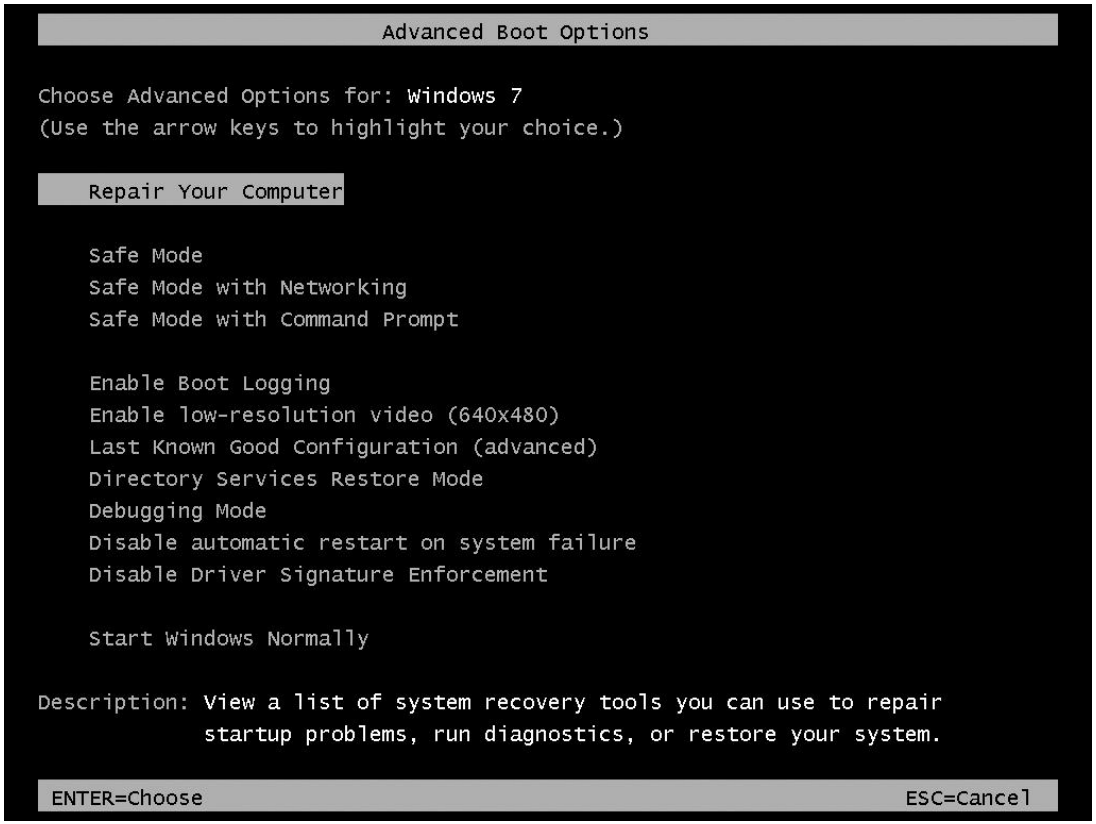

Figure 4: Selecting Repair Your Computer in the Advanced Boot Options menu

Failure to Boot: Windows Vista and Windows 7 *(continued)*

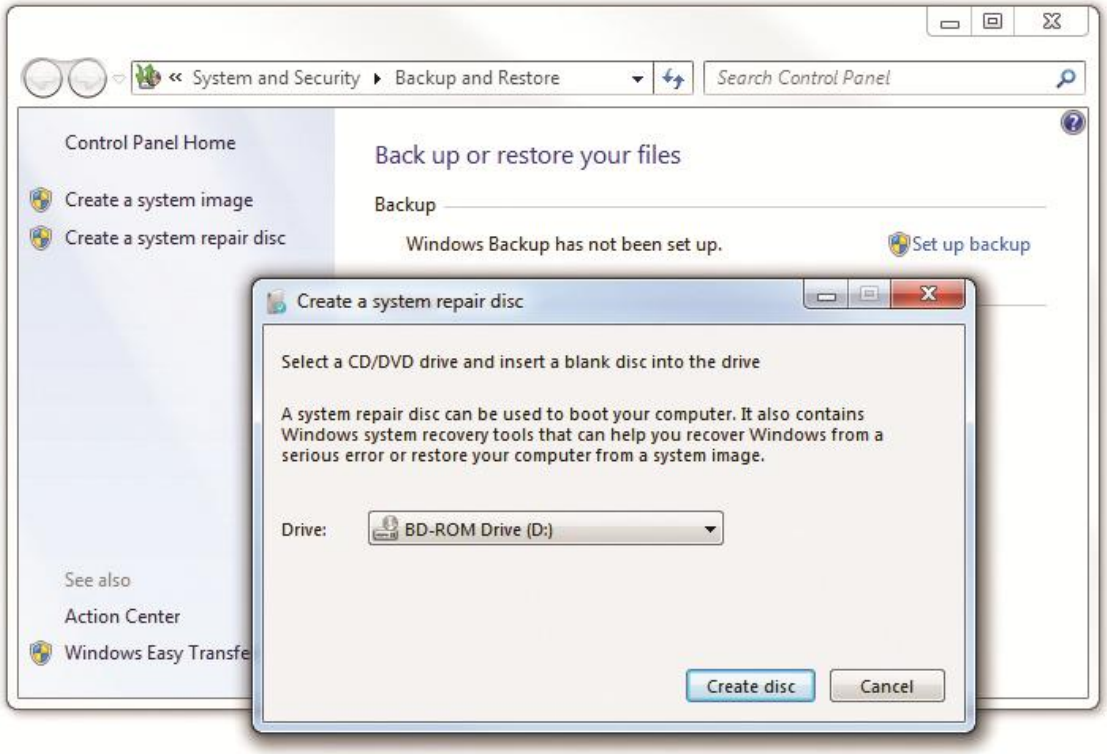

Figure 5: Making a system repair disc in Windows 7

Failure to Boot: Windows Vista and Windows 7 *(continued)*

- **Using Windows RE—you have 5 options in WinRE:**
  - Startup Repair serves as a one-stop, do-it-all option, including:
    - Repairs a corrupted Registry by using the backup on the hard drive
    - Restores critical system and driver files
    - Runs the equivalent of the Recovery Console's fixboot and fixmbr
    - Rolls back any non-working drivers
    - Uninstalls any incompatible service packs and patches
    - Runs chkdsk
    - Runs a memory test to check RAM

Failure to Boot: Windows Vista and Windows 7 *(continued)*

Figure 6: Recovery Environment main screen

Failure to Boot: Windows Vista and Windows 7 *(continued)*

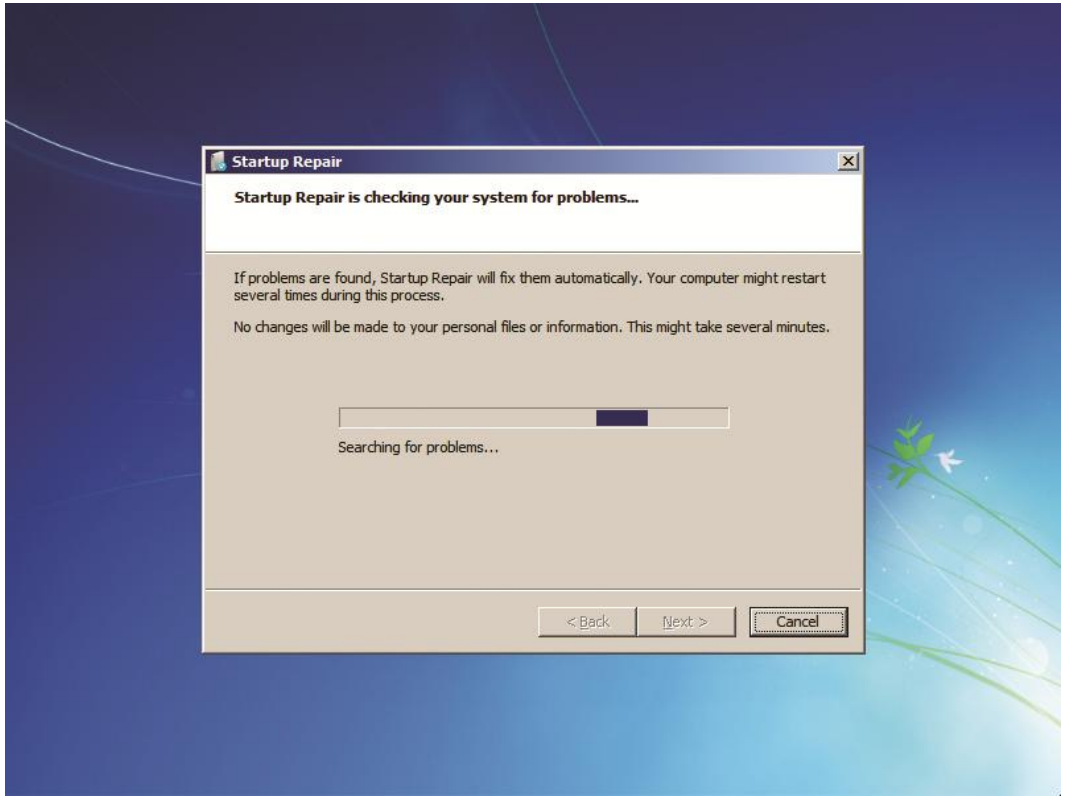

Figure 7: Startup Repair in action

Failure to Boot: Windows Vista and Windows 7 *(continued)*

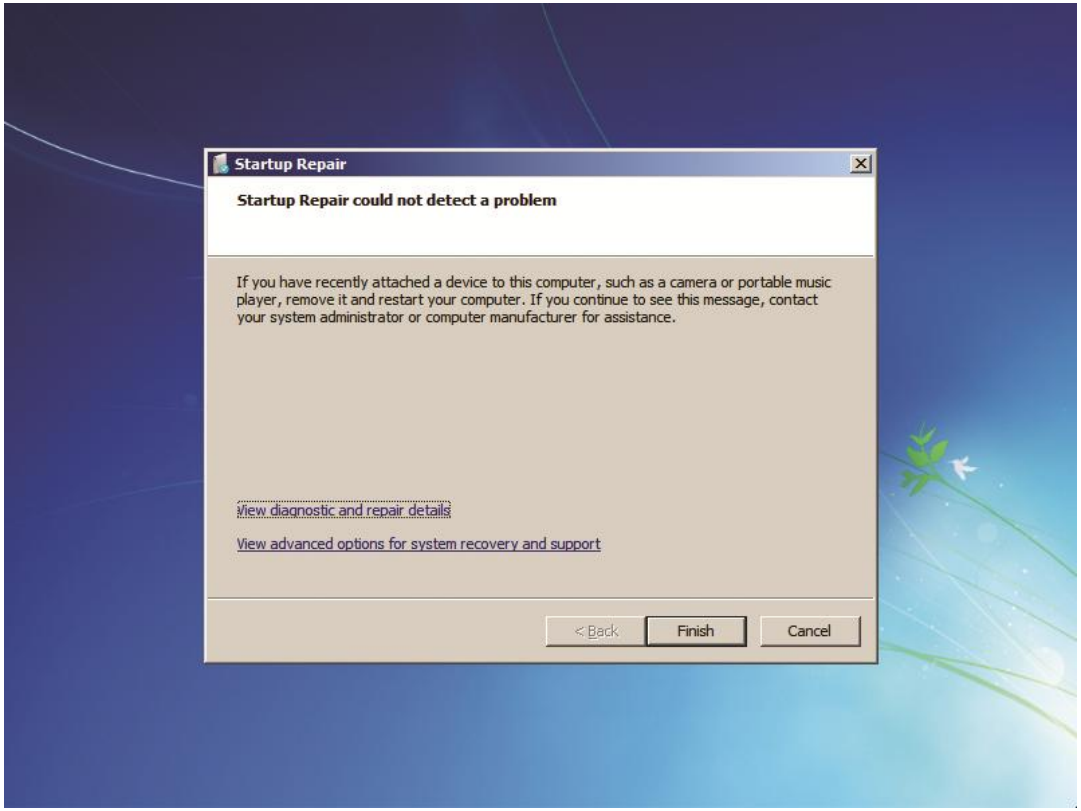

Figure 8: Startup Repair complete; no problems found

Failure to Boot: Windows Vista and Windows 7 *(continued)*

- **Using Windows RE (continued):**
  - In Windows 7, Startup Repair starts automatically if your system detects a boot problem.
  - System Restore uses restore points to go back to a time when your computer worked properly.
  - System Image Recovery (Windows 7) or Windows Complete PC Restore (Vista) uses a backup image to restore your system after a catastrophe. It offers format and partitioning options for new disks. It will destroy existing data on the drive when restoring backed-up data.

Failure to Boot: Windows Vista and Windows 7 *(continued)*

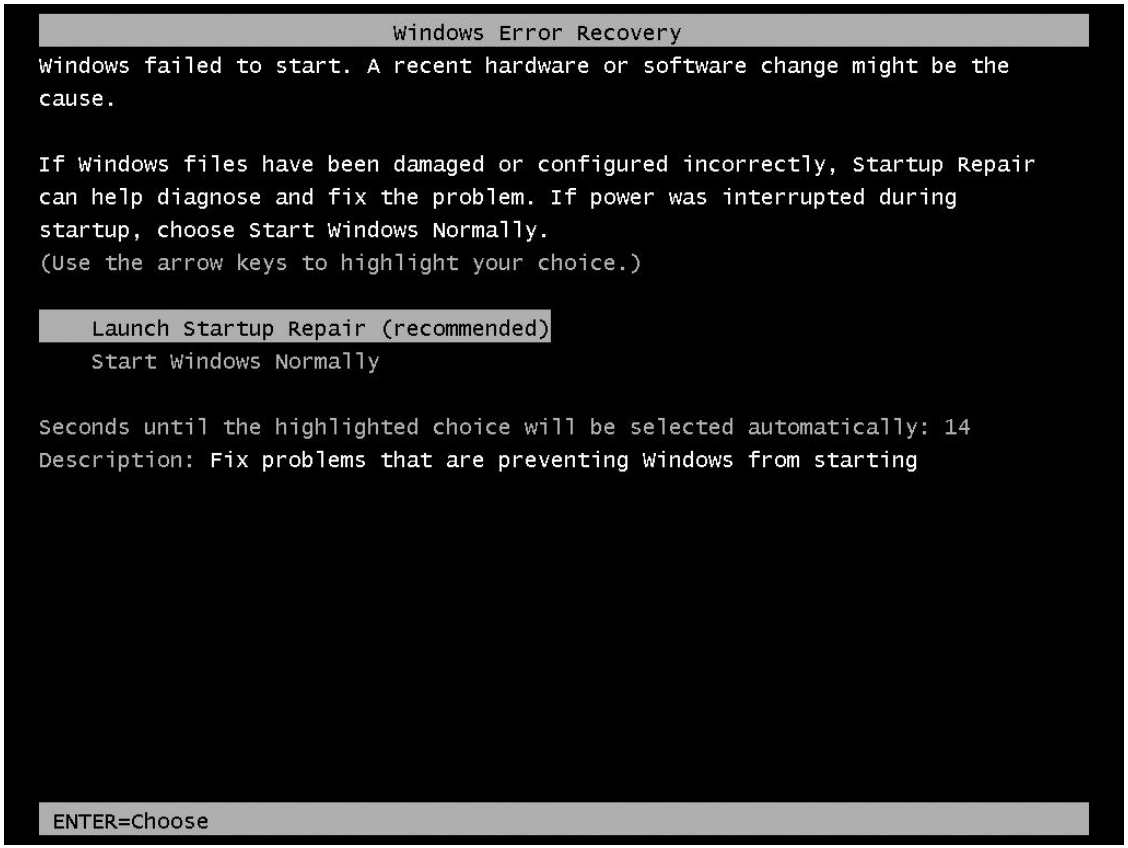

Figure 9: Windows Error Recovery

Failure to Boot: Windows Vista and Windows 7 *(continued)*

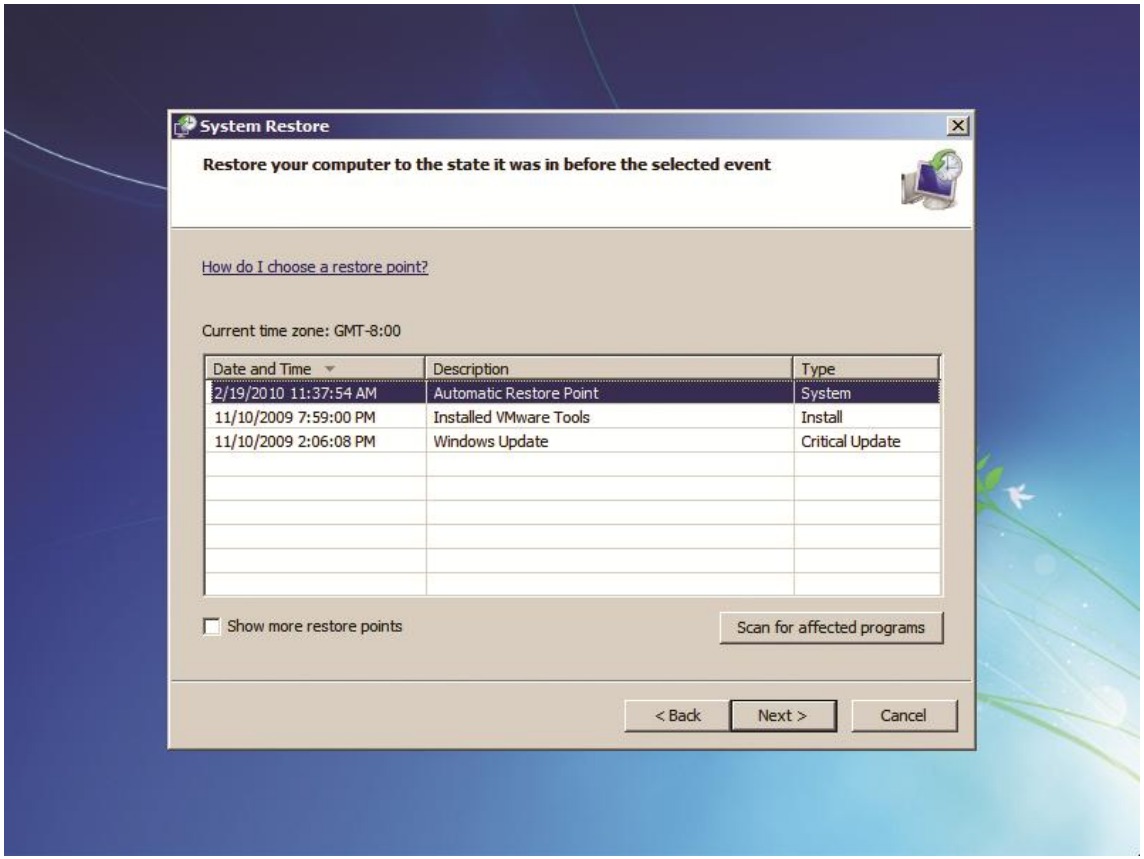

Figure 10: System Restore points

Failure to Boot: Windows Vista and Windows 7 *(continued)*

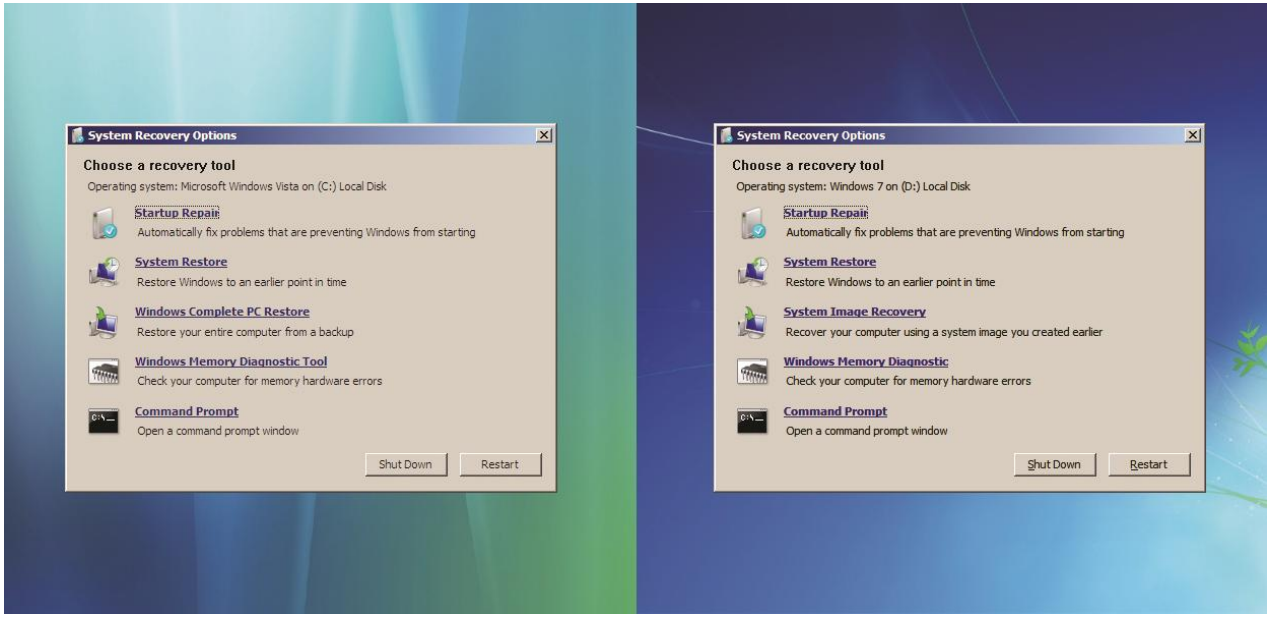

Figure 11: The WinRE options in Windows Vista (left) and Windows 7 (right)

Failure to Boot: Windows Vista and Windows 7 *(continued)*

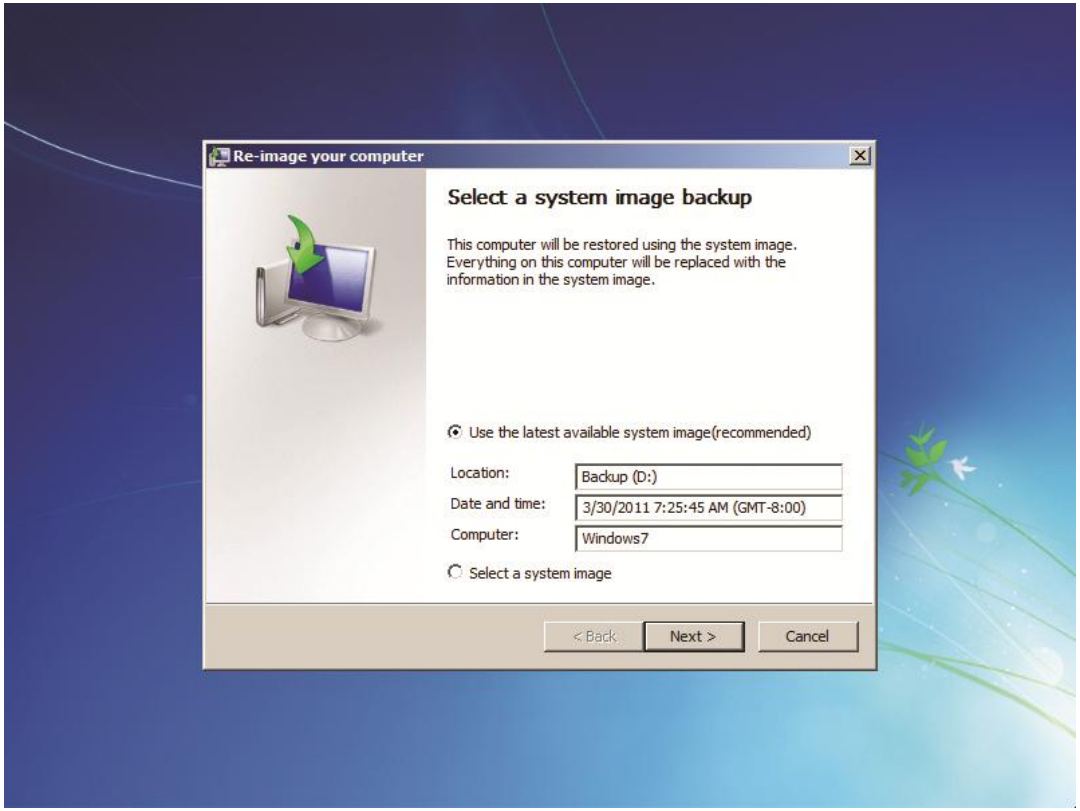

Figure 12: Selecting a system image

Failure to Boot: Windows Vista and Windows 7 *(continued)*

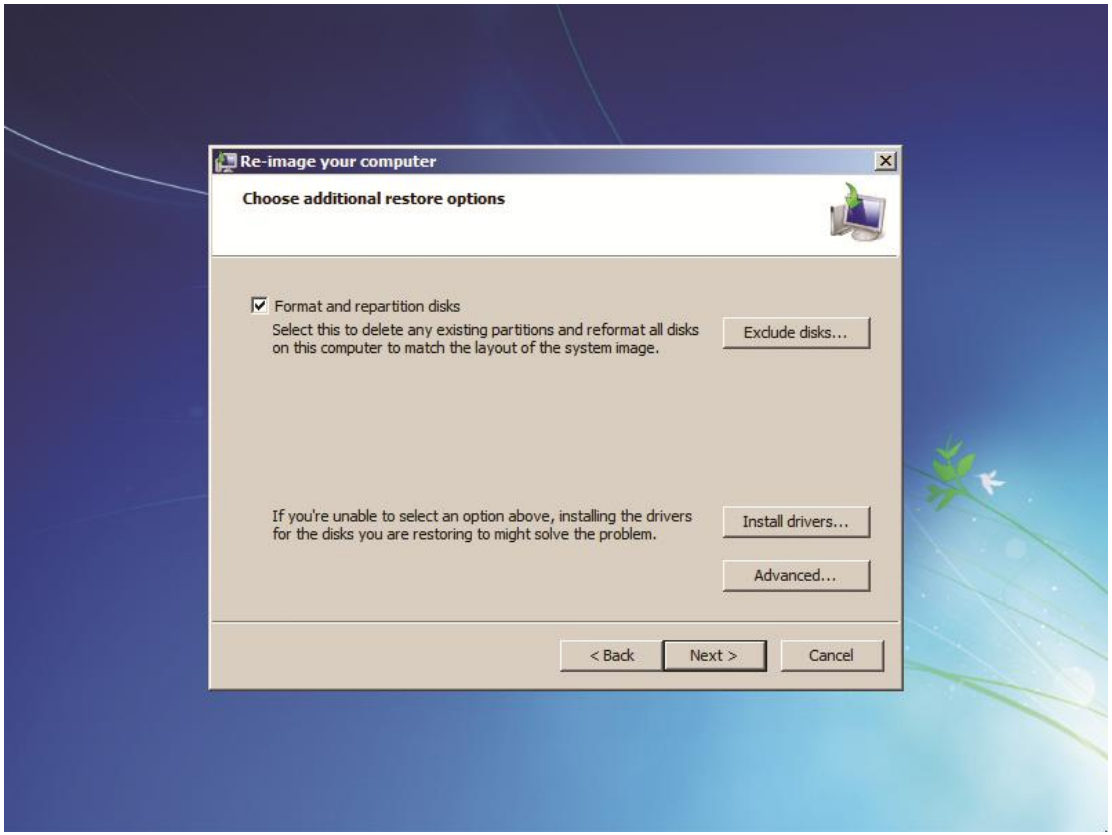

Figure 13: Additional restore options

Failure to Boot: Windows Vista and Windows 7 *(continued)*

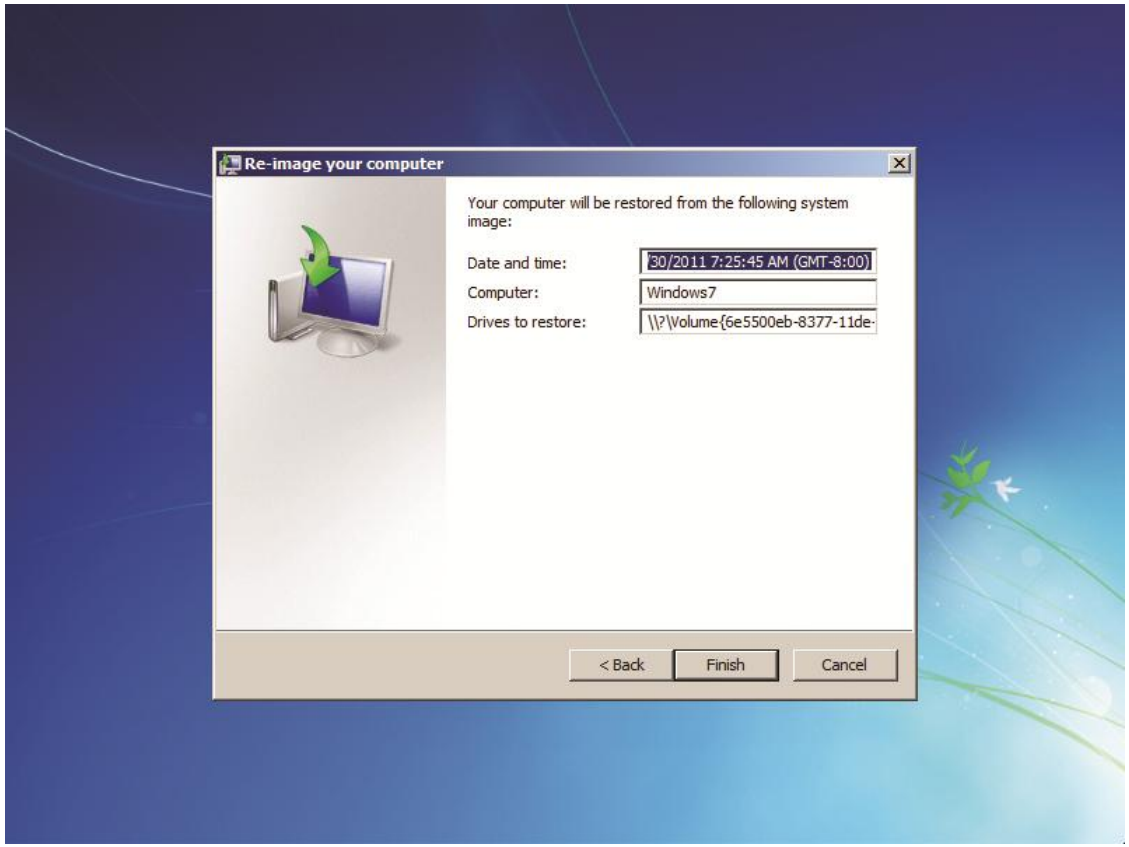

Figure 14: Confirming your settings

Failure to Boot: Windows Vista and Windows 7 *(continued)*

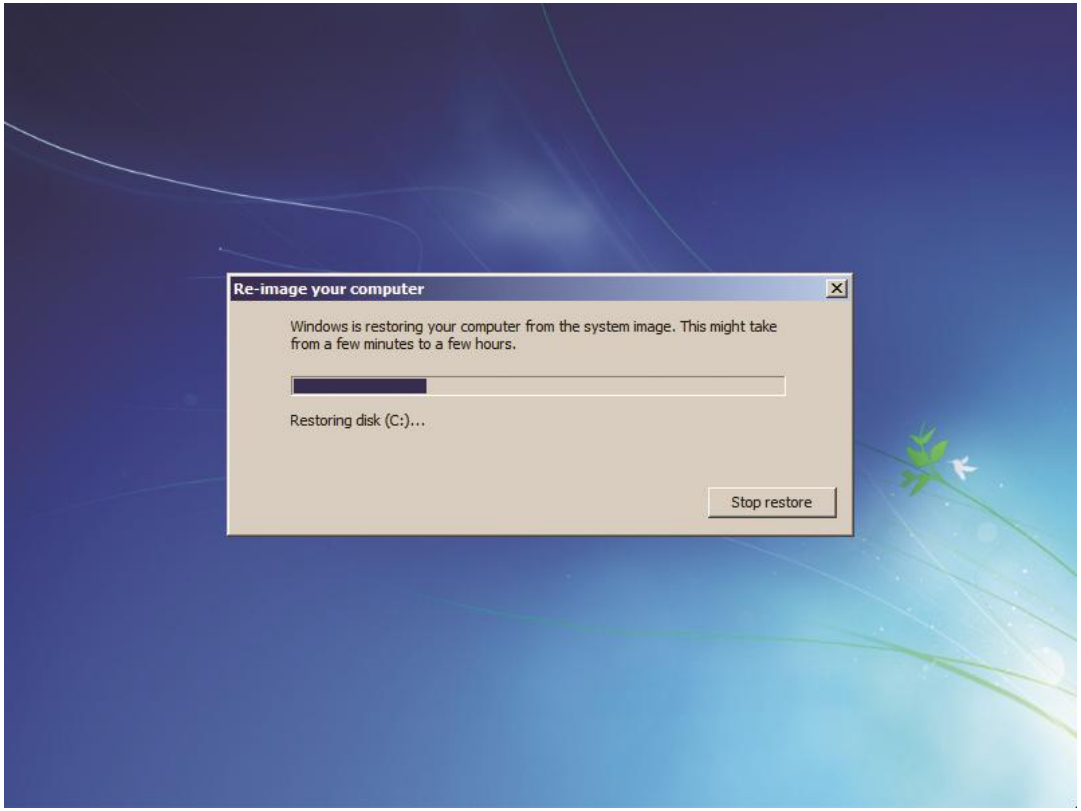

Figure 15: Restoring your computer

Failure to Boot: Windows Vista and Windows 7 *(continued)*

- **Using Windows RE (continued):**
  - Windows Memory Diagnostic (Tool) (only Vista includes "Tool" in the name) will test system RAM. When you click the Windows Memory Diagnostic (Tool) link from the main WinRE screen, it prompts you to Restart now and check for problems (recommended) or Check for problems the next time I start my computer. It restarts and tests memory under 3 possible options: Basic, Standard, and Extended, depending on how much time you want it to take and how aggressive you want it to be.

Failure to Boot: Windows Vista and Windows 7 *(continued)*

Figure 16: Windows Memory Diagnostic screen

Failure to Boot: Windows Vista and Windows 7 *(continued)*

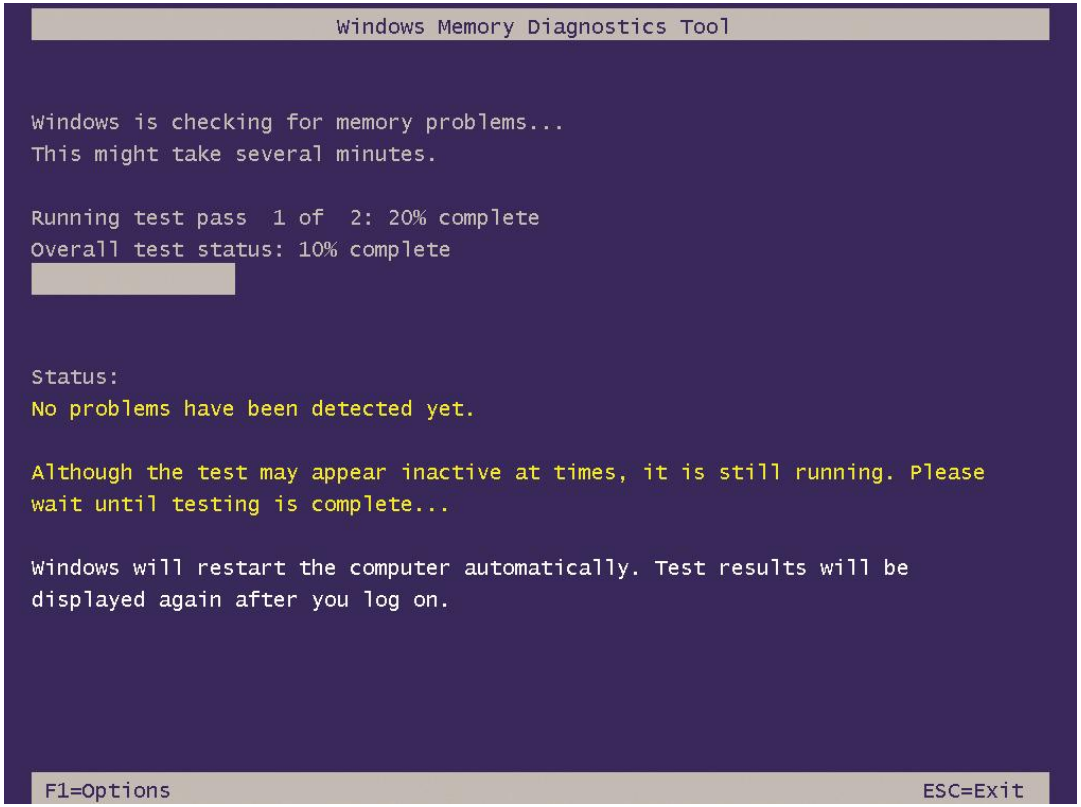

Figure 17: Windows Memory Diagnostic Tool running

Failure to Boot: Windows Vista and Windows 7 *(continued)*

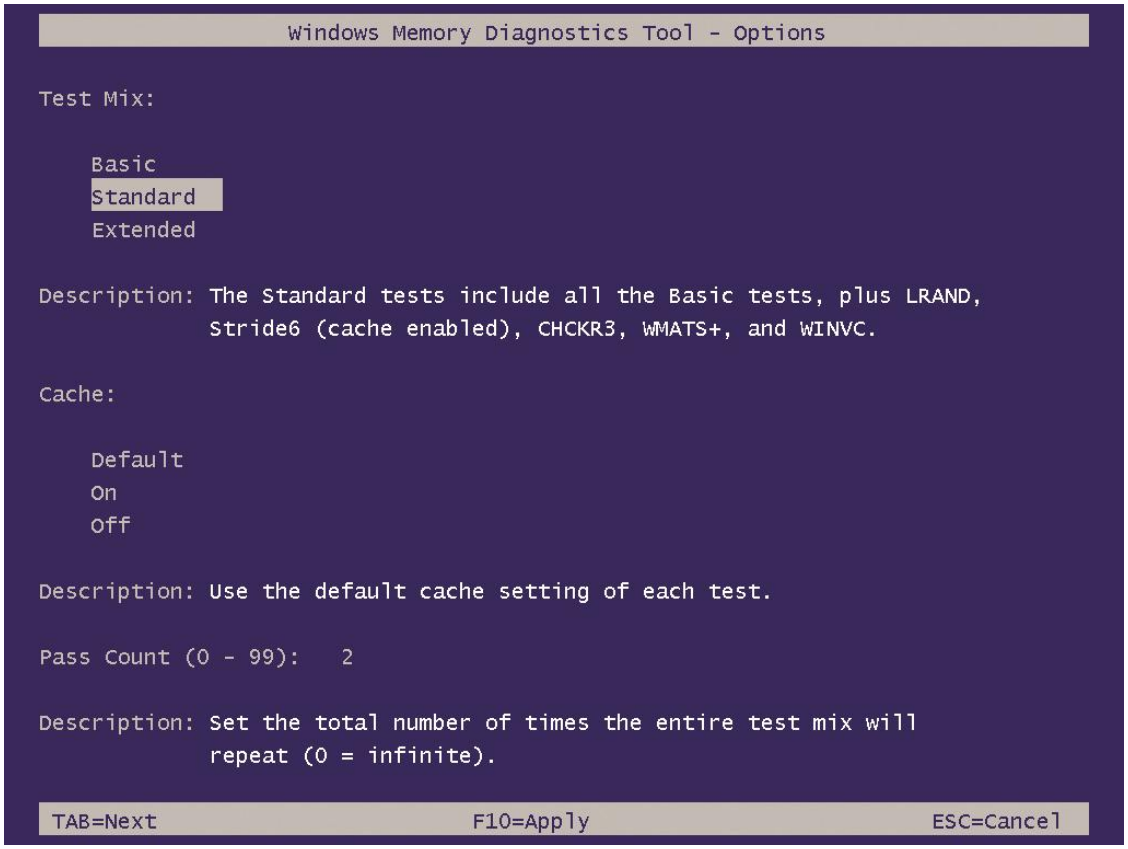

Figure 18: Windows Memory Diagnostic Tool options

Failure to Boot: Windows Vista and Windows 7 *(continued)*

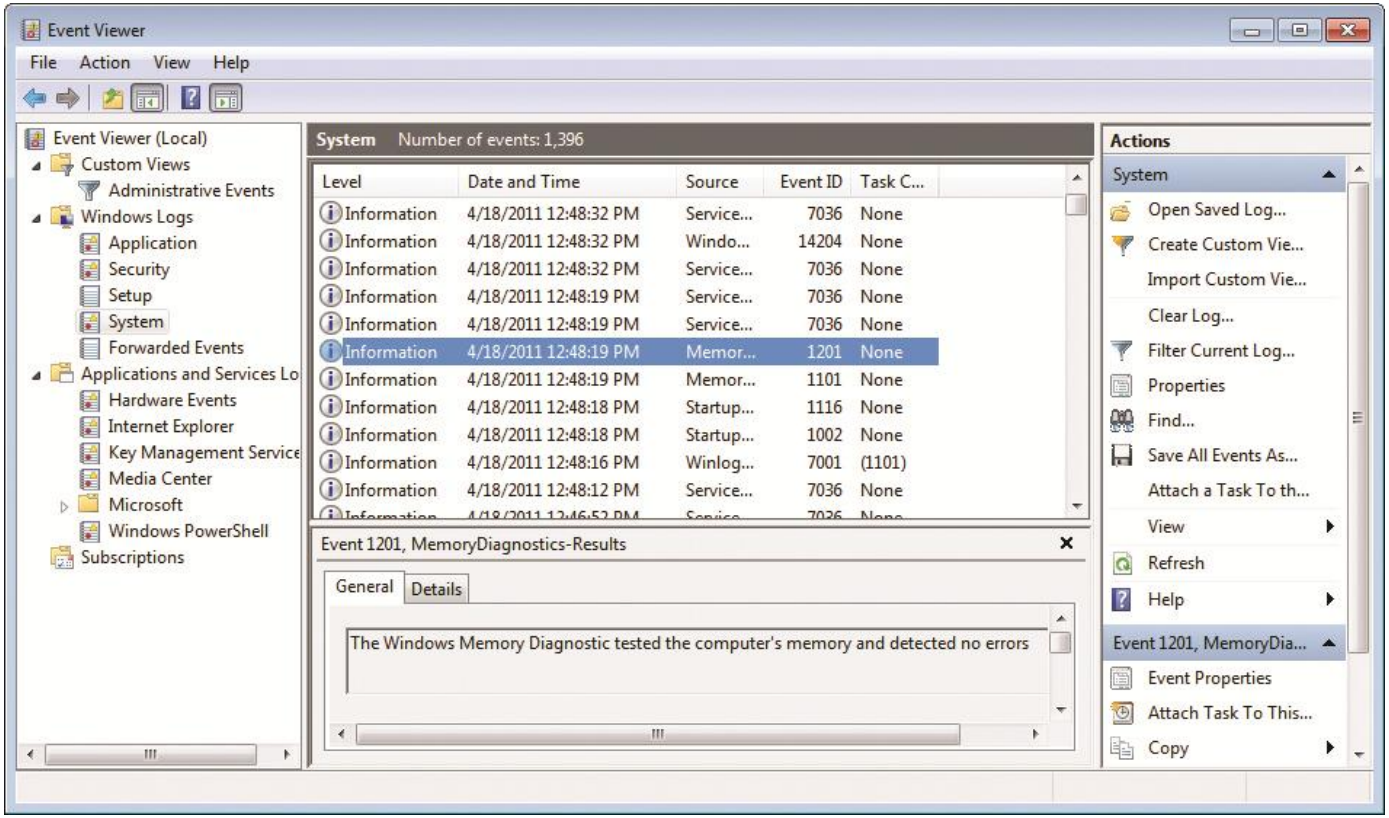

Figure 19: Event Viewer results

Failure to Boot: Windows Vista and Windows 7 *(continued)*

- **Using Windows RE (continued):**
  - Command Prompt—the WinRE Command Prompt is a true 32- or 64-bit prompt that functions similarly to the regular Command Prompt.
  - It includes an important utility (bootrec) tool that repairs the master boot record, boot sector, or BCD store. It replaces the old fixboot and fixmbr Recovery Console commands and adds two more repair features.
  - The bcedit tool views and edits the BCD store—use import/export switches to work with the BCD store.
  - EasyBCD is a third-party tool that is easier to use.

Failure to Boot: Windows Vista and Windows 7 *(continued)*

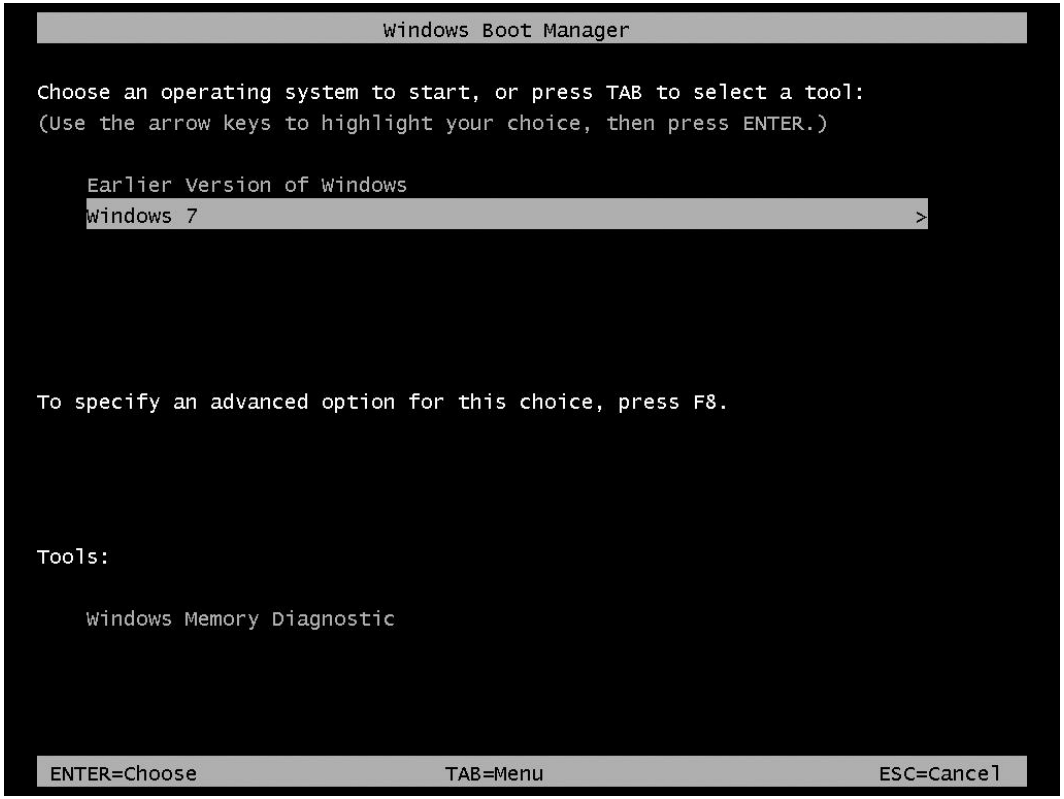

Figure 20: bootmgr showing available versions of Windows

Failure to Boot: Windows Vista and Windows 7 *(continued)*

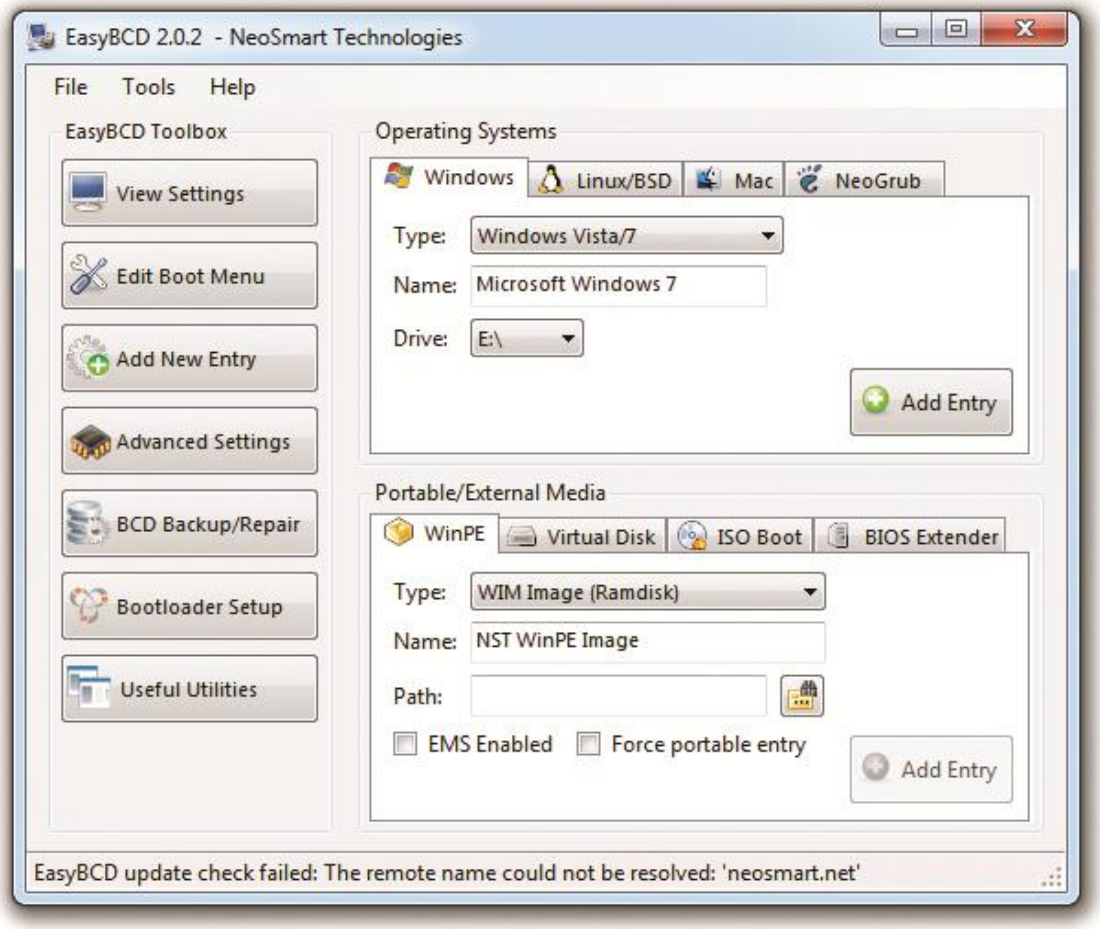

Figure 21: EasyBCD at work

Failure to Load the GUI

Failure to Load the GUI

Figure 22: GUI time!

Device Drivers

- Device driver problems can stop Windows GUI from loading and may result in the infamous Windows Stop error, better known as the Blue Screen of Death (BSoD).
- Windows BSoDs tell you the name of the file that caused the problem and usually suggest a recommended action.
- BSoD problems due to device drivers almost always occur immediately after you've installed a new device and rebooted.

Device Drivers *(continued)*

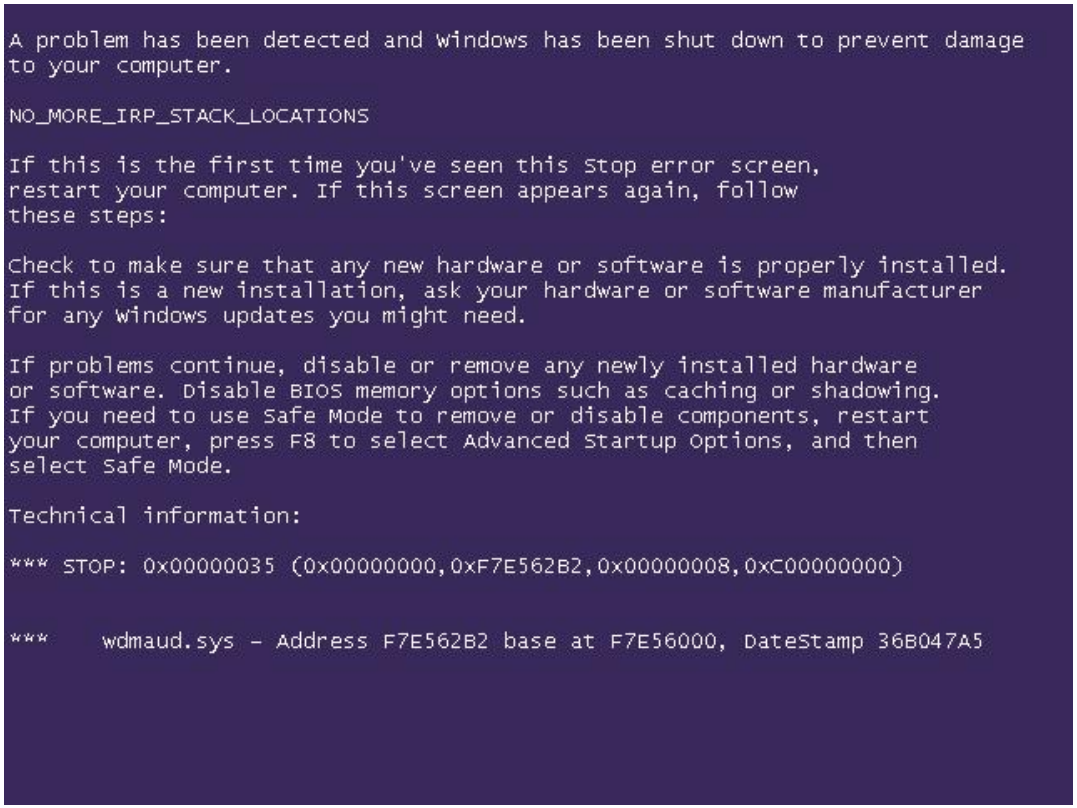

Figure 23: BSoD

Device Drivers *(continued)*

- Take out the device and reboot. If this fixes the problem, look for updated drivers at the manufacturer's web site.
- The second indication of a device problem that shows up during the GUI part of startup is a freeze-up: the Windows startup screen just stays there and you never get a chance to log on. If this happens, try one of the Advanced Startup Options.

Registry

- The Registry files load every time the computer boots.
- If Windows attempts to load a bad Registry, these errors may show up as BSoDs that say "Registry File Failure" or text errors that say "Windows could not start."

Registry *(continued)*

- **You will to need to restore a good Registry copy.**
  - The best way to do this is the Last Known Good Configuration boot option.
  - If that fails, you can restore an earlier version of the Registry through the Recovery Console in Windows XP or through Windows RE in Windows Vista/7.

Registry *(continued)*

- **Replacing the Registry in Windows XP**
  - Boot to the Windows installation CD-ROM, get to the Recovery Console, and type these commands to restore a Registry:

```
delete c:\windows\system32\config\system

delete c:\windows\system32\config\software

delete c:\windows\system32\config\sam

delete c:\windows\system32\config\security

delete c:\windows\system32\config\default


copy c:\windows\repair\system c:\windows\system32\config\system

copy c:\windows\repair\software c:\windows\system32\config\software

copy c:\windows\repair\sam c:\windows\system32\config\sam

copy c:\windows\repair\security c:\windows\system32\config\security

copy c:\windows\repair\default c:\windows\system32\config\default
```

Registry *(continued)*

- **Replacing the Registry in Windows Vista/7**
  - Windows Vista and Windows 7 keep a regular backup of the Registry handy in case you need to overwrite a corrupted Registry. By default, the RegIdleBackup task runs every 10 days, so that's as far back as you would lose if you replaced the current Registry with the automatically backed-up files.
  - You can find the backed-up Registry files in \Windows\System32\config\RegBack

Registry *(continued)*

- **Replacing the Registry in Windows Vista/7 (continued)**
  - To replace the Registry, boot to the Windows DVD to access Windows RE and get to the Command Prompt shell.
  - Run the reg command to get to a reg prompt.
  - From there, you have numerous commands to deal with the Registry. The simplest is probably the copy command.
  - Just copy the files to the location of the main Registry files—up one level in the tree under the \config folder.

Registry *(continued)*

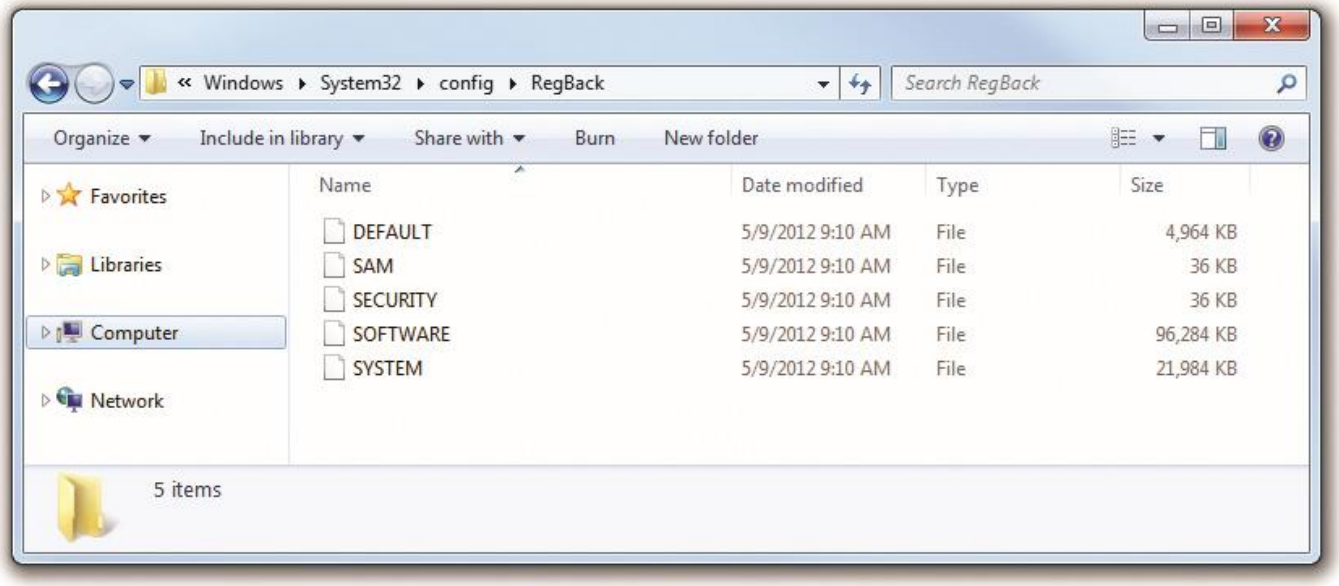

Figure 24: The backed-up Registry files located in the RegBack folder

Advanced Startup Options

- **If Windows fails to start up, use the Windows Advanced Startup Options menu to discover the cause.**
  - To get to this menu, restart the computer and press F8 after the POST messages but before the Windows logo screen appears.
  - Windows XP's Startup options are a bit different from Windows Vista's and Windows 7's.

Advanced Startup Options *(continued)*

- **Safe Mode (all versions)—starts up Windows but loads only very basic, non–vendor-specific drivers for the mouse, 640 × 480 resolution monitor (in XP) and 800 × 600 resolution monitor (Vista and 7), keyboard, mass storage, and system services.**
  - Once in Safe mode you can use Device Manager to enable or disable devices.
  - There is no safety or repair feature in any version of Windows that makes the OS boot to Safe mode automatically—this has to be configured in msconfig.

Advanced Startup Options *(continued)*

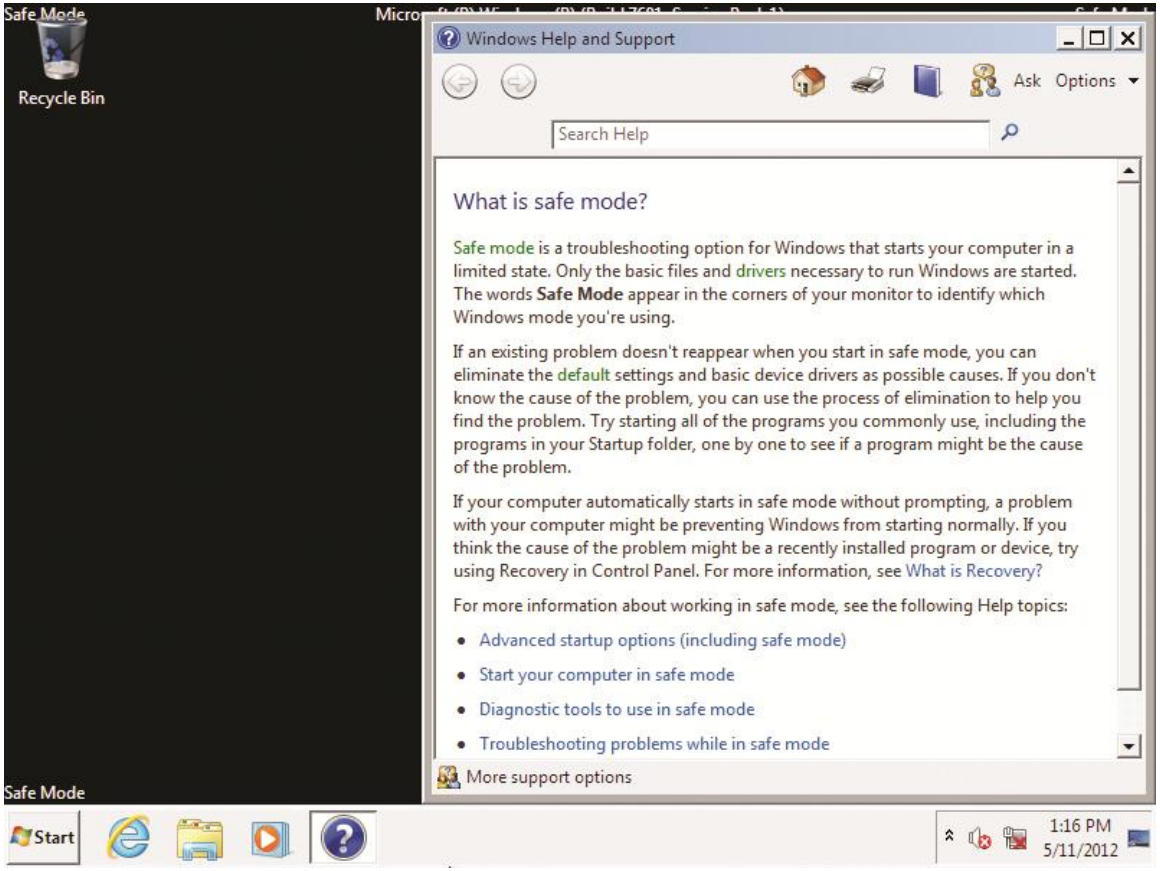

Figure 25: Safe mode

Advanced Startup Options *(continued)*

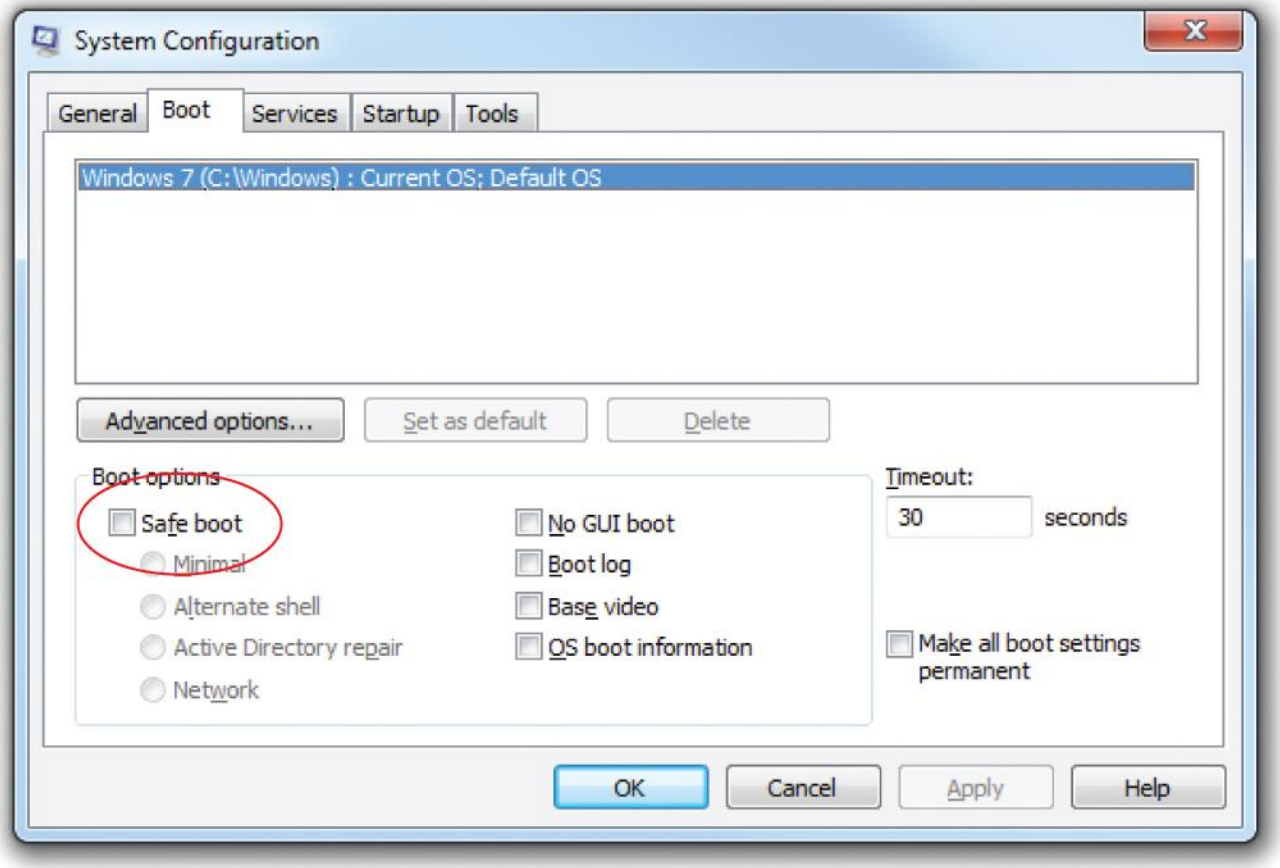

Figure 26: Uncheck Safe boot

Advanced Startup Options *(continued)*

- **Safe Mode with Networking (all versions)—identical to Safe mode except that you get network support.**
- **Safe Mode with Command Prompt (all versions)—loads a Command Prompt (cmd.exe) as the shell to the operating system after you log on, rather than loading the GUI desktop. This is a handy option to remember if the desktop does not display at all.**

Advanced Startup Options *(continued)*

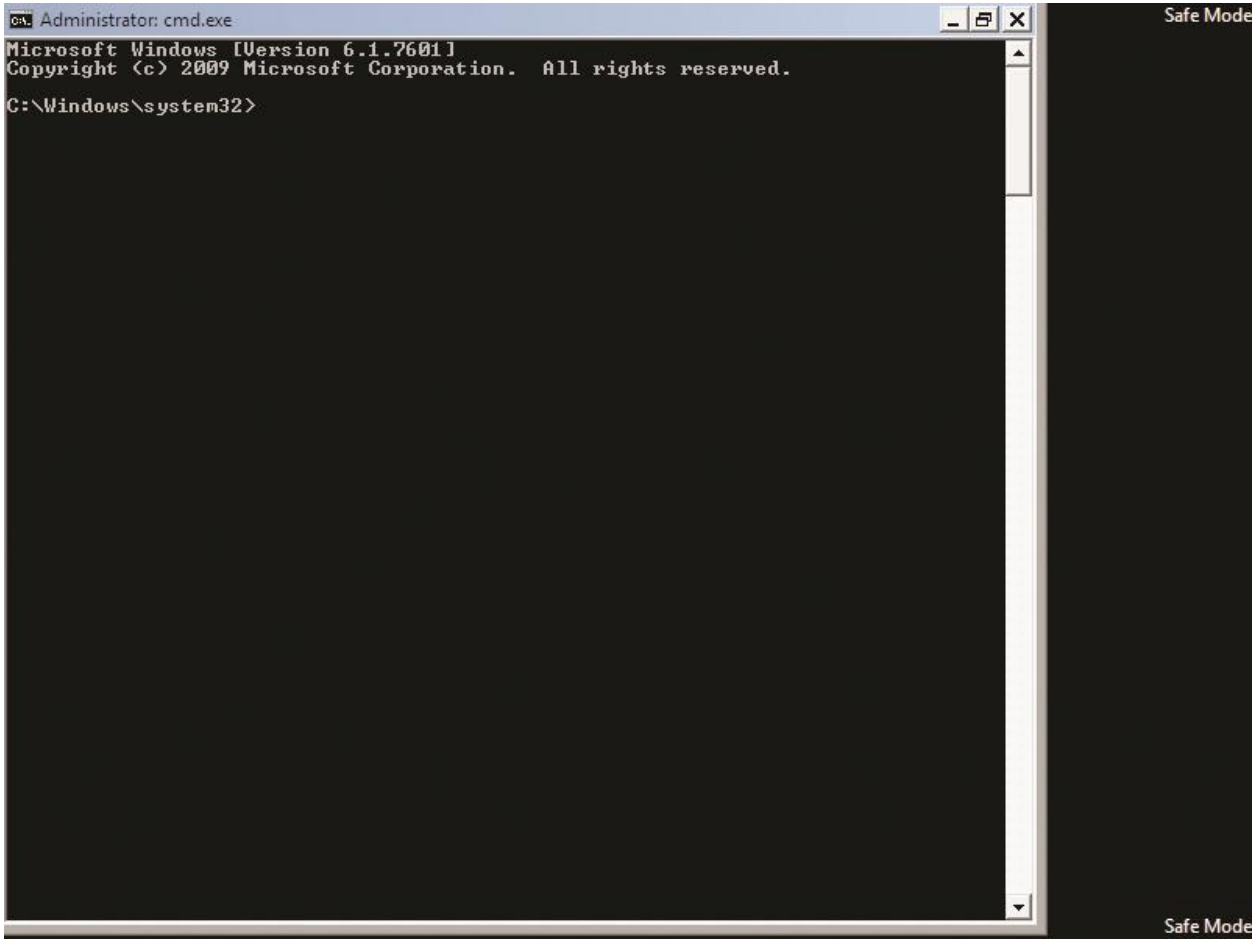

Figure 27: Safe Mode with Command Prompt

Advanced Startup Options *(continued)*

- **Enable Boot Logging (all versions)—starts Windows normally and creates a log file of the drivers as they load into memory. The file is named Ntbtlog.txt and is saved in the %SystemRoot% folder.**
- **Enable VGA Mode (XP)/Enable Low-Resolution Mode (Vista and 7)—starts Windows normally but loads only a default VGA driver. If this mode works, it may mean you have a bad driver, or it may mean you are using the correct video driver but it is configured incorrectly.**

Advanced Startup Options *(continued)*

- **Last Known Good Configuration (all versions)—this is the option to try when Windows' startup fails immediately after installing a new driver but before you have logged on again. It applies specifically to new device drivers that cause failures on reboot.**
- **Directory Services Restore Mode (all versions)—applies only to Active Directory domain controllers.**

Advanced Startup Options *(continued)*

- **Debugging Mode (all versions)—starts Windows in kernel debug mode.**
- **Disable Automatic Restart on System Failure (all versions)—stops the computer from rebooting on Stop errors and gives you the opportunity to write down the error and find a fix.**

Advanced Startup Options *(continued)*

- **Disable Driver Signature Enforcement (Vista and 7)—if you are using an older driver to connect to your hard drive controller or some other low-level feature, you must use this option to get Windows to load the driver.**
- **Start Windows Normally (all versions)—starts Windows normally, without rebooting.**

Advanced Startup Options *(continued)*

- **Reboot (all versions)—performs a soft reboot of the computer.**
- **Return to OS Choices Menu (all versions)—returns you to the OS Choices menu, from which you can select the operating system to load.**

Troubleshooting Tools in the GUI

- **Event Viewer is a powerful logging tool for troubleshooting and security.**
  - In Windows XP Event Viewer is in the Administrative Tools applet in the Control Panel and has three sections: Application, Security, and System (four if you have IE7 or later).
    - The Application section stores events specific to applications. There are three types of events recorded: Errors, Warnings, and Information.

Troubleshooting Tools in the GUI *(continued)*

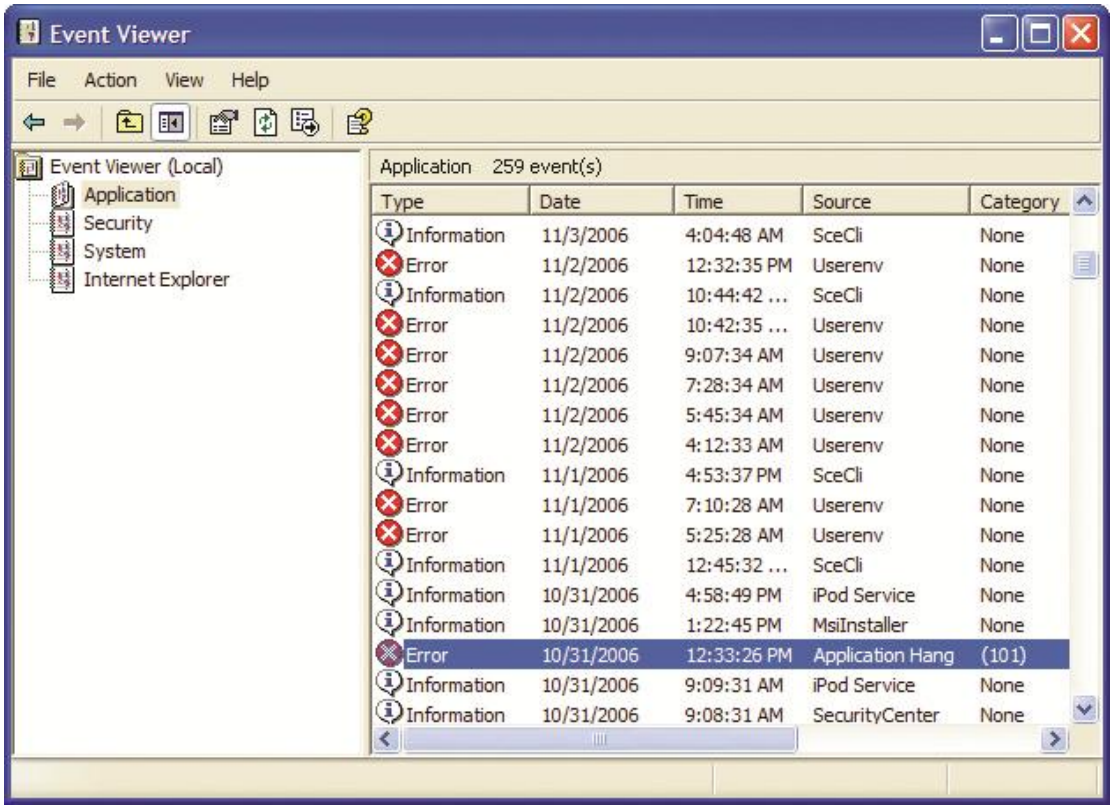

Figure 28: Event Viewer

Troubleshooting Tools in the GUI *(continued)*

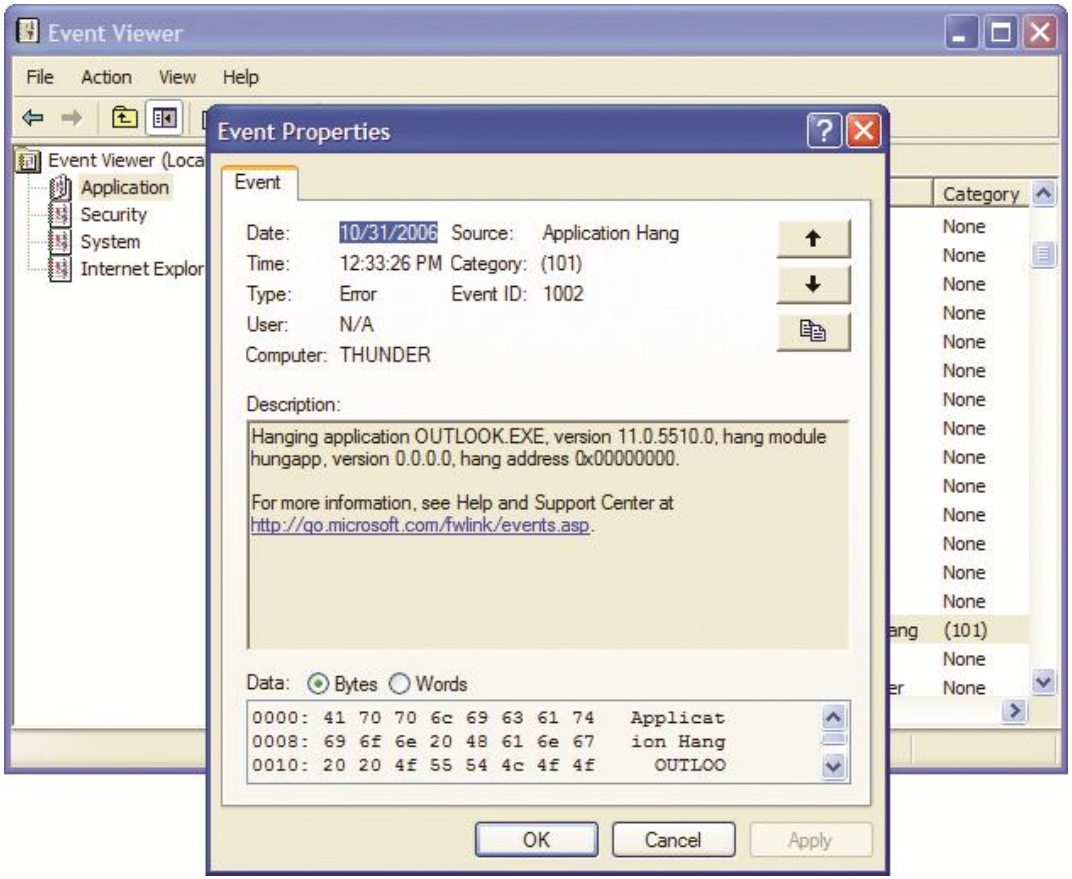

Figure 29: Typical application error message

Troubleshooting Tools in the GUI *(continued)*

- Event Viewer in Windows XP(continued)
  - The Security section records events, called audits, that have anything to do with security—such as the number of logon events. All audits are listed as either successful or failed.
  - The System section is similar to the Application section in that you have Errors, Warnings, and Information, but the events listed here are specific only to the operating system.
  - Event Viewer will let you click the link to take you to the online Help and Support Center at Microsoft.com. The software reports your error, checks the online database, and comes back with a detailed explanation.

Troubleshooting Tools in the GUI *(continued)*

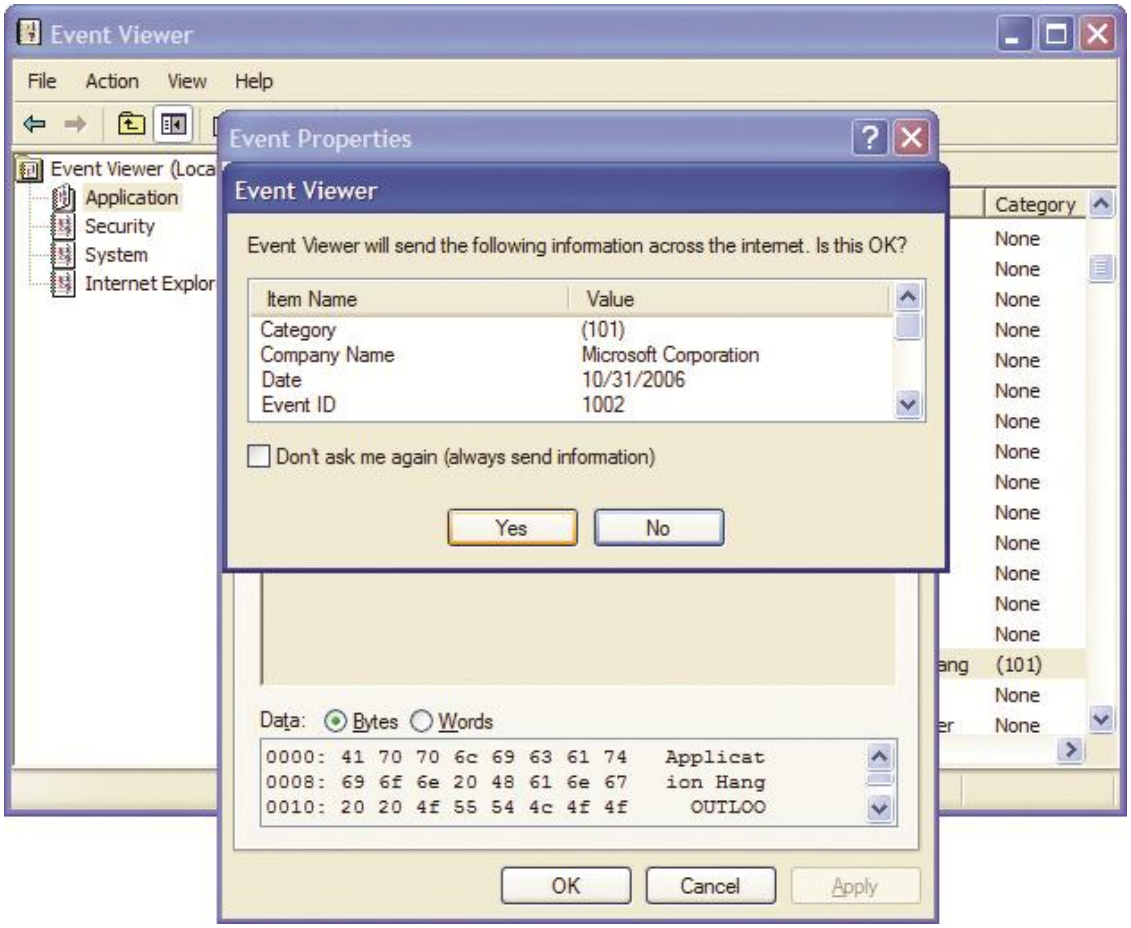

Figure 30: Details about to be sent

Troubleshooting Tools in the GUI *(continued)*

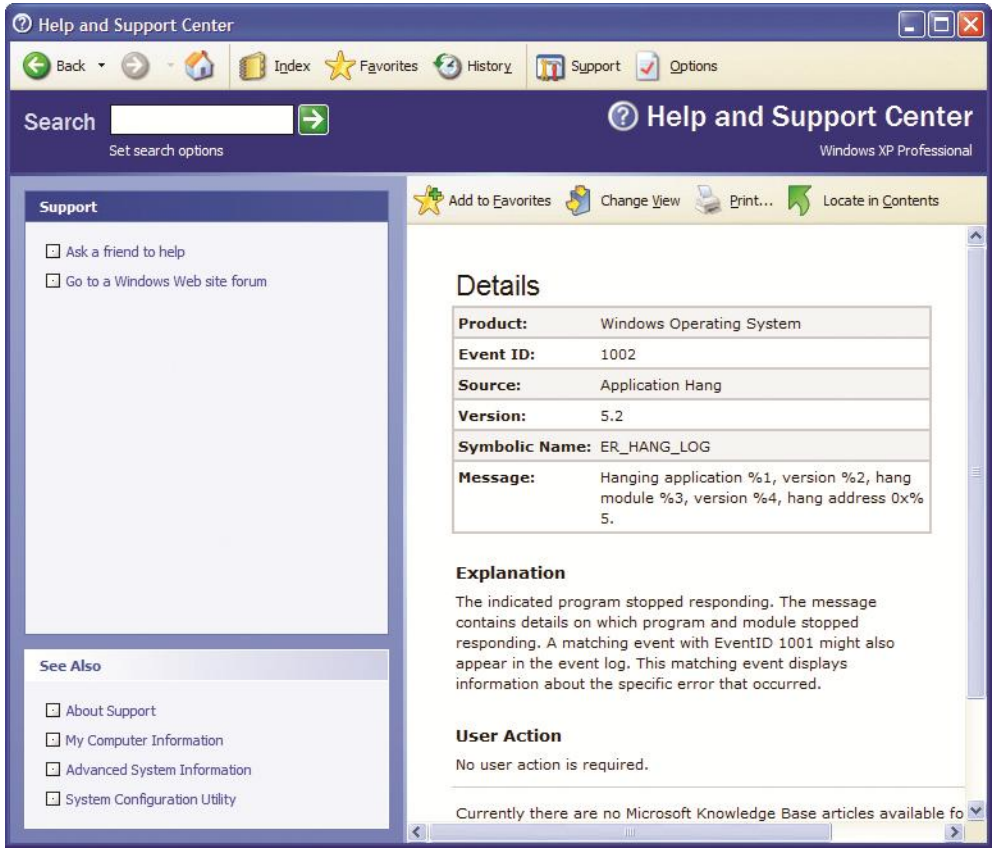

Figure 31: Help and Support Center being helpful

Troubleshooting Tools in the GUI *(continued)*

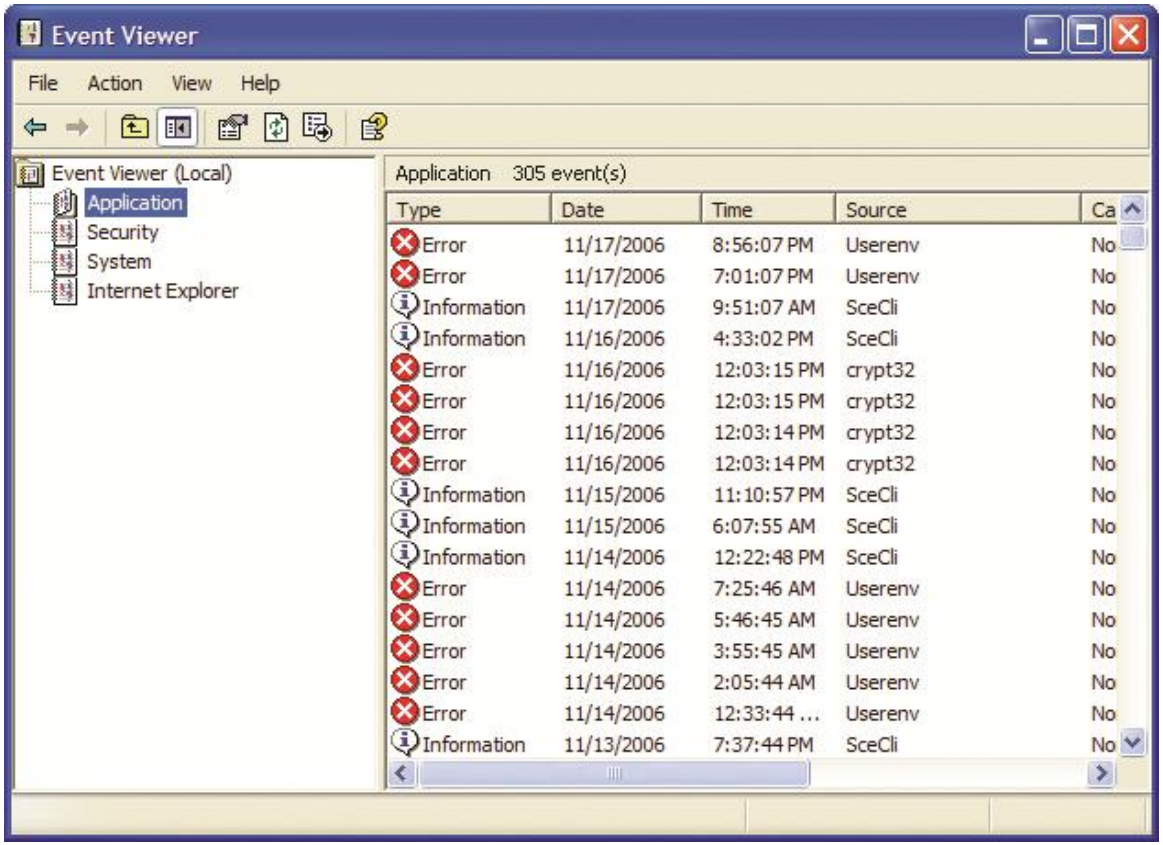

Figure 32: Event Viewer in Windows XP showing some serious application errors!

Troubleshooting Tools in the GUI *(continued)*

- Windows Vista/7 adds an easy-to-use interface to Event Viewer.
  - Four main bars appear in the center pane: Overview, Summary of Administrative Events, Recently Viewed Nodes, and Log Summary.
  - The Summary of Administrative Events breaks down the events into different levels: Critical, Error, Warning, Information, Audit Success, and Audit Failure. You can then click any event to see a dialog box describing the event in detail. Microsoft refers to these as Views.

Troubleshooting Tools in the GUI *(continued)*

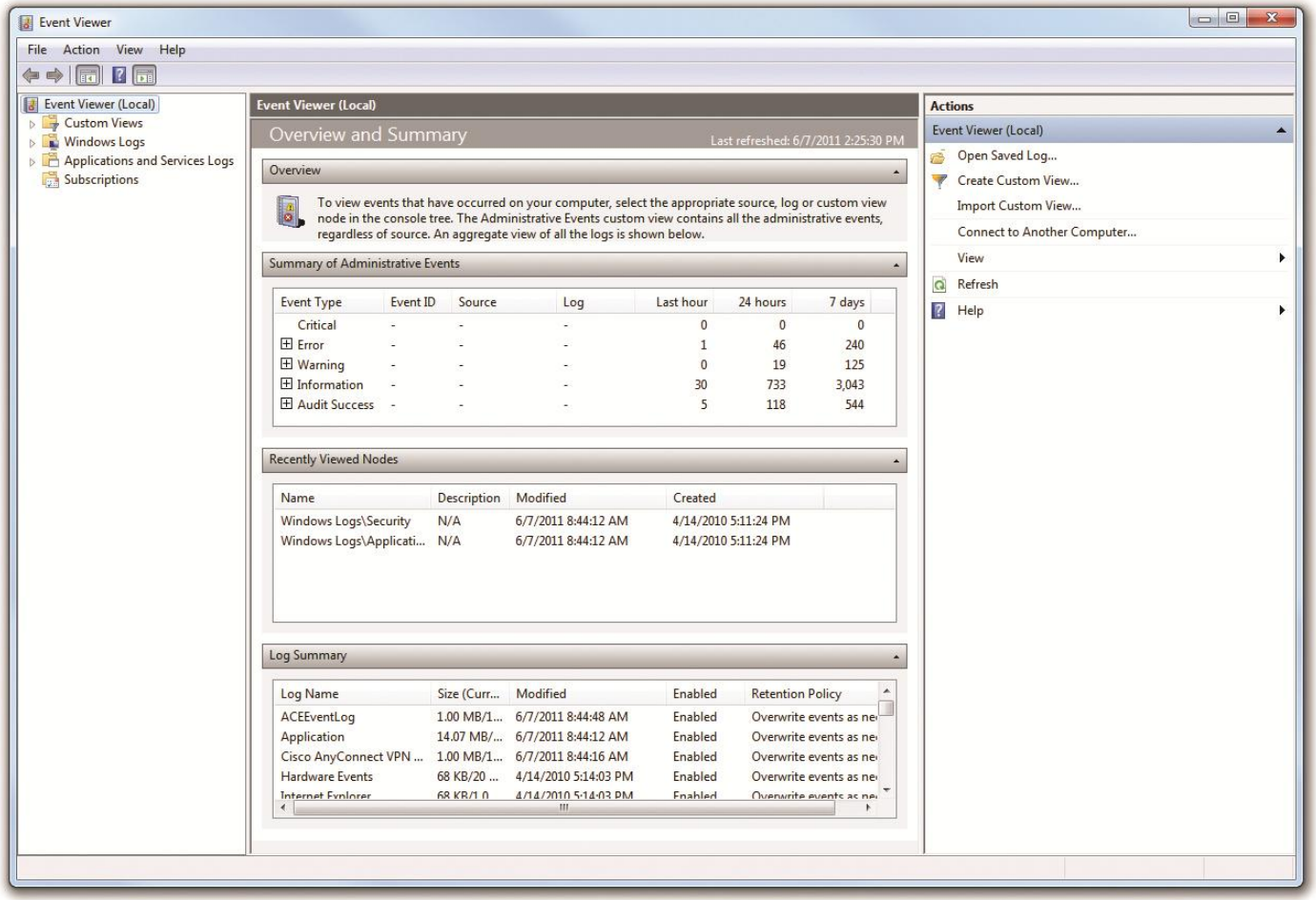

Figure 33: Windows 7 Event Viewer default screen

Troubleshooting Tools in the GUI *(continued)*

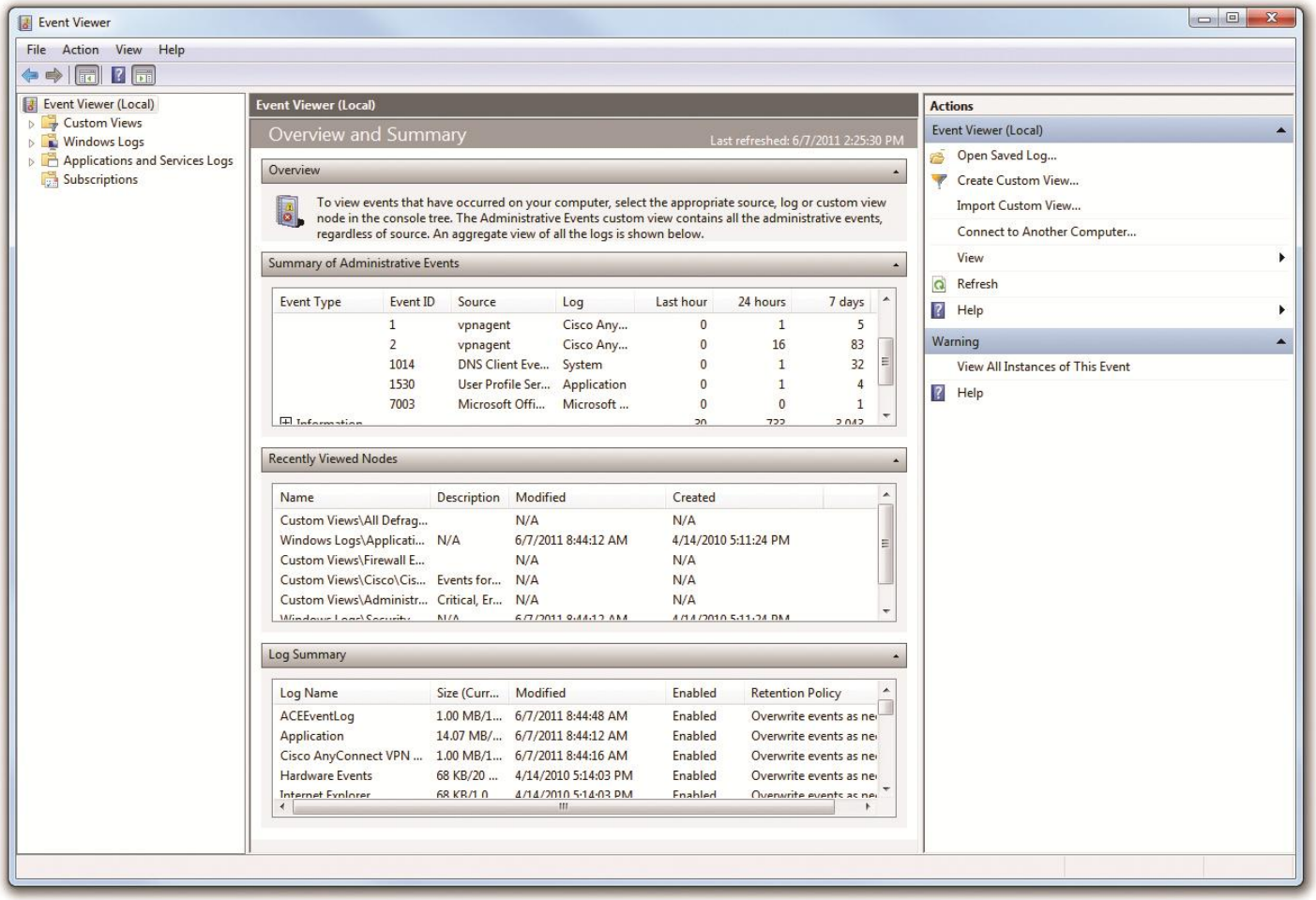

Figure 34: Warning Events open

Troubleshooting Tools in the GUI *(continued)*

- Windows Vista/7 Event Viewer (continued)
  - Views filter existing log files, making them great for custom reports using beginning/end times, levels of errors, and more. You can use the built-in Views or easily create custom Views.
  - Logs in Windows 7 still have the same limitations that logs in earlier versions of Windows had. They have a maximum size, a location, and a behavior that occurs (such as overwrite the log or make an error) when they get too big.

Troubleshooting Tools in the GUI *(continued)*

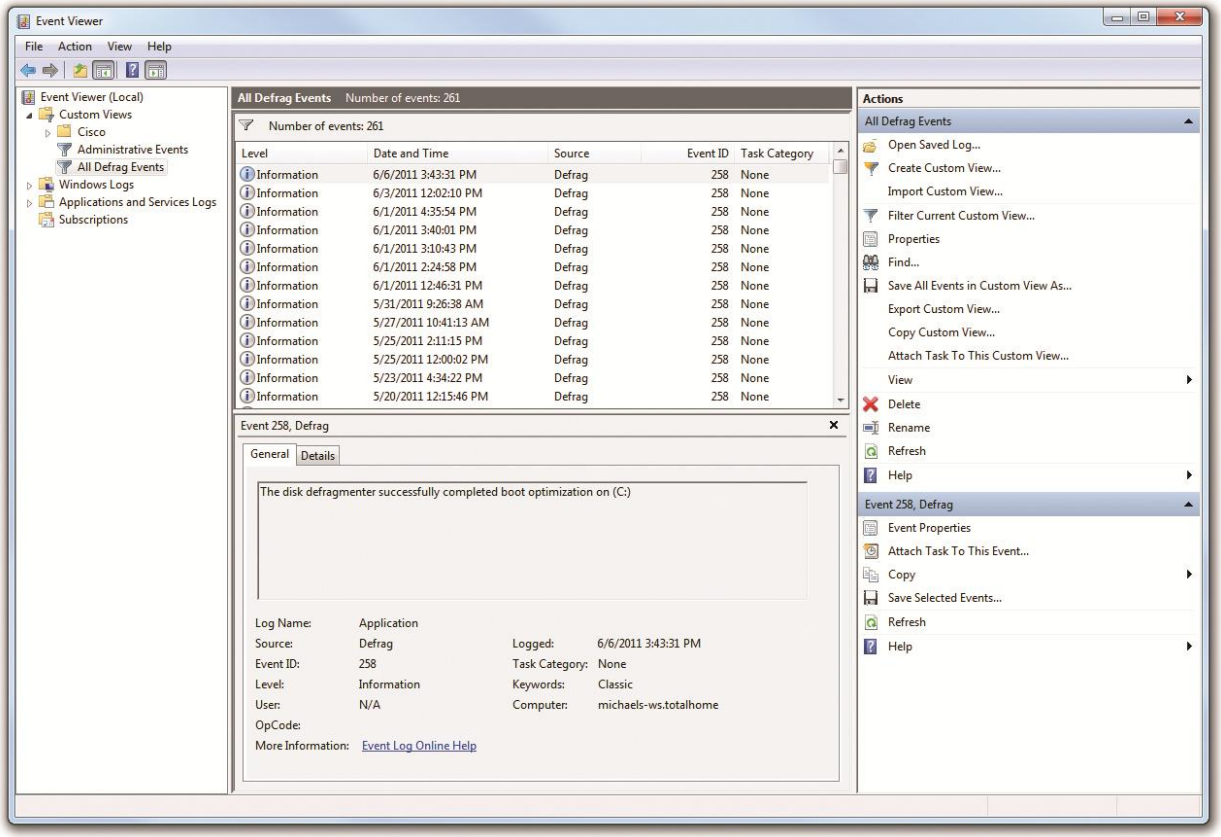

Figure 35: Created custom Views

Troubleshooting Tools in the GUI *(continued)*

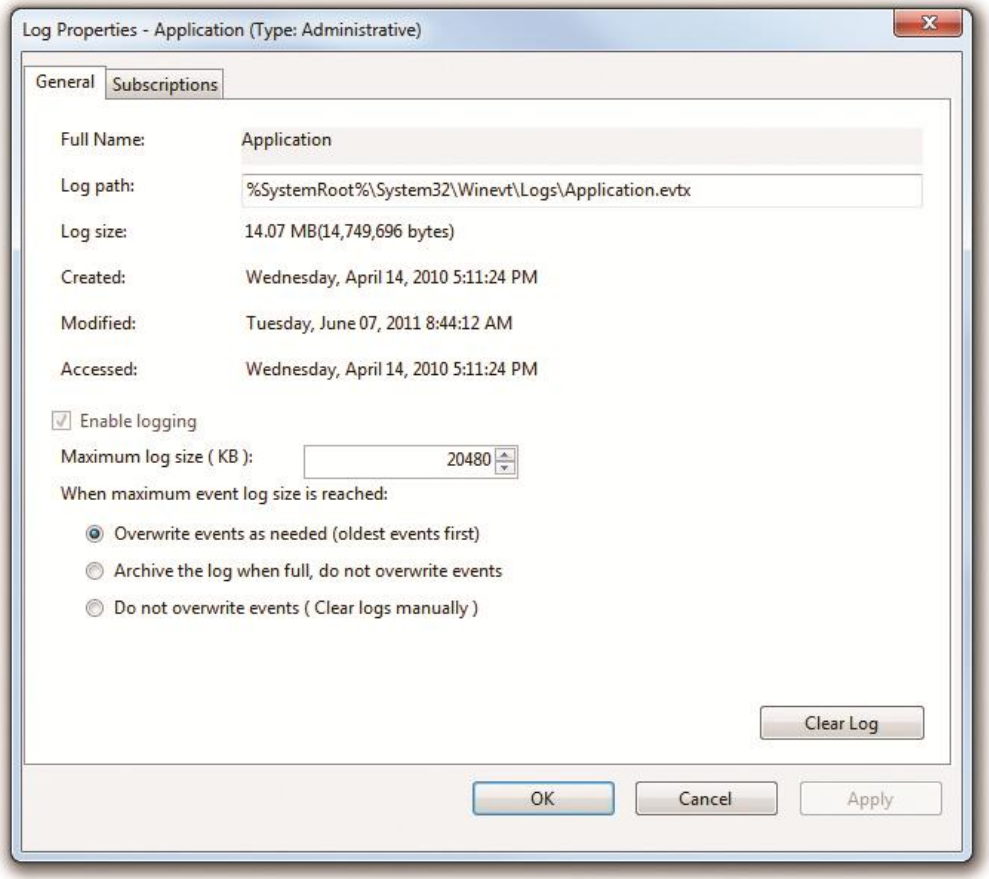

Figure 36: Log Properties dialog box in Windows 7

Troubleshooting Tools in the GUI *(continued)*

- **Autoloading programs—when one of the autoloading programs does not start properly, you need to shut off that program.**
  - Use the System Configuration utility to temporarily stop programs from autoloading.
  - If you want to make the program stop forever, go into the program, find a load on startup option, and turn it off.

Troubleshooting Tools in the GUI *(continued)*

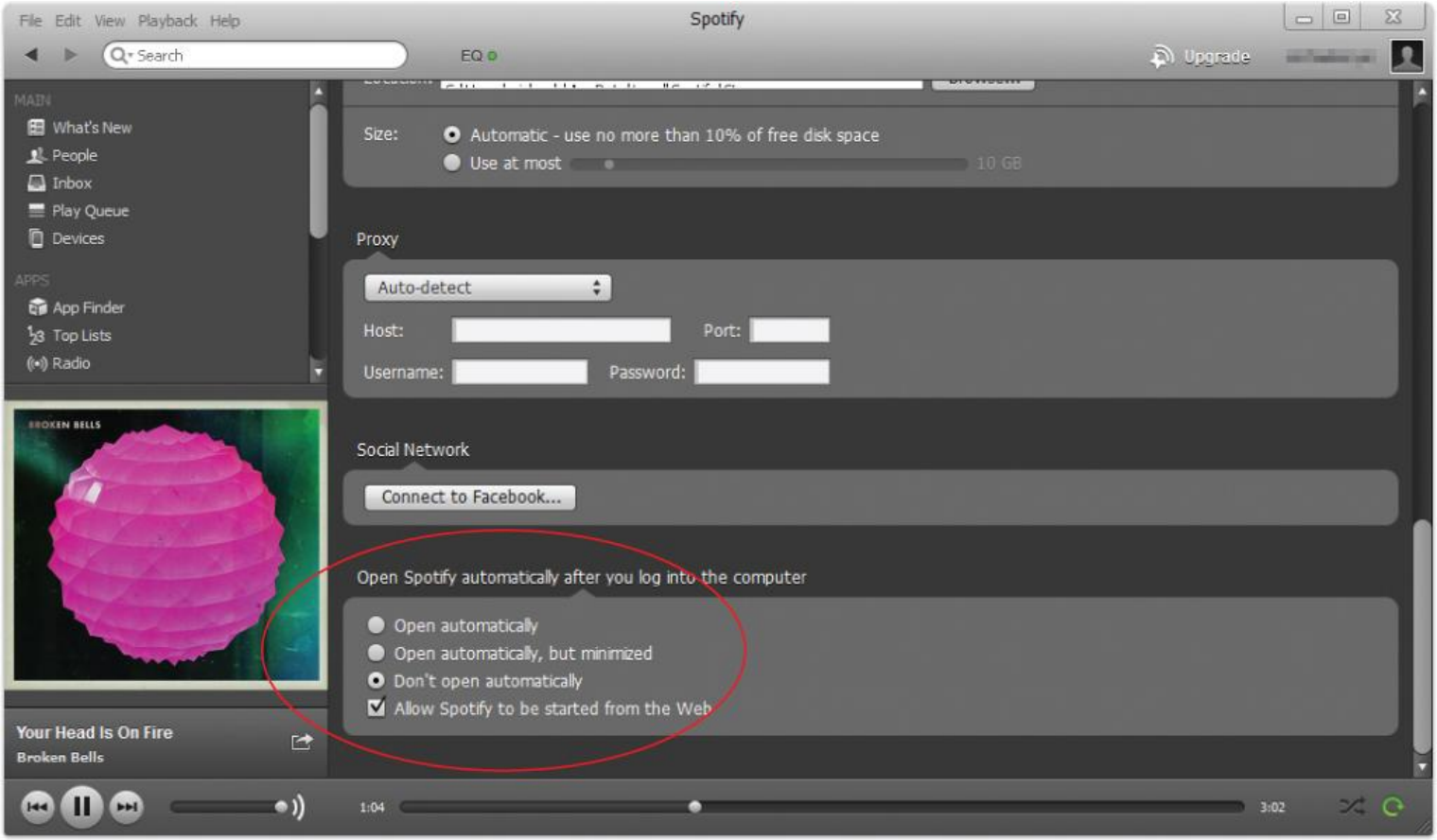

Figure 37: Typical load on startup option

Troubleshooting Tools in the GUI *(continued)*

- **Services—when any critical service fails to load, Windows tells you with an error message.**
  - To work with your system's services, go to the Control Panel | Administrative Tools | Services and verify that the service you need is running—if not, turn it on.
  - Each service has a startup type—automatic, manual, or disabled—that defines when it starts. It's very common to find that a service has been set to manual when it needs to be set to automatic so that it starts when Windows boots.

Troubleshooting Tools in the GUI *(continued)*

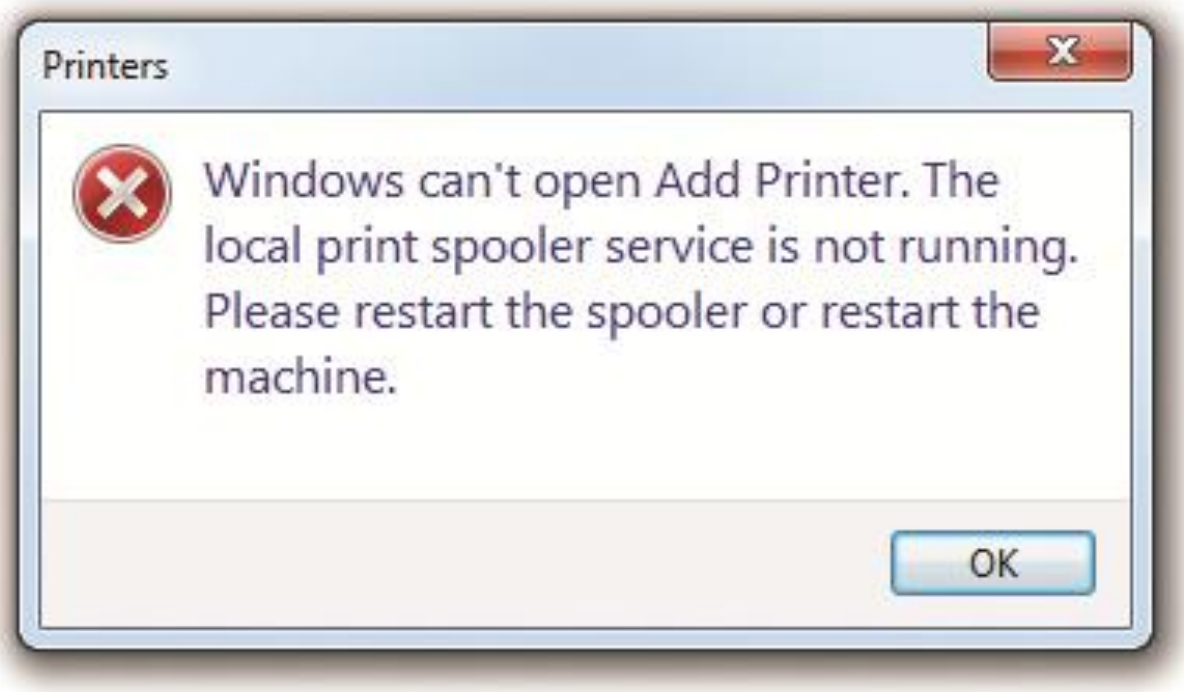

Figure 38: Service error

Troubleshooting Tools in the GUI *(continued)*

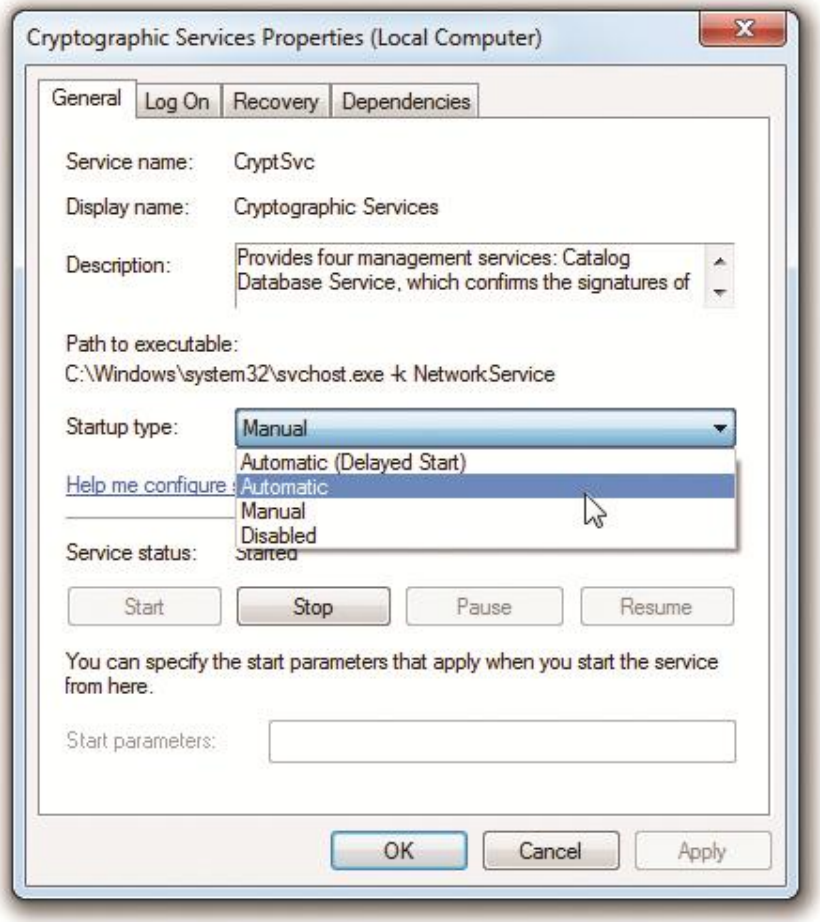

Figure 39: Autostarting a service

Troubleshooting Tools in the GUI *(continued)*

- **Task Manager and Command-Line Options**
  - Task Manager enables you to see all applications or programs currently running or to close an application that has stopped working.
  - If you can't use the GUI version, go to a Command Prompt and type the command *tasklist* to find the names and process IDs of all the running processes. You can then run *taskkill* to end any process either by filename or by process ID.

Troubleshooting Tools in the GUI *(continued)*

- **System Files**
  - Use the System File Checker to check and replace a number of critical files, including the important DLL cache.
- **System Restore**
  - Use System Restore from the Windows Recovery Environment, or you can use restore points from within Windows.

Troubleshooting Tools in Windows Vista and Windows 7

- **Problem Reports and Solutions (Vista)**
  - The Problem Reports and Solutions Control Panel applet in Windows Vista lists all Windows Error Reporting issues (as well as firewall and antimalware status).

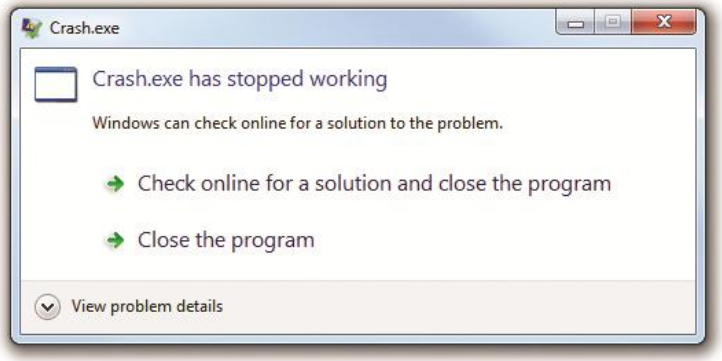

Figure 40: Crash.exe has stopped working.

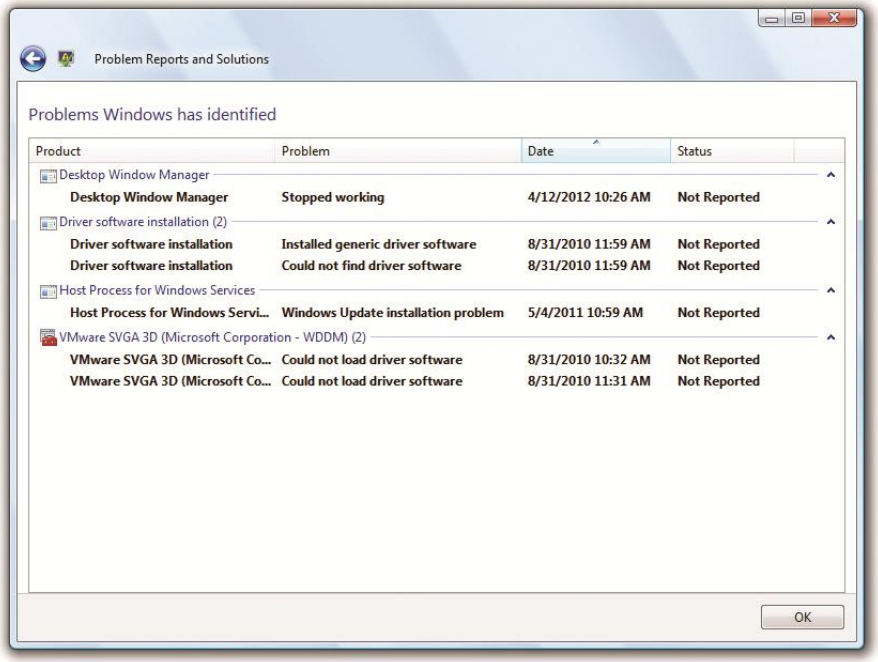

Figure 41: Problem Reports and Solutions

Troubleshooting Tools in Windows Vista and Windows 7 *(continued)*

- **Action Center (Windows 7) provides a one-page aggregation of event messages, warnings, and maintenance messages.**
  - Action Center separates issues into two sections, Security and Maintenance, making it easier to scan a system quickly.
  - Action Center only compiles the information, taking data from well-known utilities such as Event Viewer, Windows Update, Windows Firewall, and UAC and placing it into an easy-to-read format.

Troubleshooting Tools in Windows Vista and Windows 7 *(continued)*

- **Action Center (continued)**
  - Links to most common tools (UAC, Performance Information and Tools, Backup and Restore, Windows Update, Troubleshooting Wizard, System Restore).

Troubleshooting Tools in Windows Vista and Windows 7 *(continued)*

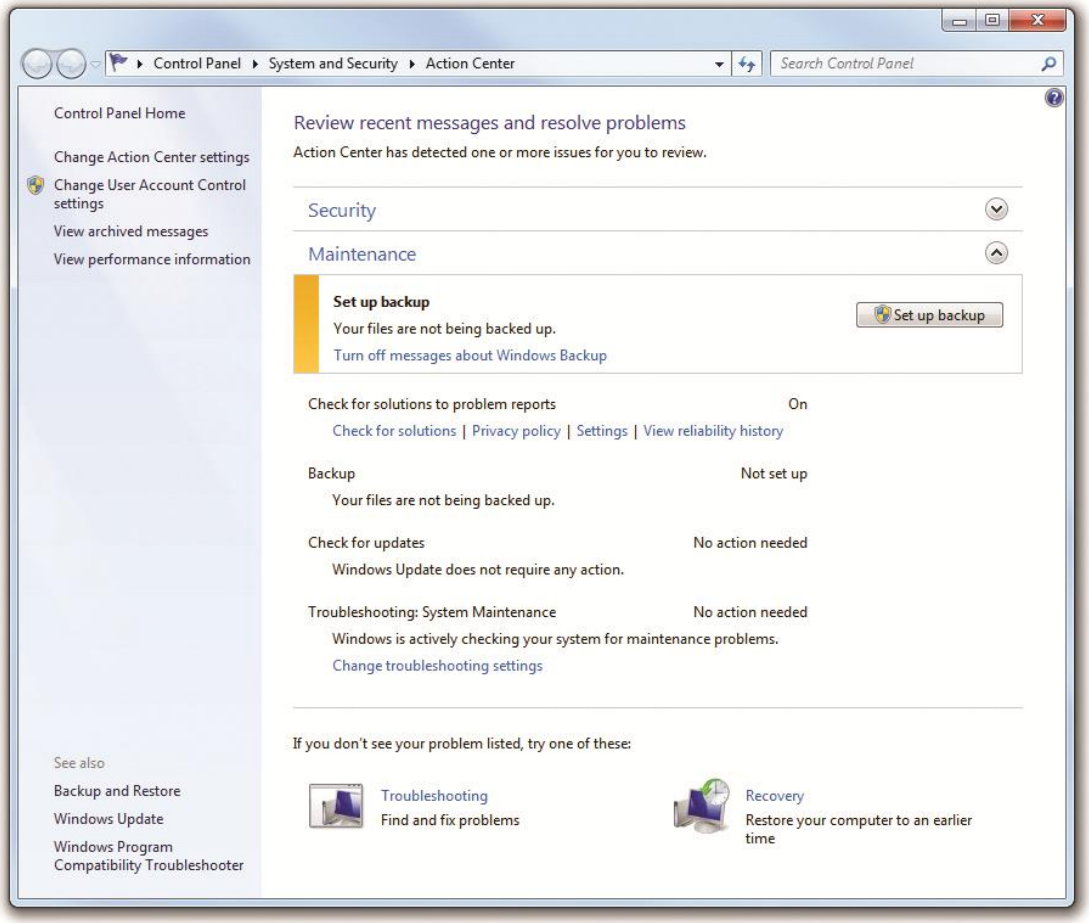

Figure 42: Action Center

Troubleshooting Tools in Windows Vista and Windows 7 *(continued)*

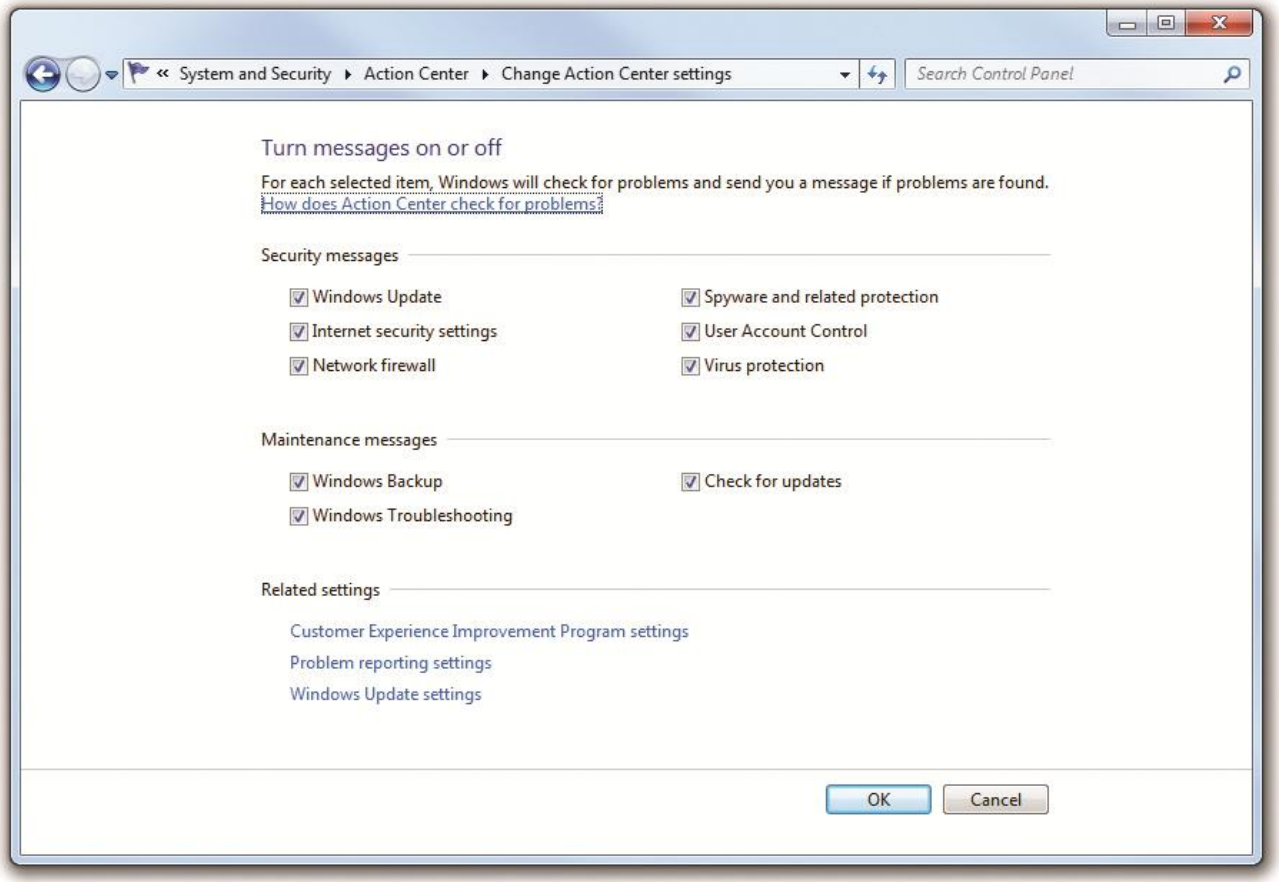

Figure 43: Change Action Center settings

Troubleshooting Tools in Windows Vista and Windows 7 *(continued)*

- **Performance Information and Tools**
  - The Performance Information and Tools applet doesn't fix anything. It just provides a comparison using the Windows Experience Index. Windows bases this on five components:
  - Processor—calculations per second
  - Memory (RAM)—memory operations per second
  - Graphics—desktop performance for Windows Aero
  - Gaming graphics—3-D graphics performance
  - Primary hard disk—disk data transfer rate
  - Each component generates a subscore. These values range from 1 to 5.9 for Windows Vista and 1 to 7.9 for Windows 7.

Troubleshooting Tools in Windows Vista and Windows 7 *(continued)*

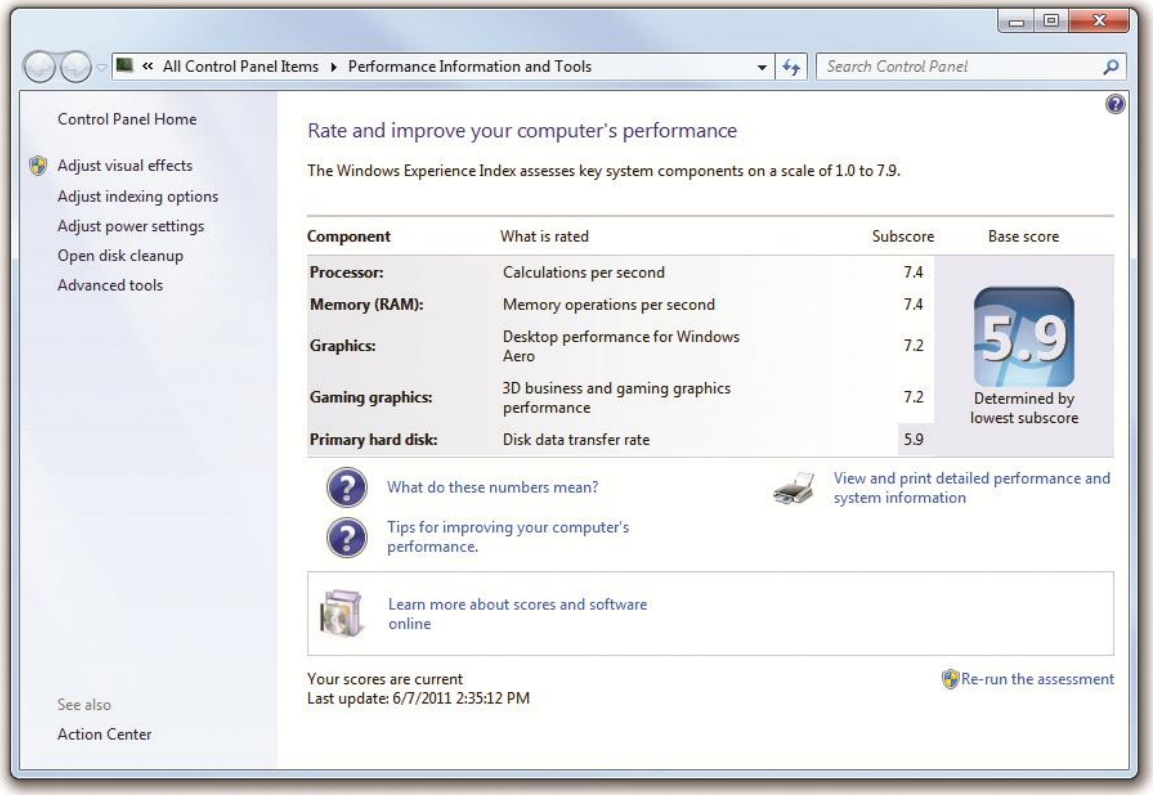

Figure 44: Performance Information and Tools

Application Problems

Application Installation Problems

- Almost all Windows programs come with some form of installer.
- If you insert a software disc, Windows knows to look for a text file called autorun.inf that tells it which file to run off the disc, usually setup.exe.
- If you download the application, you'll need to double-click it to start the installation.

Application Installation Problems *(continued)*

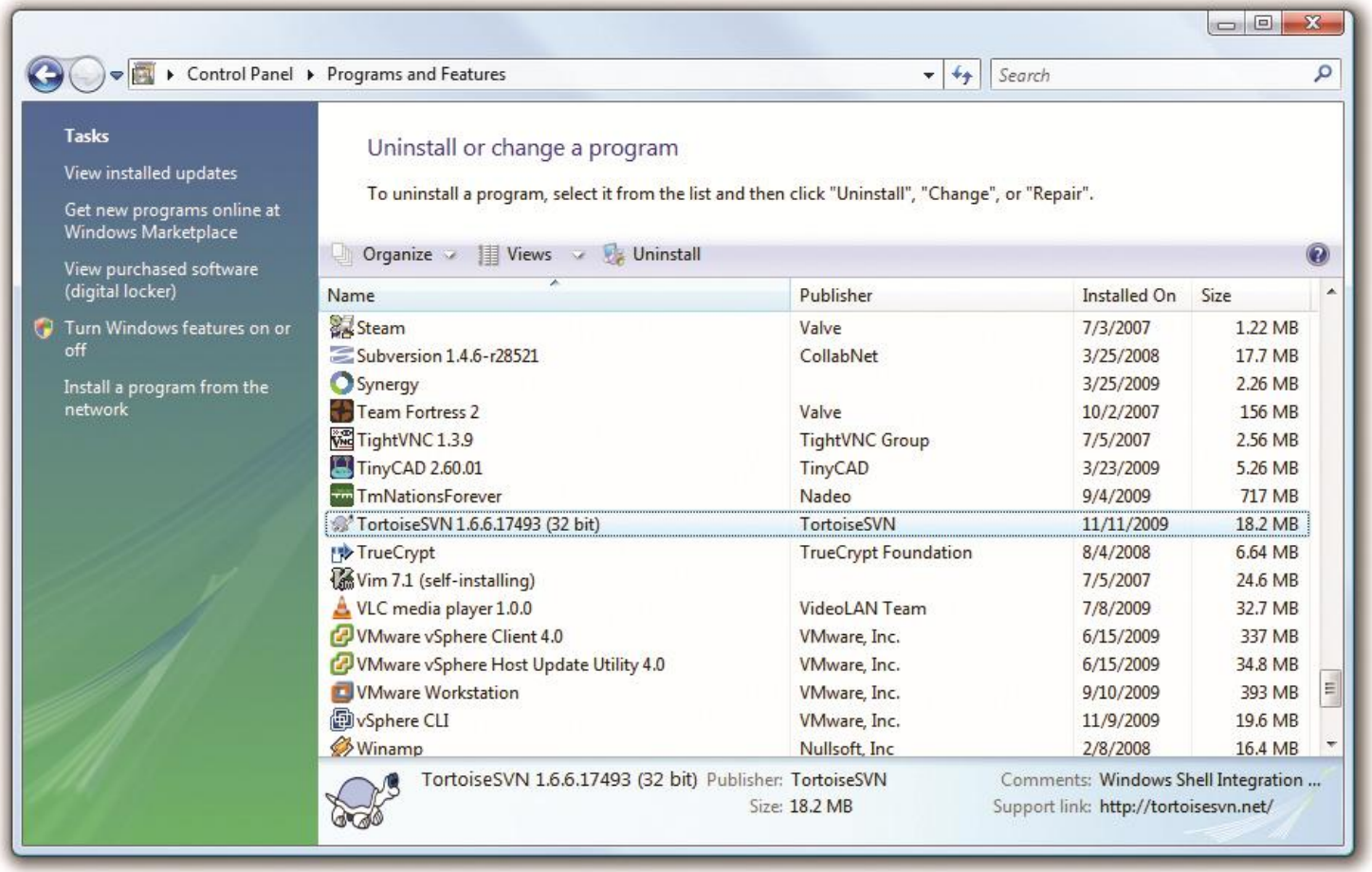

Figure 45: Programs and Features Control Panel applet

Application Installation Problems *(continued)*

- **With most installation issues, a problem with Windows prevents programs from installing, usually the lack of some other program that the application needs so it can operate.**
  - The best example of this is the popular Microsoft .NET Framework.
  - .NET is an extension to the Windows operating system that includes support for a number of features, particularly powerful interface tools and flexible database access. If a program is written to take advantage of .NET, .NET must itself be installed.

Application Installation Problems *(continued)*

- **Installation issues (continued)**
  - In most cases, if .NET is missing, the application should try to install it at the same time it is installed, but this may not happen.
  - If .NET is missing or if the version of .NET you are using is too old, you can get errors.
  - These types of errors usually require you to go online and do Web searches, using the application name and the error.

Application Installation Problems *(continued)*

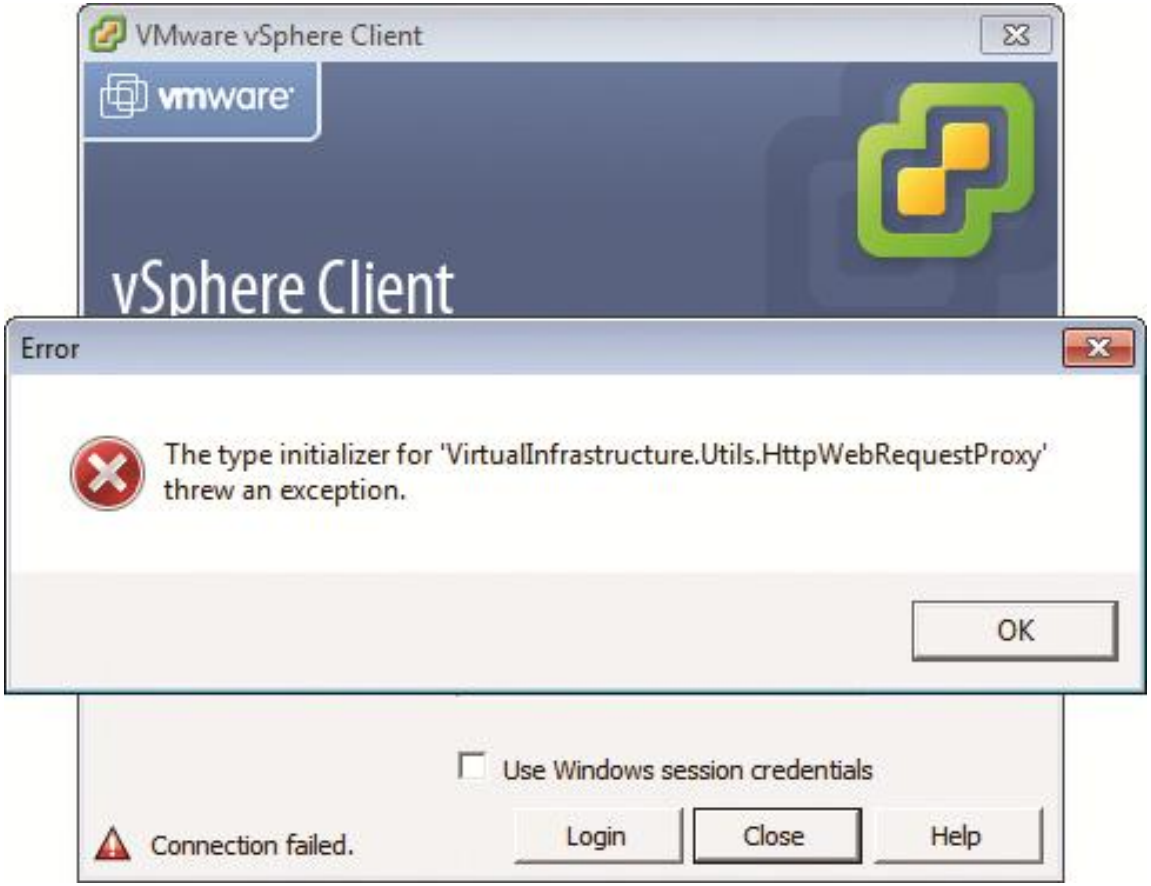

Figure 46: .NET error

Problems with Uninstalling

- **The single biggest problem with uninstalling is that people try to uninstall without administrator privileges.**
  - If you try to uninstall and get an error, log back on as an administrator and you should be fine.
  - You can right-click on most installation menu options on the Programs menu and select Run as administrator to switch to administrator privileges.

Problems with Uninstalling *(continued)*

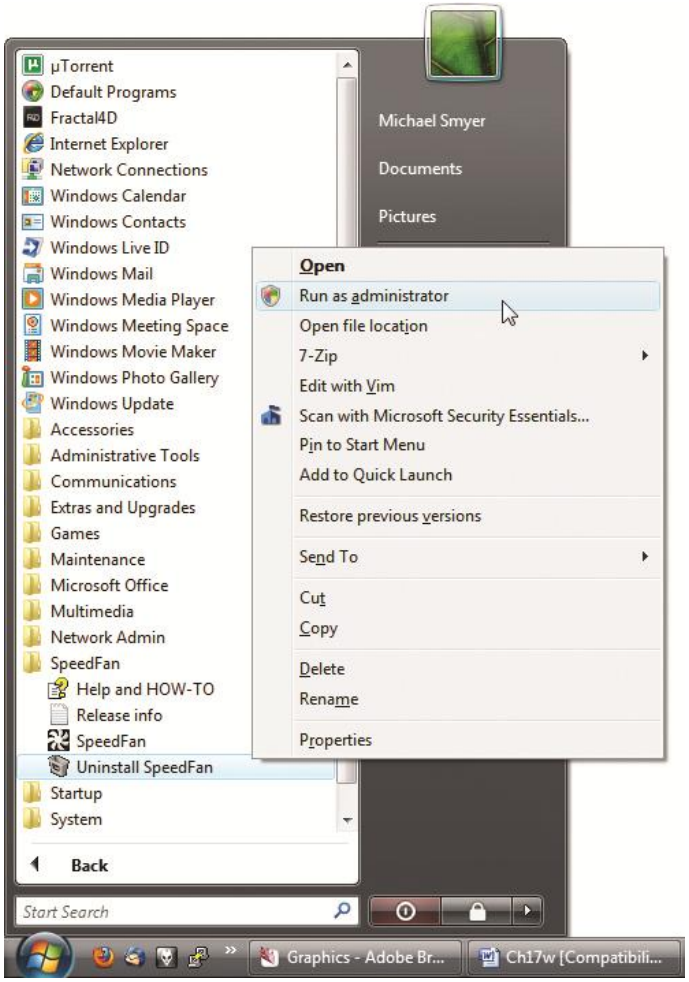

Figure 47: Selecting Run as administrator from the context menu

Compatibility

- As Windows versions change over time, older programs have difficulty running in more recent Windows versions.
- Windows XP, Windows Vista, and Windows 7 provide different forms of compatibility modes to support older applications.

Compatibility *(continued)*

- **Windows XP handles compatibility using the aptly named Compatibility tab in every executable program's Properties dialog box (right-click on the executable file and click Properties).**
  - Select the version of Windows you want Windows XP to emulate, and in many cases that is all you need to do to make that older program work.
  - You can also set other settings on the Compatibility tab, such as the following located under Display settings:

Compatibility *(continued)*

- **Windows XP Compatibility tab (continued)**
  - Run in 256 colors—Many old Windows programs were designed to run in 256 colors. Later versions of Windows that support more colors can confuse these older programs.
  - Run in 640 × 480 screen resolution—A few (badly written) older programs assume the screen to be at 640 × 480 resolution. This setting enables them to work.
  - Disable visual themes—Windows themes change a program window's title bar, fonts, and menus, which might create problems for some programs.

Compatibility *(continued)*

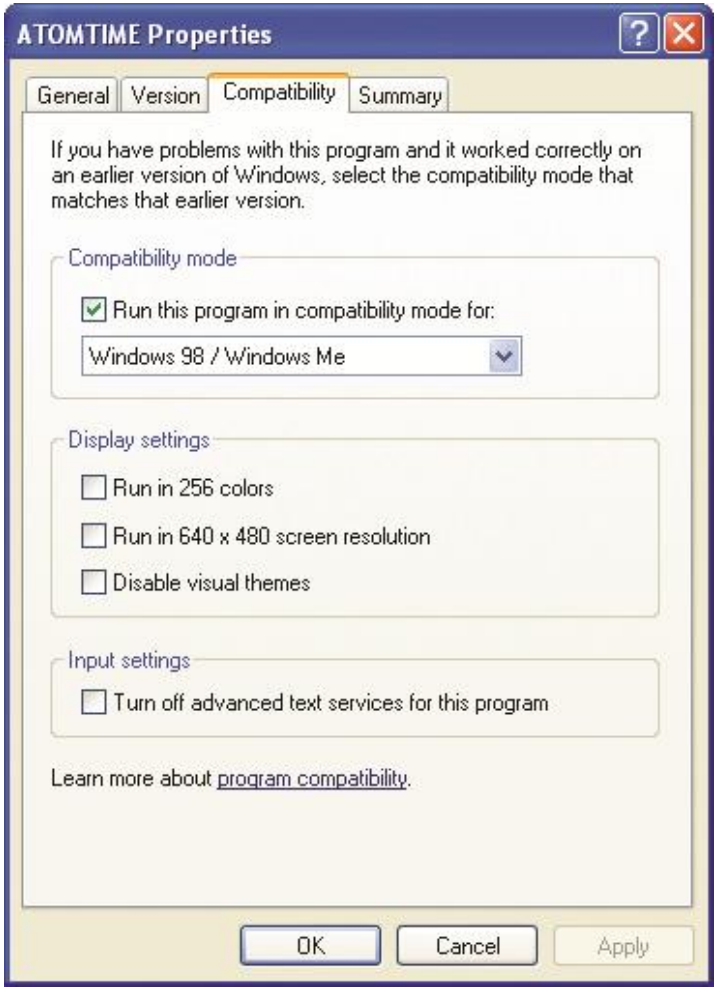

Figure 48: XP Compatibility tab

Compatibility *(continued)*

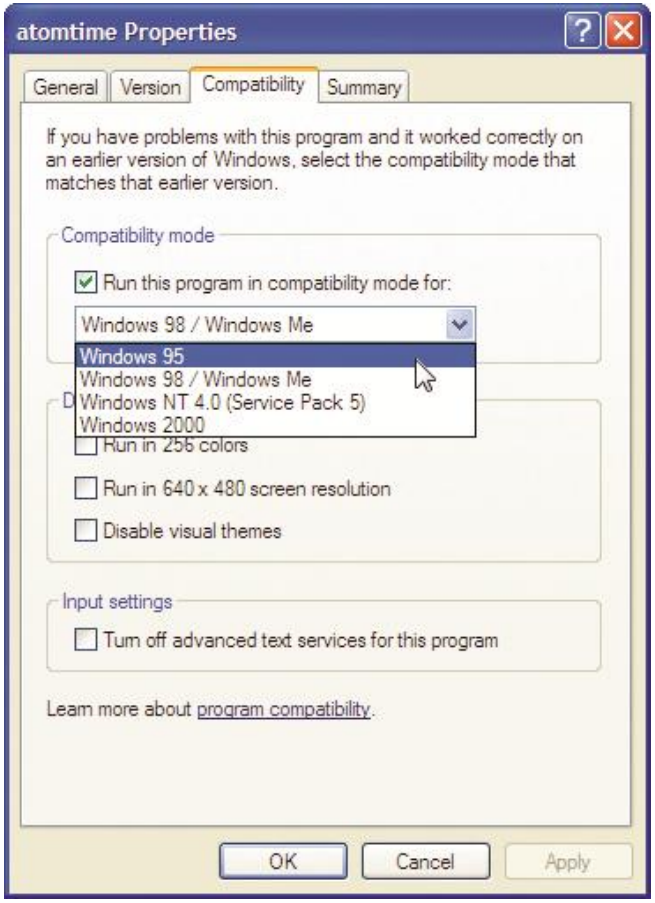

Figure 49: Compatibility mode options in Windows XP

Compatibility *(continued)*

- **Windows Vista and Windows 7 add some important improvements to the Compatibility tab. Both add more recent OS options to the Compatibility mode drop-down menu.**

Compatibility *(continued)*

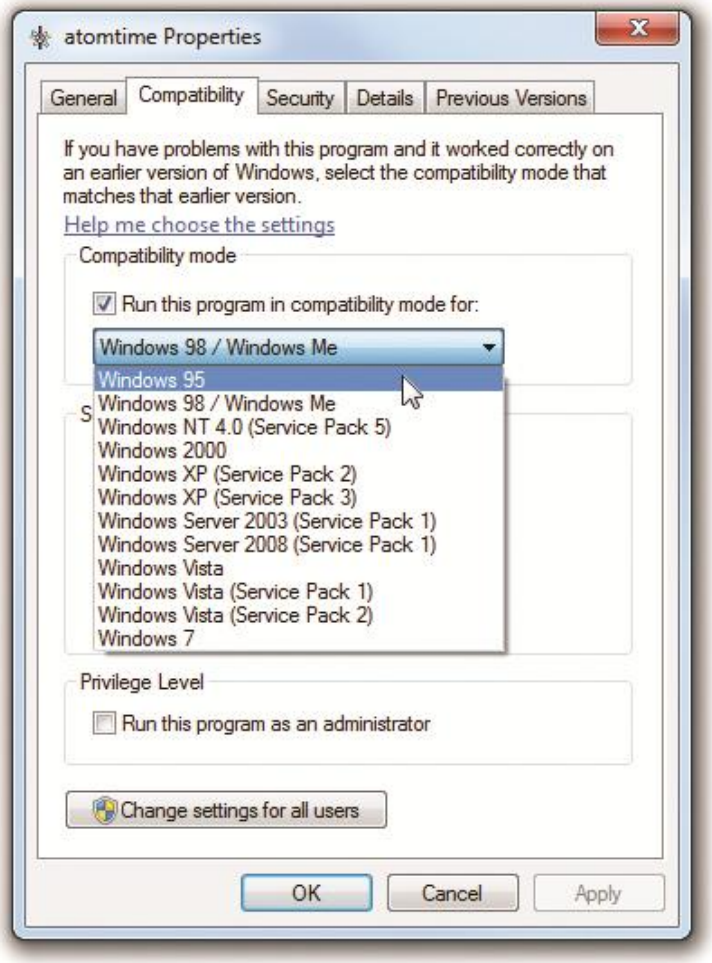

Figure 50: Compatibility mode options in Windows 7

Compatibility *(continued)*

- **The newer Compatibility tab also adds some new options to help older programs run:**
  - Disable desktop composition—Disables all display features such as Aero. More advanced Windows display features often bog down older programs.
  - Disable display scaling on high DPI settings—Turns off automatic resizing of a program's windows if you're using any high DPI (dots-per-inch) font. This was added because many programs with large fonts would look bizarre if resized.

Compatibility *(continued)*

- **The newer Compatibility tab (continued)**
  - Run this program as an administrator—As stated, enables you to run the program as an administrator. If this option isn't available, log on as an administrator to see it.
  - Change settings for all users—Clicking this button applies compatibility changes made to a program to every user account on the machine. Otherwise, the settings are only for the current user.

Compatibility *(continued)*

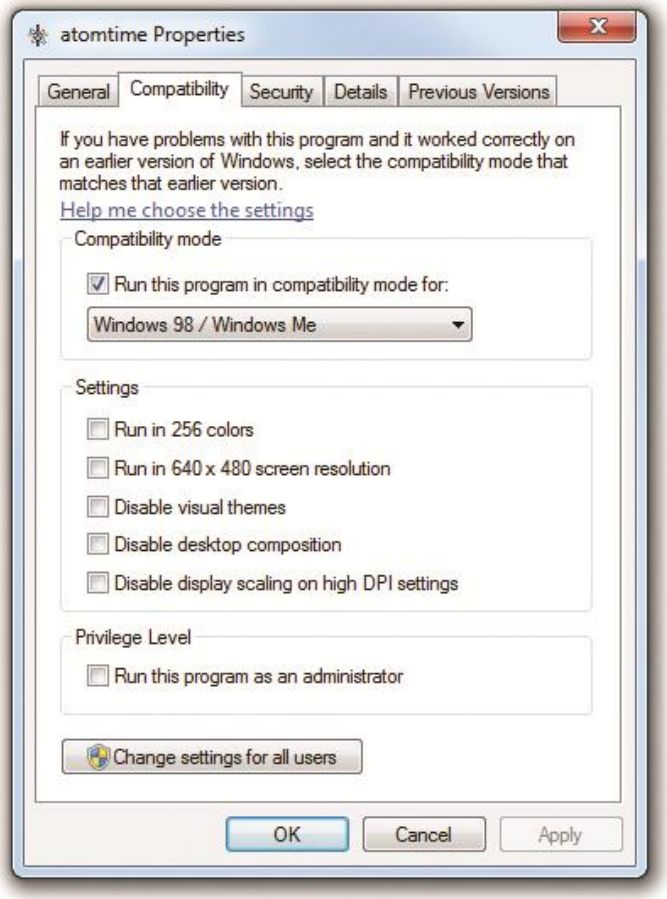

Figure 51: Windows 7 Compatibility tab

Compatibility *(continued)*

- **If you need to make things 100 percent compatible with Windows XP and you have Windows 7 (Professional, Ultimate, and Enterprise only) installed on your system, you can download Windows XP Mode.**
  - Windows XP Mode is nothing more than a premade Windows XP SP3 virtual machine that runs under Microsoft's popular (and free) virtualization program, Windows Virtual PC.

Compatibility *(continued)*

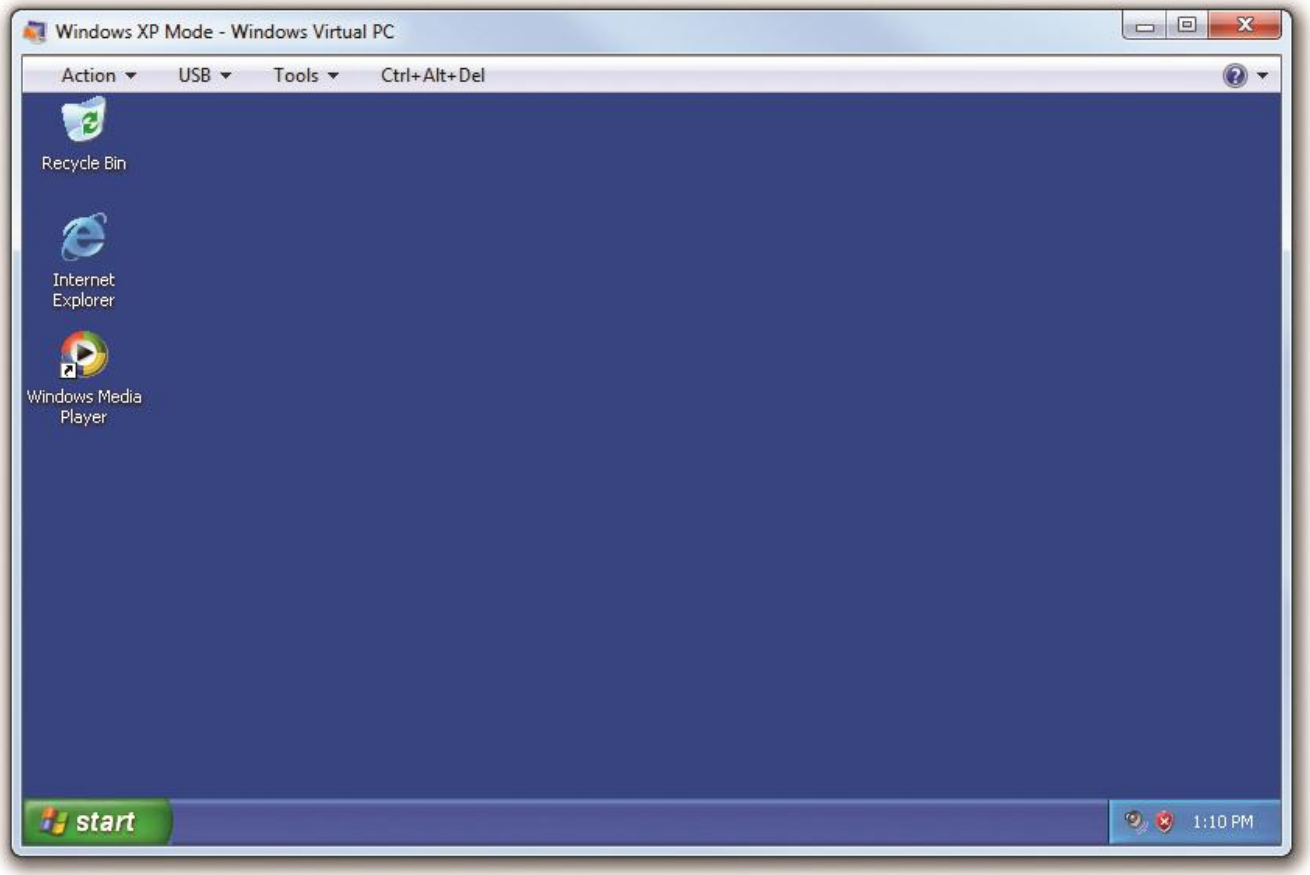

Figure 52: Windows XP Mode

Missing File or Incorrect File Version

- An application may rely on other files, in particular DLL files.
- Sometimes the application installer will bring specially formatted versions of common DLL or other files to Windows, overwriting the previous versions.
- Later applications might look for the earlier version of the DLL and fail when it's not found.

Missing File or Incorrect File Version *(continued)*

- **The usual fix for either issue is to perform an Internet search for the missing DLL or file that fails to open, along with the name of the program you're trying to use.**

Crashing Programs

- Sometimes error-prone code causes the application to crash or even causes the operating system to crash.
- Symptoms caused by such programs are the computer locking up, unexpectedly shutting down, or a crash-to-desktop (CTD).
- The system might spontaneously shut down and restart. That kind of improper shutdown can cause problems, especially to open files and folders.

Crashing Programs *(continued)*

- **In some cases, where the program runs but degrades the overall performance of Windows, it could point to the application side of things rather than the hardware or drivers, especially if the computer successfully runs other programs.**

Volume Shadow Copy Service and System Protection

- Sometimes it isn't the application itself but any data it may have corrupted.
- Microsoft introduced in Windows Vista (Business, Ultimate, and Enterprise only) and Windows 7 (all editions) a feature called System Protection.
- This feature is powered by Volume Shadow Copy Service (VSS), a feature introduced in Windows XP and used by ntbackup.

Volume Shadow Copy Service and System Protection *(continued)*

- **VSS enables the OS to make backups of any file, even one in use. In Vista/7, VSS is also used by System Protection, enabling access to previous versions of any data file or folder.**
- **If any of the following criteria are met, you will have at least one previous version in the list:**
  - The file or folder was backed up using the backup program.
  - You created a restore point.
  - The file or folder was changed.

Volume Shadow Copy Service and System Protection *(continued)*

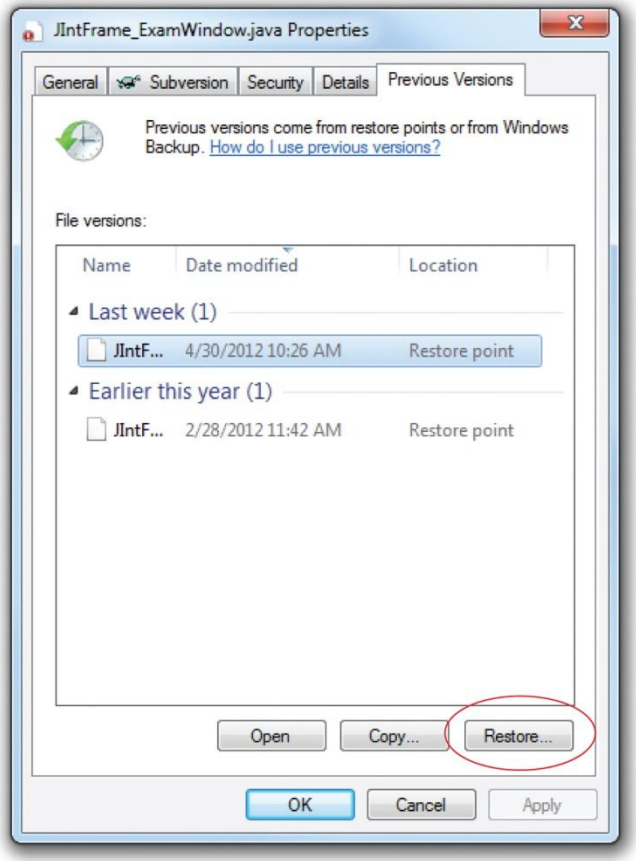

Figure 53: Previous Versions tab

Volume Shadow Copy Service and System Protection *(continued)*

- **You must make sure System Protection is enabled as well. Go to the System Protection tab in the System Properties dialog box to see if the feature is enabled (it should be running by default).**

Volume Shadow Copy Service and System Protection *(continued)*

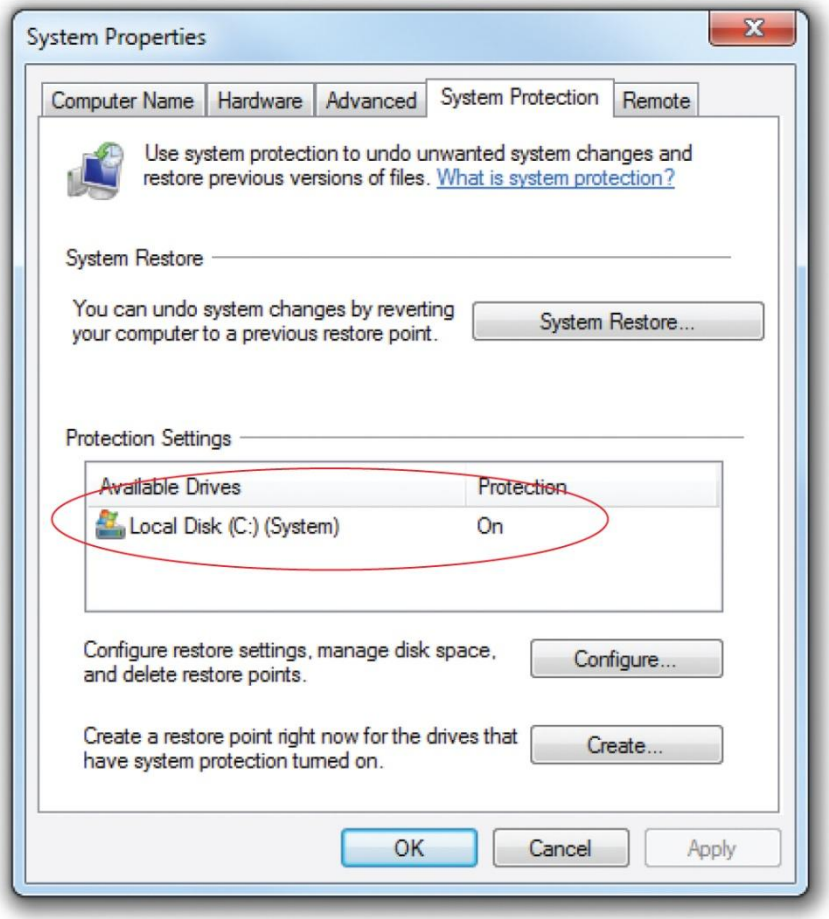

Figure 54: System Protection tab