

# Make System Repairs from the Windows Recovery Environment

Ed Bott, Carl Siechert, and Craig Stinson



(Adapted from Windows Vista Inside Out - Microsoft Corporation)

All is by no means lost if you are using the Windows Vista operating system, and it won't start, even in safe mode. This article explains how you can repair many serious system problems by using the Windows Recovery Environment. If the trouble stems from a corrupted system file, the Windows Recovery Environment might be able to get your system running again with almost no intervention or effort on your part.

The system recovery information that follows includes: launching the Windows Recovery Environment, replacing corrupted or missing system files with Startup Repair, restoring stability with System Restore, restoring an image backup with Windows Complete PC Restore, running the Windows Memory Diagnostic Tool, and working at the command prompt.

## Launching the Windows Recovery Environment

If you have a Windows Vista distribution DVD, you can get to the Windows Recovery Environment as follows:

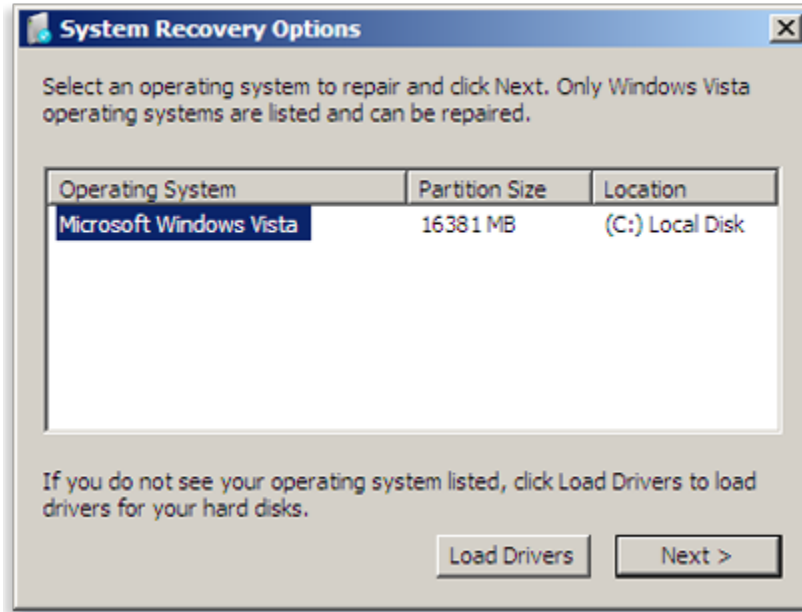
- Insert the Windows Vista DVD.
- Restart your computer:
- Click the Start button , click the arrow next to the Lock button , and then click Restart.
- Let the computer restart (boot) from the DVD.
- **Note:** If your computer is not configured to start from a DVD, check the information that came with your computer. You might need to change your computer's BIOS settings. For more information, see BIOS: frequently asked questions. For assistance, contact your system administrator or computer manufacturer.
- If prompted, press any key to continue.
- When you reach the Install Windows screen, select your preferences in the Language to install, Time and currency format, and Keyboard or input method boxes, and then click Next. The following screen appears.



# Make System Repairs from the Windows Recovery Environment

Ed Bott, Carl Siechert, and Craig Stinson  
(Adapted from Windows Vista Inside Out - Microsoft Corporation)

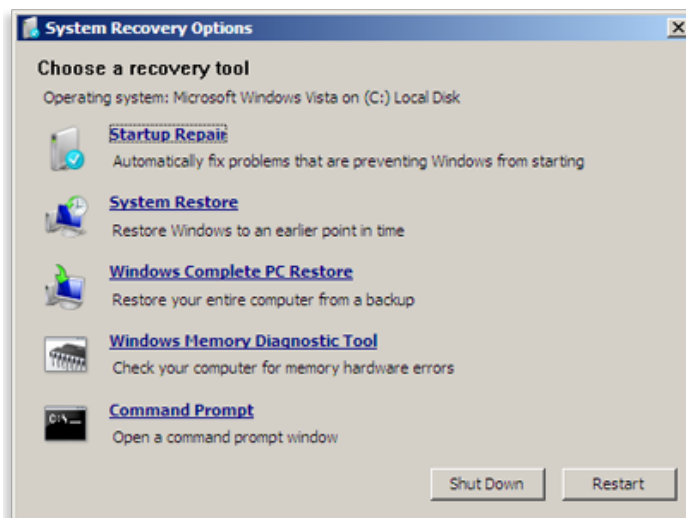
- To get to the Windows Recovery Environment, click “Repair your computer”
- Do not click Install now. Instead, click Repair your computer. The System Recovery Options dialog box appears.



- Select the operating system that you want to repair
- Make sure the correct operating system is selected, and then click Next.





**Note:** This dialog box will not list earlier versions of Windows that happen to be installed on the same computer as Windows Vista.

- After you click Next, the System Recovery Options menu appears.



# Make System Repairs from the Windows Recovery Environment

Ed Bott, Carl Siechert, and Craig Stinson  
(Adapted from Windows Vista Inside Out - Microsoft Corporation)

- The System Recovery Options menu is the main menu of the Windows Recovery Environment and offers five troubleshooting and repair commands
- Check system files while Windows is running
- If you receive an error message indicating a damaged system file while you are running Windows, and you have an account with administrative privileges (or access to elevated credentials), try running the command-line utility Sfc:
- Click the Start button , click All Programs, click Accessories, right-click Command Prompt, and then click Run as administrator.
-  If you are prompted for an administrator password or confirmation, type the password or provide confirmation.
- Respond to the User Account Control (UAC) prompt. In the Command Prompt window, type `sfc /scannow`.
- The utility will scan your system files and attempt to repair any damage that it finds. It might prompt you for Windows Vista distribution media to carry out its repairs.
- If Windows Vista was preinstalled on your computer, and you do not have a distribution DVD, your computer's manufacturer has probably set up the Windows Recovery Environment on a hard disk recovery volume. In that case, restart your computer:
- Click the Start button , click the arrow next to the Lock button , and then click Restart.
- Do one of the following:
  - If your computer has a single operating system installed, press and hold the F8 key as your computer restarts. You need to press F8 before the Windows logo appears. If the Windows logo appears, you will need to try again; to do this, wait until the Windows logon prompt appears, and then shut down and restart your computer.
  - If your computer has more than one operating system, use the arrow keys to highlight the operating system you want to repair, and then press and hold F8.
- On the Advanced Boot Options screen, use the arrow keys to highlight Repair your computer, and then press ENTER. (If Repair your computer is not listed as an option, then your computer does not include Startup Repair as a preinstalled recovery option.)

It's also possible that your system is set up so that, in the event that Windows can't start, the Windows Recovery Environment loads automatically. If neither of these is the case, and you're having trouble finding your way to the Windows Recovery Environment, consult the documentation that came with your computer, or call your manufacturer's technical support.

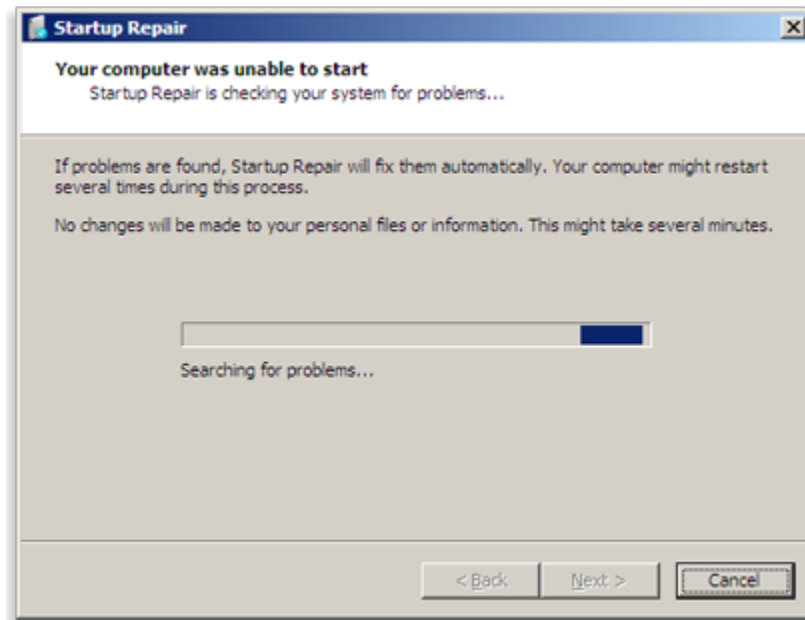
# Make System Repairs from the Windows Recovery Environment

Ed Bott, Carl Siechert, and Craig Stinson  
(Adapted from Windows Vista Inside Out - Microsoft Corporation)

## Replacing Corrupted or Missing System Files with Startup Repair

Startup Repair, the first recovery tool on the System Recovery Options menu, is designed to get you back up and running when Windows won't start because of damage to (or deletion of) one or more essential system files. Generally speaking, if you're not sure why Windows won't start, you should begin your troubleshooting by running Startup Repair. (Under some circumstances, and depending on how your system has been set up, Startup Repair might run automatically when Windows fails to boot.)

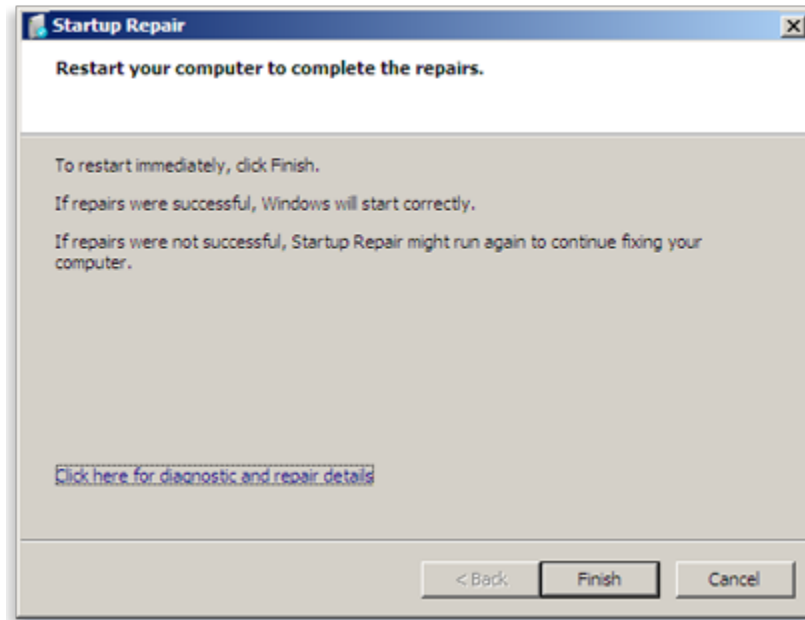
- Click Startup Repair. This recovery tool begins by displaying the following dialog box.



- Begin troubleshooting by running Startup Repair
- After a few moments, if all has gone well, you might see this message.

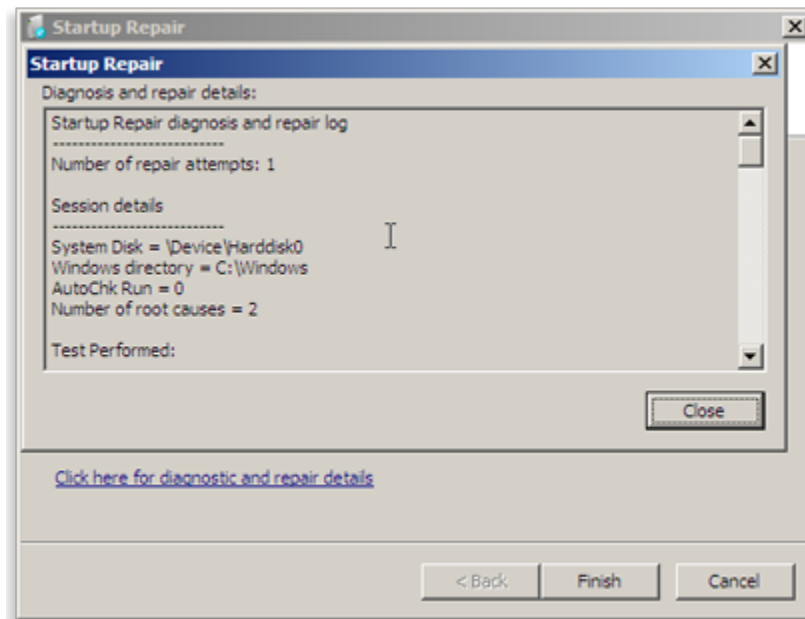
# Make System Repairs from the Windows Recovery Environment

Ed Bott, Carl Siechert, and Craig Stinson  
(Adapted from Windows Vista Inside Out - Microsoft Corporation)



- Startup Repair might prompt you to make choices as it tries to fix the problem

This is not a promise that your system has been fixed—but it is encouraging. If you respond by clicking Finish, the system will reboot. If all problems are solved, you'll be heading straight back into Windows. If more repair is needed, Startup Repair will run again. If you want more information about what Startup Repair has done, click Click here for diagnostic and repair details. Something akin to the following dialog box will appear, and you can use the scroll bar to read the full report.

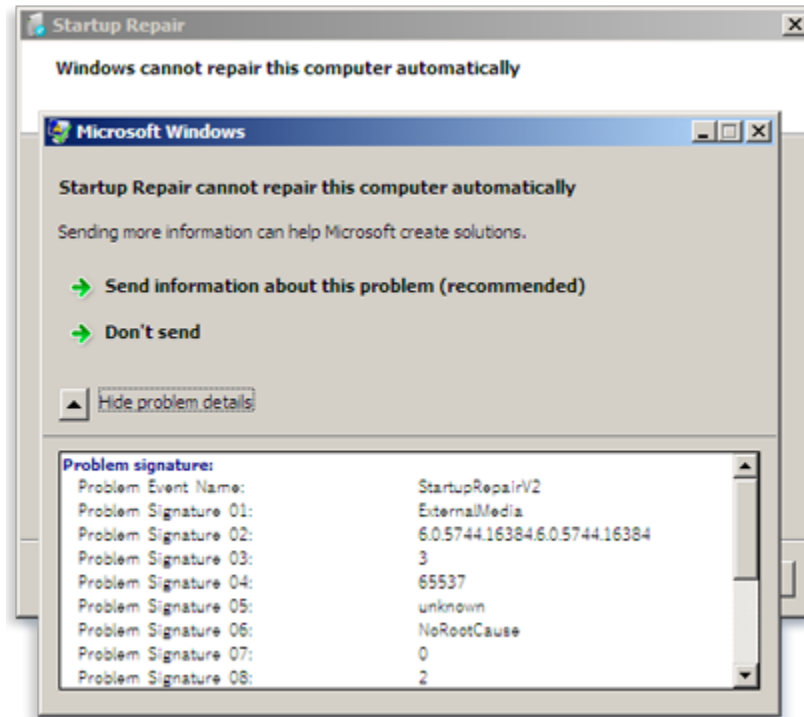


- If more repairs are needed, Startup Repair will run again

## Make System Repairs from the Windows Recovery Environment

Ed Bott, Carl Siechert, and Craig Stinson  
(Adapted from Windows Vista Inside Out - Microsoft Corporation)

- If Startup Repair is unable to solve your problem, you're likely to see the following message with a request that you consent to informing Microsoft.



- If repairs are not successful, you'll see a summary of the problem and links to contact information for support
- You might also see a message proposing an alternative troubleshooting approach—such as running System Restore.

### Restoring stability with System Restore

If Startup Repair doesn't solve your problem, or, if you know that your problem is not the result of a damaged system file (for example, if you're reasonably certain that a bad device driver is the culprit), you can try returning your system to a more stable state by means of System Restore. For information about using System Restore in Windows, see Turn back time on your PC.

The one difference between running System Restore in Windows and running it in the Windows Recovery Environment is that, in the latter case, no new restore point is created at the time you perform the restore. Therefore, if you run System Restore from the Windows Recovery Environment, and you're not pleased with the result, you won't have any simple method of undoing the restore. On the other hand, the fact that you're in Windows Recovery Environment to begin with suggests that you have nothing to lose.

### Restoring an Image Backup with Windows Complete PC Restore

**Note:** Windows Complete PC Backup and Restore is not included with Windows Vista Starter, Windows Vista Home Basic, or Windows Vista Home Premium.

# Make System Repairs from the Windows Recovery Environment

Ed Bott, Carl Siechert, and Craig Stinson

(Adapted from Windows Vista Inside Out - Microsoft Corporation)

If, prior to the current emergency, you have used the Windows Complete PC Backup program to create an image backup of your system disk, you can use the Windows Complete PC Restore command in the Windows Recovery Environment to restore that image. Restoring an image backup of a disk completely replaces the current contents of the disk. The restore program, in fact, will format the disk to which it is restoring before it begins the restore process—and it will require your acknowledgement and explicit consent before it begins. This might sound like a drastic step, but it can be a quick and effective way to get Windows running again in circumstances that Startup Repair is unable to address.

For more information about the Windows Complete PC Backup program, see Backup your programs, system settings, and files.

The important thing to recognize about using the Windows Complete PC Restore command is that it will replace the current contents of the disks that it is restoring with the exact contents as they existed at the time of your most recent Complete PC Backup. That means that your Windows system files and registry will be returned to health (provided the system was in good shape when you performed your most recent backup). Whatever programs were installed when you backed up will be restored entirely. All other files on the restored disk, including your documents, will also be returned to their prior states, and any changes made subsequent to your most recent backup will be lost.

**Caution:** If you keep your documents on the same volume as your system files, performing a Complete PC Restore is likely to entail the loss of recent work.

Your recent work will not be lost if you have an up-to-date file backup, or if you have the good fortune to have made an image backup almost immediately before your current troubles began. The same is true if you save documents on a volume separate from your system files, but you have included that data volume in your Complete PC Backup. If you have documents that have not been backed up, you can avoid losing recent work by copying them to a disk that will not be affected by the restore process—a USB flash drive, for example, or some other form of removable media. You can use the Command Prompt option in the Windows Recovery Environment to copy these documents. (For information about using the Command Prompt option, see Working at the command prompt at the end of this article.) If you do have a recent file backup, you will be able to restore files after you have used Windows Complete PC Restore to get your system running again.

You can use Windows Complete PC Restore to restore image backups stored on any local hard drive or on a set of CDs or DVDs. If you are planning to restore from optical media, insert the last disc in the backup set before you click Windows Complete PC Restore. The program will then find your backup and propose to restore it. If you insert the first (or any other) in a set of CDs or DVDs, the program will not find it.

When you click Windows Complete PC Restore on the System Recovery Options menu, the restore program will search for a backup that it can restore. If it finds one, it will identify it by date and time, computer, and location—that is, the drive on which it found the backup. The restore program will then propose to restore that backup. If you have more than one backup available, and the program has not proposed the one you want to restore, select the Restore a different backup option, and then click Next. On the ensuing screen, you'll see all available backups, and you can choose the one you want to use.

# Make System Repairs from the Windows Recovery Environment

Ed Bott, Carl Siechert, and Craig Stinson  
(Adapted from Windows Vista Inside Out - Microsoft Corporation)

When you have selected the appropriate backup (or confirmed the program's suggested backup), click Next to proceed. On the screen that follows, you will find a check box labeled Format and repartition disks. If you are restoring to the same hard drive from which you created the image backup, and if you have not changed the partition (volume) structure of that disk since the time you made your most recent backup, you do not need to select this check box. The restore program will format the drive whether you select the check box or not. But, if you leave the check box unselected, the program will not concern itself with the disk's volume structure.

If, on the other hand, you are restoring an image backup to a new hard disk because the original disk crashed, you should select the Format and repartition disks check box.

When you are ready to go on, click Next again. This time, you will see the restore program equivalent of an informed consent statement. You don't have to sign anything, but you do have to select the check box labeled I confirm that I want to erase all existing data and restore the backup. After you've done that, the OK button will become available.

## Using Windows Complete PC Restore with two or more Unformatted Hard Disks

If you are using Windows Complete PC Restore to restore disk images to two or more clean hard disks—that is, disks with no disk signatures and no volumes—the program will fail with a cryptic error message. To work around the problem, go to the Windows Recovery Environment command prompt. Then use the DiskPart command to create and format volumes on the new disks. This workaround is required only when your computer has two or more fixed disks, and all of the disks are clean.

## Running the Windows Memory Diagnostic Tool

If Startup Repair is unable to get your system running again, and if neither System Restore nor Windows Complete PC Restore has returned your computer to a condition of reliable health, consider the possibility that you have failing memory. To test this hypothesis, click Windows Memory Diagnostic Tool in the Startup Recovery Options menu. The Windows Memory Diagnostic Tool will ask whether you want to restart now and check for problems (the recommended option) or check instead on your next startup. Because you're having trouble getting to that next startup, you presumably want the first option.

While the diagnostic program is running, you will see status messages on your screen. These will give you some idea of how much longer the tests have to run and whether or not errors have been found. You can press F1 at any time to get to an options screen. Here, you can choose between Basic, Standard, and Extended tests as well as select various other testing parameters. One of these parameters controls the number of test passes the tool will make. If you don't mind letting the tests run a long time—for example, overnight—select a higher number than the default 2. When you have configured the tests to your satisfaction, press F10 to continue.

Your system will restart—if it can—when the testing is complete. The results will be displayed when you log on.

## Working at the Command Prompt

To get to the command prompt, click Command Prompt on the System Recovery Options menu. You will land in the Sources subdirectory (folder) of a RAM disk identified by the drive letter X. From here, you have access to nearly 100 command-line tools, including disk-management utilities such as

# Make System Repairs from the Windows Recovery Environment

Ed Bott, Carl Siechert, and Craig Stinson

(Adapted from Windows Vista Inside Out - Microsoft Corporation)

Chkdsk, Format, and DiskPart as well as file-management items such as Copy, Rename, and Delete. For more information about command-line tools, see Command-line reference for IT pros.

The Windows Recovery Environment command prompt is a vastly more versatile replacement for the Recovery Console that was introduced in Windows XP. Unlike Recovery Console, which imposed stringent restrictions on your command-line activities, the Windows Recovery Environment command prompt permits you to do just about anything you need to do. Among other things, you can copy, delete, rename, move, and type document files; partition and format hard disks (using DiskPart); run diagnostic utilities; and start and stop services (with Net Start and Net Stop).

## Access your Network from the Windows Recovery Environment Command Prompt

Network functionality is not available by default at the Windows Recovery Environment command prompt. To enable it, type `wpeinit`.

Because the command prompt in the Windows Recovery Environment runs in the security context of the SYSTEM account, you have full read-write access there to every file on every accessible disk. This means, among other things, that you can generate backup copies of not only your own documents but also those created under other accounts at your computer. It also means that you need to take care of the physical security of your computer because anyone who knows how to get to the Windows Recovery Environment could wander your system at will, read your documents, take copies away on removable media, and otherwise wreak havoc upon your life.

If you're accustomed to answering UAC prompts for relatively risk-free operations in Windows Vista (such as reading the event logs), or if you've had experience working in the restricted conditions of the Windows XP Recovery Console, the permissive nature of the Windows Recovery Environment command prompt might come as something of a surprise. In reality, though, the Windows Recovery Environment presents no security hazard that wasn't already there. Unless you prevent physical access to your computer by using Windows Bitlocker Drive Encryption (or by storing it in a locked closet), anyone with boot media and the appropriate file drivers could enjoy the same access to your resources that the Windows Recovery Environment command prompt affords.