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1

Performance

Windows 7, as new users will soon discover, takes a heavy toll on a PC's resources. Those of you whose systems are struggling to run this new operating system will be able to achieve a much higher level of performance by implementing the measures described in this chapter.

We also explain some more general performance-boosting steps.

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Introduction

Early versions of Windows – 95, 98, and to a lesser degree, Me – were relatively simple operating systems that would run fine on virtually all PCs. They didn't require anything out of the ordinary with regard to hardware.

Hot tip



To get the best out of Windows 7, you will need a powerful system. While it will run on medium-specification PCs, its full capabilities won't be seen.

The introduction of Windows XP changed that, and for the first time many users were faced with the prospect of upgrading their PC's hardware in order to get the operating system to run properly. Even so, in the main, this involved no more than increasing the amount of memory in the system – a relatively simple procedure.

Windows Vista, and now Windows 7, have taken the issue of hardware requirements to a different level. This is the first thing that users new to Windows 7 have to consider. To achieve a performance level that is satisfactory for typical PC uses, many more people than was the case with XP will have to upgrade their system's hardware. In order to get the maximum performance from Windows 7, the majority of current XP users will need to upgrade to some degree. However, users upgrading from Vista will not need to do so as hardware requirements for Windows 7 are similar to Vista.

Unfortunately, the upgrades most likely to be needed – memory and video – involve opening up the system case; something the typical user may balk at, not to mention the cost involved.

However, out-of-the-box, Windows 7 is configured for optimal appearance rather than performance. This means that there are quite a few adjustments that can be made to the default settings, which will make it run considerably faster. For the many users whose hardware provides a performance level that is on the borderline between poor and acceptable, these can negate the need for a hardware upgrade.

There are also some more general steps that users can take in order to keep their system running, not just at peak performance but also reliably. These are not specific to Windows 7; they apply to any operating system.

This chapter shows you the tweaks that can be made to Windows 7's default settings to improve its performance, and also shows, generally, how to keep your PC running smoothly and reliably.

Don't forget



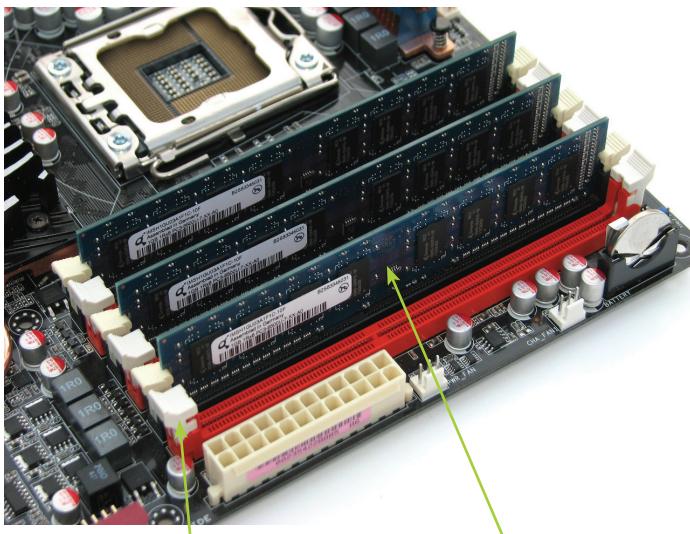
If your system is struggling with Windows 7, there are some steps you can take to reduce the demands made by it.

Add More Memory

Without any doubt, the quickest and most effective method of improving the overall performance of a computer is to simply increase the amount of memory it has.

Windows 7 will not function well with any less than 1 GB of memory. Optimum performance will require 2 GB.

So how do you go about doing this? It is in fact, a very simple procedure that takes no more than a few minutes but does require the system case to be opened. Once this has been done, you will see a large circuit board facing you at the right-hand side of the case. This is the motherboard and at the top-right, you will see the memory sockets containing the memory modules as shown below:



Open the retaining clips and insert the new module by pressing down on the top edge until the retaining clips close automatically

If one or more of the sockets are empty all you have to do is fit extra modules to complement the existing ones. If the sockets are all in use, you will have to remove some, or all, of the modules and replace them with modules of a larger capacity.

However, if the prospect of meddling inside the case doesn't appeal to you there is an easier, although less effective, option available. This is called ReadyBoost and is explained on page 10.

Hot tip



To find out how much memory your PC has, right-click the My Computer icon on the Start menu and then click Properties. Memory capacity will be detailed in the System section.

Don't forget



You cannot install just any memory - it has to be compatible. Consult your PC's manual to see which type you need.

Hot tip



Memory modules must be handled very carefully. Before touching one, ground yourself by touching the metal case chassis. If you don't, the electrostatic electricity in your body could well damage it.

Quick Speed Boost

Beware



ReadyBoost will not work with just any flash drive – it must be a good quality USB 2 model.



Don't forget



ReadyBoost enables you to increase your system's performance without having to buy and install more memory. It is also a much cheaper option as flash drives are half the price of memory of equivalent capacity.

Hot tip



The minimum amount of flash memory you can use for ReadyBoost is 256 MB. The maximum amount is 4 GB. We suggest at least 1 GB.

If Windows were to run out of memory, the PC would literally grind to a halt. To prevent this, it uses a Paging file on the hard drive as a memory substitute. The problem with this is that hard drives are much slower than memory, so performance is reduced when the Paging file is being used.

The solution is to prevent Windows having to use the Paging file, and the way to do this is to install more memory. However, many users don't know how to install memory; plus, it is expensive.

ReadyBoost provides a simple and cheap alternative. All you need is a USB 2 flash drive with a capacity of between 256 MB and 4 GB. Plug the drive into a USB port and Windows will automatically install it. Then the following window will pop up:

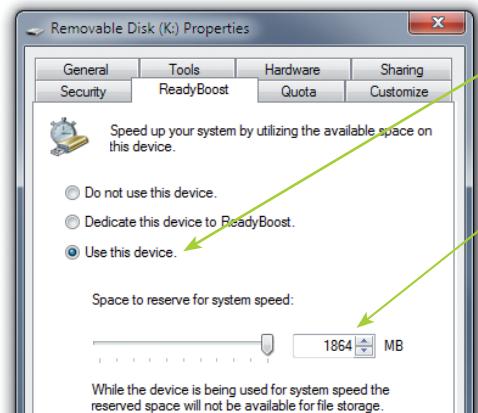
1

Click "Speed up my system"



2

Select "Use this device"



3

Specify the space to reserve for ReadyBoost. Then click Apply

Windows will now use the USB drive as a cache for the most commonly paged data. The Paging file will still be on the hard drive but will be used much less.

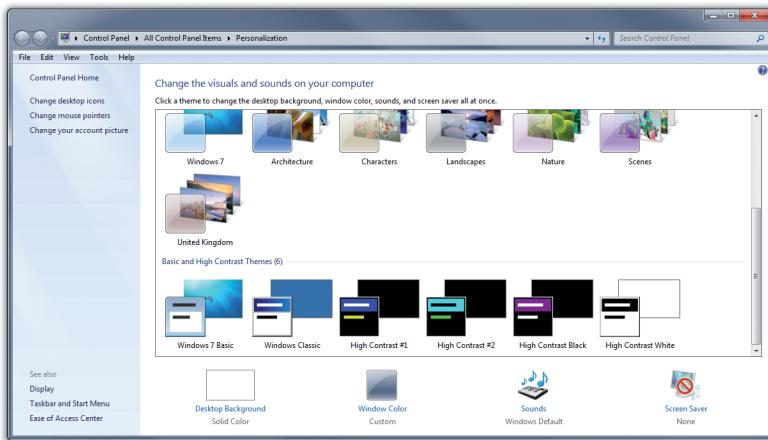
Users with less than 1 GB of physical memory will benefit considerably by using ReadyBoost.

Aero is Cool but ...

While the Aero interface with its translucent window frames is undoubtedly attractive, it does place a considerable load on a PC's video system. Therefore, disabling Aero is one of the first things users, whose systems are struggling with Windows 7, should try.

Do it as follows:

- 1 Right-click the Desktop and click Personalize
- 2 The "Personalization" dialog box will open
- 3 Scroll down to "Basic and High Contrast Themes"



Hot tip



Don't forget about the old Windows Classic interface. This is still available in Windows 7 and while visually it is outdated, it is just as efficient.

Many users who use their PCs purely for work still prefer it.

- 4 Deselect Aero by selecting a different option, such as "Windows 7 Basic"

Your computer won't look nearly as flashy as before but it should be considerably more responsive. Also, as it is so easy to enable/disable Aero, it is quite practical to disable it only when you are running a resource-intensive application (a PC game, for example) that the system is struggling to cope with. When back to run-of-the-mill applications, you can enable it again.

Less is Sometimes Better

Hot tip



Windows 7's visual effects are purely cosmetic and serve no practical purpose. Disabling them will have no effect on the PC's functionality.

12

Beware



Disabling all of the effects will have a significant impact on the appearance of the Windows interface.

Windows 7 comes with a number of visual effects, e.g. fading or sliding menus, drop shadows, pointer shadows, etc. These are all designed to improve the look and feel of the Windows interface.

They do, however, add nothing to its functionality. In fact, they can, and do, have a negative impact on the system. Remember: each of these effects consumes system resources.

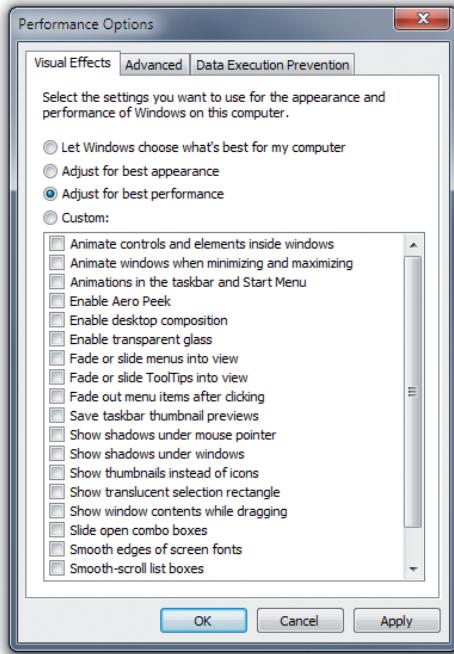
Users interested in performance rather than appearance will benefit from disabling some, or even all, of these essentially unnecessary graphic enhancements.

1

Go to Start, Control Panel, System, Advanced system settings

2

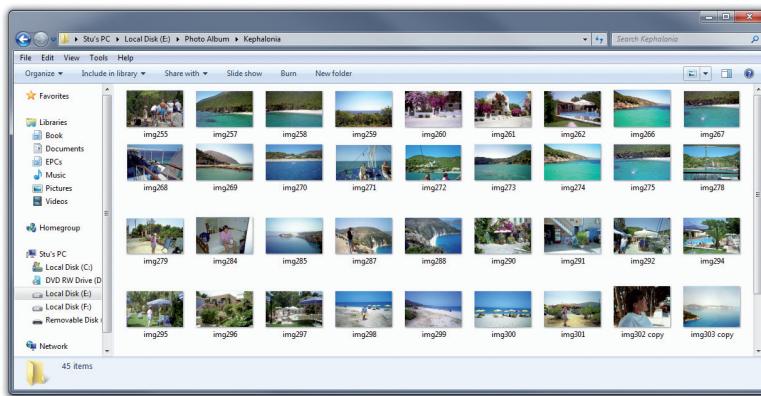
Click the Settings button under Performance



On the Visual Effects tab you will see a list of all Windows visual effects, plus several user options. By default, Windows chooses the second option "Adjust for best appearance", which enables all the effects. To disable them all, select "Adjust for best performance" as shown above. Alternatively, you can disable them individually.

Icon Thumbnails

By default, Windows 7 displays all file icons as thumbnails (mini graphical representations). This is particularly useful when viewing image files, as it enables you to see the image without having to first open it in an imaging program as shown below:



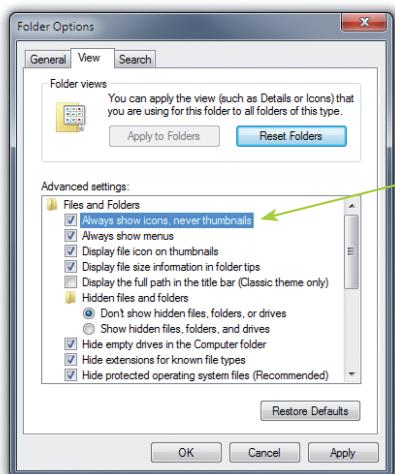
Don't forget



Graphic files are the slowest type of file to load. While icon thumbnails may be very small, because there are so many of them, they have a cumulative effect.

However, there is a downside. Because graphic files take longer to open than any other type of file, having this feature enabled does adversely affect system performance. Users who want their system to run as fast as possible, and those whose systems are struggling with Windows 7, will gain a boost in speed by disabling this feature. Do it as described below:

- 1 Go to Start, Control Panel, Folder Options. Then click the View tab



2

- Check the "Always show icons, never thumbnails" check box

Hot tip



Another effect of disabling icon thumbnails is that folder icons will load more quickly.

Faster Paging

Hot tip



A separate drive that doesn't have Windows and other applications installed on it, will be more responsive as it is used much less than the main drive. So placing the Paging file on it will improve the speed of the paging operation.

Hot tip



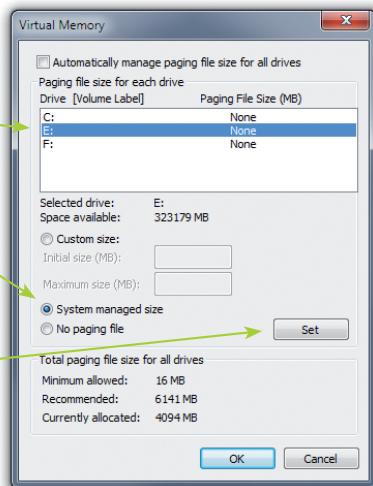
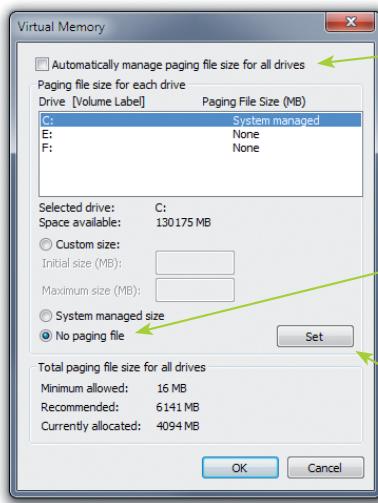
Creating a dedicated partition (see pages 117-118) of about 2 GB, specifically for the Paging file, will prevent it from becoming fragmented. This increases its performance further.

Hot tip



There is no benefit to be gained by moving the Paging file to a different partition on the main drive. It must be moved to a separate drive.

- 1 Go to Start, Control Panel, System. Click System Protection and then the Advanced tab
- 2 Click Settings (under Performance) and then the Advanced tab. Under Virtual Memory, click Change
- 3 Uncheck "Automatically manage paging file size for all drives"
- 4 Select "No paging file"
- 5 Click Set. Ignore the warning message and click Yes
- 6 Select a different drive
- 7 Select "System managed size"
- 8 Click Set and then OK. Reboot for the change to take effect



SuperFetch

The SuperFetch feature in Windows 7 helps to keep the computer consistently responsive to your programs by making better use of the computer's memory.

Windows SuperFetch prioritizes the programs you're currently using over background tasks, and also adapts to the way you work by tracking the programs you use most often and preloading these into memory. As a result, they open much more quickly when accessed.

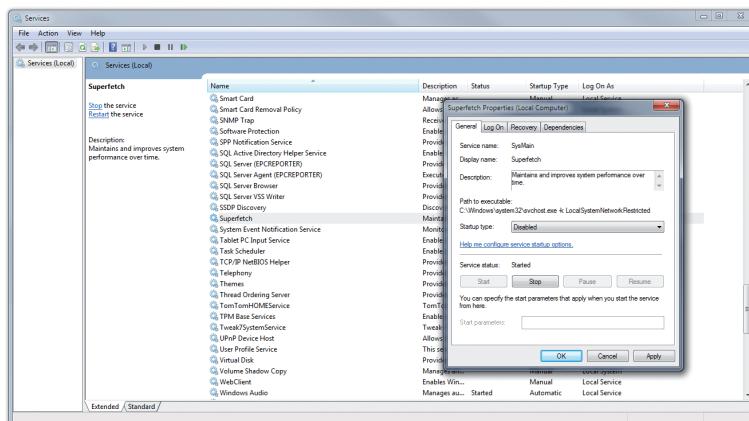
On PCs that have 2 GB or more of memory, SuperFetch works very well. However, if your PC has less than 2 GB it can lead to excessive disk thrashing (see margin note) and sluggish system performance. The less memory you have, the worse the effect.

If you find yourself in this position, you have three options:

- 1) Upgrade your memory so you have at least 2 GB
- 2) Enable ReadyBoost
- 3) Disable the SuperFetch feature

The latter is done as follows:

Go to Start, Control Panel, Administrative Tools. Click Services and scroll down to the SuperFetch service.



Double-click SuperFetch and in the Startup type drop-down box, select Disabled

Hot tip



Disk thrashing occurs on PCs that are low on memory. As a result, the operating system has to utilize the hard drive as a memory substitute. This leads to data being constantly transferred between the hard drive and the physical memory.

When this happens, the drive's indicator light will blink on and off continuously.

15

Beware



Disk thrashing can damage or cause premature failure of the hard drive due to excessive wear and tear on the read/write heads.

Cancel Unneeded Services

Hot tip



Services that can be disabled are:

- IKE and AuthIP IPsec Keying Modules
- Remote Registry
- UPnP Device Host
- WebClient
- Windows Error Reporting Service
- Windows Image Acquisition (WIA)

If you don't use your PC for networking, the following can also be disabled:

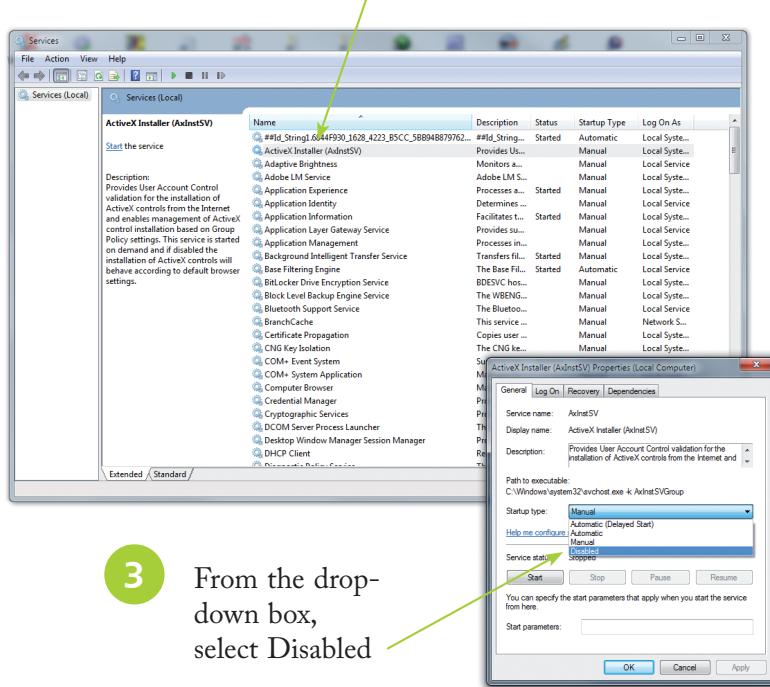
- Computer Browser
- Distributed Link Tracking Client
- Net Logon
- Network Access Protection Agent
- Peer Name Resolution Protocol
- Peer Networking Identity Manager
- PnP-X IP Bus Enumerator
- SSDP Discovery
- Server
- TCP/IP NetBIOS Helper
- Workstation

When a Windows 7 PC is being used, in the background and unseen by the user, a number of applications known as Services will be running. While many of them are essential for certain functions of the operating system, there are some that are not.

As every running application makes a hit on system performance, this is something you do not want to be happening. Fortunately, you can override Windows and make the decision yourself as to which services should be running. As a guide, the services specified in the list on the left can be disabled safely. Do this as follows:

1 Go to Start, Control Panel, Administrative Tools. Click Services

2 Double-click the service to be disabled

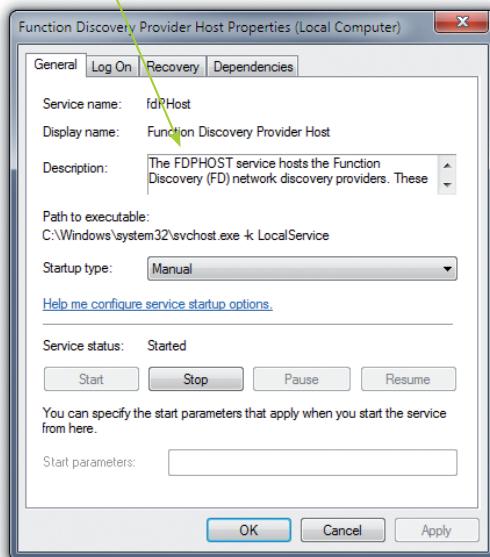


3 From the drop-down box, select Disabled

Should you consider disabling any services that are not listed on this page, we suggest that you first take a look at what the service does and also what other applications may be depending on it. This is explained on the next page.

...cont'd

- 1 Open the service's Properties dialog box. A description of the service's function is displayed here



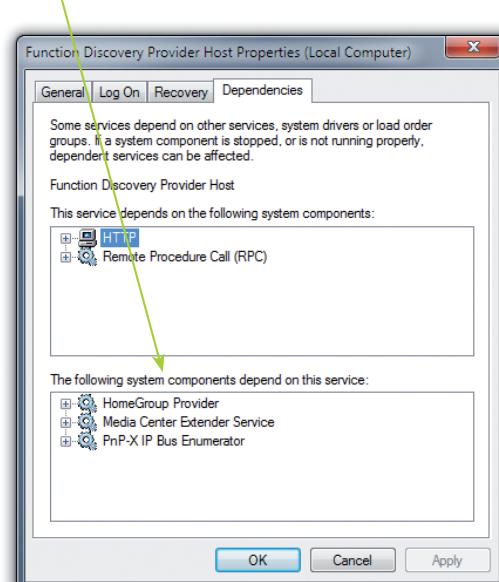
Hot tip



Be aware that some third-party applications add their own services. These can be disabled as well.

17

- 2 Click the Dependencies tab to see what other applications depend on the service



Don't forget



The Dependencies tab gives you forewarning of what will happen if you stop a particular service. For this reason, it is important to take a look here prior to making any changes.

Streamline the Registry

The registry is a central hierarchical database that holds all the important Windows settings regarding software, hardware and system configuration. It also provides a common location for all applications to save their launching parameters and data.

Beware



Changes to the registry can be dangerous. So create a system restore point using System Restore first. If you have any problems as a result of the change, you will be able to undo it by restoring the system.

Over time, as the user installs and deletes programs, creates shortcuts and changes system settings, etc., obsolete and invalid key information builds up in the registry. While this does not have a major impact on a PC's performance, it can be the cause of system and program errors that can lead to instability issues.

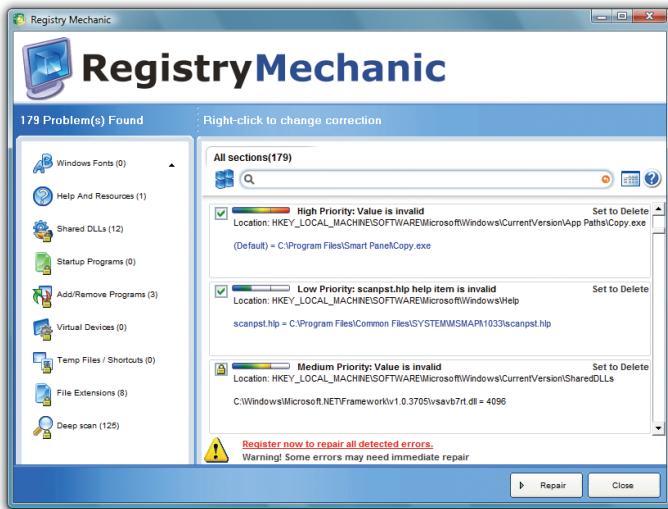
The solution is to scan the registry periodically with a suitable application that will locate all the invalid entries and delete them.

While Windows Registry Editor is adequate for editing purposes, it does not provide a cleaning option. However, there are many of these applications available for download from the Internet. A typical example is Registry Mechanic (shown below). These programs provide various options, such as full or selective scans, backups, the creation of System Restore points, etc.

Hot tip



We recommend you clean the registry about once a month. However, if you frequently install and uninstall software, change system settings, etc., it will be worth doing it more often.



Despite the operating system having been installed for just two weeks on this PC, Registry Mechanic found 179 problems (minor ones, admittedly)

Occasional use of a registry cleaner will help to keep your system stable and thus, more reliable.

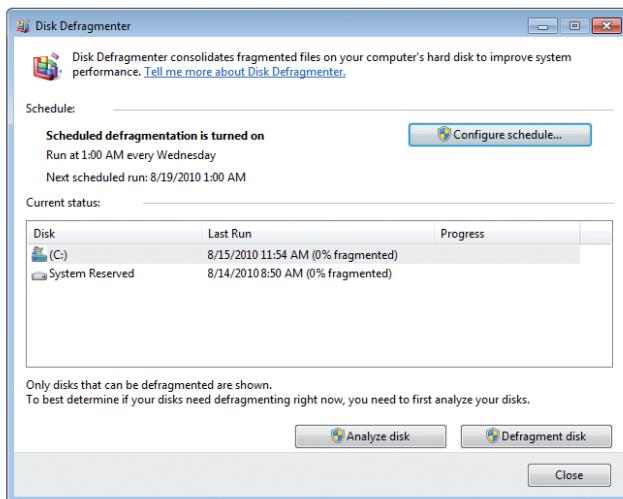
Optimize the Hard Drive

There are several measures that can be taken to get the best out of this device and thus improve system performance.

Defragment the Hard Drive

Fragmentation is a term used to describe the process where files saved to a magnetic disk drive have their data split up on different parts of the disk, or disks, instead of being stored contiguously. When a fragmented file is accessed, the drive's read/write heads have to hunt about to locate all of the different parts of the file before they can be reassembled in the original form. The result is that the file will take much longer to open than it should do, and the system will be sluggish.

To address this issue, Windows provides a tool called Disk Defragmenter. This application "undoes" the fragmentation by rearranging the data on the disk so that each file is stored as a complete unit. You can access Windows Disk Defragmenter by going to Start, All Programs, Accessories, System Tools.



By default, it is set to run once a week, which for normal usage is quite adequate. However, if you use the PC on a daily basis, or are constantly creating, deleting, modifying or moving files, we suggest you change the default setting to Daily.

To do this, click the Configure Schedule button and from the drop-down list, select Daily. From here, you can also set the time of the scheduled defragmentation.

Beware



A badly fragmented drive will have a major impact on your system's performance. For this reason, never disable the defragmenting utility.

19

Beware



When you run Disk Defragmenter, make sure that no other applications are open, as they may interfere with the defragmentation procedure.

...cont'd

Keep it Lean and Mean

When approximately 70 per cent of a hard drive's storage capacity has been used, its performance level will start to decrease. It will also be more likely to be affected by the issue of fragmentation.

Beware

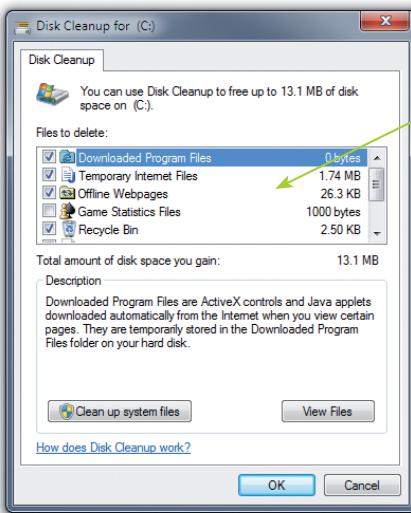


The more data you have on your drive, the worse the effects of fragmentation.

So when it begins to approach this mark, you should start thinking about freeing up some space. As it's a sure fact that many of the files on your drive will be redundant, you can usually do this without losing anything important.

1

Go to Start, All Programs, Accessories, System Tools and click Disk Cleanup



2

Under Files to delete, you will see a list of all the files that can be safely deleted. Check all the boxes and then click OK to delete them

Don't forget



System Restore points are created whenever major changes are made to the system. These points can occupy a tremendous amount of disk space, so deleting them is worth doing.

The next thing to delete is System Restore points. As these are actually system backups, they are very large files, often several GBs in size, and there will be several of them. Go to Start, Control Panel, System, System Protection. Click the Configure Button and then click the "Delete all restore points ..." button. Click OK and then back in the System Protection dialog box, create a new (single) restore point by clicking the Create button.

Finally, open the Programs and Features utility in the Control Panel. Here, you'll see a list of all the programs installed on the PC. Go through it and uninstall any that you don't use.

You'll now have a more responsive drive, plus more disk space.