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- ☒ Optimize Your PC
- ☐ Defragment Hard Drive
- ☐ Update Drivers
- ☐ Delete Unwanted Files
- ☐ Uninstall Applications



25+ easy speed tweaks

However new your PC, installing programs, downloading applications and recording audio files and video clips soon clog up the hard drive and prevent it from working at full tilt. Tom Gorham coaxes a sluggish PC back to life and improves its performance by tweaking the setup

No matter how fast your present PC we're certain that, like the rest of us, you'd love to squeeze more speed out of that beige box – whether it's to prevent your beloved system falling into obsolescence, to keep it at the cutting edge of technology for as long as possible, or simply because you're the computing world's answer to a boy racer.

Unfortunately, over time, what started life as a lightning-fast performer eventually begins to show the strain. Often this sluggishness is inevitable, as new applications and operating systems make increasing demands that older hardware struggles to keep up with. But everyday computing tasks also contribute to the slowdown. As files and applications are installed, removed and upgraded, they leave behind debris which can result in a crawling performance.

But that doesn't mean we're about to persuade you to trade in your PC for a brand-new one. Instead we'll look at inexpensive and practical ways to improve your sluggish system. Our advice, which ranges from the basics such as keeping a close eye on any installed applications to complex alterations to Registry code, will speed up your computer no matter which version of Windows you use. Even minor tweaks and changes can make a massive difference.

We'll also examine a host of third-party utilities that will help make your Windows experience that little bit faster.



What's the diagnosis?

The list of potential culprits for a sluggish PC is long. If your PC is elderly then today's graphics-intensive applications are always going to expose the limitations of your processor, highlight the flimsy capabilities of an antiquated graphics card or the lack of available memory.

But even recently purchased machines can show snail-like symptoms and the cause can be much more difficult to diagnose. While a virus checker should easily spot viruses that can slow your system to a crawl, it's harder to identify other processes that also lower system performance such as out-of-date software drivers.

One of the most frequent causes of an unresponsive machine is disk fragmentation. This occurs in everyday use but is decidedly more marked if less than 10 percent of your hard disk remains free.

When you first save a document, Windows looks for empty space on your hard drive to store it. When the file is subsequently erased, the space it takes up is freed and another file can take its place. Sometimes, though, the space



← A fragmented hard disk hinders speed so make sure that you defragment it on a regular basis

↓ Remember to keep track of any programs and processes that automatically run on startup

required by a new file is greater than that left by a deleted file and Windows is forced to store parts of a single file in separate locations.

Each time the file is subsequently opened or saved the hard drive has to access multiple locations on the disk which slows things down. After a while the effect becomes pronounced. You can tell a severely fragmented disk if it takes an unusually long time to open or save files.

A related cause of slowdowns is lack of RAM. Some applications make memory demands that can't be satisfied by the PC's hardware. In this case, Windows is forced to store currently unused RAM in a



swap file on the hard drive, switching it back out when required (see *Speeding the swap file* on page 96). A symptom of excessive swap file activity is hearing continual hard drive access even when you're not opening or saving files.



Speeding the swap file

The swap file – called the paging file in Windows XP and 2000 – is the hard drive area used by Windows' virtual memory when your RAM can't cope. It's prone to fragmentation, which inevitably slows down your system. The trouble is that a standard hard disk defragmentation doesn't touch the swap file simply because it's always being used.

To make the swap file available for defragmentation, temporarily turn off virtual memory. Exit any running applications, right-click My Computer and select Properties. Under the Performance tab click on Virtual Memory. Select 'Let me specify my own virtual memory settings' and



check the 'Disable virtual memory' box. Restart and run the disk defragmenter and your swap file will be defragmented. Remember to return to your old virtual memory settings afterwards.

← Keep your swap drive static to boost the speed of virtual memory



← To defragment the swap file, first disable virtual memory

Fragmentation is only part of the problem with a sluggish swap file. Windows has to continually recalculate its size as apps are opened and closed, which marginally detracts from performance. You can avoid these problems by fixing the size of the swap file. Enter a suitable figure – 500MB is generous for most users – in both the Minimum and Maximum fields in the Virtual Memory settings and restart Windows.

Under Windows XP the procedure is slightly different: in System Properties, click the Advanced tab then Change, enter the same value in the Initial and Maximum fields and click ok.

A further tip to limit fragmentation is to keep the swap file on a secondary, little-used partition or drive instead of the startup disk. Set the location of the swap file in the Virtual Memory window.



Basic housekeeping

Any PC, irrespective of its vintage, benefits from regular care and attention. Perhaps the most important rule for a smooth ride is to keep as much free space on your hard drive as possible by reducing unnecessary file and application clutter. This not only makes your everyday computing experience less muddled, but also reduces the risk of fragmentation and system slowdown.

It's likely that a fair proportion of ancient files can be copied on to a couple of backup CDs and removed from your hard disk. But a surprising number of files can also accumulate in the dark corners of your drive. Check the Windows Temp and Temporary Internet file folders in particular as these have a habit of accumulating redundant files.

Don't delete any new temporary files that may have been created by currently

running applications. But any files with a creation date a day or two old can be successfully removed.

Windows' own Disk Cleanup utility removes temporary local and internet files and empties the Recycle Bin. If you're having trouble using Windows XP's Disk Cleanup – it often stalls halfway through – enter the Registry Editor by selecting Run from the Start menu. Type Regedit and click ok. Navigate to Hkey_Local_Machine, Software, Microsoft, Windows, CurrentVersion, Explorer, VolumeCaches, Compress Old Files. Export this key under a different name so it can be restored later if necessary. Now delete other keys beneath the Compress Old Files key.



← Windows XP is a performance hog, but you can lessen the drain created by its bells and whistles

You can apply the same principle to redundant applications which both eat disk space and can sometimes leave background processes running. Use the program's own Uninstall option to remove the programs cleanly. As a last resort, though, turn to the Add/Uninstall options in Windows' Control Panel.

Defragging your system's hard drive is simple and effective but time-consuming

housekeeping if your disk is severely fragmented. To defragment a hard drive under Windows 98 using its built-in tools, right-click the disk and select Properties from the drop-down menu. In Windows XP, right-click My Computer, select Properties and under the Tools tab select Defragment Now. In either case, remember to close all running applications before you begin.

It's a good idea to keep drivers for hardware components – such as your graphics card – up to date. This is particularly important if you have upgraded your operating system. Check on the driver manufacturer's website or on a general website, such as www.windrivers.com or www.drivershq.com, to see whether new drivers are available.



Extra speed

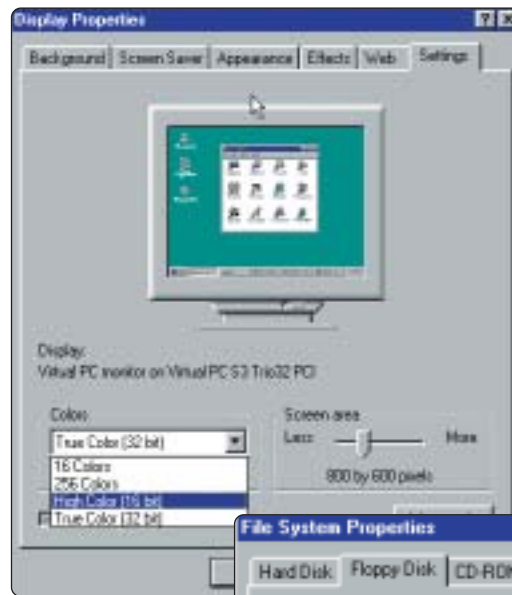
Users often feel the full wrath of a system's sluggishness when navigating the interface. Yes, Windows XP's interface looks wonderful, but unfortunately the pleasing visuals cost you speed.

Tone down those graphics

Right-click an empty area of the desktop and, from the drop-down menu that appears, select Properties. Under the Themes tab, select the less graphically demanding Windows Classic theme and click ok. It's also possible to limit some XP animations under the Appearance tab. Click Effects and uncheck the unnecessary animations.

Windows XP users may also notice a delay when navigating the Start menu. Rather than a symptom of a slow PC, that's actually a feature. You can remove the delay by tweaking Windows' Registry Editor. Go to Start, Run, type Regedit then navigate to Hkey_Current_User, Control Panel, Desktop. Select MenuShowDelay. Right-click on it, select Modify and set the value to zero. Now click ok and restart your computer.

Whatever version of Windows you use, you can make the interface more responsive by limiting the colour depth to 16bit and reducing the workload on your graphics card by keeping the background wallpaper plain.



← Reducing the number of colours displayed by your monitor eases demand on your graphics card

↓ Your PC doesn't need to check for a floppy disk each time you start up

Hasten bootstrap

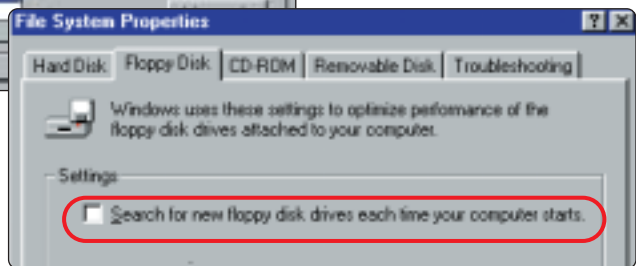
Automating repetitive everyday tasks or shaving seconds off bootstrap times can

make all the difference. Windows does a lot of work during the bootstrap process such as loading network drivers, preparing fonts and launching applications in your StartUp folder. The more fonts you remove the faster the boot process, so move any you don't use to a different folder.

You should also disable any unnecessary network protocols and check that unwanted applications aren't automatically launched at startup. Do this by running Msconfig – from the Start menu, select Run, type Msconfig and click Enter. Programs that automatically boot are listed under the Startup tab.

Unchecking the box to the left of a particular program will prevent it launching. If you're not sure what the startup item does then examine its file path on the right, which should give you a clue. Be careful, however, not to disable important background processes such as virus checkers.

Another good tip for reducing bootstrap times in Windows 95 and 98 is to restart Windows without rebooting your computer. Hold Shift as you select Shut Down from the Start menu until the 'Windows is now restarting' dialog box appears. The desktop will reappear much quicker than if you had performed a cold bootstrap.



To shorten your PC's bootstrap time even further, you could prevent the system from checking for a floppy disk on startup. Right-click My Computer and select Properties. Under the Performance tab, click the File System box then select the Floppy Disk tab. Under the Settings heading, uncheck the 'Search for new floppy disk drives each time your computer starts' option.

Additional timesaving options can be specified using your PC's Bios settings, normally accessed by holding down a specified key – usually Delete or Esc. In the Bios you can disable time-consuming bootstrap tasks, such as the RAM Memory Check feature which is unnecessary in modern machines.

Accelerate shutdown

You can accelerate Windows 2000's or XP's shutdown processes too, although it requires a trip to the Registry Editor. Go to Start, Run, type Regedit then navigate to Hkey_Local_Machine/System/CurrentControlSet/Control and select the Control folder. Right-click on WaitToKillServiceTimeout, select Modify and reduce the value to less than 500 – the default is 20,000 (20 seconds). This shortens the time XP or 2000 waits before automatically shutting down apps.

Quicker browsing

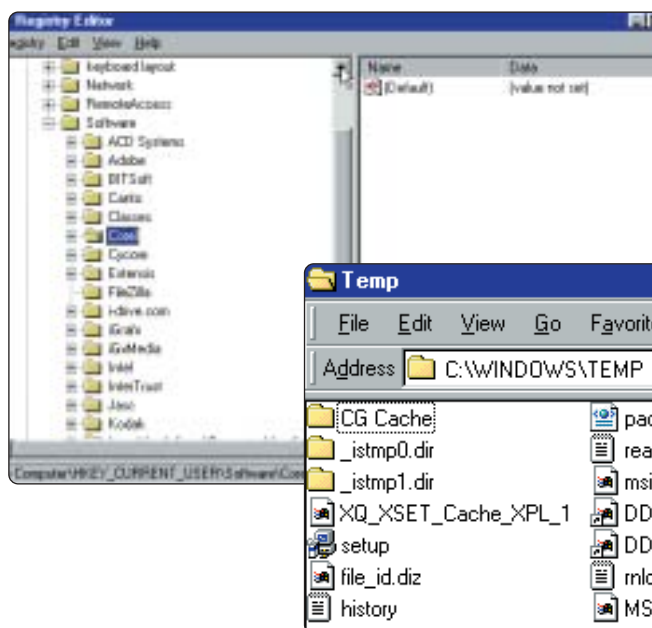
Connecting to the internet and browsing websites are two other areas where users tend to notice the sluggishness of their system. The speed at which you can surf sites is largely related to your connection rate, so if you're stuck with a slow 56K modem you need to ensure that it's hooking up to the web as fast as it can.

To optimise basic settings, right-click My Computer and click on Properties. Under the Device Manager tab, select the active modem and click the Properties button. Under the Modem tab, make sure the maximum speed is set to 115,200 – any slower could limit the speed at which you send and receive data. Under the Connection tab, click the Advanced button and, in the Extra Settings box, type S11=50. This shortens the length of the touch-tone pulse to 50 milliseconds.

If you use your internet browser more than any other application we strongly advise enlarging its disk cache. This locally stores frequently accessed web pages and images, thereby saving browsing time especially under slower connections. Under Internet Explorer's Tools menu, click on the General tab and

select Settings. Increase the amount of disk space to be used as a cache by dragging the slider to the right.

If speed is more important than the quality of the browsing experience, pare things down by turning off image display under the Internet Options' Advanced tab. You can also save time typing in URLs by entering the domain name and hitting Enter. Explorer will automatically tag on the missing extension. Another tip: rather than waiting for a link to load in a new window, keep two browser panes open and drag the link from the first to the second.



← The Windows Registry is home to many useful speed tweaks

↓ Check your Temp folder to make sure it's not bloated with fragmented files



Hardware tweaks

To get the most out of your PC you will ultimately need to make changes to your hardware setup, but this doesn't always mean replacing components. You could examine the possibility of overclocking your PC so your processor and graphics card run at speeds in excess of their rated values. However, this isn't without its risks and should be approached very carefully.



Keyboard shortcuts

One of the most effective ways of speeding up Windows is to employ keyboard shortcuts, which are often quicker than using a mouse-and-menu combination. Many users will already be aware of basic keyboard shortcuts that speed up access to commonly used Windows controls. For example, Ctrl, Esc opens the Start menu, while Windows, M minimises all open windows.

Other shortcuts are less well known, but still worth remembering. Rather than dragging items to the Recycle Bin to delete them, it's quicker to select the item and click Shift, Delete. Another way to quickly remove a batch of files in a cluttered window is to drag the files to an empty part of the Taskbar. Pause and other open windows will minimise, leaving a clear path to the Recycle Bin.

One of the neatest ways of quickly launching an application is to assign a keyboard shortcut to its desktop shortcut, allowing you to launch the program via a single keyboard

→ A shortcut key makes it much quicker to open your favourite applications

function key or a combination of Ctrl, Alt and another key. To add the shortcut, right-click on the application's icon and choose Properties from the drop-down menu. In the Shortcut key field under the Shortcut tab, select a function key or keyboard shortcut to it then click Apply.

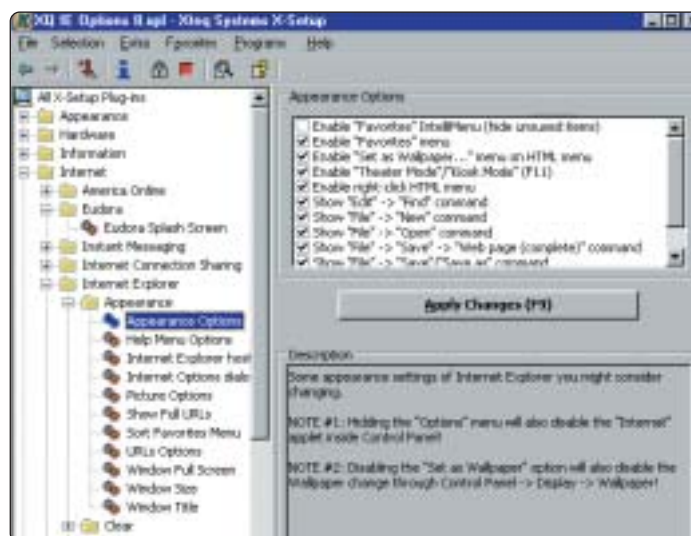


Third-party utilities

Don't forget the benefits offered by third-party utilities which can speed up Windows and enhance your web connection. These programs vary in price, but there are some excellent offerings that cost absolutely nothing.



- **Diskeeper 7.0** When it comes to defragmenting, Diskeeper performs the task far quicker than Windows' built-in tool. Ideal if you don't mind forking out the extra cash. www.execsoft.com; £19.95.
- **Tweak UI** Indispensable for removing unnecessary bells and whistles, from processor-demanding animations to unwanted operating system noises. www.microsoft.com/windowsxp/pro/downloads/powertoys.asp; price: free.
- **X-Setup 6.3** Use this program to clean invalid file references from the Windows Registry. X-Setup even sports a recording feature which allows you to save changes you make to the Registry Editor as a standalone file which can then be copied to other PCs. www.xteq.com; price: free.
- **CleanReg 3.7** Supported on Windows platforms from Windows 95 up to XP, this handy utility cleans invalid file references from the Registry. www.cleanreg.com; £11.87.
- **Propel Accelerator** Uses a proprietary compression technology to reduce the size of web pages and page elements sent to your browser. Accelerator also caches regularly retrieved pages to make connections faster. www.propel.com/ac/mypc.jsp; \$7.95 per month.
- **Cacheman 5.1.1** One of the best utilities for tweaking your PC's performance, Cacheman allows you to adjust the cache settings that Windows applies to storage devices, such as your hard disk or CD drive, in order to speed up access to them. www.outertech.com; \$10.
- **PartitionMagic 8.0** Partitioning your hard drive can aid the battle against fragmentation, but you'll need a tool such as PartitionMagic to create and resize volumes on the fly without losing data. www.powerquest.com; £50, upgrade £40.
- **Modem Booster 4.0** Automatically finetunes your modem settings to maximise your online connection, whether it is dialup, cable or ADSL. www.inklineglobal.com; \$24.95.
- **System Mechanic 4.0** While not cheap, System Mechanic is undeniably powerful. Among its 15 separate tools are several that optimise your PC's speed including a Registry Editor, a tool to optimise internet connections and even a startup manager that allows you to disable specified applications. www.iolo.com; \$59.95.



There are more basic methods of improving hardware performance. Even something as simple as moving your PC to another area of your room can speed up your processor as a blocked or dusty fan can cause the chip to heat up and automatically slow down. Make sure your computer is in a well-ventilated area and the interior is regularly cleaned to avoid dust interfering with the fan. If you decide to add some new hardware, however, there are three components to concentrate on: the graphics card, memory and hard disk.

↑ X-Setup lets you tweak an amazing number of processes – and it's free

Adding a new graphics card will improve your PC's video performance which is particularly important in graphics-intensive games or demanding 3D design applications. A sub-£100 graphics card such as ATI's Radeon 9000 Pro, which comes with 64MB of memory, is a good choice for all-round performance. Before upgrading your graphics card, check that your PC has the necessary expansion slot – newer machines will use an AGP slot, while older systems rely on PCI.

The most cost-effective way of speeding up your machine is to add extra RAM. The more memory you have, the more space there is for applications to store data and therefore the faster your computer will run. Most types of RAM are exceptionally cheap and you should be able to pick up 256MB of PC133 SDRAM for less than £50.

If your machine is an early Pentium using Simm-based (rather than more modern Dimm-based) RAM, upgrading the memory isn't as cost-effective as Simm cards are comparatively expensive. Remember to check your PC manual or the manufacturer's website to confirm the type of memory your machine requires.

Another popular and cost-effective hardware upgrade option is to add a new hard drive to your system. This provides two immediate benefits: space and speed. Extra gigabytes will allow your PC to perform disk functions – such as opening and saving files – more quickly. Defragmentation will also be less of a persistent problem.

Look for a hard drive with a speed of at least 7,200rpm (rotations per minute) – this shouldn't prove a problem as it's becoming the average rate. And don't ignore the hard drive cache as this can have a significant impact on the data throughput of your drive. The larger the cache, the better. ■