Speed Up Your PC – The Ultimate Guide to drastically improving your PC Speed & Performance

A Guide for EVERYONE !

The Internet is full of documents and web pages on how to speed up your PC and 99% miss the point : they will tell you to delete fonts you don't use, they will tell you to get rid of the pretty background or family photo that you have on your desktop, they will say you need to buy a book, they will tell you to regularly clean your registry, they will say you must use a memory optimizer, they will say you have a corrupted registry, and, finally, they will all tell you to run an anti-spyware program, and on this last one they are all correct ! However, for the most part they all miss the point – they give you fine tuning tips rather than **major tuning tips !** Even Microsoft miss the point in their *"5 ways to speed up your PC"* document.

We decided to write this document because during their tests and research, our "**Ultimate Troubleshooter**" Research Team comes across so many "snake oil" software products which users pay a lot of money for virtually no benefits, that we decided it was time to write a simple pragmatic **guide for Everyone.** This is it.

The Science of Improving PC Speed !

Making your PC go faster is a lot easier than most users think, but it does require a little effort from you the user.

The logic behind the optimization of the setup of a PC is no different to that of car performance – in fact, it is identical :

Pure Power	The more powerful the engine **(CPU / Processor)**, the faster the car will go.
Engine Size	The bigger the engine **(Memory / RAM)**, the faster it will go than the same car with a smaller engine.
Lesser Weight	A car with Mum, Dad, and 4 brothers and sisters **(unnecessary background programs, spyware)** will race to the Bank a third slower than the same car with just Mum at the wheel.

Intelligent Routing	A car with Satellite Navigation **(efficient networking)** will get to its destination a lot quicker than one where the driver constantly has to stop to read a map.
Maintenance	A car that is regularly maintained **(Unnecessary background programs, Spyware, ScanDisk, Defrag)** will go a lot further than one that is never maintained.

Hopefully things are starting to make sense. So let's now get to the juicy bits .....

Pure Power
(CPU / Processor Speed)

At the end of the day if you need a Ferrari to win Daytona or Le Mans, there is no point trying to tweak a regular Ford, it won't work. Get the tool for the job. If you are processing massive spreadsheets, or you use CAD software, or you constantly manipulate photos, and you have a 4 to 5-years old PC which you are trying to extract more speed out of, forget it. What you need is a powerful PC and no amount of tweaking will make your 5-year old PC behave like a modern day Ferrari, so, if you can afford it, buy a new powerful PC with plenty of memory. With the current recession, and despite horrific petrol prices, the prices of PCs are constantly coming down at the moment, so if you have the money, go for it !

Engine Size
(Memory / RAM)

If you have Windows XP and 1Gb or less of memory (RAM), or Windows Vista/Windows 7 and 2Gb or less of memory, there is absolutely nothing that beats **more memory** to make a PC go **a lot faster.**

Unfortunately, while memory is really cheap, unless you know how to select the correct memory to buy and install yourself, getting that extra memory in your PC is both time-consuming and expensive. You either have to pay for someone to come to you and install the memory, or you have to take your computer to the PC store and get their Tech guys to install it, all of which you pay for – you'll be lucky to get any change out of $50-$80 for 2Gb. So, for a lot of users on a budget that is often a non-starter, particularly if the PC is over 2 years old, as you start finding that the only places where you can buy the memory you need for your PC are online stores. And I haven't mentioned laptop users – it's even harder for laptop users !

For those who can afford adding extra memory to their old PC or laptop, the benefits are tremendous :

- **Speed.** You get the speed benefits already mentioned. This is so because Windows cannot run programs directly from the hard disk – <u>it only runs programs after it has loaded them into its memory</u>. Accessing a program that is in memory is hundreds of times faster than accessing a program that is on the hard disk. If you have lots of memory, and many programs open, they can all coexist in memory and therefore you can swap between programs, or open new programs, **<u>instantly</u>**. If, on the other hand, your PC has only a little amount of memory, then every time you need to swap to another program, or open a new one, Windows will temporarily push out the current program to the hard disk (slow, slow, slow), and then load from the hard disk the program you want to switch to (slow, slow, slow again); then, when you want to switch back to the first program, it will go through the same cycle : push out to the hard disk program #2 (slow, slow, slow), and re-load from the hard disk program #1 (slow, slow, slow again).

- **Longer hard disk life.** This derives directly from the benefits highlighted in the bullet point above. With more memory Windows will comparatively rarely access the hard disk, whereas with little memory Windows constantly pushes programs out to the hard disk, or reloads them from the hard disk; in other words, the hard disk works a lot harder and a lot more often when your PC or laptop has a small amount of memory and will therefore naturally start failing earlier.

> **Lesser Weight**
> (Unnecessary Background Programs)

The 1% of good advice available on the Internet as regards speeding up a PC comes from experienced IT professionals who know their stuff, from the many MVPs (Most Valuable Person) who regularly help users on the forums and who, like us, know that, aside from raw power and memory, **the most determining factor in the speed of a PC is how much weight it carries !**

Every single PC comes, out of the box, laden with programs that are running in the background and which are not necessary, or which are not necessary <u>for your own particular use of the PC</u> (they may be useful to other users on other PCs). Windows itself, before you install any other utilities (like Adobe Acrobat Reader) or programs (like Microsoft Office), is laden with background programs, half of which the majority of users will never need.

For example : how often do you use the Microsoft Windows XP/Vista/Win7 Help – once a year, twice a year, never ? So why have a background task which runs the Windows Help system constantly running every time you start Windows, and therefore using processor and memory resources, when you only ever use the Windows Help system once or twice a year ? How about having that background task only ever start when you actually need to use the Windows Help ?   And why should Microsoft Groove be constantly running in the background without your knowledge when you install Microsoft Office 2007 Ultimate if you have no intention to ever participate in over-the-Internet document sharing ?

These are just two examples, one with Windows and one with Microsoft Office. But those two are not alone – well over 60% of programs most users install, or find installed on a new PC, also install a number of usually unnecessary background tasks **which suck up processor and memory resources, sometimes so badly that a PC grinds to a halt as a result.   For example, the PC on which this document was written has 32 background tasks that I disabled because they either were totally unnecessary by any criteria, or they provide features I will personally never ever use.   32! Imagine if all those 32 programs were running right now, all sucking up CPU time and Memory space. That would be the equivalent of racing next door's Fast Larry's Ferrari with parents, brothers, sisters, grandpa, grandma, and cousins all onboard my people carrier !**

Superfluous or buggy background tasks are the single most common reason for the slow-down of a PC, for PC problems such as slow Internet, PC freezes, PC crashes, networking problems, strange PC behaviour, all the way down to a virtually inoperable PCs. Background tasks can slow a PC by 30% to an incredible 100% (total freeze). You can literally bring a PC back to normal life by eliminating those background programs that should be eliminated.

Dealing with background programs is so important that we have devoted a special section of our website to the subject, at **www.TheTaskList.com** and we have created a sub-site at **www.SearchTasks.com**.

So what do you do next :

- **If you are on a budget.** If you are on a budget and cannot or do not want to spend any money, then visit our two sites just mentioned, and, if you know how to, manually go through the process of disabling the background tasks that we highlight as dispensable with or which you know you will not need thanks to our write-ups.

- **If you can afford $29.95.**   If you can afford $29.95, do yourself a favour and do it the really easy way by buying **www.TheUltimateTroubleshooter.com** which will take the pain and wasted time out of the process.

Either way, whether you want to buy The Ultimate Troubleshooter, or whether you want to do it the cheap but long way by using either of our two websites, **you absolutely must make the time to do this step – you will not regret it**.

Lesser Weight (Spyware)

The commercial antivirus and anti-spyware vendors will have you believe that 80% of PCs are infected with spyware. Some of the less principled vendors will even tell you that 90% to 95% of PCs are infected with spyware. Don't believe a word of it – if those figures were right no-one would be doing any work – the World would descend into a futuristic anarchy of users dedicating their lives and spare time to fighting spyware.

From our own PC Support and Maintenance business, and from feedback from users of The Ultimate Troubleshooter, the true figure is more like 15%-20% only.

The above notwithstanding, you should protect your PC with a good anti-spyware program as there is nothing like "spyware" to cripple a PC.

We at AnswersThatWork prefer **SpyBot Search & Destroy** which you can download from our **www.ATWDOWNLOADS.com** Library. It is an absolutely excellent program which is regularly updated and has a great user interface and, best of all, it is free. How Patrick Kolla (Safer Networking Ltd) is able to provide such a well written and such a well supported program free of charge, we will never know.

Our recommendation of *SpyBot* is not an exclusive one – it just happens to be the one we like best. There are many other ones such as Ad-Aware, PC Tools' Spyware Doctor, or the anti-spyware offerings from all the main antivirus companies out there.

Lesser Weight
(Internet Security Suites - Firewalls)

Antivirus companies will not like this section.

Over the last 6 years Antivirus companies have made the most of users' fears of phishing and other online security threats and have successfully convinced millions of users that they absolutely need to convert to using an Internet Security suite rather than just an antivirus program. **Yet, the reality is that in 2011 and beyond, there is even less reasons for using 3rd party firewall software than there used to be in the days of broadband modems and Windows 98/2000.**

The majority of Internet users nowadays run either **Windows XP**, **Windows Vista**, or **Windows 7**, and they connect to the Internet via a **broadband router.** In such a setup :

- **Router Firewall**. The firewall on your ADSL/DSL/Cable router will protect you against 100% of hacker attacks from the outside. In 2011 and beyond all routers operate by default on NAT and protect you against all outside threats.

- **Non-routeable IP traffic**. Additionally, all routers will give the PCs that connect to it IP addresses that cannot be accessed from the outside world (from the Internet), thereby adding an extra fail-proof layer of security.

- **Windows XP/Vista/Win7 Firewall**. In addition to all the above the Windows XP/Vista/Win7 Firewall, which is turned ON by default, is similar to the firewall on your router. It gives you a third 100% layer of security on top of the security from your router, on top of the security from the IP address your router gives your PC.

- **Web browsing protection**. In 2011 and beyond all major antivirus companies now include, as part of their antivirus products (as distinct to their Internet Security suites), anti-phishing and anti-malware protection which protects the users against accidental infection of their PCs through visiting seemingly harmless web pages.

- **OpenDNS Webfiltering (parental control)**. Significantly accelerate your web browsing experience and, at the same time, protect yourself, your business, and your family home against malicious web pages, drive-by phishing scams, and more. All this a lot more effectively than with any Internet Security software and, certainly, without the massive performance hit which all parental control software programs give, Windows Live Family Security included. OpenDNS, **www.OpenDNS.com**, provides the sort of web filtering features that most companies and family homes will want, and does so cheaply. While there is a free version, our recommendation for any family home or business which seriously wants to protect their network is to go for at least the Deluxe version (only $9.95/year for a 5-devices family home).

  See below an example of a site being blocked :

In other words, the standard 2011 and beyond Internet user who uses Windows XP or Vista or Windows 7, and who connects to the Internet via a router, is 400% protected against all external Internet threats.

Each layer of protection slows communications. The router firewall slows the communications from the outside to the inside, the translation to a non-routeable IP address adds its own additional slowing down, the XP/Vista/Win7 firewall adds a third slowing down, and web browsing protection also adds an additional slowing down. **If you are a safe surfer** you do not need anything else on your PC.

All Internet Security Suites add a very significant payload to the PC they are loaded onto. **All of them**. First, from our research and monitoring there isn't a single Internet Suite whose firewall performs faster than the built-in XP/Vista/Win7 firewall, so when the firewall of an Internet Suite replaces the XP/Vista/Win7 firewall, you are suddenly faced with an additional slowing down. Second, to make matters worse all those Internet Security Suites gobble up memory that your PC could use for other programs, adding as much as 100Mb to 200Mb of additional payload on your PC when you were already protected in the first place ! Lastly, with search engines increasingly taking the lead in **flagging in red** websites which might include malware, there is nowadays almost no case for drastically slowing down your PC with an Internet Security Suite when an Antivirus program is perfectly adequate. And what about spam you might say – well, if you own a copy of

Microsoft Office, Microsoft have an excellent Junk Mail filter (which you need to remember to update each month), if you have Mozilla's Thunderbird it comes with very good anti-spam technology, and the same is true of many other email programs, and let's not forget that all the major webmail companies (Yahoo, Hotmail, AOL, GoDaddy) also have spam filtering in place.

Internet Security suites should be used for extra protection only in the following situations :

- – You knowingly access sites that are likely to contain unsafe web pages or downloads : e.g. pornographic websites, sites with illegal (cracked) software downloads, Warez sites, Get Rich Quick websites, Extreme websites, Torrent websites, File sharing websites.

- – You are a serial, but not necessarily careful, downloader. For example : you often download new programs you come across, just to test them, but you do not make the time to check out the websites you download from, or the publishers' credentials.

- – You buy from websites previously unknown to you without checking their legitimacy, their long-standing reputation (or ill reputation), and what people say about them.

All the above are circumstances where one can pick up malware which sends confidential information out from your PC, hence the need for a mechanism which prevents **outgoing transmissions** in addition to also preventing external attacks (the XP/Vista/Win7 firewalls concentrate in the main on *external* attacks).   That said, many antivirus programs nowadays include **Identity Protection Features** which would pick up such infections – one of these programs is AVG Antivirus.

In most cases, therefore, there is absolutely no need whatsoever to <u>significantly</u> slow down your PC by loading an Internet Security or a 3rd party firewall onto it.

Intelligent Routing (Networking)

This particular section is primarily for PCs operating in a business environment. System Administrators please pay attention !

All PCs come, nowadays, with an onboard network card. You buy the PC, plug in the network cable, and off you go, travelling at mega speed through your network.

Or so you think. Nothing could be further from the truth. Three of the most widely used network cards **should never be used on a business network**. They are fine for home PCs where network performance is not as crucial and, most importantly, where a PC is only talking over a small 2 to 5 PC network as opposed to dozens of PCs and network servers running server operating systems such as Windows Server 2000, Windows Server 2003, Windows Server 2008, Novell NetWare, Linux. The statements below are the result of our extensive experience of these three types of onboard network cards over a number of years :

- **NVidia onboard network cards**.   Generally slow performance talking to Windows or Novell Servers.   Excruciatingly slow during the login process.   They all have a bug which appeared in 2006, and which is still not cured at the time of writing of this document, where network transfers of files in excess of 300Mb will often fail.

- **Realtek onboard network cards**.   Slow, Slow, Slow performance.   Can be the cause of printing problems when printing to network printers connected via print servers.   Can be the cause of roaming profiles corruption.   Generally unreliable.   The worst of the three mentioned here.

- **VIA onboard network cards**.   The best of the three mentioned as regards performance.   The main problem with VIA onboard network cards is their physical reliability.   Their performance is a touch above average.   The main problem is that they are generally so unreliable with too many physical failures in short spaces of time.   This would not be so bad if when they fail, they would fail completely in that you cannot do anything with the PC.   Unfortunately when they fail they do so in such a way that 95% of the time everything continues to work fine but the user starts complaining of strange difficult-to-reproduce problems which you spend time, days investigating until, finally, you start thinking of trying to change the network card .....

Note (Realtek) :   the Realtek issue is an interesting one because, as many System Administrators and Network Engineers will know, there are many PCI and PCI-E network cards out there which are based on Realtek chipsets but which are not made by Realtek.   So what is the situation with those network cards ?   Well, in our experience so far :   **no difference if you use the Realtek drivers !**   At this juncture we believe that the problem is primarily a driver issue (lack of quality in the performance, testing, and writing of the drivers) rather than a problem with the physical chipsets themselves.   For example : many D-Link and US Robotics cards, such as the D-Link DFE-538TX or the US Robotics 7900 PCI network cards, get automatically detected by Windows as Realtek network cards.   If you decide to use them with the Realtek drivers which Windows allocates to them (or which you can download from the Realtek site), you will notice the same performance and buggy problems as if they were onboard Realtek cards.   As soon as you change the drivers to the **D-Link and US Robotics drivers** the cards perform very well and prove to be excellent budget priced entry level network cards without any of the problems associated with onboard Realtek network cards.

<table>
<tr><td>Maintenance
(Background Programs, Spyware)
(ScanDisk, Defrag)</td></tr>
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Your computer is just like a car – Maintain it well and it will reward you with reliability, speed, and lack of problems.

- **Background Programs**, Checking your background tasks must not be a one-off event. A Windows Update can suddenly introduce new background programs on your computer, a program update can introduce new possibly unnecessary background tasks, and 6 out of 10 new programs that you install on your computer will also install possibly unnecessary background programs. All of those background programs will use valuable memory running in the background, they will also use processor time, and will therefore contribute to the decrease in speed of your PC or laptop. It is therefore of paramount importance that you regularly check your computer for new background tasks whose behaviour you may need to curtail. As indicated earlier, you can do this in a cheap but time-consuming manner via either of our two sub-sites, **www.TheTaskList.com** or **www.SearchTasks.com**, or you can save yourself a lot of time and pain by getting our **www.TheUltimateTroubleshooter** program. Your choice. Either way, you must regularly check your background programs, **about twice a month minimum**, to ensure your computer is always operating at the maximum speed possible depending on your particular use of it.

- **Spyware**. We have recommended earlier in this document the use of anti-spyware software. Make sure you manually run a full anti-spyware scan **once a week**.

- **ScanDisk**. Run a Scandisk on your PC or laptop **once a month**. Scandisk checks your hard disk for defects. This has two benefits : if a problem is detected it will explain why you may have noticed a drop in the performance and speed of your PC. Most importantly, however, it will also "save your Life" by giving you a clear and unambiguous warning that you have a hard disk that is about to fail on you and that you should **backup all your data and emails** and then have the hard disk replaced. You will find here, **www.XPScanDisk.com**, a document we have written for XP users. ScanDisk is more easily accessible in Vista and Windows 7.

- **S.M.A.R.T monitoring**. TUT, The Ultimate Troubleshooter, has an **IDE & SATA S.M.A.R.T** monitoring section on the SYSTEM INFO tab. S.M.A.R.T stands for **S**elf-**M**onitoring, **A**nalysis, and **R**eporting **T**echnology. It is technology present in all of nowadays' hard disks where the hard disk monitors its own self and is able to alert the PC, or software which can read the SMART status (like TUT), of impending hard disks problems and failure. This gets shown as one or more NOT OK statuses in TUT. Note that hard disks can fail without S.M.A.R.T picking up problems beforehand - S.M.A.R.T is, in our experience, only able to predict 30% of hard disk failures. What is certain, however, is that if S.M.A.R.T picks up a problem, you absolutely MUST take heed of the warning and immediately backup all your data and emails and make plans to have your hard disk replaced as quickly as possible. Check the S.M.A.R.T section of TUT **once a week**.

● **<u>Defrag</u>**. An important part of Maintenance is the defragmentation of your hard disk. If you already run a 3rd party hard disk defragmenter, then you can ignore this section. Similarly if you have Windows Vista or Windows 7 and you have not made changes to the default defragmentation which Vista/Win7 runs in the background, then you need not read this section either. If you have Windows XP then you should learn about defragmenting your hard disk.

When Windows and new programs are first installed on a PC, they are all written in one contiguous block on the PC's hard disk. As you delete files, the space they used on the hard disk is made available by Windows for re-use. Note at this point that there a lot more file deletions that go on all the time than the files you yourself delete as a user – almost every program you open will create temporary files in the background, and delete them when it closes. So file deletion is something which occurs often and every day. When a new file is created (new document, new download from the Internet, email attachment, temporary files), Windows will try to make it fit into the next available block of space (where a deleted file used to be). If the new file is bigger than the old file it replaces, then part of the file will be made to fit into that first available space, and the remainder of the file will be placed in the next available space or spaces (if the second available space happens to also not be large enough to fit the entire remainder of the file). This means that the new file could conceivably end up split into 2, 3, 5, 8, or more different places on the hard disk. **This is called** *"fragmentation"*.

Fragmentation is a problem because it slows down the computer very significantly since, instead of being able to read a file in one operation, the hard disk is having to read the first bit of the file that it finds, then seek out the next bit, then the next bit, till it has the entire file that has been requested by you the user or by a program. This time-consuming multiple fetching process inevitably reduces the speed of your PC. But it also has another equally detrimental effect : the constant <u>additional work</u> the hard disk has to perform to fetch files means that it works harder, more intensively, and it will therefore slowing down sooner through fatigue and will eventually fail a lot sooner.

This is where defragmentation comes along. The process of **defragmenting the hard disk** is the process whereby all the files are moved around so that the files are all in contiguous blocks, with no speed-reducing empty spaces, and they are all placed near the centre of the hard disk to minimize head movements therefore increasing the speed of fetching of data and reducing the aging of your hard disk. You can now see how important the process of defragmenting the hard disk is. It is vital. You should perform a hard disk defrag about <u>**once a month**</u>.

In Windows XP you can run the Hard Disk defragmenter from **Computer Management** in **Administrative Tools** in the Control Panel.

> ## Products never to Use
> (Memory Optimization Programs)

In 2011 there are still many websites and journalists who recklessly advise their users to use memory optimization programs on Windows XP, Vista, Windows 7. And we use the word **"reckless"** politely !

First, our Recommendation :   We do **not** recommend the use of any cache/memory defragmenter or cache/memory optimizer under Windows 2000/XP/2003/Vista/2008/Win7 – in fact, we advise **strongly** against it.

Vista is a heavy beast, that is true (and our internal AnswersThatWork choice of words for it is nowhere as complimentary!), so here is a one line piece of advice – use 4Gb of memory if you have Vista-32, and more if you have Vista-64.

Now for a little history. Memory optimizers and defragmentation programs claim to improve the performance of your PC by removing from the memory (RAM) information that is no longer used by any currently running program, by forcing Windows to swap out unused programs to the slower disk-based swap file, and, in the case of some programs, by also forcing all free memory to be contiguous. These memory optimization programs date from the days of DOS and Windows 3.1 when the combination of slow PCs, extremely limited amounts of RAM (Yes, people used to pay a fortune to buy a PC with 4Mb of RAM rather than the standard 1Mb or 2Mb of those times!!), and relatively poor memory management by DOS/Windows equated to a need for frequent reboots or you would experience crashes and therefore loss of data after any prolonged use of a PC. In those days memory optimizers and defragmenters were as good as gold dust and were worth all the money paid for them, at least the better ones. Then came Windows 95 which improved the situation by a leap of gigantic proportions to add to the fact that PCs were at the same time faster, RAM was faster, and PCs would often have 32Mb/64Mb/128Mb of RAM. With the better management of memory that Windows 95 had, the need for memory optimizers receded sharply although, to be fair, there were still many scenarios where the best of such programs would make a significant difference to the performance of a PC. Windows 98 First Edition, with all its dreadful bugs, made the situation much worse unfortunately. However, the subsequent version, Windows 98SE (Second Edition) quickly corrected the problems and actually improved on Windows 95. And despite its critics in some quarters, Windows ME (Millennium Edition) went a stage further in the improvement of memory management. During all this time, of course, one must not forget that PCs also got faster and came with larger amounts of memory still.

Then came Windows 2000 and, quickly behind it, Windows XP and Windows 2003, and now Vista, Windows 2008, and Windows 7, all based on the Windows NT architecture . Starting with Windows 2000 the memory management was completely revamped from the ground up and was further enhanced and improved in Windows XP, Windows 2003, Vista, and Windows 7. At the same time, current PCs range from Dual-Cores to Quad-Cores 4GHz to 10GHz at the time of writing and usually have a minimum of 2Gb to 4Gb of RAM.

More importantly, however, the fact is that all memory optimizers effectively second-guess Windows as to whether some pages of memory are needed and should not in fact be either cleaned out completely or swapped out to the hard disk. There is some value to such programs on slow Windows 95/98/ME PCs with little RAM (128Mb, 256Mb) because the combination of the slowness of the PCs together with the fact that those operating systems still have a few serious weaknesses on the memory management side, can mean that *good second-guessing* will be better than what Windows 95/98/ME can do itself.

On Windows 2000/XP/2003/Vista/2008/Win7, however, there is absolutely no use for such programs. Worse, using these programs on these newer NT-style versions of Windows, can actually often be detrimental. Our own experiments show that, with the majority of these programs, the amount of free RAM on a Win2000/XP/Vista/Win7 PC will increase significantly after the memory optimizer has optimized the memory ("scrubbing"), only for the free RAM to decrease a minute later back to its previous level <u>or worse</u>, with nothing else having changed on the PC in terms of a new program having been opened or similar. Additionally, with many of these programs, scrubbing also results in an instantly increased swap/cache file. Think about the implications of this observation for a second (mirrored by many many users worldwide) : Windows had in memory all the information that it felt it needed to have there; some supposedly clever program decided it knew best and decided to spend <u>some of Windows own time</u> to remove some of the information from memory, sometimes forcing Windows into **extremely intensive hard disk access** (for swapping programs out) when it didn't need to (intensive hard disk access → very slow, intermittent stalling), all this only for Windows to say a minute later *"Hey, I needed that, why did you remove it ?!!"* and go and grab it back into memory again.   <u>*That is called Windows time wasting !!*</u>

<u>**Conclusion :**</u> **If you still have Windows 95/98/ME in 2011, and not much RAM for the amount of programs you run, and most probably a slow PC, then a good memory optimizer could make a significant positive difference, but you will need to test this for yourself rather than just take it for granted.   If you have Windows 2000/XP/2003/Vista/Win7, <u>then you have NO need whatsoever for a memory optimizer and using one could even have a slightly negative performance effect on your PC</u>. If you have memory issues there is simply no substitute for adding extra RAM to your PC – this has the secondary beneficial effect of lengthening the life of your hard disk as it means Windows stops swapping programs out to the hard disk as often as it would with less memory. Take your cue from the top companies : in 1998 Symantec bought Quarterdeck which had the leading and most well known memory optimizer, QEMM, and they dumped the product because it had no future, and you will know as well as we do, if Symantec had thought there was a worthwhile opportunity to take your dollars with QEMM for 2000/XP/Vista/Win7, they would have done it – they did <u>not</u> because memory optimizers have no use in the current modern world of Windows.**

In Closing ....

We hope you enjoyed the read, and found it useful. **Enjoy your new speedy computer ! Ciao.**

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