

## **Make Your Computer Much Faster and Much More Responsive**

There are many different ways to improve the overall performance of a computer/laptop. No doubt you will have performed a spring clean on your computer to get back some of its performance (by removing junk programs and also viruses and malware. Having done this important first step, the overall performance depends on three critical bits of hardware inside your computer/laptop– in layman’s terms:

- The CPU (Central Processing Unit). Its specification and performance (e.g. a Pentium dual core or a Celeron or an Intel i3-1030, i3-4350U etc.) is going to make a big impact on how fast your computer is. Each of these look and sound the same / similar and operate the same functions as each other. However some are slow and some are fast. It is often not really economical or even possible to upgrade the CPU in many cases due to cost and compatibility with the motherboard inside the machine.
- The storage drive (hard drive). This not only stores your personal files but also holds the operating system files that must be constantly read and modified during normal operation. Some hard drives are faster than others (spin speed of 5400rpm or 7200rpm can make a difference). Overall this is the biggest bottleneck on the system and the thing that is likely to make the most impact if it is upgraded to a newer technology (SSD). A hard drive that is overburdened makes the rest of the system sit and wait until it can do what is asked of it. Often (especially during bootup and initial Windows front screen display) this is a serious issue slowing the whole system down to a crawl for several minutes.
- The amount of RAM. This is where programs and process data is temporarily held (once read from the hard drive and while waiting to be executed by the CPU). It is very fast but limited in amount. If you don’t have enough then the system can queue and wait for RAM to become available. This is an easy fix as a memory upgrade from 2Gb or 3Gb to 4Gb or more is both simple and quick to do.

If your computer is still slower than you would like – even after a full clean-up and malware removal then you must understand that you can never get back to the sort of speeds you

had on day 1 with the same hardware items above (CPU, RAM, Hard Drive). This is because of many factors including:

- Installing applications that run in the background all the time – too many of these will slow the boot time of the computer and also make it feel sluggish. Programs such as Cloud storage programs, Office programs, email programs, antivirus programs, web browser programs, printer management programs, iTunes, Skype, GoPro, Dropbox, Picasa +++ the list goes on) all load drivers and widgets and toolbars when the machine boots up. Even if you never actually use the program it will be there, loaded up and taking away precious RAM and CPU cycles and thrashing the hard drive in the process.
- Microsoft and Intel (and AMD) patches to the operating system and underlying BIOS/Firmware – many security vulnerabilities have needed to be “patched” by Microsoft / intel / AMD. Some are so serious (e.g. Meltdown and Spectre) which have been in the news recently that they really must be installed to keep you safe and secure Some of these patches have a very dark side though – **some of them can slow down older computers (older CPUs) by as much as 20%** and there is nothing that can be done about that. See here for info about Spectre and Meltdown and the effects on the CPU performance: <https://bit.ly/2OOJctT> There are many other sites out there that explain the issue and the consequences of the patches you have to apply (and will already be applied by Windows update)
- Programs evolve. For example Office 2000 is much less resource (CPU, RAM, Hard disk) intensive than Office 2010 or office 2016. The newer programs will be slower as they do more and offer more features. Things sadly move on...

So... In summary – If you ask the question “*What can I do to make my machine much faster (most likely a lot faster than it was when new)*” then the answers are as follows:

Firstly do a proper “full malware cleanup” and “software spring clean”. This will give you the best possible performance for your existing hardware by removing Junk, Malware and little used programs that eat away at the performance.

After this you need to be sure you have at least 4Gb RAM (and 6 – 8Gb if you are a power user). If you only have 2Gb or 3Gb then this is likely to be slowing your computer down. You may have saved a few pennies when you purchased your machine by selecting a machine that was under spec’d on RAM (as RAM is an expensive component for manufacturers).

Finally – and actually most importantly in reality – upgrade the old slow hard drive to an SSD (Solid State Drive). They are more expensive Gb for Gb than an old slow spinning hard drive but they have many advantages. In many cases they can make the machine around 3x faster that it would be with a normal hard drive. 2-3x faster to boot up, 3-4x faster to get to the point where you can launch the web browser and go to websites etc.

See this article for info about the benefits of an SSD in older computers: <https://bit.ly/2sHtmq7> There are many other reports all over the internet about the benefits of an SSD so please Google.

An SSD upgrade is well worth the extra cost in my opinion. The SSD would also be removable at the end of this computers life and you could put it into a new computer at that point and get the same benefits. In other words buy a cheaper computer and immediately pop the SSD into it to make that new one nice and quick too. A basic (reasonable) new laptop might cost £400 just now but one with a 240Gb SSD would be more like £650 so the money spent now would be a good investment.

Approximate costs:

240Gb SSD £40 - £70 depending on spec of drive and warranty supplied.  
480Gb SSD £75 - £110 depending on spec of drive and warranty supplied

*Prices fluctuate weekly so please note this is guidance only*

Add to this the cost of my time to clone the old hard drive over to new SSD and test. This would be 1 – 2 hours of labour (depending on ease of removal of old drive).

To give an example on an older computer of the boot time gains I have compiled a small table below. This was on an 8 year old Toshiba laptop and with a Core 2 Duo T7200 CPU and 4Gb RAM:

	Old Hard Drive	A400 SSD
Time from power on to the desktop screen in Windows 7 (welcome music played)	3min 50sec	36 sec
As soon as welcome music plays - launch Google Chrome and wait until the search box appears. This is the total time including boot.	4min 37sec	55 sec

These results speak for themselves. If you would like me to evaluate your laptop / desktop and upgrade the RAM or migrate you over to an SSD then I'd be more than happy to help. Please give me a call to discuss.