WHITEPAPER

Maintaining Computer Performance

vs

Natural Performance Degradation

In

Windows based Computer Environments

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Introduction

A common experience with computer users who purchase a new computer, is that it performs to their expectations for a while. After 6 months they get the feeling their computer is slowing down in performance.

These 'feelings' of slow computer performance can be summarized as follows:

- The computer cannot keep up with the ongoing demands of it and increased use by the user
- After 12 months my expectations and demands on the computer have increased – more applications, more simultaneous tasks, more family users etc
- The computer is now out of date and as such cannot serve my needs and there is better technology that can satisfy my computing needs
- The computer has slowed down and it cannot keep up with my demands

Even though computing technology develops at a high rate with the value for money constantly increasing, generally only the last point is valid over the course of 12 months.

This paper will explain:

1. The reasons for natural performance degradation in computing environments
2. How an individual or small business can address and maintain computing performance over time
3. The ROI (return on investment) in maintaining a computer's performance over time

The current sophistication in Windows based environments is very high and compared to the early Windows editions a person has access to multimedia and work productivity tools that would have been unheard of 20 years ago.

In saying that, an operating system (the brains) that controls computer systems cannot be all to all people. Non IT (information technology) will generally need some support either through a computing service business, friend or work IT department.

There are <u>some</u> tools built into Windows to assist you in the
maintenance of your computer however as a person who purchases a
computer to for work, kids homework, internet access or to run your
small business accounting software, you may not be aware that these
tools exist or know how to use them without damaging your computer.

Next we will look at the main components of a Windows that require
maintenance and if not maintained will contribute to a slowing down of
your PC.

Windows Sub Systems and How they Are affected through Normal Use

Your computer system is composed of various parts that you interact
with such as the keyboard, mouse, monitor, windows user interface and
systems that you indirectly use such as the operating system driver
system, hard drive management and Windows or registry database.

Registry Database

The Windows Registry is a database that stores configuration
information across much of the operating system such as installed
program settings, shortcut locations, file system structure, system
performance measures, driver information and much more.
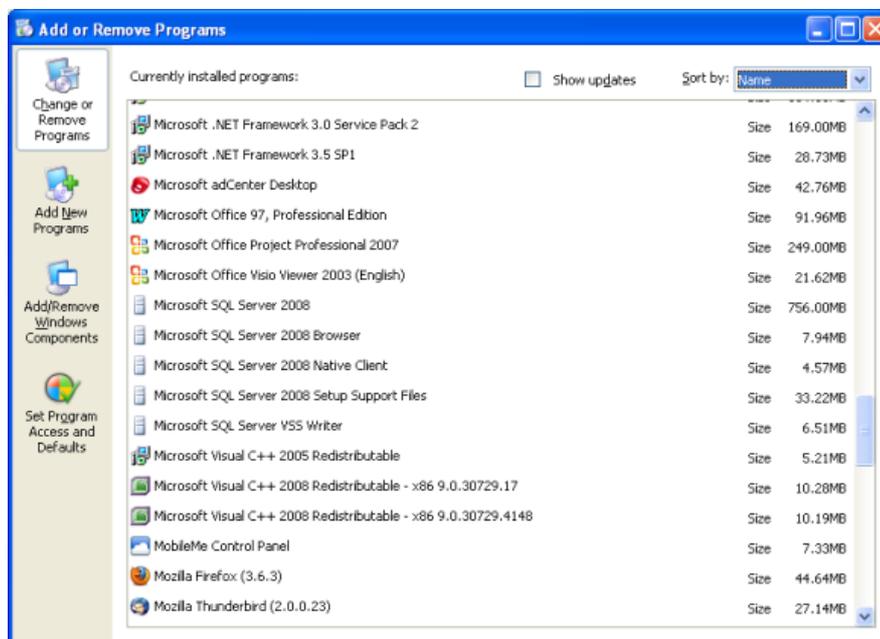
Over time as you install/uninstall applications, create, modify,
delete files, install new drivers and devices the registry grows and

becomes more fragmented or another way to describe it as a messy
clothes cupboard.

If your cupboard is organized, it is easy to find the clothes you want
at any particular time. If it is unorganized you will need to spend
more time to locate the items you need.

As you know the Windows operating system comes with a set of core
applications and you also have the option to purchase other
applications which will run on Windows. As the operating system and
third party applications access your system they may incorrectly make
entries to the registry that are invalid or incomplete.

This can happen as a result of a variety of reasons:
- Power failures
- Hardware failures – hard disk, removable drives, peripherals such
  as webcams etc causing erroneous information to be stored in the
  registry.
- Clash with another application causing program crashes whilst
  updating the registry or a lockout whilst trying to access the keys
  in the registry database.

So as the registry becomes defragmented and corrupt, Windows will have
a more time consuming or hard time trying to operate correctly for
you. Performance will decrease and the amount of RAM left for the
running of applications will decrease as the registry grows in size.

Hard Drive

Your hard drive is a repository for your operating system files,
program or application files and the data that you store on your
system that you want available after you turn off your computer.

The inside of your hard disk drives will look something like this:

It consists of one or more platters with a special magnetic coating and 1 or more drive heads that skip across the platter(s) reading and writing digital information. Information is stored in cylindrical tracks across the whole drive platters. When you first purchase a computer the operating system has been freshly installed and the files are generally organized in a contiguous block as per below:

Finacial_2010.xls:
Cylinder 1 [x][x][x][x][x][x][x][x][x][x][x][x][x]   **Example 1**

As the file grows or is moved the pieces of the file may end up like this

Cylinder 1 [x][x][x][x][x][x][x][x][x][x][x][x][x]   **Example 2**
Cylinder 4   [x][x][ ][ ][x][x][x][x][x]

When the operating system writes to the disk it generally writes information to the next available free space. In example 1 as the disk spins, the disk read head can load the file in one revolution of the platter.

In example 2 the read head loads the file information from cylinder 1 and then waits for a second revolution to read the remaining file information from cylinder 4. So the result of file fragmentation is that it takes longer to load and run files and programs and causes cumulative defragmentation for new files and programs.

How You Can Maintain Computer Performance

You can see from the information presented the reasons why computers gradually and naturally decrease in performance. The hardware is the same, however the data and applications that we create cause this slowing down of a computer's operation.

So what options do you have ?

Options	Description
1. Rebuild your computer by backing up all your critical data, formatting the drive and re-installing all applications and data from your backs ups	This is common amongst IT support professionals however they use purpose built tools to backup drive images and rebuild computers using SOE (standard operating environment) disks. **Approximate cost**: $100 to $500 per rebuild
2. Have your local computer store run maintenance on your computer	Not all computer stores have the technical expertise onsite to complete Windows backup and maintenance. In addition you are exposing yourself to potential privacy breaches of your data so you will need to securely remove data before dropping off your computer. **Approximate cost**: $90 to $250
3. Take a computer course to learn the intricacies of computer maintenance, registry repair, file defragmentation.	Most people are not interested in taking a computer course so that can operate their computer – you wouldn't take a course to operate your toaster or refrigerator and you should have to take a course to have your computer working optimally. **Approximate cost**: $250 to $2000
4. Use purpose built applications for computer maintenance that focuses on maintaining computer performance at an optimal level, is user friendly and can be run on a regular basis by the non IT professional.	These applications are solution specific offering a user friendly interface to complete complex tasks. They are Windows compatible offering the ability to carry out regular system maintenance by the home computer user. **Approximate cost:** $30 to $70 Registry Cleaner Driver Downloads

In terms of cost effectiveness option 4 provides the best ROI and gives you control back to manage you computer easily. Also this option allows you to maintain your Windows database (registry) and update your drivers and applications whenever necessary.

Disk defragmentation is built into all Windows XP, Vista and 7 operating systems. This can be accessed easily by right clicking on your hard drive, selecting defragment drive and following the prompts.

Maintaining your computer on a regular basis will extend the longevity of your hardware investment and provide you with computer performance that is acceptable to you for a longer time.

Software Resources	Description
Driver Update	Keeps drivers and applications up to date
Registry Clean and Defrag	Specialist registry tool than corrects errors, remove erroneous entries and defragments your registry