How to safely tweak and optimize your system - A Guide

This document tells you various ways in which you could optimize your windows system with some little bit tweaks and pushes.

Bootup Speed Tweak

Introduction

Computers are not like televisions and takes much time to start. There is no way about you can change this to few seconds like televesion sets but we can reduce this time considerably. This document will help you to minimize the time your computer takes to startup.

First Step - the BIOS

The first step to making your system startup quicker is to tweak certain BIOS settings that lead to slow downs and delays. To enter the BIOS setup, restart your PC and hit the del key or any other designated for setup. These commands can be found in various sections of different BIOS setup programs. Search for the following:

Turbo Frequency - ENABLE. This will set your bus speed approximately 2.5% higher, offering a generous speed increase. This may not be supported or work on all systems. It will make the system startup a bit faster. Note that this can cause problems with some systems.

IDE Hard Disk Detection - This part of the BIOS Setup will detect your hard disks for you and you can save this configuration. If you configure your hard drives here, you will not have to let your BIOS auto-detect the drives every time you boot up, which will save you time Otherwise at boot up you will always sees the meesage detecting primary master... and can take about five to ten seconds.

Standard BIOS Setup Menu - This part of the BIOS Setup will confirm that all of the hard disks are configured. If you're sure you're not using a certain drive, turn off auto-detection and save yourself some time.

CDROM drives usually do not need to be configured for Windows and your computer to identify them.

AGP Aperture Size - This number will set the maximum amount of memory that can be accessed by the AGP graphics card. It is recommended that you set this to 1/4 or 1/2 of your total system memory, unless instructed otherwise by your graphics card manual. If you receive odd errors when executing OpenGL applications, consider setting this value back to its default setting. E.g. if you run Quake 2 and the following error pops-up: Error GLimp_EndFrame0 - SwapBuffers0 Failed!

Quick Power On Self Test (or POST) - ENABLE. This will have your system run a less detailed POST, resulting in a quicker boot sequence. Many newer PCs have a special BIOS setting, usually called "Quick Boot" or "Quick Power On Self Test" that can be enabled to make the boot take less time. This setting is described in more detail here. Try enabling this setting; this will cause the BIOS skips some of the normal test routines that it performs at boot time, speeding up the boot process.

Enable Booting SCSI Ahead of IDE On Supported Motherboards : Most PCs default to the so-called "standard" boot sequence, in which the BIOS first checks the A: floppy drive for a bootable disk, and if one is not found there, checks the C: hard disk drive and boots it instead. If you are using both SCSI and IDE/ATA hard disks in your system, and if your motherboard supports the feature, you can tell the system to boot the SCSI drive ahead of the IDE one, even though normally IDE drives always boot in a system where both IDE and SCSI are installed. This is controlled by the boot sequence BIOS setting.

Most motherboards do *not* support booting from SCSI when an IDE hard disk is present. If you want to do this, then you need to check your motherboard documentation in the area where BIOS settings are discussed, or go into the BIOS setup program itself and look at the "Boot Sequence" parameter. If it has an option to boot SCSI ahead of IDE (sometimes incorrectly called "C:") then enable it, and you should be able to boot your SCSI disk.

Boot Sequence - Unless you plan on booting off of any drive other than your hard drive, set this to start with C, your hard drive.(ex: "C, A, SCSI.")

Boot Up Floppy Seek - DISABLE. If you enable this, your system will take a few seconds to examine the floppy drive in search of a disk, wasting your time.

Standard BIOS Setup Menu - This part of the BIOS Setup will confirm that all the hard disks are configured. If you're sure you're not using a certain drive, turn off auto-detection and save yourself some time.

CPU L1 (Also known as Level 1 or Internal) Cache - ENABLE. This will enable your system's small, very fast cache, which helps overall system and startup speeds.

CPU L2 (Also known as Level 2 or External) Cache - ENABLE. This will enable your system's larger, fast cache, which helps overall system and startup speeds.

CPU L2 Cache ECC Check -DISABLE - Disable this for more speed. But if you start getting strange errors. enable it.

Autoexec.bat, Config.sys...

Choose Start, Run, and type **sysedit**. This should launch the System Configuration Editor. Click the autoexec.bat window first. These programs are automatically executed when you first boot up your PC. Since some programs are not needed with Windows 98, you can remove these from your memory. First, make sure the program you are going to remove is not something that is required. If you think it may be used by a program, simply put REM (remark) in front of the line that launches the program. For example:

```
REM C:\WINDOWS\COMMAND\MSCDEX.EXE /D:IDECD000
```

Once you are sure you've REM'd out the proper programs, close the autoexec.bat window and check out the config.sys window. If you see any drivers that you're sure you don't need (remember, most of these will only be needed for DOS), delete the line(s) that pertain to the driver. Close config.sys.

Second Step - Windows Startup

Windows has numerous programs available to tweak your system's startup process. Luckily, one of the best programs, System Configuration Utility, was included with Windows 98. Even Windows 95 users can still grab most of these features from TweakUI. Other Programs such as started (freeware) lets you remove uneeded program from the windows startup.

CDROM Tweaking

CD-ROM tweaking is a tricky subject. There isn't a lot of information out on the subject, but the few tweaks that are around can boost performance significantly.

Drivers

The first step to successfully tweaking anything is downloading the newest drivers. For the ones you need, check out the Drivers Headquarters. Click the CD-ROM link on the left and it should be easy to find them. Note that most CD-ROM drives do not require drivers, but updating firmware can help fix bugs. This site will give you links to firmware as well.

Enabling DMA and Other Settings.

Enabling DMA (direct memory access) will not give you a huge increase in speed, but will take load off your CPU. Not all CD-ROMs can enable this, or use it successfully, so results will differ. After enabling it try some games out. If it seems to take less time to start reading and the games seem to be running faster then it is working fine. If the CD-ROM is not working correctly then you should disable it.

To enable DMA on your CD-ROM drive:

Right click My Computer on your desktop, choose Properties. Click the Device Manager tab. Click the + next to CDROM. Double click on your CD-ROM drive (which should be shown next to CDROM). Click the Settings tab at the top. Check the box that says DMA. Also try to enable "Sync Data Transfer" as well. Now reboot.

CD-ROM Cache

Right click My Computer on your desktop, choose Properties. Click the Performance tab. Click the File System button below. Click the CD-ROM tab at the top. Make sure your Cd-Rom is set to Quad-speed or higher, even if it's not. This will just let you use an extra big cache. Now, make sure your Supplemental cache size is the largest it can be. It should be 1238 KB.

CD Quick Cache

CD-Quick Cache is a great program for optimizing cache of your CD-ROM. At first I doubted it, but after trying I was amazed. Making changes to your cache is faster than ever because the program resides in your system tray.

Check this program out.. it is well worth your time. Do some benchmarks yourself if you don't believe me, this program is great.

Winboost 2000

Winboost 2000, by Magellass, also includes settings to optimize your CD-ROM drive. Select the "Optimize CD-ROM Speed" setting, set the Cache size to large, and then choose the appropriate speed for your drive. This should dramatically increase the speed of your CD-ROM drive.

System & Registry Tweaks

Introduction

After few months of reinstall Windows the overall performance of the computer starts to suffer. Only because of unsused DLLs and junk enteries registry which Windows fails to manage. Is it time to reinstall the OS!!!!! The painful long nail bighting process of deleting the Windows directory, reinstalling the operating system, and then having to reload all of the applications and games. Ouch!!!!.

Well it can be done without reinstalling Windows.

what we will need

- **Microsoft Regclean ----- IMPORTANT -** Cleans registry
- **System Mechanic (shareware) / Easy Clean (i think it's free) -** Clean registry and other files
- **Clean System Directory -** Clean system directory of unused files
- **CLEANREG -** Clean unused keys in registry
- **Norton Utilities / FIX-IT Utilities / Nuts & Bolts -** Any one which is cheap but i recommed to go for FIX-IT.
- **Scanreg -** Comes with windows 98 but can be downloaded from here.

1. Always run regclean atleast once a week.
2. Run above mentioned utilites at least once a week.
3. Defrag and optimize registry by using tool scanreg. Unzip all files in windows directory. Restart in dos mode. Type scanreg /fix and after completion reboot.
4. **If you use Microsoft office remove microsoft find fast from the windows startup.**
5. **Scan for File System Errors to Free Lost Space and Improve Data Integrity** : One of the most important--and yet simple--ways to optimize the performance of your hard disk's file system is to scan it regularly for errors. Over time, errors can creep up in the file system, which can lead potentially to lost data, file corruption, and also wasted disk space. I recommend that you scan for file system errors regularly, using a tool such as Microsoft's SCANDISK or Norton's Disk Doctor. This should be part of your preventive maintenance routine, and can be automated if you use the correct tools.
6. **Defragment to Improve Performance :** Over time, files on hard disk tends to become fragmented i.e. they are broken into several parts lying on different places on hard disk. It takes lot of time to read such files. The cure for fragmentation is, of course, defragmentation. Running a defragmentation utility such as Microsoft's own Defrag, Norton Speed Disk or **Disk Keeper Lite (FREE)** are possible solutions.

7. **Recycle Bin :** When you delete a file, it isn't really deleted, it is just moved to a special hidden area on the disk, which you can access by opening up the Recycle Bin. To really delete a file, you purge it by emptying it from the Recycle Bin. One problem with the Recycle Bin is that it takes up a lot of space. By default, it is set to allow up to 10% of the hard disk to be used for deleted files. On a 4 GB drive, you could be allocating 400 MB of disk space to items you thought you deleted! This can cause you to prematurely run out of free space. Right Click on Recycle Bin and clear its contents. And after that agin right click and in properties set its minimum to 1 %.

CPU and Motherboard Tweaks

It is mostly changing the Bios settings to get full speed. Here is how. **Write down any old BIOS settings you are going to change!**

To enter your BIOS setup, when booting up your computer hit "delete" or the key mentioned in the first screen when you turn on your computer.

Turbo Frequency - ENABLE - Increases clock speed by 2.5% to 5%. This setting can cause problems because it sets the CPU clock speed higher than it was supposed to be. However, if it works without problems it can lead to a fair performance increase for all programs. Not all motherboards have this option.

Quick Power On Self Test (POST)- ENABLE - This will speed up the POST (the test that runs when you first cold boot a computer). It should be enabled to shorten boot times.

CPU Level 1 (L1) Cache (also called Internal Cache)- ENABLE - Enabling will activate the small, on-die cache included with your CPU.

CPU Level 2 (L2) Cache (also called External Cache) - ENABLE - Enableing will activate L@ cache and will improve performance.

Video BIOS Shadow -ENABLE - This feature will "shadow" (or copy) the basic BIOS functions of your video card to memory in order to keep them present at all times. The CPU then reads those functions

much quicker than before. This leads to a large performance increase when enabled.

System BIOS Cacheable -ENABLE - This will copy your main BIOS code to RAM and increase performance a great deal if enabled. However, this can cause problems with certain video cards and or memory conflicts. Test both settings and decide which is best for you. If you see no problems with it enabled, leave it on for a nice performance increase.

8 Bit I/O Recovery Time - As low as possible - This option sets the wait time that is added to an 8 bit ISA instruction originated by PCI. Your motherboard should already be set to the default value. Increasing this value will lengthen the delay. Decreasing will shorten the delay. Setting this value to 0 or NA will remove the delay (BEWARE).

16 Bit I/O Recovery Time - As low as possible - This option sets the wait time that is added to a 16 bit ISA instruction originated by PCI. Your motherboard should already be set to the default value. Increasing this value will lengthen the delay. Decreasing will shorten the delay. Setting this value to 0 or NA will remove the delay (BEWARE).

AGP Aperture Size - 25 % of System Memory Size - The AGP aperture size specified in your motherboard is the maximum available memory to an AGP card. Setting this higher than your system memory may result in poor performance or excessive memory usage. Try setting this value to anywhere from 25% to 100% of your memory, unless otherwise specified in your video card manual.

TweakBIOS - Mentioned above, this program allows you easily access your BIOS features from Windows. The program even allows you to access features that your CMOS setup won't allow you to alter. There's one downside though.. it will not save features unless you register.

PCIInfo - A freeware utility written by the person that wrote TweakBIOS, this little program will list specific details about devices on your PCI and AGP bus. This will list the vendor's name, type of device, what IRQ it takes, if it supports 66 MHz bus, if it can use AGP 2X, the latency timer set for it, whether or not it is capable of bus mastering, and what type of bus it is using. It is definitely a valuable program for a person looking to tweak their system or a person looking for detailed information.

PowerTweak - PowerTweak is an excellent program that will optimize your processor and chipset. This program does wonders for most machines, and can boost performance across the charts.

CpuIdle - CpuIdle is a fairly good program that allows the CPU to cool down in between idle cycles. I have seen this program work well in some cases, poorly in others. Either way, it's worth a shot as a free cooling solution. Read more at the page here or download the program here.

SoftFSB - As far as overclocking programs go, nothing even comes close to SoftFSB. This program allows you to change your FSB (front side bus) speed on the fly from Windows. Yes, change your clock speed from Windows at any time! Not all motherboards support this program, but many do, and work very well.

Recovering from Tweaking

If you had little success tweaking your BIOS, motherboard, and/or CPU, you can always recover your original settings. In your BIOS setup, there should be an option called "Restore Setup Defaults." Choose this option, then change back any settings you wanted to use.

Hard Drive and Memory Tweaks

General Hard Drive Tweaks

Go to the Control Panel / System applet (Start -> Settings -> Control Panel -> System) and go to the Device Manager tab. Under the Disk Drive subheading, choose the listing of your hard drive and open it by double clicking on it. Go to the settings tab and make sure that DMA is enabled. Warning: This setting may cause problems on older hard drives. Make sure your drive supports DMA before continuing.

Within the BIOS, make sure your hard drive is configured to Master and that any supported UDMA settings are turned on (for most newer hard drives, that would be UDMA 33 - UDMA 66 hard drives are just starting to hit the market and should be even faster).

If you have both your Hard Disk and CD Drive connecting to Primary IDE then make your CD rom secondry master and hard disk primary

maste. It will improve your hard disk speed.

CAS Latency

CAS latency has to do with how fast your computer can access a column of data in your RAM. Generally the lower the number, the better.

Enable Hard Disk Block Mode

Most newer BIOSes support the enabling of block mode, which allows multiple hard disk sectors to be transferred on a single interrupt. This feature is controlled with this BIOS setting. Usually block mode can be set to either 16 or 32 sectors per interrupt. If your hard disk currently has block mode disabled, you can try enabling it to see if performance improves, but you may have to turn it off again.

Enable 32-Bit Hard Disk Transfers

A feature available on most newer BIOSes is the so-called 32-bit transfer mode. This feature provides a small performance improvement when enabled via this BIOS setting; the feature itself is described here. Try enabling 32-bit transfers for a small performance improvement, as long as it does not cause any problems.

Optmize memory for dos programs - Do not load extra unneed drivers in your startup files i.e. config.sys and autoexec.bat. Here is my config.sys and autoexec.bat file on P-II - 64 MB - win 98.

Config.sys

DEVICE=C:\WINDOWS\himem.sys
DOS=HIGH,UMB
rem device=tricd.sys /d:cdrom ----------> my cdrom driver not needed,
rem only in rare case

BUFFERSHIGH=64,8

DEVICEHIGH=C:\WINDOWS\IFSHLP.SYS ----------> Loaded by

Rem windows default

DEVICEHIGH=C:\WINDOWS\DBLBUFF.SYS ----------> Loaded by windows default

Autoexec.bat

@echo off

set TEMP=c:\temp ----------> Temp file directories

set TMP=c:\temp ----------> Temp file directories

That's all and see the improvements. I don't recommend using emm386.exe though it could recover more memory at dos prompt but it do cause some instability and caused few crashes.

Swap File (Virtual Memory)

Begin by creating a permanent swap file on your hard drive. At desktop right click your computer -> select properties -> Performance -> Virtual Memory. Select the "Let me specify my own virtual memory settings" button. I recommend setting the size of the file between 128 and 256 Megabytes. Set both the Minimum and Maximum to the same value so that Windows doesn't spend time resizing the swap file. If you experience any problems, try increasing the size or setting it back to "Let Windows manage my virtual memory settings". Do full Defrag before and after this to avoid fragmentation of swap file.

VCache

Windows splits your RAM into two sections, the cache and the executable section. The cache stores information on programs that you have already loaded so that if you restart them, they execute faster. This is a great concept, but Windows doesn't manage the cache well, so I recommend manually setting the Cache setting. Go to Start Menu/Run and type sysedit and go to the system.ini file. Find the [VCache] header and insert these three lines:

MinFileCache=8192
MaxFileCache=8192
Chunksize=1024

I recommend that value in minfilecache and maxfilecache should be atleast 1/6 or 1/8 of the mail system memory. Users with 32 Mb's or less may want to use a setting that is slightly lower (4096). Power users (those with 128 Mb's of RAM or more) may get better results out of the settings 12288 or 16384.

I used to do this by hand, but Outer Technologies created this great little program called Cacheman - it does the VCache stuff and more.

Modem Tweaks

Drivers

The first step to successfully tweaking your network is downloading the newest drivers. For links to tons of drivers, check out the Drivers Headquarters. Another alternative would be to simply search the manufacturer's website; however, it is often faster to find the link on DHQ.

Dial-Up Adapter and TCP/IP Protocol Settings

Open up the Control Panel and double-click the Network icon. Under the configuration tab, select the Dial-Up Adapter and click Properties. Go to the Bindings tab and uncheck all boxes except the TCP/IP box. Then select the Advanced tab and set Enable Point To Point IP to Yes, IP Packet Size to Auto and Record Log File to No and enable IPX Header Compression.

Next, open your Dial-up networking folder and go to the server-types tab. Make sure that TCP/IP is enabled (and compression if you want web pages to load faster, and don't care about ping), and everything else is disabled (unless you have specific instructions from your ISP otherwise). This will help you connect to your ISP faster.

Optimizing Other TCP/IP settings

Windows 95 Modem: After drivers, optimizing your network settings is the most important step in tweaking your LAN or modem. I personally recommend using iSpeed from High Mountain Software for tweaking your modem. Here are terms you must know :-

MTU (Maximum Transmittable Unit): This setting is imperative for optimal packet transmission, for if it is set correctly, it will stop the information from being broken up during the transfer.

MSS (Maximum Segment Size): This is the largest amount of data that can be sent in one transmitted unit. The rest of the packet is reserved for the header, which includes destination information as well as other information. An unconfirmed rumor that is going around recently

states that Windows 98 doesn't use this setting because it determines the MSS dynamically. However, even if this is correct, inputting this setting will in no way be detrimental to the system.

RWIN (Receive Window) Multiplier: This setting determines how many packets are transmitted before the system determines the integrity of the data transfer. Raising this setting will increase modem speed at the price of possible packet loss. Generally, a good multiplier is 4x, but if you have particularly clean, or bad, phone lines, you may want to adjust the setting accordingly.

TTL (Time to Live): This setting determines how many "hops" the computer will allow before it closes the connection. A low number, such as 32, will slightly increase performance, but a higher number, such as 128, will allow you to reach sites that are having connection problems (such as when a pipeline goes down and the information has to be rerouted through another system).

MTU Auto Discover: Even through you calculate your MTU using your ISP, sometimes other sites will be connected to the Internet using an even lower MTU. In these situations, Auto Discover comes into play. It will determine the optimal MTU for that particular site so that your information has to be fragmented as little as possible. NOTE: This is only a Windows 98 feature - it doesn't do anything for Windows 95 users, so leave it disabled.

Black Hole Detect: This setting enables the computer to determine some reasons for packet loss. This setting, however, is not recommended because it will dramatically lower performance. Better to just leave it off.

NDI Cachesize: Very little is known about this setting except that it is very important in Windows NT environments. Whether or not this setting does anything for Windows 98 users at all is unknown, but 16 is the default and that is what I recommend. If you find that you have better results with another setting, let me know.

FIFO Buffers, Modem, and Port settings for Modems

Here are some of the other settings that will help you maximize modem performance.

First, change your FIFO settings. To do this, right click on My

Computer. Go to Properties. Then click the Device Manager tab at the top. Locate Modem, double click on it, then double click your modem.

Click the CONNECTION tab at the top of the properties section. Click the PORT SETTINGS button. Now slide the FIFO buffers all the way right. If things don't work correctly when you attempt to use your modem then you should change this back.

Now from the other menu click ADVANCED. Make sure your modem is using hardware flow control, use compression, and error control for best results. It is also important for the flow control setting to be set to hardware, because software mode is more taxing on your CPU then hardware mode is.

Go back to Device Manager. Double click the Ports section, then double click the Communication Port your modem uses.

It will bring up a similar Properties section. Click the Port Settings tab. Change Bits Per Second to 115200 or higher. Change flow control to Hardware. Then click the Advanced... button and it will bring up the same FIFO menu as above. Slide the bar all the way to the right again.

Modem Cache

Modems have a relatively small on-board cache and data buffer. The following settings allow the modem to access some of the system RAM to use as cache during times of high modem activity. Go into your system.ini file. Locate the following: [386Enh]

If your modem is on Com 1, on the line directly below the [386Enh] add this:

Com1Irq4Buffer=1024

If your modem is on Com 2, on the line directly below the [386Enh] add this:

Com2Irq3Buffer=1024

If your modem is on Com 3, on the line directly below the [386Enh] add this:

Com3Irq4Buffer=1024

If your modem is on Com 4, on the line directly below the [386Enh] add this:

Com4Irq3Buffer=1024

If you have a modem that uses a non-standard COM Port/IRQ configuration, change the setting accordingly.

Shell & General Tweaks

A regression took place during the upgrade between Windows 95 and Windows 98. The Windows 98 shell is arguably much less stable than its older, yet still fully featured than win95. Though Windows 98 is much more stable but still crashes are there. here how you could prevent them -

Stabilizing the Windows 98 Shell

- Use 98lite to remove Internet Explorer 4.0 and then install IE 5.0. This version of Internet Explorer is much more stable and better then previos versions - not to mention it has a lot of really cool new features. Installing IE 5.0 on top of the Windows 95 shell should not be a problem, but it is better to be safe rather than sorry.

- If possible install windows 98 afresh using a program called 98Lite. I recommend the PRO version - it only costs 25 dollars and adds a huge number of functions to the already excellent [free] 98Lite software. This program now optimizes and automates EVERY conceivable way of stabilizing the Windows 98 shell, and the PRO version allows the users to even determine which, if any, features from the Windows 98 shell they want to keep! Here's a list of the things that 98Lite will let you do:

- Remove IE from your system

- Separate IE from your OS
- Change standard Windows features into options you can remove
- Remove the MS HTML engine from Windows 98 entirely (less than 70 Mb. Total)
- Choose which parts of the new Windows 98 shell to keep and which to ditch
- Lay the Win95 shell on Win98 for maximum stability and performance
- Install Windows 98 or Win98 SE without IE ever hitting your hard drive

The entire program is automated and very easy to use.

The Importance of Current Drivers

Keeping your drivers up to date can make or break your system. Newer drivers are generally faster and more stable, not to mention that they often support new features. To freshen up your drivers, begin by going to Windows Update and clicking on the device drivers link. This little area of the web site will check your drivers against the versions that Microsoft supports, and will update any drivers that need to be.

Next step would be to go to your computer manufacturer's web site and check for the newest drivers they have there. Many times, these drivers will be more up to date than the ones that Microsoft has access to. Another bonus of working with your manufacturer's site is that any drivers that you download off their web site, they are required to support. You could also go to the manufacturer's web site for each specific component and download their newest drivers. Generally these drivers will be based on the newest internal driver builds, but remember that these drivers, while faster, may not necessarily be any more stable. In fact, some of these drivers are less stable than their older cousins. So if you are planning on using these drivers (especially if they are called beta), make sure you keep a copy of your older drivers to fall back on if there is a problem.