



WinSpeed V1.0 - Windows Performance Analyser

WinSpeed measures machine performance from the point of view of Windows. Windows performance is not merely a function of the CPU/Memory/IO speed of the hardware (although the faster the better), it also depends on the way your system is configured. This utility allows you to determine how well Windows is performing on your system, and how this compares to other systems. This help file also contains some suggestions for improving speed in various areas.

Please report any bugs/suggestions to me (Chris Hewitt) on CompuServe ID 100036,133.

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Main Window

The initial screen which is displayed when you invoke WinSpeed shows several items of information about your hardware and software, and two speed indicators, a bar and a numeric LED, which indicate the relative speed of your CPU (the 'WindMark').

The information presented is: the CPU type, if a math co-processor is present, the base physical memory of the machine, the amount of extended memory available, the version of Windows being run, the current Windows Mode, the amount of Windows Heap currently Free, and the size of your swapfile.

The WindMark is an indicator of the general performance of your CPU (excluding floating point), larger numbers are better. The ^ marks below the speedbar indicate current (late '91) average performance figures for various motherboards based on Intel 80x86 CPUs. The speed is calculated every second, and is the number of test loops completed in 100ms. If you use your mouse or run another program while Winspeed is active, this number will drop.

More Information Window

This window shows you two sets of bars and LEDs representing the system's Video (screen) and Disk performance as tested when Winspeed starts (these will not vary). The legend below the bars (Poor, OK, Good, Great) gives you some feel for what the numbers mean.

Video performance is tested by painting a weighted set of lines, bitmaps, and text using the Windows API. Your machine's video speed is determined by several factors: how fast your video card runs, your CPU speed, and memory caching.

Disk performance is calculated from the weighted result of three tests: physical (reading an uncached file then writing another on the default hard disk), cached (reading the file we just wrote), and tempfile (writing to then reading from your Windows tempfile directory). Disk performance is dependant on disk speed, hardware caching, and software caching.

CPU Performance Considerations

Windows 3.0 is a lot slower than DOS for most applications. There is nothing much that you can do about this other than buying a faster machine. A 386SX/20 should be OK for a normal Windows user (Word processors and spreadsheets), if you have a 286, you should be seriously thinking of upgrading.

Another option is to buy Windows 3.1 as soon as it is available. Windows 3.1 includes a lot of tuning in the API, and you should see a dramatic improvement in video speed and general application performance.

Due to the overheads of the Windows API, CPU speed also has a significant impact on your disk and video performance.

Memory Size and Allocation

You should have at least 2MB of memory to run Windows. Adding more memory (at least 2MB) is a good idea, because you can use it as a disk cache with SMARTDrive or some other disk caching software.

Typical SMARTDrive assignments for various memory sizes would be:

| Memory | SMARTDrive Size | Minimum |
|--------|-----------------|---------|
| 1MB | 384KB | 256KB |
| 2MB | 1MB | 512KB |
| 4MB | 2MB | 1MB |
| 8MB | 4MB | 1MB |

i.e. for an 8MB system use: "DEVICE=SMARTDRV.SYS 4096 1024" in CONFIG.SYS

Many Windows applications use temporary files. These are usually placed in the directory identified by the TEMP environment variable. This directory should be on your fastest hard disk, or if you have enough memory (4MB or more), in a RAM disk.

To set TEMP directory:

In AUTOEXEC.BAT use: "SET TEMP = C:\TMPFILES"

To setup a 256KB RAM disk:

In CONFIG.SYS use: "device = c:\windows\ramdrive.sys 256"

If you have Expanded memory, you can convert it to Extended memory (which windows uses) with the appropriate software.or hardware switches.

You should create a permanent swapfile if you require extra virtual memory to run applications in Enhanced 386 mode. If you are using a swapfile you should still use a reasonable amount of memory for the disk cache.

Disk Considerations

Windows uses your hard disk intensively. Windows programs tend to be large, and application programs often use tempfiles. In 386 Enhanced mode the disk may be heavily used for application swapping. Use Standard mode if you have enough real memory. You should use disk caching software to minimise actual disk accesses. See under Memory Tuning in this help file for recommended SMARTDrive sizes.

A caching disk controller card will improve your system's performance, but it is usually better to spend your money on extra extended memory which can be configured as either Heap or disk cache.

Video Tuning

Video speed is dependant on the speed of your CPU and video card. Some systems allow video BIOS to be placed in high conventional memory (640KB-1MB), or to be cached with fast RAM. Use these options if you can.

Some video cards implement common Windows video functions (BitBlt, TextOut etc.) in hardware. These cards improve video speed dramatically, but care should be taken to ensure that your hardware will support future versions of Windows.

If you are using higher display resolutions (800x600 etc) or more than 16 colours, you may notice that your video slows down quite a bit (depending on the card).

Base Physical Memory('Real' memory):
Usable memory below 1MB as determined by the BIOS POST routine.
Usually limited to 640KB.

Extended Memory:

Extra (above 1MB) conventional memory installed on your system, usually on the motherboard.

Windows comes with HIMEM.SYS which manages extended memory. Some machines can utilise memory between 640KB and 1MB as extended memory..

Expanded Memory:

Extra memory available via an expanded memory manager. Often installed on a special card.

Windows comes with a driver, EMM386.SYS, which manages expanded memory. Expanded memory can be converted to extended memory for windows use. Check the manual for your expanded memory board or software.

Windows Mode:

Windows can run in 3 modes: Real, Standard, and Enhanced.

Real mode uses the base physical memory ('real' memory) of the machine, it can also utilise Expanded memory.

Standard mode uses base and extended memory. Windows runs faster in Standard mode than in Enhanced mode.

Enhanced mode requires a 386 or 386SX machine with 2MB of memory. Enhanced mode allows you to use a swapfile (virtual memory).

Heap:

The memory available to Windows to run applications, includes base, extended and virtual memory.

Swapfile:

A disk file used as virtual memory in Enhanced 386 mode.

tempfile directory:

The directory identified in your environment as TEMP. Usually defined in AUTOEXEC.BAT as TEMP=C:\WINDOWS\TEMP or some other directory.

cache:

Memory used as a temporary store for information from slower memory or disk.

Motherboards may have fast cache memory to improve access time to main memory.

Software like SMARTDrive allows memory to be used to improve disk performance. Some disk drives have integral cache to improve their performance, and disk controller cards are available which include CPUs and memory to boost the speed of attached disk drives.

Caching is a generally good idea,
see under Disk tuning in this help file.

SMARTDRV.SYS:

SMARTDrive is a disk caching program supplied with Windows. It is added to your CONFIG.SYS file automatically by the Windows install program.