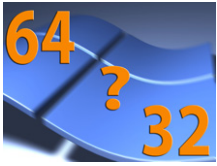


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By:

[Windows versus Windows or 32-bit versus 64bit](#)

How much does the transition from 32-bit to 64-bit matter?

Recently, Windows XP 64-bit Edition has turned Gold and by the end of the month it will be retailed. What are the advantages of the 64 bit technology, how does it work and what was the history of its introduction on the consumer market, all these topics [were debated in this article](#). It's clear that Windows XP Professional x64 Edition will provide the necessary support for the 64 bit applications, but it will take another year for their appearance. Until then, those who'll chose to install this version of Windows will have to run 32-bit applications. So the next question arises: Is it worth it to install the 64-bit Windows and give up your old Windows XP? To answer this question, we have put together a test, whose main objective was to identify if the performances of the Windows x64 are better than the ones of Windows x32. **Test configuration and benchmarks** The systems used for testing on which we have successively installed Windows XP SP 2 and Windows XP x64 Professional Edition was provided by Senorg Romania www.senorg.ro. **The configuration of the test system:- ABIT AN8 Socket 939 with nForce 4 chipset motherboard- AMD Athlon 64 bit 3000+ boxed processor, cooler included- 512 MB RAM Kingston Dual Channel 400 MHz - SATA Western Digital 120 GB hard disk - ATI Radeon X700 PCI Express cu 256 MB RAM GDDR3 ABIT video card - DVD-RW Lite-ON optical device - 350 W power source - Eizo 1280x1024@85 Hz monitor** For the motherboard, the following drivers were used: nForce 6.53 for Windows x32 and nForce 6.39 for Windows x64, being the last available versions from Nvidia when this test was done. The driver for the ATI Radeon X700 video card was Catalyst Center 4.5, available on the ATI site both for Windows XP Professional Edition and Windows XP x64 Professional Edition. The operating systems were Windows XP Professional Edition SP2 and Windows XP x64 Professional Edition SP1 build 1433. The following benchmarks were used: **SiSoftware Sandra 2005 Professional Edition, both 32-bit and 64-bit 3D Mark 2005 1.20 ScienceMark 2005, both 32-bit and 64-bit bit Chronicles of Riddick : Escape from Butcher's Bay, both 32-bit and 64-bit bit Preliminary observations** For both operating systems the size of the partition was 120 GB and it was created with Windows's installing routine, the hard disk was completely formatted before the installing of Windows XP x64. For both systems, the size of the swap file was set double than the installed RAM, and the graphical interface was set to minimum, by choosing the Adjust for best performance from Performance Options, Visual Effects. The resolution of the monitor was set to 1024x768@100Hz, except for the game which was tested at: 800x600, 1024x768 and 1280x1024, at a refresh rate of 85 Hz. For both operating systems, DirectX 9.0c was installed and the Windows Firewall was activated. **Windows XP x64** The installation routine of the Windows XP Professional is known by all users and the one for Windows x64 is not much different, the steps taken being similar. The only noticeable difference is represented by Microsoft's messages which outline the importance of the new operating system and the advantages of the 64-bit technology. Installing the S-ATA hard disk didn't require the floppy with drivers as for the 32 bit Windows XP. The setup program had the driver necessary for the S-ATA controller and the procedure was greatly simplified. The graphical interface is almost identical to the one of the Windows XP and the only difference noticed by the user will be the presence of the 64-bit Internet Explorer in the Start menu. If the installation procedure for motherboard and video card drivers were not a problem, installing older equipment could be a problem, the 32 bit drivers being incompatible with the new operating system. So before installing the new operating system, make sure you find drivers on the producers' sites, even beta versions, because otherwise you will be forced to give up on some components. Briefly, the migration from

Windows x32 to x64 doesn't require you to accommodate with the new graphical interface, but the fact that a series of programs don't have 64 bit versions could cause serious problems. For example, you might have to give up your favorite antivirus and to choose between Avast Antivirus 4.5 and McAfee Enterprise 8.0i, the only programs with 64 bit versions. It is expected that once the Windows XP x64 is officially released, the majority of producers will start releasing 64 bit versions for their programs, so you don't have a lot to wait. Installing Daemon Tools or any other program for mounting CD or DVD images proved to be a total failure.

TESTS AND RESULTS

SiSoftware Sandra 2005 Professional Edition

The first test program installed and run was SiSoftware Sandra 2005 Professional Edition. The installation procedure allowed choosing between the 32-bit and 64-bit versions, so there were no problems at the installation. Among the modules offered by SiSoftware Sandra 2005 Professional Edition, the following tests have been made: CPU Arithmetic Benchmark CPU Multi-Media Benchmark File System Benchmark Memory Bandwidth Benchmark For each system, the following results were obtained:

OS CPU Arithmetic Benchmark CPU Multi-Media Benchmark File System Benchmark Memory Bandwidth Benchmark Windows x32

Dhrystone ALU - 8385 MIPS Whetstone FPU/iSSE2 - 2841/3707 MFLOPS Integer x16 iSSE2 - 17290 it/s Floating Point x8 iSSE 2 - 18603 it/s Drive Index - 35 MB/s RAM Bandwidth Int Buff'd iSSE2 - 5286 MB/s RAM Bandwidth Float Buff'd iSSE2 - 5222 MB/s

Windows x64

Dhrystone ALU - 8875 MIPS Whetstone FPU/iSSE2 - 3233/3763 MFLOPS Integer x16 iSSE2 - 13471 it/s Floating Point x8 iSSE 2 - 20826 it/s Drive Index - 34 MB/s RAM Bandwidth Int Buff'd iSSE2 - 5319 MB/s RAM Bandwidth Float Buff'd iSSE2 - 5257 MB/s

INTERPRETATION OF RESULTS: Sandra 2005 SR1 was installed on the Windows XP 64 bit in the optimized version for AMD64. It seems the optimization led to a significant increase, especially in the non accelerated arithmetic tests. The differences between the SSE2 accelerated tests, the hard disk test or the memory bandwidth test (also SSE2 accelerated) are insignificant.

3D Mark 2005 1.20

Even though 3D Mark doesn't have a 64-bit version, its installing went along without problems. On Windows x32 it ran without any problems, but on Windows x64, until we deleted the pcibus.sys file, installed in the driver section, it refused to start. For testing, 3D Mark 2005 was configured in two ways for both operating systems. The first time it was run without the Anti Aliasing option and with Texture Filtering set to Optimal – the default settings of the program. The second time, the Anti Aliasing option was set to 6 sample AA, and for Texture Filtering it was chosen the Anisotropic setting. The initial resolution – 1024x768@85Hz was unchanged for both tests.

RESULT THE FIRST CONFIGURATION

THE SECOND CONFIGURATION INTERPRETATION OF RESULTS

As you can see, in both tests (with the initial settings, respectively with AA 6X) the system behaved similarly, the differences being insignificant. Although Windows XP 64 bit is at the beta version and the drivers for 64 bits are new, the system was stable and it performed well. It should be mentioned that 3D Mark 05 doesn't have an executable optimized for AMD64. The fact that the score is not different from the one obtained by Windows 32 is worth taking into consideration.

Science Mark 2005

Science Mark 2005, one of the most precise benchmark programs, stretches the hardware resources to the maximum in order to obtain accurate results. It is based on the correct identification of the CPU and the efficient usage of its extensions during the test. It's worth mentioning that the 64 bit version of the Science Mark was in the Beta stage, but is dated the same as the final 32 bit version: March 21, 2005. The operating frequency of the processor was identified as 1808 MHz, the 32 bit version adding 0.34 MHz compared to the 64 bit one.

THE RESULTS

	32 bit	L1 BW:	
20728.01 MB/s	L2 BW:	6573.76 MB/s	Mem BW: 4958.26 MB/s
Benchmark:	15.13797 seconds.		

AES Encryption (Rijndael): 100.80 MB/s 64 bit 27278.16 MB/s 8409.88 MB/s 4842.18 MB/s 0.01040 seconds 146719.10 MB/s

INTERPRETATION OF RESULTS: The majority of tests for the cache memory didn't run on 32 bit – 6 out of 13 tests were performed. The results for those that did run, for L1 or L2, were clearly smaller than the ones performed

for 64 bit. For the memory test, 4 tests didn't run on 64 bits. The results are again favorable to Windows 64. The result of the AES computation is almost unreal, but we repeated the tests 5 times and the result was always the same. UPDATE from Softpedia User Illaaa: according to <http://www.sciencemark.org/changelog.html>: CipherBench is not supported in 64-bit mode. Running AES returns an incorrect result, that is impossibly too fast. This will be remedied in a future version.

Chronicles of Riddick: Escape from Butcher's Bay

Chronicles of Riddick: Escape from Butcher's Bay is a new game, with an engine that sucks the life out of your system and is comfortable only on medium to high-end configurations. It also one of the few games that has an executable optimized for AMD64, and that is why we chose this game for our test. To use the game as a benchmark, we had to record a demo (the game doesn't have its own demo for included benchmark) which was run afterwards from the console with the time demo command.

THE RESULTS

Resolution	Average	Min	Max
32bit	1024x768 Average: 18.66	7.39	97.66
1280x1024	Average: 12.00	4.68	96.42
64 bit	1024x768 Average: 16.56	8.23	28.22
1280x1024	Average: 11.23	6.42	20.54

INTERPRETATION OF RESULTS The average values were close, with the 64 bit Windows XP being behind XP 32. At higher resolutions, the difference was smaller. Very interesting is the huge difference between maximum values. One could conclude that the variations between minimum and maximum of the 64 bit version are very close, which would mean a high number of frames even in complex scenes; or, the number of frames is reported incorrectly.

CONCLUSIONS The code optimized for 64 bits is executed much faster, but the SSE 2 optimized one is constant. 3D applications don't benefit from the migration from 32 bit to 64 bit, probably because of the GPU. The 64 bit video drivers didn't improve significantly the performance, but didn't decrease it either. In this moment, Windows XP 64 bits is not an option for AMD 64 owners. The incompatibility with 32 bit programs is one of the problems of Windows XP 64 bits. For programmers things are different, the compiling of the programs being done much faster. The optimization for 64 bits is clearly a step forward, but momentarily, the only benefit you can obtain by installing this operating system is the possibility of administering more than 4 GB of RAM. The test pointed out that as long as there isn't a wide range of 64 bit applications, migrating from Windows x32 to Windows x64 is not yet justified, the complications regarding drivers and incompatibility being major disadvantages.