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32-Bit vs. 64-Bit Systems

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32-Bit vs. 64-Bit Systems

Which One Is Best For You?

Perhaps you stumbled upon a 64-bit operating system while shopping for a new computer, or maybe you heard about it from a friend. Either way, knowing those 64-bit computers are out there could leave you wondering if you're missing out by sticking with your own 32-bit computer. Chances are, you're not. But if you regularly run intensive programs, you might want to consider it.

■ What's The Difference ?

The difference between 32-bit and 64-bit computers lies with the CPU (central processing unit) and how it manages information. A 64-bit processor means that it can handle 64 bits of data at one time, while a 32-bit processor can only handle 32 bits. So, a 64-bit processor can handle more intensive programs than a 32-bit processor, because the 64-bit chip can process more data per clock cycle. Don't assume that a 64-bit system will make all processes faster. Many variables factor into the overall speed of your system. For example, a CPU's megahertz measures how quickly your computer can process data. Also, if applications are designed for a 32-bit system, you may not see any difference in speed. The bottom line is that a 64-bit processor can handle more complex calculations, so something such as a CAD (computer-aided design) application made for a 64-bit system will perform better on a 64-bit computer than a similar 32-bit program.

The 64-bit processor also supports more memory than a 32-bit processor. This means you can run intensive programs simultaneously, without seeing as many performance issues as you may in a 32-bit system. 32-bit CPUs can generally handle up to 4GB of memory, with the ability to process 2GB of memory at a time while a 64-bit system can utilize significantly more memory.

In order for a computer to be a 64-bit system, all of the hardware drivers must be 64-bit compatible. Many mid-to high-end computers come with compatible 64-bit hardware, but few actually come with the 64-bit operating system. If you decide that a 64-bit computer is right for you, you will want to ask for the 64-bit operating system specifically or check with the computer manufacturer to determine if your hardware is 64-bit compatible.

Most home computers have 32-bit versions of Windows, but if you aren't sure, you can easily find out. Open your Start menu, and then select the Control Panel. Click System And Maintenance (Performance And Maintenance for WinXP users), and then choose System.

■ So You're Thinking About Upgrading

There are many things a 64-bit system can do better than a 32-bit system can, but a 64-bit system isn't for everyone. Before you decide on a 64-bit system, there are many things to



The AMD Athlon 64 is a 64-bit chip used in desktop systems.

This not only includes a 64-bit processor. You also need to make sure you have 64-bit device drivers on peripherals such as printers and keyboards. Check with the manufacturer of the device if you are unsure whether or not it is compatible.



The Intel Core 2 Extreme quad-core processor can be found in 64-bit desktop systems.

Even if your computer system supports 64-bit operating systems, you cannot perform a typical upgrade installation to go from a 32-bit OS to a 64-bit OS. For example, you cannot upgrade a 32-bit Windows XP operating system to a Windows Vista 64-bit operating system using the same method as you would for a typical upgrade. You must perform a custom installation of Windows Vista and boot the computer from the 64-bit Windows Vista DVD. Visit support.microsoft.com/kb/932795/en-us for step-by-step upgrading instructions.

Some software produced for a 32-bit system will run fine on a 64-bit system, but some won't. Check with the manufacturer of the software to be sure. Older 16-bit software won't run on a 64-bit system at all. Also, note that 64-bit software will not run on a 32-bit system.

A 64-bit computer can be beneficial, however, for professionals and amateurs alike, who are interested in editing complex videos and photos or producing music and audio files. Programs related to these tasks generally use a lot of memory and require a lot of processing power, so they could cause a 32-bit system to be sluggish or unresponsive—particularly when running other programs. Also, individuals in the automotive or aerospace design fields who work with intense designing programs or scientists who handle large amounts of data would benefit from a 64-bit computer.

■ Types Of 64-bit Operating Systems

When it comes to purchasing a 64-bit operating system, not all are created equal. All of the Windows Vista editions—Home Basic, Home Premium, Ultimate, Business, and Enterprise—have 64-bit versions. In addition to the standard 4 GB of memory supported by the 32-bit editions of Vista, each 64-bit version supports a different amount of memory. The Home Basic supports 8GB, Home Premium supports 16GB, and Ultimate, Business, and Enterprise are all capable of 128GB or more. Additionally, a 64-bit version of WinXP supports at least 128GB of RAM.

Because the 64-bit Windows operating systems are built on the Windows Server 2003 SP1 (Service Pack 1) code-base, these operating systems have enhanced security and reliability. And for the most part, you have more flexibility in regards to new software applications, as most newer programs are meant for 32-bit systems, but can be run “as is” on 64-bit systems. The 64-bit operating systems from Windows include DEP (Data Execution Prevention), along with PatchGuard, to add an extra layer of security features.

For Macs, however, the 64-bit story is a little different. The standard version of Apple's Mac OS X Leopard is already 64-bit, so you won't need to worry about your drivers or applications being compatible. The 64-bit technology fuels the robust collection of multimedia applications offered by Apple.

Sun offers a fairly robust 64-bit operating system free in Solaris 10. It is compatible with common software applications such as Cadence Design Systems software. OpenSUSE 10.3 also comes in a 64-bit version, but few 64-bit desktop applications have been developed for this particular operating system.

■ Living On 64 Bits

When you decide whether or not to purchase a 64-bit system, remember that the majority of your applications will not benefit from a 64-bit system, only the ones that take up a lot of memory and require a lot of processing power. But if you are looking for a system to run your professional multimedia applications, a 64-bit system is definitely for you. ■

by Tessa Warner Breneman

Common 64-bit CPUs

When looking for computers that will be compatible with 64-bit operating systems, look for these common CPUs.

Intel 64 Architecture

Best for Notebooks: Intel Centrino (Duo and Pro)
Best for Desktops: Intel Core 2 (Extreme, Quad, Duo)