

Windows 32bit vs. 64bit OS's

Like any other subject of common conversation, computer technology has its share of myths, rumors and urban legends in circulation at any given time. One topic that seems to have the rumor mill grinding lately is the difference between 32bit and 64bit versions of the Windows operating system.

The release of Windows 7 has the potential to turn the discussion in a completely different direction, because WN7 is a completely different animal in this regard. This will no doubt add to the confusion that already exists.

This edition of the Tech Corner will attempt to set the record straight with fact based information about the differences and how to choose the right OS. But first, let's put to rest some of the myths.

Busting the Myths

First and most prevalent is the myth that a 64bit OS is "future-ware" and of little use in the present day beyond the realm of high-end gaming since there are very few software applications that are written for 64bit systems. The fact is that 64bit versions of the Windows various operating systems have been in use for several years and there are cases where business computers with 64bit systems are quite useful today. WN7 offers drastic performance increases with the 64bit version, if you have the hardware to run it correctly.

Next is the myth that 32bit software will actually run slower on a 64bit OS. This is one of those strange urban legend type myths that is totally untrue but has a familiar ring to it so it spreads at a high rate of speed among those that don't understand the topic – which would include most business computer users not involved in the business of I.T. The fact is that software written for a 32bit OS either runs fine on a 64bit OS or it is incompatible with obvious issues. Even incompatible software will run fine on a 64bit system in Vista and WN7 if the built in compatibility protocols are utilized.

Last, there is a smorgasbord of myths concerning specific benefits and perils with a 64bit OS on a computer. These myths are usually based in misinterpretation of facts about how much RAM is used by various operating systems and how OS's work with drivers. This is not surprising, because the facts can be a bit confusing.

For example, many people think only 64bit versions of XP or Vista can use over 3GB of RAM. This is true for the most part but the 32bit versions of Vista can "recognize" up to 4GB of RAM in the system, even though no 32bit system can use the extra RAM for system processes like a 64bit system. Confused? Unless you have an integrated video device that can share the RAM, 32bit Vista can see 4GB but like XP 32bit it will only use 2.8 GB of the RAM for computing. 64bit Vista Business can use up to 128GB of RAM, a ridiculous concept for a workstation since peak usage for even the most demanding applications rarely exceeds 2GB of RAM. The primary use for major amounts of RAM is in start up of Windows and programs, and some other system processes like printing.

64bit systems have the capability of using more RAM and running faster than 32bit versions but they are unable to accomplish this feat due to improper or poorly developed drivers. For this reason certain

applications that rely on close integration with hardware like a video card or peripheral like a printer function poorly or experience errors with a 64bit system. Even though this is really a driver issue that isn't actually related to the 64bit OS, the word gets around on the blogs that the 64bit OS is the problem since things seem to work fine in a 32bit system. WN7 is about to change all that for the better.

So what is the straight story?

It's really pretty simple. 64bit versions of Windows are an excellent option where they fit the need, but they are only a fit for certain circumstances. For the purpose of this article, let's assume that we are talking about business workstation computers only and not servers or computers for recreational or home use. Within that scope, what follows are the facts about 64bit OS's for workstations.

The primary benefits of a 64bit OS are the increased computing capacity of having twice the bandwidth of data flow, the ability to use more system memory (RAM) and increased protection against malware and viruses. The main drawbacks are that there are a limited number of hardware drivers and virus software applications available for XP and Vista 64bit systems when compared to 32bit systems. WN7 promises to have a much wider compatibility with drivers than previous versions. Understanding what these facts actually mean is the key to making the right choice of OS.

RAM and the 64bit OS

Many people know that a 64bit OS will recognize and use more RAM than a 32bit OS but they don't understand the primary function of RAM in a modern workstation computer. All current versions of Windows use RAM primarily as a buffer or loading mechanism when opening or closing the OS or a software application, or processing a file. This also includes OS functions like saving or processing files for storage or printing. Once a software application is open and running the speed at which it runs is primarily dictated by the horsepower of the processor (CPU) and other system components – not the amount of RAM.

This buffering process is a function of the Windows operating system, not the software application or file being loaded, so it doesn't matter if the software is designed for a 64bit OS or a 32bit OS – the increase in speed is still realized – if such an increase is possible.

Ah, now you may be asking why wouldn't an increase in speed be possible?

Answer – if you have a robust, well matched set of hardware in your workstation currently, the computer may already be loading most applications and processing files as fast as possible with a 32bit OS! At a certain threshold of performance the increase in speed resulting from the ability to use more RAM may be negligible due to the limitations of how Windows works with hardware in all versions prior to WN7. Windows 7 has fundamentally changed that aspect of the OS so 64bit versions of the new OS are much faster than the 32bit versions – but only if you have the hardware to run it.

Also, all RAM is not the same. The type of RAM that is typically used in the average desktop computer that you might find in retail stores costs about 20 bucks for a 1GB stick and it has a capacity rating for bandwidth and speed that just meets the minimum requirements of the hardware and OS for that PC. A

1GB stick of high performance RAM can cost over \$100 and have performance capacities that are exponentially higher than the \$20 dollar stick. In terms of actual performance 2GB of high quality, high speed RAM with a 32bit OS can actually work better than 4GB of the cheap stuff with a 64bit OS.

64bit Systems and Software

With the exception of 16bit software (DOS) and older 32bit software that runs in 32bit Windows by using a 32bit shell over a DOS application, software compatibility issues with a 64bit OS are generally limited to virus software and hardware drivers. Almost all 32bit software applications that have been written for Windows XP or Vista will run fine and load faster (RAM and other hardware permitting) in a 64bit Windows operating system. If there is a problem, installing the software to run in compatibility mode assures that it runs in the 64bit OS just like it would run in a 32bit OS.

Virus software and hardware drivers must be 64bit versions, that is to say developed specifically for use with a 64bit OS in order to be compatible. This is due to the fact that bug-ware and drivers interact with parts of Windows that applications like design software or a word processor never use.

As always, there are certain exceptions to the rule. Some software applications rely on specific hardware drivers to function correctly, and those applications can have issues with a 64bit OS. Most applications that fall into that category are recreational in nature or non-essential for business. Examples might include music software like I-Tunes or software for a Bluetooth headset or mouse. Cheap discount rack software or shareware apps that are the product of low quality or non-standard programming practices may also have problems running in a 64bit OS.

We have extensively tested quality software applications like MS Office and CV Solid in 64bit systems and found no issues at all.

64bit Systems and Hardware

Most conventional drivers for quality mainstream hardware such as video cards, motherboards, network adapters, printers, keyboards and mice are readily available for 64bit versions of Windows. Once again there are exceptions. New multifunction printer-scanner devices and trendy new Bluetooth devices may not have drivers for 64bit applications even though they are quality products. Handheld devices like smart phones and PDA's may also lack software versions to connect to a 64bit system. Software to connect digital cameras and drivers for memory stick readers may also have compatibility issues. This depends on market demand and the diligence of the hardware manufacturer in developing software and drivers and varies from one brand to the next.

64bit Systems and Virus Protection

The security benefits of a 64bit OS gets pretty technical in the details but the short story is that a computer running a 64bit version of Windows has certain additional protection against malicious or rouge software intrusion that is not possible in a 32bit OS. Many modern CPU's have a type of protection built right into the hardware called DEP that will only function in a 64bit OS. Also, the 64bit versions of Vista protect the Windows Kernel (one of the most critical parts of the OS) from any

modification by viruses or unauthorized software updates by drivers or programs. Not a big deal for most users but it's a plus nonetheless.

Windows 7 Changes Everything

The trial versions of Windows 7 64bit that we have tested have been remarkably stable and compatible – far beyond any previous version of Windows. This is because WN7 has finally dealt with the issues that existed in previous versions regarding the use of hardware. Until WN7 the Windows OS was years behind the hardware that has been available in the market. WN7 makes use of modern technology in hardware while providing new levels of software compatibility that are long overdue.

Making the Decision

Speaking in the broadest terms, if you have a quality high performance desktop or notebook workstation that is relatively current technology you can probably update to a 64bit OS without major issues – but you probably don't need to unless you are going to upgrade to WN7. If you are using a computer that is up to the task of running your business and manufacturing software applications now, the time and effort required to update to a 64bit version of older versions of Windows probably won't be worth the minimal increase in overall performance.

Over the course of several years of bench testing we have rarely seen any business or manufacturing software application max out the system resources of the computers that we build and sell here at 1Goal with 32bit versions of Windows. Running applications on a single user workstation only needs so much horsepower and anything over and above that is just folly for bragging rights.

But we have sold lots of computers with older 64bit OS's when that type of system was called for. For example, due to the speed constraints caused by heat management in laptops we have found that 64bit operating systems provide significant performance improvements with mobile computing technology over the 32bit versions. Also, we always suggest a 64bit OS for the dedicated CV Solid servers and server/workstation desktop machines that we build. This is due to the fact that multiple users accessing programs and files on the same machine can benefit from the 64bit OS's ability to use of larger amounts of RAM much more than a single user workstation.

If you can see the need for a 64bit OS now that you have the facts then you might as well give it a go, but before updating an existing machine or ordering a new computer with a 64bit OS you just need to do some simple homework and you will avoid all problems. Verify that your virus software makes a version for 64bit systems and that compatible drivers are available for all your hardware and peripherals and then plan accordingly. You will want to backup everything before upgrading an existing system.

Here is one other tip. Hard drives are cheap. You might consider adding another hard drive to your new or existing system and setting up a dual boot machine. That gives you the ability to run your business software in the faster 64bit system and still boot to the old 32bit system for playing I-Tunes and rocking out with that Bluetooth headset that you love.

We always welcome your questions about computers for your business. Just give us a call or send an email and we will be happy to help.