64-bit Windows 7 Discussion Paper

This paper discusses the pros & cons of using the 64-bit version of Microsoft's Windows 7 operating system on a desktop PC.

Memory Addressing

In a 32-bit operating system, memory addresses are 32 bits in length, limiting the total number of unique addresses available to around 4 billion—effectively capping the total amount of memory your system can use at one time to 4GB.

A PC with a 32-bit version of Windows, is in fact limited to about 3.5 GB or less, the PC architecture reserves certain memory addresses for compatibility reasons. (I.E. even if a PC comes with 4 GB or more of memory installed, a 32-bit version of Windows can only use about 3.5 GB of that memory).

With 64-bit addresses, an operating system could theoretically use up to 16.8 million terabytes of RAM.

Microsoft impose an upper maximum limit of 192GB of RAM in Windows 7 64-bit.

All editions of Windows 7 (except for Home Basic) include both 32-bit and 64-bit software versions.

32-bit versus 64-bit processors

To run Windows 7 64-bit you must have a computer with a 64-bit processor (also called an x64 processor, or CPU).

Computers with a 64-bit processor can run either a 32-bit or 64-bit versions of Windows.

You need at least 4GB of memory

A 64-bit operating system won't help if you don't have at least 4GB of memory (It will help a little bit if you have exactly 4GB, as 32-bit Windows actually limits you to using 3.5 GB, but it is unlikely to be noticeable.

32-bit drivers don't work

Generally, 32-bit applications work in 64-bit Windows, but the same isn't true for drivers.

You will need a Windows 7 64-bit driver for each of your printers and scanners. This can also be true if you have dual head monitors hosted on a non-integrated graphics card. This can be problematic if your peripheral hardware is old. You should check for the availability of 64-bit drivers before installing Windows 7.

Some software breaks in 64-bit Windows

It's less common than hardware issues, but some programs break in 64-bit Windows. Particularly, old programs written for pre-XP versions of Windows may not work in 64-bit Windows 7.

If you're running a 16-bit program for some reason, it definitely won't work in a 64-bit operating system.

Also, even if a program has a 64-bit version, don't assume that all plug-ins for that program are 64-bit compatible as well. Not all Photoshop plugins, for instance, will work in 64-bit Photoshop.

Not all software benefits from 64-bit

Finally, consider that when you upgrade to a 64-bit operating system, all your programs won't start taking advantage of the extra memory. A program has to be written and optimized with 64-bit processors in mind.

Internet Explorer

Internet Explorer is basically the combination of a number of platform components, including the networking components (URLMon/WinINET), the rendering components (MSHTML), the script engines (JScript.dll, vbscript.dll) and a variety of other components.

These components are made available in 64-bit versions so that 64-bit applications can be built using these components. Additionally, because Internet Explorer can be launched/created/used as a COM Server, a 64-bit version must be available to enable hosting inside 64-bit processes.

Microsoft include the 32-bit version of Internet Explorer in the 64-bit version of Windows. The 32-bit version is always the default and that setting cannot be changed. The 32-bit version is more performant, but also the majority of plugins are built as 32-bit components and may not be available as 64-bit versions.

Microsoft Office

By default, Microsoft Office 2010 installs the 32-bit version of Office 2010 even if the computer is running a 64-bit edition of Windows.

The 32-bit version of Office 2010 is the Microsoft recommended option for most people, because it prevents potential compatibility issues with other 32-bit applications, specifically third-party add-ins that are available only for 32-bit operating systems

Office 2010 provides support for the 32-bit version of Office 2010 programs running on 64-bit operating systems by using WOW64, a compatibility environment provided by the operating system that allows a 32-bit application to run on a Windows 64-bit operating system. Using the 32-bit version of Office 2010 allows people to continue to use existing third-party add-ins for Office that are 32-bit.

- The ActiveX controls library, ComCtl, is not included in the 64-bit edition of Office. This library contains ActiveX controls that are used to build solutions. It is most commonly used in Access, Excel, and Word.
- SharePoint List control is not included in the 64-bit edition of Office. The list view in SharePoint Technology is not available when using the 64-bit version of Office.

Compatibility with existing Office files and solutions

- The 64-bit version of Office 2010 is not compatible with any other 32-bit version of Office programs.
- Any solutions that use the ActiveX controls library, ComCtl will not work. No viable alternatives are available for some of these controls.
- There is no 64-bit version of Visual Basic 6. As a result, objects may need to be ported and rewritten.
- Any Microsoft Visual Basic for Applications (VBA) that contains the Declare statement will only work in the 64-bit version of Office if the code is updated manually.
- The .MDE and .ACCDE files, a common way for Access application developers to distribute solutions do not work in the 64-bit version of Office.
- If the 64-bit version of Office is installed, certain Microsoft Office Communicator features that involve integration with Outlook are lost. For example, you cannot right-click a Communicator contact to schedule a meeting or send an e-mail message. This is because Office Communicator R2 is 32-bit, and Messaging Application Programming Interface (MAPI) calls do not cross the 32/64-bit boundary.

Excel Compatibility

Generally workbooks are interchangeable between 32-bit and 64-bit editions of Excel. There's no special flag in the file marking it as a 64-bit workbook. Every day, smaller-sized workbooks will work OK in both environments. However, with 64-bit Excel it is possible to create workbooks that are too big for 32-bit Excel to open.

VBA code may require a review and updates in order for it to work with 64-bit Excel. Any ActiveX controls, COM Add-ins, or XLLs will also need to have 64-bit versions.

The big advantage is the ability to create very large workbooks and pivot table caches.

Coexistence

Unless the whole estate were to migrate to Windows 7 64-bit it will be necessary to maintain 2 software estates, a 32-bit estate and a 64-bit estate.

Performance

A larger memory map can have huge performance advantages even if 32-bit applications are being hosted in the 64-bit environment. Reduced or no memory paging to disk can be achieved with sufficient memory making switching between applications instant.

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