

I. Introduction

Microsoft offers nine editions of Vista: 1 starter version, 3 home versions, and 5 business versions. Some editions are available in both 32 bit and 64 bit, for a total of 17 possible product editions. However, not all versions are acceptable for high-performance geoscience computers. This article attempts to clarify the available options and list some of the pros and cons of the new operating system.

Vista product edition	Compare with...	x64 version available?	Type	Acceptable for geoscience computers?
Windows Vista Starter	XP Starter Edition	No	Select countries only, with new PC purchase	NO
Windows Home Basic	XP Home Edition	Yes	Retail	NO
Windows Home Basic N	XP Home Edition	Yes	Retail, EU only	NO
Windows Vista Home Premium	XP Media Center Edition	Yes	Retail	NO
Windows Vista Business	XP Professional Edition	Yes	Retail	YES
Windows Vista Business N or K	XP Professional Edition	Yes	Retail	NO
Windows Vista Enterprise	XP Professional Edition	Yes	Volume-license only	YES
Windows Vista Ultimate	n/a	Yes	Retail	YES

Highlights by Version

Here is a quick summary of some of the basic differences between the most common editions:

- **Vista Home Basic, Home Premium, and Vista Ultimate** have parental controls and some multi-media functionality that is not available in Vista Business and Enterprise versions.
- **Vista Home** is intended for workgroups and lacks the ability to join a domain.
- **Vista Home Basic N** (the EU version) and **Windows Vista Business N** (EU) or **Windows Vista Business K** (S. Korea) were developed to avoid antitrust regulations in those regions. Some media functions have been removed such as Windows Media Player, Windows Movie Maker, and other Windows media-related technologies.
- **Vista Business** is the version that will come pre-installed by the OEM manufacturer on most business computers.
- **Vista Enterprise** is optimized for the enterprise. This version will be a true superset of Windows Vista Business and is available only via a volume license to Software Assurance (SA) customers.

- **Windows Vista Ultimate** is a superset of both Vista Home Premium and Vista Business, so it includes all of the features of both of those product versions. This version is aimed at high-end PC users and technology influencers, gamers, digital media enthusiasts, and students
- The following features are available only in **Vista Business, Ultimate, and Enterprise**:
 - Internet Information server (ftp and webpage hosting)
 - Shadow copy
 - Image X System image backup and recovery
 - encrypting file system (EFS)
- Bitlocker (drive level encryption) is only available in **Vista Enterprise and Ultimate**.

II. Minimum Hardware requirements

Minimum hardware requirements vary by version, as listed in the following table.

Minimum hardware requirements	Vista Home Basic	Vista Business or Vista Home Premium	Vista Enterprise or Ultimate (Geophysical workstation)
Processor	800 MHz 32-bit (x86) or 64-bit (x64) processor	1 GHz 32-bit (x86) or 64-bit (x64) processor	2 GHz 32-bit (x86) or 64-bit (x64) processor 64-bit OS is preferred due to the increased memory address space available to the application. Dual core or dual processor preferred.
System Memory	512 MB	1 GB	2 GB per CPU
GPU	SVGA (800x600) DirectX 9 Capable A WDDM Driver	DirectX 9-class GPU A WDDM Driver	DirectX 9-class GPU A WDDM Driver

Minimum hardware requirements	Vista Home Basic	Vista Business or Vista Home Premium	Vista Enterprise or Ultimate (Geophysical workstation)
	Recommended.	Pixel Shader 2.0 32 bits per pixel Adequate graphics memory ¹	Pixel Shader 2.0 32 bits per pixel Adequate graphics memory ¹
Graphics Memory	64 MB or more. See note 1 for more details	128 MB or more for a single monitor ¹	At least 256 MB for a single monitor ¹
HDD	20 GB	40 GB	40 GB
HDD Free Space	15 GB	>15 GB	> 15 GB
Optical Drive	CD-ROM Drive	DVD-ROM Drive	DVD-ROM Drive

¹Adequate graphics memory is defined as:

- 64 MB of graphics memory to support a single monitor at 1,310,720 pixels or less
- 128 MB of graphics memory to support a single monitor at resolutions 2,304,000 pixels or less (1600 x 1400)
- 256 MB of graphics memory to support a single monitor at resolutions higher than 2,304,000 pixels (1600 x 1400)
- Graphics memory bandwidth, as assessed by Windows Vista Upgrade Advisor, of at least 1,600 MB per second.

If the GPU uses shared memory, then no additional graphics memory is required beyond the 1-GB system memory requirement; if the GPU uses dedicated memory, then 128 MB is required.

Vista Enterprise and Vista Ultimate with BitLocker Drive Encryption require a TPM 1.2 chip or a USB 2.0 flash drive.

For Vista hardware guidance, see

<http://www.microsoft.com/windows/products/windowsvista/editions/systemrequirements.mspx> and <http://support.microsoft.com/kb/919183>

III. Application and driver compatibility

Software and hardware compatibility is vendor-dependent. Please check your vendor or Microsoft's website for known compatibility issues.

Vista x64 still has some application and driver compatibility issues. For instance, Vista could not install a sound card driver on our test system.

We also found that we needed a newer version of antivirus software. Firewall, anti-spyware, and antivirus programs should be certified and marked as "Vista-ready" before they are installed.

We had no difficulty installing KINGDOM software on Vista 32-bit Business and Vista 64-bit Enterprise and it has run without any problems.

IV. Processor and Memory Support

Most Windows Vista product editions will be available in both 32-bit (x86) and 64-bit (x64) versions.

Vista allows a maximum of two processors, but the processors can have multiple cores. There has been some confusion about the difference between multiple processors and multiple processor cores. For example, both Intel and AMD are currently selling dual-core CPUs, and quad-core chips are on the way. While all of the Vista product editions support only one or two physical processors, none are limited to the number of processor cores they will support.

V. Networking Considerations

Vista has some known issues when networking with other operating systems. Vista sometimes has difficulty finding Linux or UNIX network shares published in a Windows domain through Samba. This is due to changes in security settings which require NTLMv2 Protocol by default. The problem has been identified by RedHat Linux. They do not have a fix at this time, but there is a workaround for the problem:

On the Vista workstation, run secpol.msc.

Go to: Local Policies > Security Options.

Find "Network Security: LAN Manager Authentication level."

Change the setting from "Send NTLMv2 response only" to "Send LM & NTLM - use NTLMv2 session security if negotiated."

NetApps has released a new firmware update that resolved the Vista networking problem.

VI. Vista Performance

Vista developers targeted I/O and memory management for improved performance, but test results have been inconclusive on the success of the changes. The new Superfetch feature allows the operating system to adapt to usage patterns and proactively put applications into memory. Our in-house testing, run on a 64-bit system, showed that CPU processing was faster than Windows XP Professional by 5 to 10%, but file IO was slower.

Graphics applications such as VuPAK suffer due to the lack of support for the OpenGL graphics library under Windows Vista.

Vista utilizes Direct3D to render OpenGL commands and does not support the full OpenGL graphics library. Support for native hardware-accelerated OpenGL (versions 1.5 and higher) is implemented through the video card driver. This means an up-to-date driver is critical for best performance.

For users with three or four monitors, simultaneously using graphics cards from multiple vendors will not work, because Vista only allows a single WDDM (Windows Display Driver Model) to be loaded at a time. Multi-card solutions from the same vendor should work because they will all be using the same driver.

When compared to XP, you can expect higher video memory usage and slightly worse video performance (approximately 10-15% slower) due to the Vista compositing engine. It is recommended that you disable Windows Aero to improve video performance.

VII. Summary

Pros

- The Vista UI adds cool features, such as the new Aero Glass interface, with its rounded, translucent windows and new Start button icon. Although the UI takes a bit of getting used to, it gives Vista a more modern feel.
- Vista also has an advantage over XP in the area of deployment. Vista deployment is radically different from XP deployment. Vista uses a file-based deployment image called Windows Imaging (WIM) that's much more flexible than XP's sector-based image deployment. Plus, Vista can now detect the hardware abstraction layer (HAL) dynamically, letting you use the same image for multiple hardware platforms.
- Vista clearly wins in the security category. Requiring users to have administrator privileges to effectively use Windows has been at the root of XP's security problem since day one. Vista's User Account Control feature promises to solve

that problem. Plus, Vista (finally) gets a two-way firewall and enhances security through BitLocker Drive Encryption.

Cons

- In Vista, Microsoft seems to have sacrificed software compatibility for security. Vista's security enhancements--while needed--make it difficult to install and run some software.
- Problems with networking Vista to non-Windows network shares require changes to system settings and troubleshooting.
- Overall, Vista is slower than XP. Users looking for more raw performance will be disappointed with Vista. Windows XP x64 still performs better in tests.
- Vista has higher CPU, RAM, and video requirements than Windows XP.
- High-performance graphics applications suffer from the lack of support for the OpenGL graphics library. Support for native hardware-accelerated OpenGL (versions 1.5 and higher) is implemented through the video card driver. This means an up-to-date driver is critical for best performance.
- Utilizing more than two monitors requires compatible video cards.

At this time, the best OS for running current SMT software is still XP Professional x64.

Although we have started using Windows Vista on some computers and find it to be stable and secure, we feel most users will be happier if they wait until there is more widespread software and driver support before upgrading. We would not recommend that SMT clients upgrade to Vista x32 or x64 just yet. Microsoft has targeted a Service pack for Vista in late 2007, which may fix some of the performance issues that have been observed.

Vista may be more secure and stable and may have a better user "look and feel," but it cannot perform out-perform Windows XP.

References

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