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Road Map

x64 Windows: A New Edge for OEMs

By Robert L. Scheier
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OEMs have gained new opportunities at the high end of the client and server markets with the release last month of the new 64-bit client and server versions of Windows®. Both [Microsoft® Windows® XP Professional x64 Edition](#) and the 64-bit versions of [Windows Server™ 2003](#) will bring **new performance levels to PCs and servers** built around x86-compatible microprocessors from Intel Corp. and AMD Inc., providing a compelling reason for customers to upgrade.

While power users will dominate the initial upgrade cycle, **even mainstream users will find it easy to migrate** to 64-bit systems for two main reasons: the low price premium chip vendors charge for 64-bit capable chips; and the fact that the new Windows OS will run 32-bit applications as well (if not better) than 32-bit processors.

The timing could hardly be better. In 2004, 64-bit capable processors from AMD and IBM made up less than 5% of desktop processor shipments. With volume shipments from AMD, IBM Corp. and Intel ramping up, that figure should rise to more than 50% this year, says Shane Rau, a PC microprocessor analyst at International Data Corp, Framingham, Mass.

At a Glance: 64-Bit Windows

- ▶ 64-bit data path increases data throughput
- ▶ Physical memory address space in clients increased from 4 GB to 128 GB
- ▶ Physical memory address space in servers increased from maximum of 64 GB to 1 TB
- ▶ Can run 32-bit applications as well, or better, than 32-bit Windows

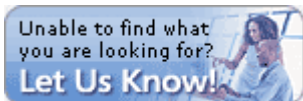
Source: Microsoft Corp.

OEMs can tap this market now by configuring 64-bit systems with the processors, memory and disk needed to exploit a 64-bit architecture.

Key selling points include ease of management (to steer high-end corporate users to more powerful Windows clients), and the positioning of 64-bit Windows servers as a **cost-effective alternative to existing 32-bit systems**.

Why 64 Bits are Better

The 64-bit architecture boosts performance by processing data 64 bits of data at a time, double the capacity of 32-bit systems. Even more important is the far larger memory spaces supported by 64-bit Windows. The more physical memory the operating system and applications can access, **the more complex applications the system can run** without slowing down as the system pages data to and from disk using slower virtual memory. Windows XP Professional x64 Edition supports up to 128 gigabytes of physical memory, compared to 4 GB on the previous 32-bit Windows client.



Meanwhile the 64-bit versions of Windows Server 2003 can address as much as 1 TB of physical memory, compared to a maximum of 64 GB in the 32-bit [Windows Server 2003, Datacenter Edition](#). Older 32-bit server applications that are memory-constrained **will also get a speed boost through an** emulator that allows them to run without modification, but faster than they did on the 32-bit Windows Server 2003.

Target Markets: Client

Microsoft sees **two major client opportunities** for Windows XP Professional x64 Edition: Customers running high-end technical applications on the desktop; and the consumer/influencer market.

High-end technical computing includes engineering work such as CAD/CAM, 3D modeling, analysis and prototyping; and digital content creation such as editing digital video and audio. These and other high-end workstation applications make up a **worldwide market of about six million PC users**, and it is a prime target for the new OS.

The memory boost is attractive for customers such as automotive designers, whose computer models can consume large quantities of memory. "A lot of these users did switch over to Windows a few years back because it's so much cheaper, but they've tended to be a bit memory-starved," says Gordon Haff, a senior analyst with Illuminata Inc., an industry analyst firm in Nashua, NH. "Those folks are going to be very enthusiastic about the **ability to access more memory**" with a 64-bit Windows client.

The very large data sets and complex applications used in this market often require robust system configurations with prices ranging as high as \$20,000 USD, with higher margins than lower-end PCs, says Brian Marr, senior product manager in the Windows client product management group at Microsoft. Typical systems include dual processors, 16 GB of RAM or more, one or more high-end graphics cards and 400-500 GB of disk storage. Because much of the data on these systems is often backed up on a separate storage device, Marr says OEMs have an **opportunity to bundle them with external storage or NAS** (network-attached storage) systems.

Because a 64-bit Windows PC can run both technical and office productivity applications on one system, Marr says OEMs can **reach out to new customers** "who are on proprietary, expensive workstations and have a second Windows PC just to do office productivity work like sending e-mail." Replacing those systems with a single PC lets the user run and update all their applications on a single machine. Reduced management costs are one of the main arguments OEMs can cite to customers who would otherwise consider Linux-based clients, says Marr.

Key Markets for 64-Bit Windows Clients

	High-End Workstations	Enthusiasts / Influencers
Typical applications	<ul style="list-style-type: none"> Digital content creation (3D modeling and animation, audio editing and composing, digital video editing, DVD authoring) Engineering (CAD/CAM/CAE, 3D modeling, simulation analysis and prototyping) Other vertical market technical applications (financial modeling, oil and gas) 	<ul style="list-style-type: none"> 3D gaming Feature-length video editing Storage, manipulation and sharing of large quantities of photos

Source: Microsoft Corp.

Beyond the technical computing niche looms the **much larger consumer/influencer market**, "and for some OEMs it is an easier one to tackle," says Marr. Power users are the most influential, savviest and most performance-hungry top 4% of the PC market. "These are customers who replace their PCs every 12 to 18 months, who typically give advice to other customers," says Marr. "They're probably doing editing of near feature-length video editing at home; they might be doing 12 to 20 hours of gaming per week. They'll do anything to push another couple of percent of performance out of their PCs."

Typical configurations for such users would typically include at least 2 GB of RAM and a 100 GB or larger hard drive, says Marr, with a price range in the neighborhood of \$2,000 to \$2,500 USD. Higher-end workstations for technical applications range in price from \$4,000 to \$5,000 USD on up, depending on the amount of RAM, the size of the hard drive, and other accessories purchased with the system, he says.

Target Markets: Server

The wider data paths and increased address space provided by the 64-bit versions of Windows Server 2003 will provide **significant performance improvements** for a variety of demanding applications. They include:

- Database applications (particularly online transaction processing, online analytic processing, data warehouse and business intelligence programs);
- Business applications such as ERP and CRM (the ability to support more users per server will help customers save money through server consolidation);
- Terminal Services (the increased memory to run the Windows kernel allows as many as 80% more users to be supported per server);
- Microsoft Active Directory (early customers report improved performance through larger available memory space, especially for data stores of more than 2 GB);
- Web serving (the 64-bit server improves reliability by reducing the amount of processing power required for cache recycling); and
- Technical computing (customers report significant performance gains, especially for high-performance computing clusters).

More than **300 applications are now, or will be, ported** to the 64-bit versions of Windows Server 2003. Among them: Oracle 10G, IBM DB2, SAP R/3 4.7E, BEA WebLogic and Citrix MetaFrame.


As the number of 64-bit applications continues to grow, OEMs should be able to **undercut pricing of more expensive high-end servers** while still keeping a decent profit margin for themselves, says IDC's Rau. Because of the competitive price/performance ratio of the new processors, a Windows OEM can offer roughly the same performance as a midrange server at about half the cost, he says. "If you're already saving them \$50,000 USD, they might be slightly more inclined to spend an extra \$10,000 to \$20,000 USD to deck out that PC server" with added memory, storage or other components that can boost an OEM's profit margins.

Top Six Markets for Windows Servers 2003 x64 Editions

1. Databases and Database Programs
2. Business Applications
3. Terminal Services
4. Microsoft Active Directory
5. Web Serving
6. Technical Computing

Source: Microsoft Corp.

Analysts agree the mass market move to 64-bit systems will speed up next year as the launch date

nears for the next generation Windows operating system now under development, code-named Longhorn. But until then, there is what Rau calls an **"island" of opportunity today** for those OEMs which know how to configure and target higher-margin 64-bit Windows systems. 

For More Information

[Windows XP Professional x64 Edition Overview](#)

[Windows Server 2003 x64 Overview](#)

[Overview: Benefits of 64-bit Computing](#)


[Windows Server 2003 x64 RC2 Customer Preview Program](#)

[Special Design Considerations for 64-bit Hardware Platforms](#)


[SQL Server 2000 64-bit Home Page](#)

[Webcast: Developing 64-bit Applications for Windows Server](#)

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About the Author

Robert L. Scheier is a freelance writer based in Boylston, Mass. He is the former technology editor at *Computerworld*, and previously was a senior editor at *VARBusiness* and *PC Week*. In addition, he was an analyst for The Hurwitz Group specializing in databases and middleware.

Have a question? Want more information? Contact the writers and editors at oemedit@microsoft.com.

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